ENS PIME 2000



# Transactions

## Case Studies, Discussion Documents, Posters, Videos

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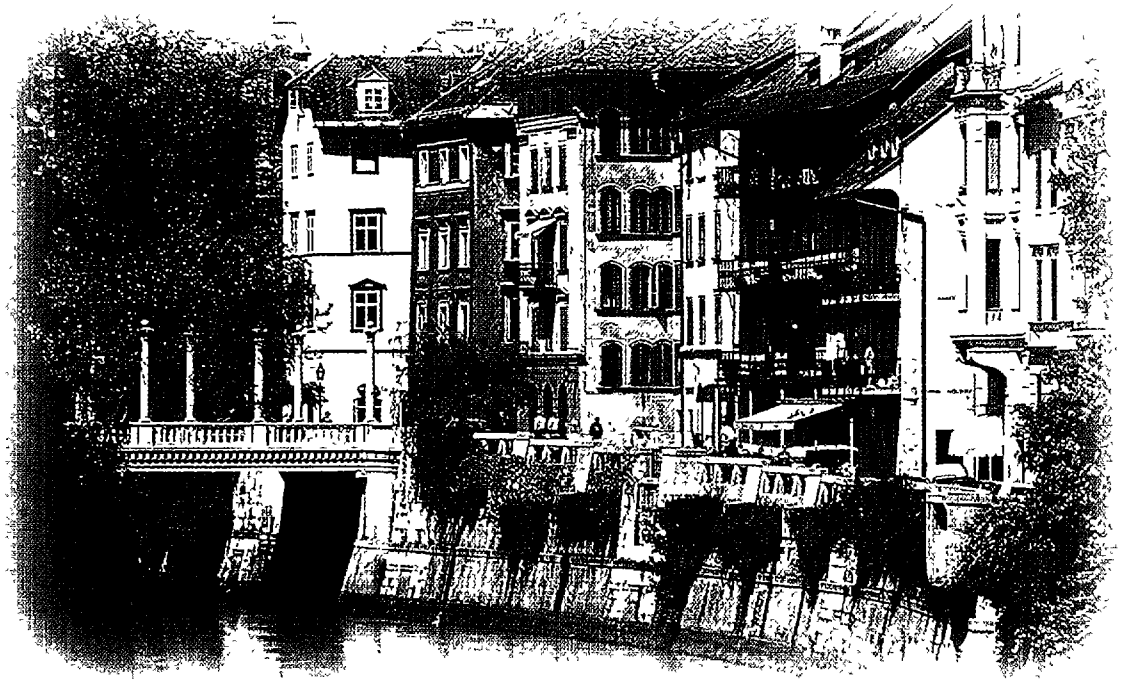

12th International Workshop on
Nuclear Public Information in Practice
February 13 to 16, 2000
Cankarjev Dom, Ljubljana, Slovenia
Organized by the European Nuclear Society
with the support of the Nuclear Society of Slovenia

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## EUROPEAN KEY ISSUES



## ACCESSION TO THE EUROPEAN UNION



## WORKSHOP: BUILDING AND MAINTAINING MEDIA RELATIONS



## CLIMATE CHANGE / COP5

## WASTE



## SITING NEW NPPS



## THE INES SCALE REVISITED



## HOW MUCH DO REGULATORS SPEAK TO EACH OTHER AND THE PUBLIC?

## HOW TO TARGET YOUR AUDIENCE



## ETHICS AND NUCLEAR ENERGY



## POSTERS

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# EUROPEAN KEY ISSUES

Angela Gey, Informationskreis Kernenergie, Results of an opinion poll:

## "Have public attitudes in Germany towards nuclear energy changed?"

When the Federal Government developed its phase-out scenario in the autumn of 1998, this was happening at a time in which the public debate about nuclear energy in Germany had waned and the anti-nuclear movement among the population had clearly lost much of its backing. Since the beginning of the 90s, the proportion of Germans referring to themselves as "opponents of nuclear power" has gone down from almost 19 % to only just 12 %.

This decrease has been particularly strong among younger Germans: While in 1990 29 % were still opposed to nuclear power, in 1999 this figure was only 17 %. Within the age group of 30 - 44 year-olds, 26 % were against nuclear power in 1990; today, it is only 16 %. As for Germans aged 45+, the number of nuclear-power opponents decreased within this period by around 6 % to a mere 8 %.

The issue of the "use of nuclear power", which used to be ideologically charged and discussed with great passion in Germany for a long time, has cooled off, so to say. Taking apart an ever decreasing minority of militant opponents, the issue is considered by the public in a more and more matter-of-fact way, with a rational balancing of advantages and drawbacks, chances and risks.

For many people, abandoning nuclear power has become a lesser personal priority over the past years, and the circle of those defining their ideological position especially by their attitude towards nuclear energy has become smaller - the passion with which this issue used to be charged has largely expired. In the cooler, more penetrating light of the prevailing new, sober way of looking at things, the militant protests against nuclear power have also been viewed with increasing criticism.

Correspondingly, there exist quite different views about the further use of this technology, and what the public wants especially in view of the planned phase-out is a prudent energy policy, based on a careful analysis of the consequences.

In contrast to this, a general discomfort has increased within the last months, triggered by the impression that the political line can at present hardly be discerned or calculated.

The overwhelming majority of Germans feel that this course is unclear and unsteady. At the same time, however, there is a widespread need for calculability and steadiness as well as for carefulness and caution in connection with political decisions of far-reaching consequences.

This aspect is one of the major points of the current opinion poll on the topic: **"Have public attitudes in Germany towards nuclear energy changed?"**, which is being carried out by the *Institut für Demoskopie Allensbach* on behalf of the *Informationskreis Kernenergie.*

Apart from this first major point, this poll is to find out which general course an energy policy should ideally take according to public opinion, along which lines such an energy policy should orientate itself, what is the place value of the principle of having an energy mix, and how much importance is attributed to sustainability.

Another focus lies on probing the knowledge of those polled in order to check to what extent the population assesses correctly the quantitative importance of nuclear power and alternative energies and how well it is informed about the potentials of different forms of energy.

<u>The specific points that are investigated are:</u>

- Which energy policy guidelines find the support of the population?
- How important does the population think is it to orientate an energy policy on the principle of having an energy mix and drawing energy from as many sources as possible?
- What does the population associate with the principle of a sustained energy policy?
- How far does it want a steady energy policy and long-term perspectives?
- Judgement of the current energy policy in general, and specifically of the policy concerning nuclear energy

- Basic position on nuclear energy
- Assessment of the advantages and risks of nuclear energy
- State of information regarding the importance of nuclear energy and that of other energy sources
- Assessment of the future importance of different energy sources
- Favoured line of a future nuclear energy policy
- Willingness to make sacrifices in return for a phase-out of nuclear energy
- Support for the continued development of reactor technology
- Place value of the argument that German expertise can contribute to higher safety standards world-wide
- Where does the population think lie the risks above all: in Germany, in Western or Eastern Europe, in Russia, in Asian countries, or in the USA?

The results of the opinion poll will be available at the end of January 2000, and the summary of its major findings will form the basis for the paper to be given at PIME 2000.

# Britain's Nuclear Energy Policy

**Colin D Duncan**
**Director of Public Affairs**
**BNFL**

In the mid 1980s the Labour Party's position and clear intention was to phase out nuclear generated power in the UK. BNFL's reprocessing business was singled out for particular criticism. Many argued that this sounded the death knell for an industry with a legacy of negative public opinion and no commercial future.

How against this background then was the Rt. Hon Tony Blair able, on 9 June 1999, to state that „If we were to question the continued operation of Thorp, I think that would not be right. Thorp is an operation with orders now valued at some £12 billion, it provides 6,000 skilled jobs, it indirectly supports many more... I do not support the case of those who would like us to abandon Thorp."?

Furthermore, in June 1999 the Royal Society stated that „it is vital to keep the nuclear option open" and in October of the same year the House of Commons Trade & Industry Select Committee went further and advised „ a formal presumption be made now for the purposes of long-term planning that new nuclear plant may be required in the course of the next two decades"

On 13 July 1999, the Secretary of State for Trade & Industry, Rt. Hon Stephen Byers, announced a possible sale of up to 49% of BNFL by a Public Private Partnership.

Dare we view this as the genesis of a nuclear renaissance for the United Kingdom?

This clear change in political attitude towards the nuclear option has come about as a result of a concerted public and government relations effort over the past ten years. That said, many barriers remain if we are to meet the challenge of delivering new nuclear build in the UK.

Public opinion may allow new build but only if the industry demonstrates a track record of safety and environmental stewardship. There will always be the „not in my back yard" argument so we must be a good neighbour and, most importantly of all, a long-term solution must be found for the disposal of nuclear waste.

If the stage is set for the nuclear renaissance, the industry's challenge is to deliver the climate in which this renaissance can happen.

## Making nuclear "normal"


Dr. Peter Haehlen, Secretary General, Swiss Association for Atomic Energy (SVA)
Dr. Bruno Elmiger, Head, Communications Department, Goesgen NPP

The mechanics of the Swiss NPPs' "come and see" programme 1995-1999 were illustrated in our contributions to all PIME workshops since 1996. Now, after four annual "waves", all the country has been covered by the NPPs' invitation to dialogue. This makes PIME 2000 the right time to shed some light on one particular objective of this initiative: making nuclear "normal".

The principal aim of the "come and see" programme, namely to give the Swiss NPPs "a voice of their own" by the end of the nuclear moratorium 1990-2000, has clearly been attained and was commented on during earlier PIMEs. It is, however, equally important that Swiss nuclear energy not only made progress in terms of public "presence", but also in terms of being perceived as a normal part of industry, as a normal branch of the economy.

The message that Swiss nuclear energy is nothing but a normal business involving normal people, was stressed by several components of the multi-prong campaign:

- The speakers in the TV ads were real – "normal" – visitors' guides and not actors
- The testimonials in the print ads were all real NPP visitors – "normal" people – and not models
- The mailings inviting a very large number of associations to "come and see" activated a typical channel of "normal" Swiss social life
- Spending money on ads (a new activity for Swiss NPPs) appears to have resulted in being perceived by the media as a normal branch of the economy.

Today we feel that the "normality" message has well been received by the media. In the controversy dealing with antinuclear arguments brought forward by environmental organisations, journalists nowadays as a rule give nuclear energy a voice – a normal right to be heard. As in a "normal" controversy, the media again actively ask themselves questions about specific antinuclear claims, much more than before 1990 when the moratorium started. The result is that in many cases such arguments are discarded by journalists, because they are, e.g., found to be irrelevant for readers.

The Swiss media's way of handling the contaminated irradiated fuel element transports and their politically delicate resumption in September 1999 after a 15 months ban confirmed the advantage of being treated as a normal industry, even in a peculiar situation, rather than being treated as a special case, even in routine conditions.

*Next double page:*
*Normal people – real NPP visitors and not models – encouraging the public to "go and see" as they did themselves. Advertisement published at the end of the four-year Swiss "come and see" programme.*

Über **1 Million** Schweizerinnen und Schweizer haben bisher die Möglichkeit genutzt, sich durch einen **Besuch in einem Kernkraftwerk** eine eigene Meinung zu bilden.

**Da vielerorts die Meinung vorherrscht, der riesige Kühlturm sei ein potentielles Gefahrenmoment, war es für mich ein spezielles Erlebnis, während des informativen Rundganges inmitten dieses Turms zu stehen. Kernenergie ist für mich vor allem in der Schweiz eine höchst saubere Energie und gar nicht wegzudenken.**

**Die Besichtigung des Kernkraftwerkes änderte mein Verhältnis zur Atomenergie. In der Vergangenheit wurden mit grossen Eingriffen in Natur und Lebensraum kleinere Kraftwerke gebaut. Heute werden auf kleinstem Raum enorme Mengen Energie hergestellt.**

**Um qualitativ gute Lebensmittel zu produzieren, brauche auch ich Energie aus Schweizer Kernkraftwerken, die einen hohen Sicherheitsstand vorweisen. Davon konnte ich mich persönlich überzeugen.**

1 Chiza Di Rosa | 2 Roland Löw | 3 André Zumbühl | 4 Ernst Landolt | 5 Erwin Probst | 6 Jakob Gisler | 7 Christa Goldoner | 8 Christina Ceresa | 9 Hold Apolloni | 10 Josef Manser | 11 Peter Kuster | 12 Luzia Betschmann | 13 Peter Bischof | 14 Madelaine Fischer-Lambrigger | 15 Alfred Stotz | 16 Doris Ferencz | 17 Claudia Schmid | 18 Odile Jaeger | 19 Christina Meier | 20 Urs Degen | 21 Vreni Trittbach | 22 Maurice Puippe | 23 Marianne Vogt | 24 Rosmarie Rüttimann-Krucker | 25 Stéphanie Dousse | 26 Paul Camichel | 27 Silvia De Luca | 28 Bruno Stüssi | 29 Denise Sapin | 30 Daniela Lurati | 31 Gerhard Heim | 32 François Joannerot | 33 Suzanne Buffat | 34 Pierre David Candaux | 35 Janou Coderey | 36 Roberto Algisi | 37 Jean-Pierre Berger | 28 Jean-François Chappuis | 39 Anne Eperon | 40 Monique Praymond-Bouquet | 41 Philippe Wiblé | 42 Andreas Furgler

▲ Als Künstler und Grafiker brauche ich täglich Strom. Ich wollte wissen, wie Strom hergestellt wird, und habe deshalb ein Kernkraftwerk besucht. Meiner Meinung nach wird der Strom unter den grössten Sicherheitsmassnahmen produziert.

▲ Der Besuch im Kernkraftwerk Gösgen war sehr lehrreich. Bezüglich der Sicherheit der Schweizer Kernkraftwerke habe ich nun weniger Bedenken. Es ist nur zu hoffen, dass das Ausland auch dieselben Massstäbe setzt. Die Probleme mit der Entsorgung der Abfälle scheinen mir jedoch noch nicht definitiv gelöst zu sein.

Ich habe während einer Führung durch das Kernkraftwerk die Sicherheitsmassnahmen kennengelernt und war sehr beeindruckt. Die Zuverlässigkeit der Spezialisten hat mein Vertrauen in die Kernenergie verstärkt. ▸

**Wenn auch Sie sich an Ort und Stelle Ihre eigene Meinung bilden möchten:**
Kernkraftwerk Leibstadt 056/267 72 50 | Kernkraftwerk Gösgen 0800 844 822
Kernkraftwerk Beznau 056/250 00 31 | Kernkraftwerk Mühleberg 031/330 51 25
Internet http://www.atomenergie.ch

SCHWEIZER KERNENERGIE
TÄGLICH STROM

# THE BRITISH NUCLEAR INDUSTRY FORUM'S PUBLIC AFFAIRS CAMPAIGN

## SYNOPSIS OF PRESENTATION TO PIME 2000

KEITH PARKER
DIRECTOR OF COMMUNICATIONS AND PUBLIC AFFAIRS, BNIF

In March 1999, BNIF launched a public affairs Campaign with the objective of influencing the views of opinion formers – particularly in the political field – about the case for nuclear energy as a long-term, sustainable component of the UK's energy mix.

The Campaign was launched to BNIF's 70 member companies under the slogan, *Profiting through Partnership – By Changing the Climate of Opinion.* That slogan was chosen to emphasise a key feature of the Campaign approach, which is the importance of an industry speaking collectively with one voice, but with each individual company actively playing its part by spreading the industry's messages to their own local and regional audiences – Members of Parliament, local politicians, local media – to build a groundswell of support for the eventual renewal of nuclear energy in the UK. Our aim was to place the prospect of a new nuclear power station firmly on the political agenda during the lifetime of the next Parliament – that is, in the period 2002-2007.

The Campaign was launched at a time when a few encouraging signs were emerging of a growing recognition in Government, Parliament, and in academic and scientific circles that nuclear energy has an important role to play in meeting the energy and environmental challenges of the 21st century. The challenge, in particular, of climate change and the UK Government's commitment to reduce greenhouse gas emissions undertaken at Kyoto and in its election manifesto, gave the industry a strong, positive issue on which to campaign. However, we fully recognised that to make a convincing case for nuclear energy we would also have to address the issues of concern and doubt in the minds of the public and politicians – economic competitiveness, waste management, transport and decommissioning.

During the year, BNIF produced a range of Campaign materials, made submissions to several Government and other inquiries and consultations, organised events, meetings and discussions, all with the view of promoting a balanced and persuasive case for nuclear energy and the achievements of the nuclear industry. There are indications that the messages are being heard and acknowledged by those whose opinions and decisions could determine the future shape of energy and environmental policy. There is, though, still a long way to go to change the prevailing climate of public and political opinion towards nuclear energy.

Despite some modest successes in the first year of the Campaign, the degree of support and active involvement BNIF had hoped for from its member companies has not materialised. Therefore, the ways in which BNIF has sought to orchestrate the delivery of the Campaign will need to be reviewed and revised.

# ACCESSION TO THE EUROPEAN UNION

## Experience of Bohunice V-1 NPP

*Dobroslav Dobák - Foreign Affairs and Public Relations Manager*
*Slovenské elektrárne - Bohunice NPPs*

**Although it is not simple, I will try to explain the role or perception of politics of Bohunice V-1 NPP.**

Slovakia remains significantly dependent on imports of primary energy sources, which represent as much as 80% of the demand. Of the total consumption of electricity in Slovakia, 40% was generated in nuclear power plant units in 1998.

Slovakia operates 6 units with VVER 440 nuclear reactors. The first two units, known as Nuclear Power Plant Bohunice V-1 are a subject of interest. They use first-generation pressurised water reactors, model VVER 440/ V-230, unit 1 having been put into operation in 1978 and unit 2 in 1980. Units three and four, formed Nuclear Power Plant Bohunice V-2, work with second-generation reactors (model VVER 440/V-213). The units were put into operation in 1984 and 1985, respectively. The same type of unit has been in operation at Mochovce since 1998 and 2000.

**Slovakia is the signatory of all important international agreements and conventions in the field of nuclear energy, and its legislation is in an advanced stage of approximation to European Union law.**

This is a very important aspect, showing Slovakia´s approach to nuclear safety.

In 1993 Slovakia accepted the commitments of the UN Convention on Climate Changes, including a reduction of greenhouse gases to 1990 levels by the year 2000. Moreover, as an internal target Slovakia has set the reaching of the „Toronto Objective", i.e. 20% reduction in $CO_x$ emissions through the year 2005 as compared to 1988. In our opinion, this is not possible without nuclear energy.

We, in Bohunice, are technically competent. We have been taking care of the equipment since the construction period. The former Czechoslovakia was an industrially developed country with a very high standard of education, knowledge and skills. In the period of V-1 NPP construction, the status of country's industry allowed the NPP design realisation as a combination of delivered Russian components, mostly for the primary circuits and of Czechoslovakian components - nearly complete secondary circuits and also some components of the primary circuits. The capacity has continued during the operation period and, in spite of opinion of some experts in the West, we have been improving the safety level of the VVER 440 / V -230 type to an internationally acceptable level.

Time has shown, that the political aspects are more powerful, especially if you underestimate their importance over the than the technical ones.

In the case of Bohunice V-1 NPP the political aspects were on the following levels:

1. Slovak republic (Czechoslovakia), political changes, decisions of the government
2. European Union - Agenda 2000, Accession criteria, nuclear safety criteria, EBRD
3. Austria as a neighbouring country

***Historical overview***

**1989** - change of political system in former Czechoslovakia. One of many changes was also openness in questions of Nuclear Safety. More intensive exchange with western countries has been started. Western experts visited our units and didn´t find the same technology as they have at their units. Our experts started to accommodate „western style / approach to work.

**1991** - Decision No.5/91 of CSKAE / former Czechoslovak nuclear safety authority/ - requiring implementation of improvements in defined areas at Bohunice V-1 NPP - so called „Small Reconstruction" of V-1 NPP was issued. It was based on previous experience, analyses, calculations and safety missions´ results. A number of technical modification at these units was performed before this decision.

**1991 - 1993 - Bohunice V-1 NPP „Small Reconstruction"** preparation and realisation followed. Approx. Costs were 80 MUSD, financed by the operator itself. I will not mention the technical extend of the programme.

**1992 - G-7 Summit in Munich** - NPPs with VVER 440 / V-230 and RBMK type of reactors were by some western experts, without deep analyses and maybe knowledge of the design, declared not to be safe enough and that it is not possible to improve them at reasonable costs. In my opinion it was very clearly said in the Foratom's statement of December 15-th, 1999 - „...largely based on fears in the wake of the 1996 Chernobyl accident." The first part, saying that the units are unsafe is still used in opponents argumentation. The rest about improvement possibility is naturally left out.

**01.01.1993** - split of Czechoslovakia - creation of **independent Slovak republic**, connected with creation of new state authorities, especially of independent Nuclear Regulatory Authority of the Slovak Republic reporting directly to the government. Importance of nuclear safety for Slovakia was clearly stipulated and the NRA started development with IAEA and US NRC support. **Nowadays the authority itself and the system of nuclear material supervision, including the legislation in Slovakia is given as an example for other Middle and East European countries.**

**1994** - Decision of Slovak government of Bohunice V-1 NPP shut down after the completion of Mochovce NPP in case of EBRD financial help.
**The loan from EBRD was not realised !**

Again one argument, which is used by domestic opponents mostly, but only a part taken out of the whole truth.

**1994** - Decisions No.1/94 and 110/94 of NRA SR requiring SR requiring implementation of measures in indicated areas were issued.
Preparation of "Large reconstruction" has started with the Basic Design. Due to operational and financial needs it was decided to realise this large amount of work in steps - during extended refuelling periods mostly and the programme was named **„Gradual upgrading".**
Realisation started in 1996 and will be finished in June 2000
Estimated costs are 230 MUSD, financed again from the sources of the owner - Slovenské elektráne,j.s.c.
The purpose of the gradual upgrading is not only the replacement of out-of-date equipment for new, qualified and up-to-date, but also extensive changes and strategy and automatic function improvement in order to meet requirements of internationally accepted standards and regulations.
I will not list the systems within which the measures are being taken.

The Gradual upgrading carried out to this extent will considerably change V-1 NPP against the original design and V-1 NPP will reach an internationally acceptable safety level.

**1995** - Nuclear Safety Convention was ratified by the Slovak Republic, where, from the nuclear safety point of view the only valid international requirements are defined.

The Bohunice V-1 NPP upgrading process is transparent and open to international practice. It can be proved by world-wide record number of international missions and assessments, which were performed at our units. Starting with year 1990, **23 expert missions** took place at Bohunice V-1 NPP by now.

***The following safety review missions have been conducted on the Bohunice V-1 units:***

1. IAEA Fact Finding Mission, Sept. 3 - 7,1990; the objective of the Mission was to document safety measures taken to improve safety of operation of units 1 and 2 throughout their operation time: operation control, facility improvements, staff training, and control and testing activities.
2. Mission of the Siemens company to assess the project and safety level, August - November,1990. Based on deterministic assessment of the project and safety level, the group of experts provided recommendations for safety improvements; they were accepted by the operator, and included in the Small Reconstruction" program.
3. Commission of the CSFR government and Federal Ministry of the Environment - August - September,1990. The aim was to asses the current status of nuclear safety of V-1 units and to review

the impacts and possibilities to resolve the energy situation of Czechoslovakia if a need should occur to immediately shut down V-1 units because of insufficient safety. Based on the report, CSKAE conducted a comprehensive assessment of V-1 units current condition. The reports clearly stated that there was no need to immediately shut down the power plant, in spite of certain deficiencies, in particular concerning V-1 design. CSKAE issued the Resolution No.5/91 to change approvals on permanent operation of both units, issued by CSKAE in 1980 and 1981, and it regulated the further operation of the units. The operation of the units is now subject to annual approvals based on the progress of upgrading. In addition, the necessary safety improvements to be implemented were defined.

4. Austrian Expert Commission, August - October,1990. The objective of the Commission's visit was to collect information on V-1 unit's safety and to recommend to the government of the Republic of Austria how to further proceed in negotiations with the CSFR government.

5. IAEA ASSET (Assessment Of Safety Significant Events Team), October 1-12,1990; the objective was to review the accident (operation events) prevention concept, to assess the adequacy of measures taken, and to recommend areas for improvements. All events have been reviewed which occurred since the start of operation of the units, and safety significant events were identified. Any of the events, as stated, had no radiological impact on the environment. The activities of the Breakdown Commission for Investigation of Nuclear Installations Events as well as the measures taken immediately were considered adequate. Recommendations were extended for improved process efficiency as well as for quality assurance, staff training and design improvements.

6. IAEA Safety Review Mission, April 7 - 26,1991 within the IAEA VVER-440P230 Nuclear Power Plants Safety Program, in the framework of which the first conceptual review of these units has been performed in February, 1991. This was followed by missions to the individual power plants. The objective of the program was to review the design and the operation, considering specific conditions of the power plant, and to formulate recommendations (classified into four classes according to their safety significance) which were expected to assist in decision-making concerning the achievement of a higher safety level. The safety significant problems identified during the missions were incorporated into the document TECDOC-640. The approach of the operator who develops its own plan to deal with the issues identified, was positively assessed as a good practice in safety culture.

7. IAEA Safety Review Mission in Relation to the Design of Seismic Upgrading for Bohunice NPP, September 2 - 6, 1991; the objective of the mission was to review criteria and design documentation developed for seismic upgrading of V-1 and V-2 units. The mission appreciated the high professionalism of the staff involved in the seismic upgrading project, and suggested recommendations concerning structures, systems and components the application of which would secure safe shut-down of the power plant and its maintaining a safe condition after an earthquake.

8. IAEA Safety Review Mission, April 27 - 30,1992; the objective was to review the implementation of the recommendations and suggestions of the preceding mission (April, 1991) and to evaluate activities performed in response to the Technical Report of the mission. Also, the Report contained an evaluation concerning safety issues identified by IAEA and published in TECDOC-640 document and their degree of implementation under the Small Reconstruction. The Mission Report considered the activities of the power plant a satisfactory progress, and numerous safety- related issues were considered as eliminated.

9. IAEA Seismic Safety Review Mission Relating to the Seismic Upgrading of Bohunice NPP, May 5 - 7,1992; the objective of the Mission was to check the implementation of the recommendations of the preceding Mission of September, 1991, to review the implementation of works relating to the seismic upgrading project of V-1 units. It was stated that the seismic risk of the V-1 power plant has been substantially reduced due to the previous upgrading works, and recommendations were extended concerning problems identified during the receding review, and issues were pointed out accordingly.

10. IAEA Seismic Safety Review Mission Relating to the Seismic Upgrading of Bohunice NPP, April 5 - 8,1993; the objective of the Mission was to review the project and the implementation of V-1 units upgrading works as recommended by preceding IAEA Missions (September 2 - 6,1991 and May 5 - 7,1992) The Mission Report appreciated the volume of works done to seismically upgrade both units, and pointed to the need to continue dealing with issues identified by the preceding Missions.

11. IAEA Peer Review Mission to Review the Probabilistic Assessment of V-1 Units Safety Study, March 8 -12,1993; the first review stage has very positively assessed the extent, organization, quality assurance, identification and grouping of initiation events, development of event trees of the Level 1 Probabilistic Safety Assessment Study, and defined certain issues to be dealt with in the next steps. The Level 1 PSA Study was developed in cooperation of the operator with the company Electorate Engineering Services, United Kingdom.

12. IAEA ASSET (Assessment of Safety Significant Events Team Follow-up Mission), July 5 - 9,1993. Its objective was to review the implementation of recommendations of the ASSET 1990 Mission and of

those of the ASSET Advisory Group meeting of July,1991, to identify the efficiency of the Conception of the prevention of power plant operation events since 1990, and to extend further recommendations to improve event prevention efficiency. The Mission Report has appreciated the energetic response to the preceding recommendations, and noticed significant progress in the safety improvements of both units. Extensive plans of safety improvement were highly commended, and continuous taking of measures has been recommended, the implementation of which could not be completed due to their significant time-consuming nature.
13. IAEA Small Reconstruction" Assessment Mission, July, 1993. The Report has stated that a significant progress had been achieved with respect to the definition and implementation of safety improvements since TECDOC-640 was issued. At the same time the need was pointed to revise the strategy and safety implications of suggestions on the "main reconstruction program".
14. The IAEA Site Safety Review Mission to Review the Design Basis Seismic Input for Bohunice and Mochovce NPP Sites - October 18 - 22,1993. The aim was to assess data and methods used in determining the impacts of design earthquake and to provide recommendations for further activities in the seismic upgrading area.
15. Review of the Leak Before Breaking Concept Application to the Bohunice VVER- 440/230 NPP, consultation meeting; February 28 - March 2, 1994. The aim was to evaluate LBB analyses conducted, consequent changes in equipment and application, as well as the general adequacy of the LBB program to meet the set safety requirements. The technical aspects and the LBB concept programs were assessed as suitable, and the resufts of the analyses conducted have provided evidence for meeting the criteria ;and that, some unavoidable project adjustments have been made. Operation control programs conceming the main circulation pipe are adequate.
16. IAEA Peer Review Mission to evaluate PSA NPP V-1 Study, February 28 - March 11, 1994. The final evaluation continued the preceding March 1993 Mission. Two PSA models have been reviewed: PSA Level 1- before and after small reconstruction including intemal fires and floods. It has been stated that the method, technique and PSA data used follow standard practices as recommended by IAEA Guidelines.
17. A seminar organized by NRA SR in cooperation with IAEA to evaluate embrittlement and baking of the VVER 440 reactor pressure vessel (RPV) - March 29- 31,1994. The aim was to discuss issues of the integrity of VVER-440/230 reactor pressure vessels, the previously taken measures, ongoing activities and plans for the future. The evaluation report of the workshop contains recommendations with respect to RPV integrity of this reactor type.
18. Consultation Meeting on Safety Improvements to WWER-440/230 NPPs - September 26- 30,1994, Vienna. The meeting reviewed the previous resutts of the dealing with safety problems of VVER-440/230 units identified by the preceding missions, and updated the IAEA database of the status of the problem solving at the various power plants. It is evident from the assessment that among all the units, the best progress in safety improvements had been achieved at the Bohunice power plant.
19. IAEA Safety Mission to Slovakia: Seismic Safety Review for Bohunice and Mochovce NPPs - October 31- November 4,1994. The aim was to review the tectonic stability of the subbase and to review the design parameters of earth movements for the Bohunice and Mochovce NPPs. This mission was a continuation of the October 1993 mission, and it provided recommendations for further proceeding.
20. IAEA Technical Safety Review Mission - May 6- 8,1996- the aim was to update information available to IAEA on the implementation of safety improvements and to review activities of the power plant with respect to safety problems resolution (both operating and design problems) identified by the preceding missions. The mission has stated that all safety measures contained in the IAEA TECDOC - 640 document concerning design and operation improvements had been reflected in the V-1 NPP reconstruction program.
21. IAEA Gradual Upgrading Review Mission - June 15 -19,1998 - a continuation of the 1991 - 1996 Safety Review Missions. The Mission's focus was on the evaluation of the implemented and/or planned modifications of NPP V-1 units under the gradual rehabilitation program, in particular from the aspect of the dealing with the safety significant problems of the VVER 440/230 units defined •n the TECDOC 640 document. The Mission appreciated the previous approach as well as the further implementation of the safety upgrade program as far as the scope and the adequacy of the measures are concerned. The Mission also defined certain recommendations, including an invitation for an IAEA Mission which would comprehensively assess the treatment of safety significant problems after the completion of the gradual rehabilitation program beyond 1999.
22. World Association of Nuclear Operators Peer Review took place at V-1 NPP, October 22 - November 6.
23. Western Europe Nuclear Regulatory Authorities mission to Bohunice V-1NPP, October 12 - 14, 1999

Things have moved rapidly in the last two years.

**1998** - Parliamentary elections in Slovakia resulted in a new Parliament and government creation. The new government has started active negotiations with EU - an High Level Working Group between EU and Slovakia was established.
In the frame of HLWG a Joint EC - Slovakia Group on Nuclear Energy was working, where the highest concern was the operation of Bohunice V-1 NPP. It resulted in
5 options of Bohunice V-1 shut-down dates.

*Frankly said, at the end it was not the nuclear safety, which should have been a priority, but the electricity production capacity of Slovakia and its future role in the common European market - whether we will be importing electricity or, what is not expected by EU, exporting electricity.*

**1999** In April a Decision of Slovak government was issued about further operation of Bohunice V-1 NPP. It has cancelled the Decision from 1994.
The only criteria for further operation should have been Nuclear safety, which is supervised by NRA SR.
**It was fully in compliance with EU policy, each country is solely responsible for its energy sector and for nuclear energy use.**

***Our satisfaction lasted not too long. Following negotiation with EU on the highest political level, driven by willingness to be invited for negotiation of accession on the Helsinki Summit, the Slovak government decided on September 14th.on Bohunice V-1 Units shutdown in 2006 and 2008.***

My paper is already long enough. I did not mention the often used **"European nuclear safety criteria"**. In short: **They don't exist!**

We, in Bohunice have used all international recommendations and our results were highly quoted at the following events:

**IAEA**

- April - Meeting of contracting parties to Convention on Nuclear Safety
- May - Final Report of the Programme on the safety of VVER and RBMK NPPs
- June - Conference on Nuclear Safety in the Middle and East European Countries

There are unless two activities, both on a voluntary basis - WENRA´s assessment of some aplicants countries NPPs / Bohunice, Kozloduj, Ignalina and another activity trying to define safety criteria for NPPs / large producers and operating utilities are involved in.

As far as there is not a unique legislation in this area existing in EU, it cannot be an official item of the accession negotiation.

# Political discussion in Western Europe on the future of Russian-designed NPPs in reform states

*Wolfgang Breyer, Siemens AG, Power Generation Group (KWU)*

Over the last decade, the debate on nuclear power in Western Europe centered on the future of the nuclear power plants of Russian technology in the former East-block countries. The topic has got additional fuel by the current talks between the EU and the accession candidates.

At stake is, however, not only the extent of nuclear power generation in reform states but also the role of nuclear power in the West or, more specifically, in Western Europe.

## Chernobyl changed the world for nuclear power

The Chernobyl catastrophe of 1986 created a severe credibility gap for the proponents of nuclear power – governments, utilities, manufacturers, reactor safety institutes – in East and West alike. In the East, because the political system had failed, and the lack of safety culture had become apparent. In the West, because it seemed to prove that a catastrophic nuclear accident was more than a mere hypothesis. If it had happened in the East, why shouldn't it also happen in the West?

Green parties and anti-nuclear NGOs recognized their chance to deal a deadly blow to nuclear power. They demanded not only the immediate shut-down of „the dangerous reactors in the East„ which they called „ticking time bombs„, but also a stop of all NPP construction in the West and a short-term phase-out of nuclear power altogether. At the beginning of 1986, there was a total of 163 NPP units under construction, 46 of which in Central and Eastern Europe, 45 in Western Europe, 47 in the Americas and 25 in Asia. At the same time, there were 355 nuclear units in operation around the world, representing an installed capacity of 263 000 MW.

It couldn't surprise that the principal interest of the Western countries was to save their own nuclear power programs. To this end, a second nuclear catastrophe like the one at Chernobyl had to be prevented by all means. As early as September 1986, a safety conference was held in Vienna in order to study the causes of the Chernobyl accident and to establish early-warning and emergency assistance agreements. Many politicians demanded the shut-down of all RBMK and first-generation VVER plants (type V230) „as soon as possible„. The re-united Germany examined the feasibility of safety-upgrades for second- and third-generation VVERs which had been under construction in East-Germany at the time of re-unification. Contrary to what certain NGOs continue to claim, it was found out that the plants could be brought to (West-) German safety level at acceptable cost. Nevertheless the projects were finally abandoned because no investor was ready to shoulder the re-licensing risk, given the fact that a most modern plant was blocked - and continues to do so since more than ten years - by a series of court processes for formal mistakes in the licensing procedure.

## Nuclear power in Western Europe regains public acceptance

The negative judgement on RBMKs and first-generation VVERs by Western governments and their safety institutes greatly contributed to reestablish credibility with the Western public. While during the first months after the Chernobyl accident public opinion in the West

was highly emotional, with a lot of media involvement beating the drums of fear and voicing doubts on the safety of Western plants, it was, later on, recognized that there were very significant differences in actual plant safety and particularly in safety culture. In discussing real and perceived safety deficiencies of Russian-design reactors, Western safety standards were taken as the unquestioned yardsticks. As a matter of fact, no power plant in the West was closed and not a single construction project was stopped as consequence of a Chernobyl-induced political decision. Opinion polls showed that a comfortable majority in Western countries again supports the continued operation of existing plants. On the other hand, no new project was initiated after 1986 in Western Europe or the Americas.

**Western assistance serving Western interests**

The collapse of socialism in the Comecon countries in 1989 and 1990 paved the way for openness and cooperation between countries that had for decades belonged to antagonistic blocks. The new democracies looked to the West for help in reforming their economies and their administrative structures. The EU set up its PHARE and TACIS assistance programs. Individual countries started bilateral programs. One of them was Germany which had benefitted so much from the political turn-around by achieving re-unification. Following a German initiative, the G7 summit in Munich in June 1992 agreed on a multilateral Action Program for improving the safety of Russian-design reactors in Central and Eastern Europe.

In its diplomatic language, the Communiqué made clear

- that assistance for short-term improvements for RBMKs and first-generation VVERs would be conditioned to commitments to a shut-down "as soon as possible" and

- that assistance for safety upgrades of newer plants would require safety studies and analyses of energy policies, energy alternatives and financing. World Bank and EBRD were put in charge of this.

In this way, the G7 governments created very strong stumble-stones to an efficient cooperation because it interfered with the energy policies of sovereign states and established complex administrative procedures. Above all, it failed to strike a balance between the interests of the G7 countries with those of the reform states. As a result, almost 8 years after the Munich G7 summit, both sides have reasons to be disappointed: None of the reactors marked "the most unsafe ones" has been closed, and none of the newer plants has been upgraded in the framework of EU or EBRD credits. However, it is highly likely that EU funds will be made available for upgrading Kosloduy 5 and 6, and it is hoped that EBRD and other credits will contribute to the completion and upgrading of Rovno 4/Khmelnitski 2. But the only upgrading projects that have been or are being implemented so far, i. e. Mochovce 1+2, Paks and Temelin, were financed privately.

**Western European NGOs oppose saftey upgrades in reform states**

It should be noted that the G7 program met with strong opposition by anti-nuclear NGOs. In advance of the summit meeting of 1992, for example, 11 German NGOs had formed an "Anti-Atom-Forum" that rejected any safety improvements of Russian-designed reactors, demanding their immediate shut-down and a complete restructuring of the energy sectors of the reform states, favoring energy efficiency and regenerative energy sources. They called the Action Program a "survival program for the starving Western nuclear industry". In the following years, two German NGOs, namely BUND and the German section of IPPNW, launched a boycott campaign against Siemens in order to pressure the company to give up its nuclear activities. It had no measurable effect because the organizations evidently failed to convince major segments of the public that it served their interests if Siemens refrained

from servicing existing plants in the West and from upgrading plants in Central and Eastern Europe.

In implementing its Action Program, EU and EBRD followed consistently their goal of promoting the early closure of RBMKs and first-generation VVERs. In exchange for assistance in safety reviews at Kozloduy 1 + 2, they made Bulgaria promise to close all four V230 units by 1998. During the negotiations in 1995 on financing the completion of Mochovce 1 + 2, the Slovakian government announced the intention to close down Bohunice 1 + 2 after Mochovce having become fully commercial, but in the year 2000 the latest. The German government explicitly referred to that commitment of Slovakia when approving Hermes export credit coverage for Siemens's participation in the safety upgrades of Mochovce. In late 1995, a "Memorandum of Understanding" was signed with Ukraine on the closure of the remaining units at Chernobyl by the year 2000 in exchange for assistance in modernizing the Chernobyl-4 shelter and in improving the energy sector of the country including the completion of Rovno4/Khmelnitski 2.

**Focusing on shut-down dates**

Later on, their respective counterparts recognized they were paying to high a price regarding the failure of the West to speedily and efficiently assist them in solving their problems. Therefore, all the units mentioned are still operating, and regarding Chernobyl it is uncertain whether the 2000 deadline will be maintained.

A new round was started with the "Agenda 2000" of the EU, i.e. the invitation of reform states to join the EU. One of the conditions layed down by the EU in this 1997 document is that all NPPs operating in those states that want to be admitted have to achieve Western safety standard within 7 to 10 years. In this context, shut-down dates for VVER V230 units are again on the agenda. This time, EU negotiator Günter Verheugen is more flexible than the EU and its member governments in the past. It looks as if Kozloduy 1 + 2 would be closed before 2003, and shutdown dates for Kozloduy 3 + 4 would be fixed in 2002 in the context of an updating of Bulgaria's energy strategy. Slovakia has accepted to close Bohunice 1 + 2 by 2006 and 2008 respectively. Lithuania agreed to close unit 1 of its RBMKs at Ignalina by 2005 and to fix a date for unit 2 in 2004, probably the year 2009.

As yet, it is not clear what the requirement of "Western safety standard" will mean for the other NPPs operating in reform states. Some plants mentioned before have undergone or are undergoing major moderization programs bringing them to Western safety level. WENRA, the Western European Nuclear Regulators Association, has been put in charge of analysing the safety level of all plants in EU accession candidates. The first report, published in March 1999, has met strong criticism regarding some of their findings and is being reviewed.

One of the EU member states finds it hard to accept new members that do not share its anti-nuclear course. I am referring to Austria which promotes the concept of a "nuclear-free Central Europe" but is neighboring six countries operating NPPs, four of them being accession candidates, the other two being Germany and Switzerland. Austria has a track record of unsuccessful fights against the NPPs being operated and under construction in the Czech and Slovak republics, Slovenia and Hungary.

While 8 of the present 16 EU member states operate NPPs, 7 out of 13 accession candidates have nuclear power in their energy mix. Europe is, indeed, far from phasing-out nuclear.

# WORKSHOP:

# BUILDING AND MAINTAINING MEDIA RELATIONS

# Why do we act like Calimero, when facts say we could be Superman?

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**Introduction**

Nuclear Energy is subject to constant attacks from different opponent groups. They have managed to make negative public opinion, which tends to minimise the importance of that energy production sector and create a feeling, that in the near future this will cease to exist. Much too often we, nuclear professionals, are also subject of that propaganda and are even by ourselves pessimistic about the future of our industry.

By constant delivering of subtle messages opponents of nuclear energy have managed to create very negative opinion about anything nuclear among general public. And we, nuclear professionals, are also joining it! We ourselves are becoming convinced that our industry is in deep troubles and that in the future it will be even worse. We are telling to young people: "Well, maybe nuclear really is not very promising, but would you not consider choosing it for your career anyway?" We ourselves are making negative opinion about us. And that may eventually achieve the goal of our opponents - kill nuclear.

But facts are talking differently. In this paper I have tried to summarise the actual data about the history of nuclear energy production, the current status and the future. At the Nuclear Training Centre in Ljubljana we have created a database about all the nuclear power plants around the world. We have used almost all publicly available sources and have tried to create some additional analytical data out of that collection.

**The history of energy production**

If you ask a question: "What are fastest growing primary energy industries in the World?" probably most of people would be reluctant to mention nuclear among them. I have taken data from BPAmoco[I], published at http://www.bpamoco.com/worldenergy/. Figure 1 presents the growth for the period 1988-1998 for the whole World. It is evident that the growth of the nuclear is the fastest.

Of course nuclear is not covering the major share of primary energy supply. Nuclear share has increased from 6,45 % in 1988 to 7,39 % in 1998.

**The future**

To make a prediction for the future developments of the use of nuclear power we have created a database containing data about each commercial nuclear power plant in the world. We have used most of publicly available sources, most of them from Internet (IAEA[II], INSC[III], NucNet[IV], UIC Newsbriefs[V]). From the beginning this task seemed to be simple and straightforward, but later it turned out that available data are surprisingly unreliable. Even data about the electrical power for each reactor could differ for several tens of MW at different sources. So we have decided to carefully follow developments in the industry at various sources and update our database permanently. We are trying to achieve as accurate data as reasonably achievable (could we call it AAARA?).

Our prediction for future installed nuclear power is based on the following:

- 40 years life time for western power plants unless other information is available for individual plants
- 30 years life time for WWERs and RBMKs
- operating plants, plants under construction and firmly planned plants are taken into account
- uprating is not taken into account

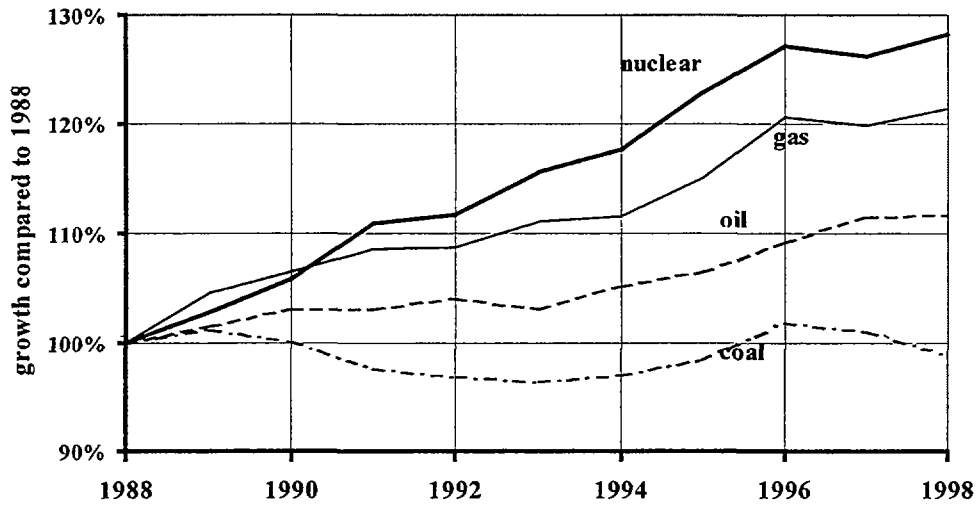


Figure 1: World relative growth of major primary energy consumption - BPAmoco

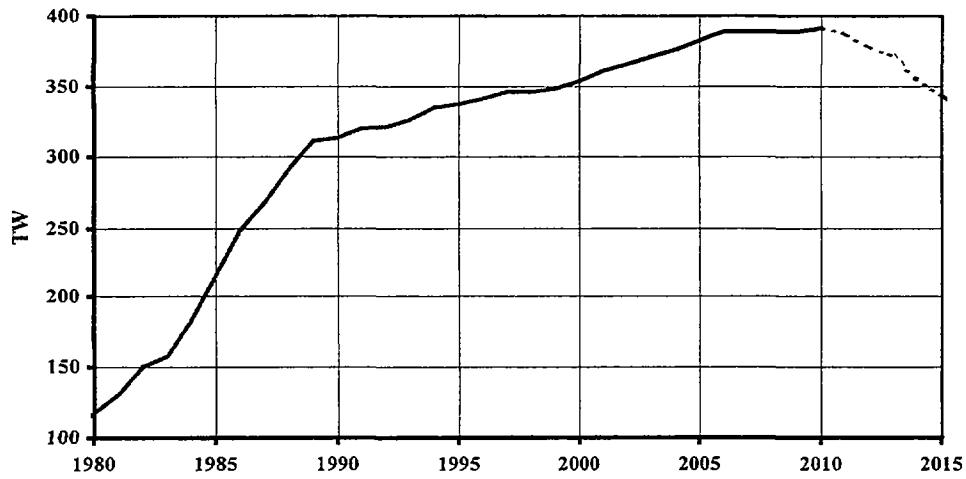


Figure 2: History and future of installed nuclear power around the world.

Figure 2 shows the history and future of installed nuclear power around the world. The days of fast growth (almost 100 % in five years) in eighties are gone. But the growth is still steady in stable. Based on the best available data, we can expect even slightly faster growth in the beginning of the next decade. Only at about 2010 we would reach a peak installed power and only at around 2014 we would be back at the current level of the installed nuclear power around the world.

Prediction of the future nuclear energy production is more uncertain. It depends on achieved availability of plants, i.e. on the excellence of nuclear operators. We have made three scenarios:

1. **Basic** case - all power plants continue to operate with the same availability as in the year 1998. If no individual data were available than the average world NPP availability was used. It was around 75 % in 1998.
2. **Increased availability** case - all plants were assumed to improve their availability from current level for 1 % per year until the year 2008. After that achieved availability remains the same. For plants without availability data the world average availability was assumed.
3. **Longer lifetime** case - the lifetime of 50 years for western power plants and 40 years for WWERs and RBMKs were assumed.

Just to be consistent with the previous analysis we have started the prediction from the data published by BPAmoco. So on the next figure 3 we have history of nuclear energy production until 1998, which is taken from BPAmoco and shown on figure 1. For the 1998 we have adjusted data from our database by means of average world availability to BPAmoco data and continued from there.

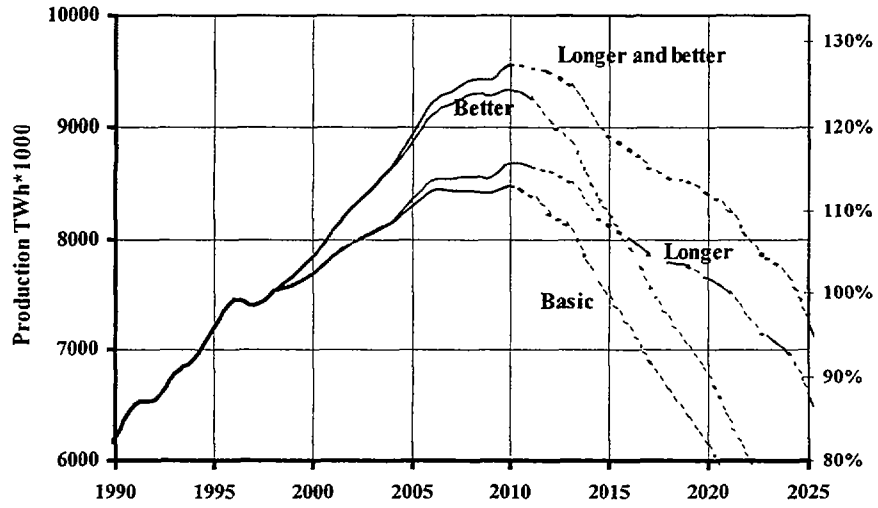


Figure 3: World nuclear energy production - all four cases

From figure 3 we can see that there are significant possibilities for the increase of production (and revenues) hidden in improved quality of operation.

Of course many things could influence the future. The history curve in 2009, ten years from now, will probably lie somewhere between my predictions from figure 3. But most probably in the years to come there will be new nuclear power plants ordered and the curves could also turn upwards.

**Conclusion**

We have no reason for pessimism. During last ten years nuclear energy was growing faster than coal, hydro, oil and even gas industries. Facts also tell us that in the future such trend will continue. We can expect to have between 12,5 and 25 % more production of electricity after next ten years.

Therefore we, nuclear professionals, should be aware of that and should deliver appropriate messages whenever possible. Instead of words like "retreat" or "renewal", we should have words like "growth", "challenge" and "excellence" in our minds and headlines.

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[i] Statistical review of World energy, BPAmoco, http://www.bpamoco.com/worldenergy/, 1999.

[ii] PRIS, Power reactor information system, database maintained by IAEA.

[iii] INSC, International nuclear safety centre, database at Argonne National Laboratory, sponsored by DOE, http://www.insc.anl.gov/index.html

[iv] Nucnet, Nuclear news agency, operated by European Nuclear Society, http://nucnet.aey.ch/nucnet/.

[v] UIC Newsbriefs, electronic newsletters distributed by Uranium Institute, London.

# BUILDING AND MAINTAINING MEDIA CONTACTS

## BOB FENTON, CHIEF PRESS OFFICER, BRITISH ENERGY PLC

One of the questions I am always asked is how does British Energy build and maintain its relationships with journalists in so many areas.

Not only do we have to think of the basic industrial correspondents that you would expect to have to deal with an industry like ours, we also have to cater for those dealing with science and technology, the environment, personnel and training, city and financial, political... I could go on and on. And that is just the national press.

We must also look after our friends in the specialist magazine markets – those looking at the utilities, innovative science and technology magazines to name but three – again there are a whole host more.

Then add the local and regional media around our power station sites - literally hundreds of contacts and you start to get an idea about the size of our media contact database.

But manage we do, and you may be not be surprised if I told you that we actually manage to do it rather well. But you don't have to take my word for it – take that of the people we deal with. Every six months British Energy takes part in a survey run by one of the UK's leading market research companies who conducts a poll among journalists and then rate each company's performance.

In the last three years British Energy has not been outside the top five in most categories, and in the top two in several. Our ambition is, of course, to have the number one media team in the sector – and that, ladies and gentlemen, is why they employed me!

So how do we do it?

The answer is a lot of work over a long period of time. You cannot expect to build trusting relationships with a journalist overnight. You may get them to run a story for you, but don't expect that to be the start of a beautiful friendship there has to be more than that.

At British Energy the key is being open and honest, and always available. We will never – okay maybe just the once or twice when were dealing with legal or financial matters – be quoted as saying 'No Comment". That is the most negative response there is, and it also implies something completely different to the journalist: he thinks what you are really saying is „I know what the answer is, and I am not going to tell you". The cover-up story starts here, and you are the one that just caused it.

We're there 24 hours-a-day, 365 days a year – always available on the end of a telephone, no matter what else is going on. As an example, if you were to ask me what I did on New Year's Eve to celebrate the dawn of a new millennium, I would tell you that I was ringing power stations and issuing press statements to key agencies. Sad, but true.

And this is the key – if you are not there, and you don't provide the answer then expect to be bypassed. You can only gain the trust of the people outside if you can be relied upon to give accurate, timely information. It's their deadlines you have to worry about, not internal ones. Unless you are extremely lucky once you have been contacted you must assume that the story will run – you must try and influence the way it appears and the only way you can do that is to be ready with an answer.

You should also consider who you are talking to – it's not just the guy on the end of a phone you are talking to – it's his reader, or the person who will watch his report on TV. Therefore the information you give must not only be timely and accurate, it must be understandable. I have never worked in an industry where jargon is so rife – talk to a journalist about a reactor trip and he will be left wondering how a million tonnes of concrete, steel and heaven knows what else can go on holiday. If the journalist doesn't understand you, don't expect his reader or viewer to. Therefore, use every day language not that of the technocrats within your organisation.

Of course good media relations is not a one-way street, and there has to be some element of compromise if you are to achieve a relationship based on mutual trust. That way, we all gain. The media produce reports based on real information, the public is able to share that information and to have confidence in its providers, and we are able to limit totally unnecessary damage to our business.

There are two other ingredients in this recipe for success that we have not touched on yet. Both can be equally difficult. Firstly bad news: what if you know you are sitting on a story that will at some point get into the public domain. Working on the assumption that news is whatever someone else does not want publicised, you really have only one option, namely tell it yourself. You know the story will come out, so why not try and make it your story. If you are going to have a fight, you may as well take it on your terms, rather than just sitting back waiting to be hit when you may not be ready.

I could list a few dozen examples where we have deliberately given out information that in many ways could have been considered detrimental, but – as I said earlier – our ethos is to be open and honest, even when the news is not good. In the cases where we have taken this attitude the results have been spectacular. The story has run but because we have given it to a trusted contact it has been handled well and more or less on our terms. After all, it is very difficult to attack someone who has just given you a story on a plate.

Of course the journalist ran the views of other people involved – Friends of The Earth or whoever – but they took a very low profile in the story compared to where they would have been had the story simply leaked out. A word of caution though – if you are going to embark on a strategy like this, make sure that all the key players in your company are behind the move, if not, well I don't think I need to go any further....

Okay, so we now have the building blocks in place for the press office to deal with the media effectively. We have agreed that we will provide information, even bad news, rapidly – allowing of course for the times when you have to check information; we will be available at all times; and that you will only deal in accurate information rather than speculation. Is that it? Alas no.

The one thing that is guaranteed to spike your attempts to win friends in the media is a lack of understanding of media relations in your own organisation. If your senior management do not actively support you in your aims then two things are likely to happen. The first is that you will not get the information you need to do your job; the second is that you will probably be fired for giving too much information away. It is therefore fundamental that you persuade management that the only way to deal with the media is by being open, truthful and available, no matter how tiresome that might be. You must win that argument, or your plans will simply fail.

In British Energy I am very lucky. My chief executive is very media friendly, as are most of our other chief officers, and they are happy to give their time to this end. They won't be at PIME, so don't think I am saying this for their benefit!

Having made your contacts, and built up a bit of trust, how do you keep them? The most important thing is not to let that contact dry up. Regular news releases, bits of information – the occasional e-mail or fax all help. None of them are as good as a phone call. Just pick up the phone and talk – if you can make it a 'You might not be interested in this, but..." conversation so much the better.

On the record lunches or meetings with your executives, launches and open days; trips to sites or power stations, Christmas parties – and, of course, my own favourite lots of beer in gloomy pubs – all help keep that contact, and do not really need that much effort to sort out. They are well worth the expense of a meal or whatever, though I have yet to put in a bill for those long boozy nights in various pubs up and down the country.....

After you've done all that it is no use sitting back thinking you have done everything you can, maintaining the contact is a full time job. Remember that your best contact is not yours exclusively - if he works for a national media outlet he has a hundred other 'best contacts' vying for his time.

You have to work very hard to make sure he remembers you.

# Snoring Puddle Frog

**Mark Anthony Lloyd, Executive Chairman, The Achievement Management Group**

The purpose of this paper is to hold a biological mirror in front of ourselves, the nuclear energy community, and to suggest that the reflection we will see there will help us both professionally and as members of a broader society.

Let us start with sex. For sex to function as a means of reproduction, a male and a female of a particular species have to recognise each other and mate. The important terms here are „particular species" and „recognise". Within most species, extraordinarily precise mate recognition systems have evolved. The precise frequency of the croak of a particular species of frog; the precise seasonal colouration of a particular species of salmon; the precise length of the tail of a particular species of bird; each is recognisable instantly to a prospective mate, though not to untrained human ears or eyes.

„The Recognition Concept of Species" (1985) is a monograph that has become something of a „classic" in annals of evolutionary biology. Its author, HEH Paterson, suggests that a species can be defined as a group of organisms that share a common mate recognition system.

Mating is an exchange of genes, and creatures that do not recognise each other do not exchange genes. A mate recognition system closes off the gene pool and may increasingly isolate its participants from even their nearest relatives.

Biological evolution has numerous links and parallels with the evolution of human cultures. Some of our recognition systems seem to have a knack for drawing everyone in – American popular culture, for example, is now inescapable. Other recognition systems repel all but a few – take, or rather don't take, the Hell's Angels or the Ku Klux Klan.

We, as members of the nuclear energy culture, are members of a closed and even repellent gene pool. We share a recognition system by which we perpetuate ourselves from generation to generation, from Hiroshima to Chernobyl. Outsiders do not understand our language: terms like „credit for fission products", „sub-criticality", „neutron poison" and suchlike all serve to isolate us. We seem to live in darkness, only to be seen when there is something to fear. Then we croak our incomprehensible nuclear song and vanish again behind high security gates, name tags, formal press releases and the words „no comment" and „acceptable risk".

In some parts of the world, the slightest of differences in interpreting a holy book is enough to get one killed; such is the human tendency to be suspicious of cultural recognition signals that are not very precisely one's own. No wonder journalists hunt us down, looking for ways to stop us reproducing amid the dark mysteries of radioactivity.

But there is hope. The biologists tell us, rather dryly, that few sub-species are totally isolated. It may still be possible for our exclusive little cultural gene pool to merge with the rest of humanity.

In order to offer recognition signals that the rest of the world can not only understand but also respect, we need to abandon the pose of being nuclear communicators and just be ourselves on our best behaviour. We need to help the media and thence the public to get to know us. If they were to spend time with nuclear scientists and technicians, they would see for themselves that members of the nuclear sub-species have human children whom they love and protect; that they have a deep and personal interest in sustaining our planet; that they are intelligent, responsible people who would hate to risk harming anyone.

We also need to find symbols to convey these attributes; symbols that cut through our jargon. These symbols do not necessarily have to be words. Live, self-evident symbols, such as the wild fauna and flora that flourish around our power stations, or the cheerful healthiness of the people we employ, may constitute our best recognition system.

Our true moral high ground lies in our ordinariness, our sharing of common values with the rest of society. It is here that we will find our best route to strong, healthy and positive relationships with the media.

# ESTABLISHING A RELATIONSHIP WITH MEDIA

**Dana Mesaru, CNE-PROD, Cernavoda NPP**

The Cernavoda NPP site is in Constanta County in the Dobrogea region. The nuclear facility lies about two kilometres Southeast of the town of Cernavoda, in the lower Danube region near the Black Sea. This site was previously a limestone quarry with a cement plant. About 220,000 people reside within 30 km of the site. The terrain of the Cernavoda is generally flat but there are hills and low mountains especially to the south. There is also a hill between Cernavoda NPP and the town of Cernavoda. The climate is continental with a Mediterranean-like influence from the Black Sea. However, summers are hot and dry, and winter moderate with some snow.

The Cernavoda NPP site is located at the convergence of several transportation systems. There are both nationally and internationally important waterways – the Danube River and the Danube-Black Sea (DBS) Canal. Road and railway networks connect the town of Cernavoda with locations to the North and South along the Danube River and East and West along the DBS Canal.

Within a 30-km radius of the Cernavoda NPP site there are several historical monuments and archeologically significant ruins, some of which date to Greek and Roman times. There are also four natural reserves. There is a museum in Medgidia, an art collection in Topalu and folk architecture sites in several villages, the monument and a museum in Adamclisi. There is a little tourism in the area.

None of these features are sufficiently close to the NPP to be disturbed by its operation

The start of the nuclear program in Romania, about 20 years ago, was a high-level government decision based on economical and political considerations, but without any commitment or acceptance of the people.

Early Romanian studies investigating the use of nuclear power began in the 1970s and culminated in 1977 with the signing of a Bilateral Safeguards Agreement between Canada and Romania. In 1980s (Unit 1 contract effective date), the Romanian Electricity Authority (RENEL) signed a contract agreements with Atomic Energy of Canada Limited (AECL) for provision of the nuclear steam plant and other services. Thereafter followed a protracted construction phase marked by poor quality work, performance and project management. The laborious pace of construction ceased completely in late 1989, just before the overthrow of Communist government.

In November 1990, work on Unit 1 restarted with the funding of RENEL – Romanian Electricity Authority. AECL and ANSALDO formed a joined venture, the AECL-ANSALDO Consortium (AAC), and in August 1991 signed a contract with RENEL to manage completion of Unit 1. This marked the beginning of a new era for Romania. On October 2, 1996, the Cernavoda Unit 1 NPP reached 100% full power and on December 2, 1996 was placed into successful commercial service.

The Romanian National Nuclear Company SNN, created in July 1998 as a result of restructuring RENEL, is the owner of the Cernavoda NPPs, on behalf of the Romanian government, and is responsible for their operation and construction. The site has provisions for five CANDU 6 (700 Mwe) NPPs. Construction of Unit 2 is 40%, and Units 3 to 5 have been placed in a state of preservation.

Unit 1 is provided with a CANDU nuclear reactor, using as nuclear fuel the natural uranium, and as primary heat transport and moderator fluids – heavy water. The Unit 1 electrical power output is 706.5 MW and its internal service consumption is less then 8%. Unit 1 delivers to the national grid 20% of the national electricity demand.

Compared with other similar CANDU units, during 1998, the gross capacity factor was:

| | | |
|---|---|---|
| **1.** | **EMBALSE** | **86.70%** |
| **2.** | **CERNAVODA** | **86.19%** |
| **3.** | **WOLSUNG 2** | **83.60%** |
| **4.** | **WOLSUNG 1** | **78.50%** |
| **5.** | **GENTILLY** | **69.16%** |
| **6.** | **POINT LEPREAU** | **67.80%** |

Like Krsko, Cernavoda is the only nuclear station and the only Unit operating in the country. The difference is that we are just starting. As you know, the plant has been in commercial operation a little more than three years, so the Public Relations Department is a fledgling one, too.

The site PR group was first formed during the latter stages of the construction. The PR group has to deal with the changing of the access to the information, still going on in Romania. First, the PR group had the public who used to view the information with apathy and scepticism, as the information was coming from a single controlled source. The same public today views the information with the scepticism and apathy, confused by the unrestricted access to the information. First, the information was unbelievable, and now it is bewildering. The PR group is in the middle of this change. We must convince the public that the messages we put out are factual and that this is an honest exchange.

The challenge before us is to build a bridge of understanding and trust between the NPP and the public. The PR group has the necessary foundation on the NPP side and the full commitment from the management. What are needed are a formation of a group of public sufficiently interested in the affairs of the NPP and the influence of the NPP on the life of community.

Very little is known about our station performance indicators, about thermal energy supplied by station for site, contractors' facilities and 60% of the Cernavoda town without affecting the electrical power output of the Unit. Very little is known if there is an impact or not on the population and the environment.

An uninformed public will not make good decision in case of referendum decision-making.

The success of the nuclear power depends on the support of people. People should know about the benefits from nuclear power so, we took the decision that the **media** could be the messenger between station and public.

The journalists are looking for interesting subjects to write about on their papers. The reporters are looking for interviews. If they express complete, clear, proper, prompt, intelligible information, everything is fine. If they look only for sensation, everything, not only the nuclear program, becomes a problem.

Most reporters, like the average citizen, do not have sufficient knowledge about nuclear energy issues.

So, favourable and unfavourable articles in the newspapers, most of them lacking the technical support, have led to the distorted and false perception of information.

First of all we considered that if the media is educated to understand the concept of a nuclear power plant, it would be easier to communicate to public the day by day activities in the nuclear industry. In this respect, we established a training program for media. The reporters from central and local media come to Cernavoda NPP for one day training course. The training course helps the journalists to understand the nuclear safety issues and therefore avoid incorrect messages in the newspapers. The topics of the course are:

- **Presentation of CANDU concept and nuclear safety characteristics.**
- **Operation's organisation - terms (ALARA concept)**
- **INES scale**
- **Waste management**
- **Basic concepts of ionising radiation:**

1. Types of radiation and their interaction with matter;
2. Sources of radiation (natural and man-made);
3. Quantities, symbols and units used in radiation protection;
4. Biological effects of radiation.

- **Emergency planning, preparedness and response.**
- **The role of journalists in communicating nuclear issues.**
- **Discussion of any other topic of interest.**

In order to keep people well informed on what they have to do in case of a nuclear accident, every year the NPP prepares emergency plans and drills. In this drill everybody is involved: employees, public from community, authorities, schools. For this drill, every year, media represent a great help in preparing public to respond to emergency plans and drills.

Based on NPP information, media explain to the public the purpose of the drill, how the drill is organised, controlled and evaluated. The public should know that the main objective of the drill is to test the emergency plans and procedures of the NPP and the other authorities involved in protecting the public and environment. The public should know that the drills offer the opportunity to identify the plans' and procedures' deficiencies, in order to correct and to improve them.

Media inform people when the drill is planned, explaining before the drill the consequences of a nuclear accident and asking people to take the drill seriously. In the same time, based on NPP information, media explain through their articles in newspaper the meaning of the specific terms as: public authorities, controller, evaluator, general drill, annual drill, active participant, participant to the drill.

Finally, media publish the result of the drill, the NPP comments about public response, asking for a better co-operation next time.

In order to keep the relationship with journalists; some communication professionals hold regular briefing sessions. One advantage of these sessions is the opportunity to establish a level of trust and credibility. We did not have any event during the construction, commissioning and operation of our NPP without media being with us. Sometimes we used a direct telephone conversation with journalists.

Sometimes we invite the journalists to NPP to interview the management board or to have discussions with any employee they want to. So the journalists can compare what the management said with what impressions employees have about different issues. In this way the journalists can themselves judge if the information they receive from the NPP is correct.

The power plant is pursuing a policy of openness. The conditions of its operation are primarily depending on the attitude of its immediate environment. The co-operation existing between the power plant and the neighbouring settlements is based on peaceful coexistence and a correct system of relations built on mutual benefits.

Every year hundred visitors interested in the power plant visit the Cernavoda Unit 1 Nuclear Power Plant. In addition to general professional information, visitors can also see the Main Control Room and the turbo generators producing electric energy. The Cernavoda Unit 1 Nuclear Power Plant provides regular support to the health care facilities, schools in the region, as well as various associations, cultural and sports events. All these activities are advertised with media help.

The Unit was visited many times by people from many walks of life. So we had the opportunity to see their wondering eyes, to hear their questions and to learn lessons like:

- Romanians are open-minded, and interested in nuclear energy issues, if you bring up the subject which is appears as complex and scary.
- In fact, they know little about nuclear energy issues. This is a disadvantage.
- They want to know the truth, but don't know who to trust.
- Opinions are soft and change frequently.

- People have two basic feelings about nuclear energy – they are afraid of it because it is dangerous, but want to keep it because it will be needed in the future.
- People don't want to hear about industry problems. They want to hear about the solutions to the problems.
- People aren't impressed with scientific risk assessments, which show how safe nuclear energy is compared with other risks. They think more about the consequences of an accident or radiation leak than about probability of danger.
- Recognising the dangers, people want strong controls: a strong independent regulator, redundant systems, and carefully trained and monitored workforce. They don't want anyone to mess up and hurt people.
- When it comes to nuclear energy, they don't want to save money. Efficiency and learning from experience is good, but „taking chance" is bad.
- People want to be asked and to participate in making decisions that are in their area.

The fact that the CANDU reactor is a safe concept is proved over approximately 400 reactor-years of safe operation, but the main question is how safe is this project in Romania? The answer is affirmative, CANDU is also safe in our country, and the following arguments were presented by the Romanian central newspaper and by the national TV channel:

- The advanced countries experience from Canada, Italy and United States is implemented in Cernavoda Unit 1 project, Canadian and Italian specialists were deeply involved in construction, commissioning and initial operation of the station.
- Very well trained in Canada Romanian staff, with hundred thousands training hours in the Point Lepreau nuclear power plant and in the very modern Cernavoda Training Centre, using a full-scope simulator.
- The very strong nuclear international community support, with significant results in the implementation of the „safety culture" among Romanian specialists and Romanian authorities. PRE-OSART missions from IAEA, training programs, seminars, co-operation with IAEA, WANO or COG are supplementary warranties to the safe operation of Cernavoda Unit 1 NPP.

# Building and maintaining media relations

**Anders Österberg, Oskarshamn NPP, Sweden**

In my opinion good media relations are among the most valuable investments regarding the communications and Public Relations operations within an organisation. This means, that all the work you put up in building and maintaining media relations, is worth all the efforts. It can mean the difference between success or failure.

Although a reporter never would admit that he or she is easily influenced, the fact is that you would get better press in an emergency case if you have a positive personal relation to the reporter. So, in my opinion there is nothing more important, in building and maintaining media relations, than the face-to-face-contact.

My experience of good personal relations to reporters is also that you're not only getting better press in emergency cases. You are more successful in getting published when you have something positive to say, too.

Honesty and openness are two key-words in this context. I have never tried to manipulate and delude a reporter, since that definitely would ruin the relationship. I always try to be as straight forward as possible and underline what I can say and what I can´t. That instead of presenting some forced lies.

For me, it is also very important to create some kind of mid-field ground, where the reporter and I can meet unprejudiced. Sense of humour and distance, both to yourself and your organisation, are two main characteristics that are unvaluable in order to create a good personal relationship with a reporter. But, I'm very accurate in emphasizing when I enter my role as a company representative. All in order to be regarded as correct, yet obliging.

To be quick when it comes to returning calls is another vital component that gives the reporter a feeling that he or she is important enough to be contacted as soon as possible. This serviceminded attitude is of course good for the relationship.

Besides the more personal relation it's important to have a business-like relation, where you show a great deal of respect for the mission and skill of the reporter, in hope for the same treatment in return. For instance, I try to always accept the news valuation that the reporter has made. If you reject that, you're interferring with the reporters job. Instead, I try to
make the best out of it. Sometimes I have to ask to get back to him or her, in order to have som time to think how to respond to the idea of the story an how to make the best out of it for the sake of the company.

This business-like relation can easily be established by paying the editorial office visits for the purpose of studying. Even in this case you hopefully get a visit in return... A visit that gives you the opportunity to give a great deal of background information, valuable to the reporter in the future.

Furthermore it's a good idea to establish a tradition with annual press lunches, for example at christmas-time. The main purpose with these gatherings is to create a good mood and working climate between the two parties. Although, the reporters often expects to have som kind of information at the same time and I usually describe company figures for the past year at the time; all in all during maybe ten minutes.

In spite of the importance of face-to-face-contacts I finally would like to stress the use one can have of a good site at the Internet. Medias are more and more keen on gathering information from the webb. A well-structured site for journalists is a must, especially for your own works sake. It's important to always be able to refer to something that you present at your site. My aim is to create a site that is the reporters next best friend...

That is also contributing to the personal relation - though in a computorised way...

# Media – Our Friends
# (Improving our Relationship with Media)

by
Mihaela Stiopol, SN „NUCLEARELECTRICA" SA
Iosif Constantin Bilegan, SN „NUCLEARELECTRICA" SA

The paper will present the principles, goals and the steps followed in establishing media relationships. It will highlight the company' s activity developed over this year within the Romanian Public Information Programme in the nuclear field, in order to establish friendly relationship with media, as well as the conclusions we have reached in performing such an activity.

A today modern society involves two keywords which our everyday life cannot ignore any longer: information and communication.

Most people want to be informed about different topics. And nuclear is a special one. This interest does not not mean that they seek out information on these topics. We must offer them the information they need and the answer to their questions. We mustn't forget that the lack of information does not mean that people are ignorant. That means we didn't offer them enough information; we didn't find the proper way of communication.

The basic objective of communication in the nuclear field is to keep public informed about the facts on different aspects and events of nuclear field.

When developing a communication plan on specific issues, more elements are needed:

a) to establish clear objectives;

b) to identify the audiance according to the objectives of the communication plan;

c) to identify the message to be communicated and the channels of communication;

d) to establish a management plan having clearly stated the goals for each audiance that will help to achieve the objectives;

e) to evaluate the results by establishing a plan to incorporate leartnt lessons in future planning.

A plan of communication implies much information which different audiances perceive and understand, distinctly; each of them will have his own questions and requirements which determine the proper way of communication.

One of the main audiance is the media which act as a watchdog by bringing issues to the public attention. Therefore, the media play a crucial role. By spreading information, they may also represent a channel of communication. But, the public vulnerability versus mass-media which, in their rush for sensational or lack of knowledge on the domain, many times launched simple, unfounded speculations. A good reporter is willing to listen to all the parties involved in an event. But this is not always the case, and some journalists are advocates of a particular point of view. We cannot ignore them. In many cases they present all sides of an issue as equal, without giving credit or paying attention to the scientific evidence. It is very important that media have quick access to information. Editors and publishers are also very influential in deciding what information is published and in deciding the balance of an article's content.

In establishing the relationships with media we have to take into account some specific elements: there are many young and unexperienced journalists and reporters, most of them having a humanistic formation and no elementary technical and economical knowledge.

In our relations with media we have appealed to basic, *general principles* governing any communication policy:

- *The respect for the public,* for their need of education and communication, as well as the trust in their capability of correctly perceiving the information;
- *Being aware of all the major interest problems and fears* of the public related to the nuclear program;
- *Ensuring a perfect openness.*

All the information necessary for a better understanding of a nuclear event, no matter how unpleasant it might be, should be available for the public.

- Being aware of, and *respecting the opponents' opinions;*
- *The quality and content of the messages.*

Communication means questions and answers. It should address the demands and fears of the public, the developments of the events. The tone, language and content are essential.

- *Initiative in information supply.*

It should be taken into account that, the lack of an initiative in supplying information, the correction of false information or just the subsequent penetration of correct information will be more difficult.

Beside all these, we have to point out several aspects that we have been trying and are still trying to take into consideration in our relationships with media:

(a) That which makes an event for us does not always represent one for the press.

(b) A journalist will always be interested in:
- what is new
- what is striking
- what is significant

(c) The laws governing the event:
- event proximity
- reader's delight
- reader's culture level and interest
- combination of circumstances

(d) For a better collaboration with the press we need:
- cultivating the relationships
- simplicity
- knowledge of being original

Having in mind all these considerations, in establishing the company's strategy related to the information and communication in the nuclear field, we have paid a special attention to the relationship with media.

***The relationship with mass-media through:***

- elaborating support documentation for radio and television programs;
- initiating some radio programs, quizzes, eventually live talking to the listeners;
- initiating some TV programs on various topics mutually set out with the programs editors;
- issuing press releases for a prompt information of the public related to some events occurred during the operation of the subsidiaries reporting to „Nuclearelectrica" National Company – SA;

- adopting an „offensive" attitude at the press level by publishing articles on Cernavoda NPP operation, reliability, safety, economic, ecological and social advantages, on radioactivity and so on, as well as interviewing scientific, medical personalities, specialists involved in the nuclear power program, Romanian operators, representatives of the nuclear regulatory body and so on;
- organizing initiating courses on nuclear power for media representatives.

***The main actions:***

*The activity developed during 1999 has followed these points. Prompt press releases following the main events related to the Cernavoda NPP and interviews on different subject of interest in the central press have been issued.*

*Press conferences were organized on site and at the headquarters having as main topics hot subjects such as Cernavoda NPP-Unit 2 completion.*

*The initiating courses for journalist have started. They are carried out within the Training Center, at the Cernavoda Nuclear Power Plant for one day and consist of a technical presentation followed by a visit of the plant. The main subjects discussed are: a short story related to the history of nuclear energy, the history of the Cernavoda NPP, nuclear fission, nuclear power generation, CANDU type reactor presentation –safety aspects, technical and economical performance, waste management, radiation levels, INES and other aspects depending on the participants „requests". The main result of this action was that we made a lot of new friends. A real „channel of communication" between mass-media representatives and our company was created. They supported the company in some difficult moments including a correct presentation of the nuclear events which have occured at the world level. Some of them even became members of the Romanian „Nuclear Energy" Association. After the first courses, the main conclusion is that their interest, participation in the course , the level of understanding depends on their background. Many of them have expressed their desire to continue the course and many other subject of interest to be presented.*

*Recently we have started some Radio programs, consisting in very short programs so-called „nuclear radio pills". In the near future a debate on attitude pro and con nuclear energy and the Cernavoda NPP are to be organized.*

*Also, TV round tables on different topics such as the Romanian nuclear program or the aspects related to the radwaste disposal were also organized.*

*In these moments, the way in which the public receives the real information has a great impact on the future development of this alternative and the role of media is an essential one. So, we consider that the utility mission is to act promtly to transmit to the public complete and honest information with the help of this important segment which is media.*

# Establishing media relations

Julia Stonogina,
RADON-PRESS Director General

**Journalist and PR Professional:**
Pulling together to achieve the same goal

RADON-PRESS has contacts with more than 40 newspapers and magazines. The main principle of our co-operation with them is that we seek to act as their partner rather than a mass media agent. We cannot provide information on the subject of radiation safety and let a newspaper, a radio station or a television channel use them as they see fit. Even a year ago we used to fax messages and press releases to editorial offices. We called this work 'informational initiative' and viewed it as a service to society. But what happened after our information reached reporters? All too often, they used it to advance the interests of their publications. Sometimes they introduced it into other materials which, they thought (often mistakenly), dealt with the same subject. Not infrequently, they added unverified facts to add spice if they felt that the paper needed more popularity. They were known to doctor facts and figures causing unnecessary upset among readers. Thus, they exaggerated radon content on school premises. As a result, until we insisted on a retraction, parents and school administrations of a large Moscow suburb remained in a state of agitation.

These are the reasons why we revised the procedure of supplying information to journalists. We are trying to enlist their co-operation on the basis of the principle of social responsibility. If a journalist wishes to disseminate information that has to do with public safety and health, he or she must have a good grasp of the subject. With this end in view, we at the agency organised training seminars on environmental journalism for the publications that wish to use RADON-PRESS information. In the past six months, 30 journalists working for leading newspapers took this course, receiving a better idea of radiation and radio-ecology and the operation of specialised services in charge of radiation safety. They were issued relevant printed matter, such as the leaflet „10 Questions about Radiation" intended for the general reader. We never requested them to use information to promote our interests and did not mention the need for censorship. But we did our best to persuade them to act professionally and responsibly and convince them that radiation is not a subject where „poetic license" is permissible. We saw that our seminars made their participants alter their approach to the work on such materials. Now we feel safe supplying information, including reports about radiation accidents, to those who have taken our course. We have had no more trouble trying to combat distortions or dilettantism in the presentation of facts. As a rule, these journalists send us galley proofs of their pieces dealing with radio-ecology for us to check their factual side.

A very important aspect of our work is television, which wields a lot of power over the minds. When television reporters request us to arrange a shooting for them, they are not always sure just what they would like to shoot („Something about radiation" is the usual cliche). The first thing we do is offer them a number of subjects with a brief description of each. As a rule, television reporters are pleasantly surprised at having such a broad choice. Then we suggest that they should spend some time familiarising themselves with the subject so that, finding themselves at a plant or research laboratory, they would understand what they see and refrain from concentrating on simple questions where an exclusive program could be done. As a result of such work with television crews, nearly all came up with a series of educational programs, not just one brief reportage, as had been their original intention.

Yet another form of information exchange is the ecological bulletin issued by RADON-PRESS and dispatched to newspapers and radio and television stations. Journalists regularly quote extracts from our bulletins or use them in full.

Such policy seems fruitful for both sides and beneficial for the public. A telling example of it came late last summer. A group of cheats tried to make money on people's fear of radiation danger. They bought a large number of personal dosimeters planning to sell them at a profit. They were launching an aggressive advertising campaign printing leaflets which were distributed in residential districts. The leaflets contained misinformation about the radiation level in Moscow aiming to terrorise the population into buying scores of dosimeters. We felt it necessary to expose the fraud without delay and started a PR campaign of our own. It seemed impossible without the media support. We got in touch with newspaper and TV reporters providing them with press releases revealing the machinations behind the seemingly innocent effort to supply Muscovites with dosimeters. Meanwhile despite our partnership journalists would not have been considered as professionals if they had not check the incoming information. They tried to check our information by calling to sellers under the guise of potential clients. It was a sort of journalist investigation. The dosimeters turned out to be terribly overpriced. The woman taking the calls was practically ignorant of the matter, besides she proved to be quite secretive, refusing to supply information about the firms officials or experts. Nevertheless the journalists found out later the sellers had no licence or any permission to realise such activity. A large number of articles were published in major Russian newspapers. The journalists felt it their duty to calm people down. Thank to our co-operation, at least one dirty scheme was thwarted.

# Connections of OAO "Mashinostroitelny zavod" with mass-media

**S. Gelman, Ph.D., PJSC "Mashinostroitelny zavod", Russia**

PJSC "Mashinostroitelny zavod" (MSZ) is located 55 km to the east of Moscow, in an industrial town called Electrostal with the population 150.000 people. Recently this dynamically developed enterprise joined the world leaders-manufacturers of nuclear fuel (NF), its capacity being 1000 t U02 per year. The quality of the fuel rods and thermal assemblies fabricated by the factory was marked several times with prestigious European and Russian awards and certificates.

Currently the products of the factory are supplied to more than 50 NPP units of Russia, CIS and Europe as well as to the power units of the atomic fleet of Russia. Together with the intensive work related to the optimization of nuclear fuel fabrication the management of MSZ pays serious attention to the public communication and connections with mass-media bearing in mind that a part of the town population is concerned a lot about the state of things and development of the atomic power and related enterprises. So the Centre of public information of MSZ is constantly under the supervision of the management. Widely equipped with illustrative material, the Centre meets up to 2000 visitors annually, during tours, lectures and discussions. But the main part of the Centre work is performed outside the Centre. At the beginning of the year the MSZ management signed a number of agreements with to\vn mass-media: newspaper "Novosty dnya", radio centre, cable TV studio "Eitelecom". These mass-media, during the year, gave to the Centre employees and factory technical specialists a good possibility to make presentations that objectively enlighten the safety aspects ofNPPs and nuclear technologies, including those performed in the workshops of MSZ. So there were broadcasts on radio and TV that were consecrated to the famous dates in the history of the atomic power:
45-th anniversary of starting the first in the world NPP; 35-th anniversary of starting Novo-Voronezhskaya NPP; 40-th anniversary of commissioning the atomic power ice-breaker "Lenin"; 50-th anniversary of the industrial perfection of the technology of uranium enrichment in the USSR;
100-th birthday of the famous designer of the first atomic reactors in the USSR, academician N. Doliezhal.

All these broadcasts related not only to the historic aspects of the subject matter, but mainly brought the information on the modern state-of-the-art of the science and technology as well as on the perspectives of their development. Even the broadcast referring to the 50-th anniversary of testing the first Soviet atomic bomb was not consecrated to the destructive, but to the creative aspect of using the atomic power. As a rule, programs on radio or TV (over 37 thousand users) were broadcast in the interactive mode and a number of phone calls to the studio were a proof of the great interest to the considered topic.

I do not touch upon the content of the presentations of the leading factory specialists on radio, TV and in the newspaper. The majority of them were, directly or indirectly, stressing one and the same idea: in the coming century there is no alternative to the atomic power as one of the power sources for the mankind. The researches performed by the sociological department of MSZ demonstrated that the majority of the town population is in for this.

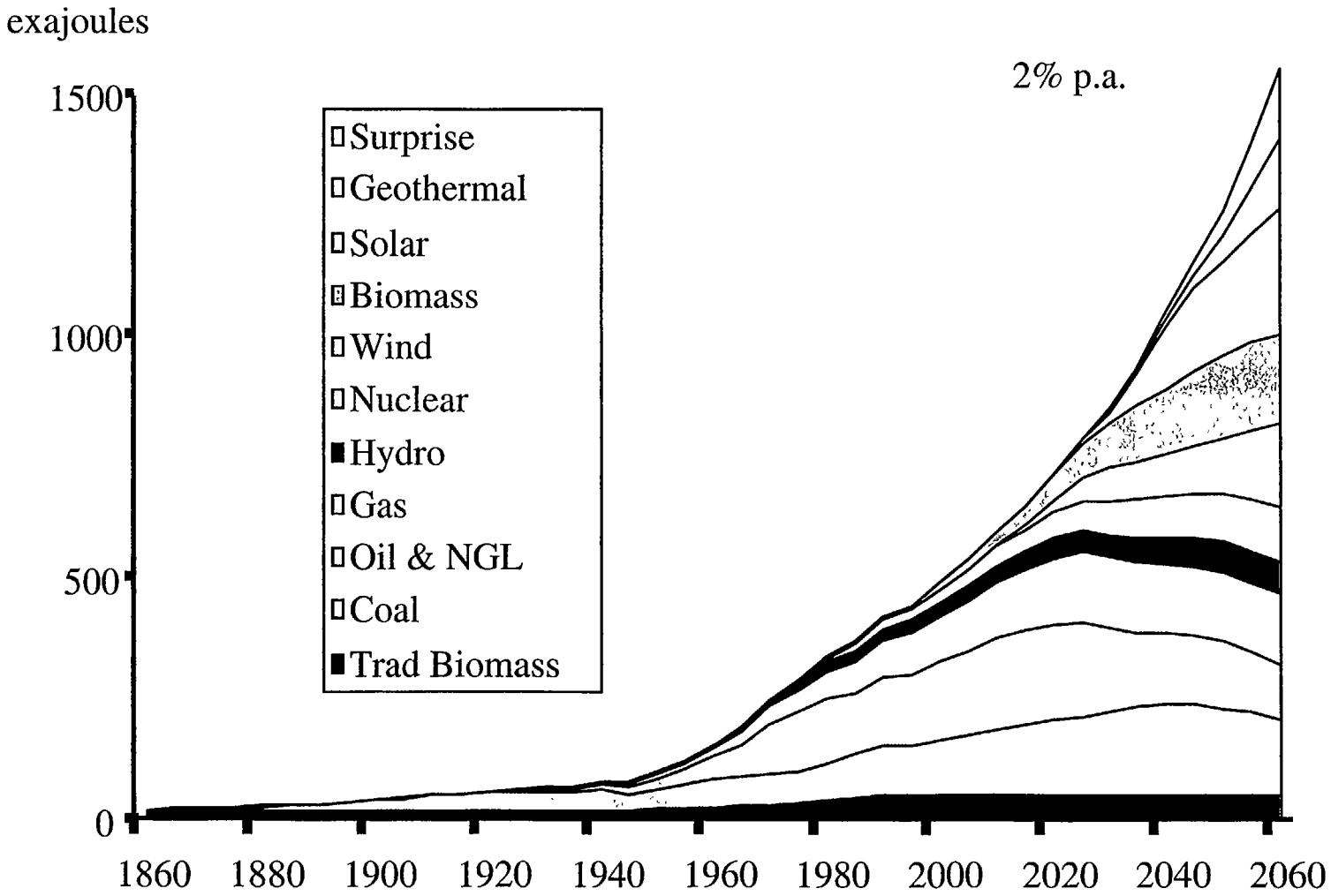
# CLIMATE CHANGE


# Climate Change and the Nuclear Industry

by

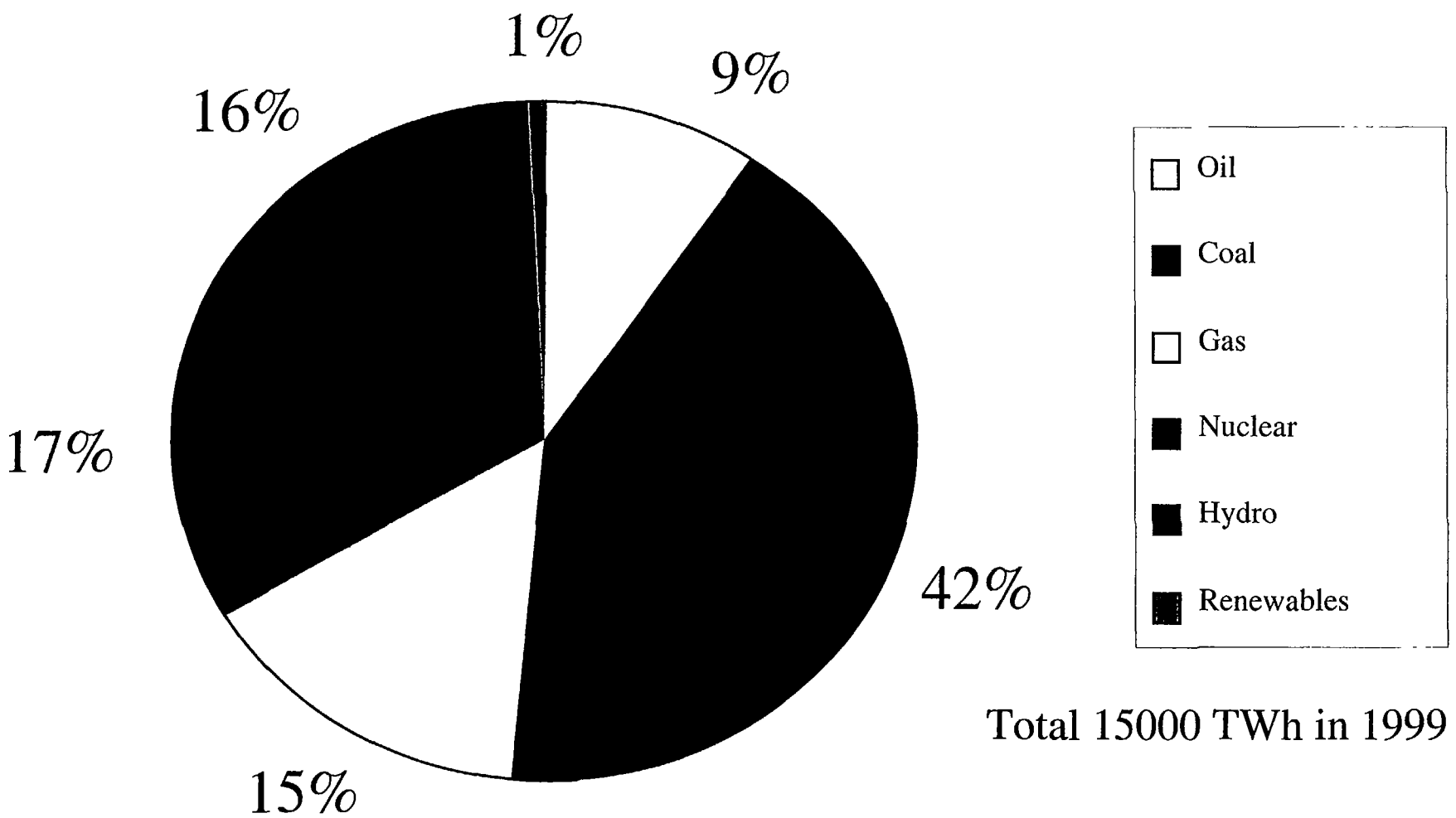
**C. Anastasi**
**Senior Environmental Adviser**
**British Energy**

# Sustained growth




*Source: Shell International*

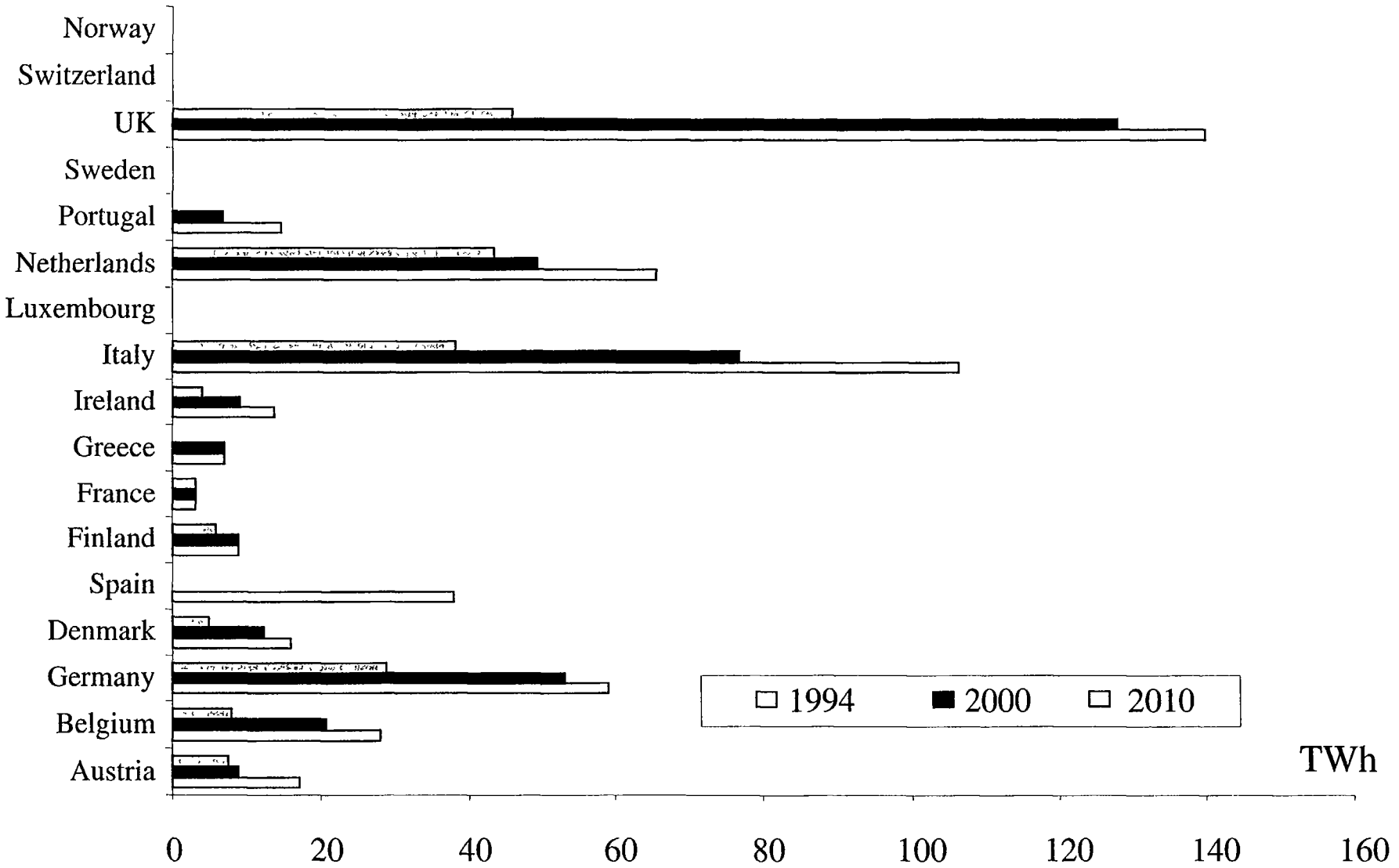
# World's electricity mix in 1999




Total 15000 TWh in 1999

*Source: International Energy Agency*

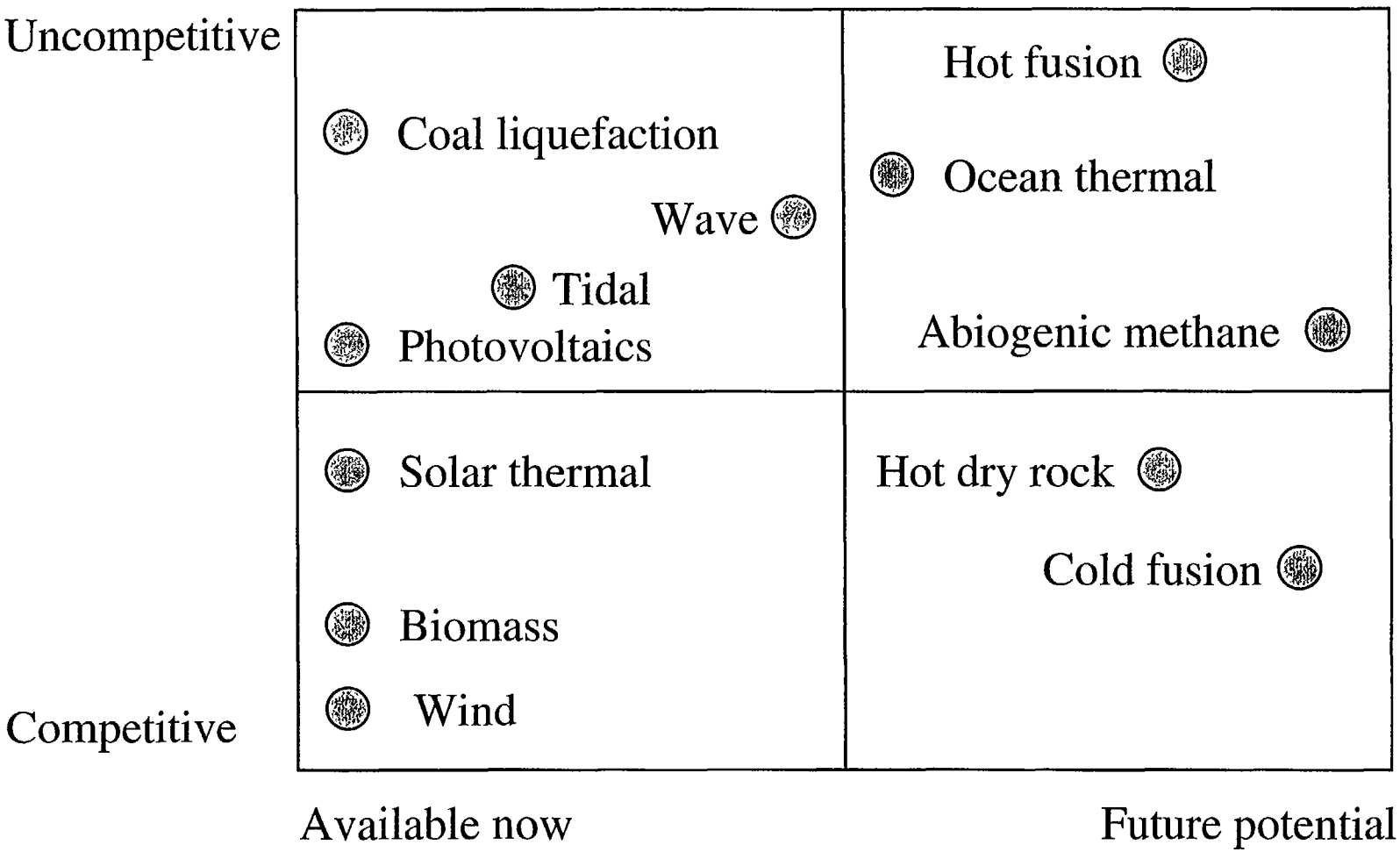
# Gas fired generation in Europe



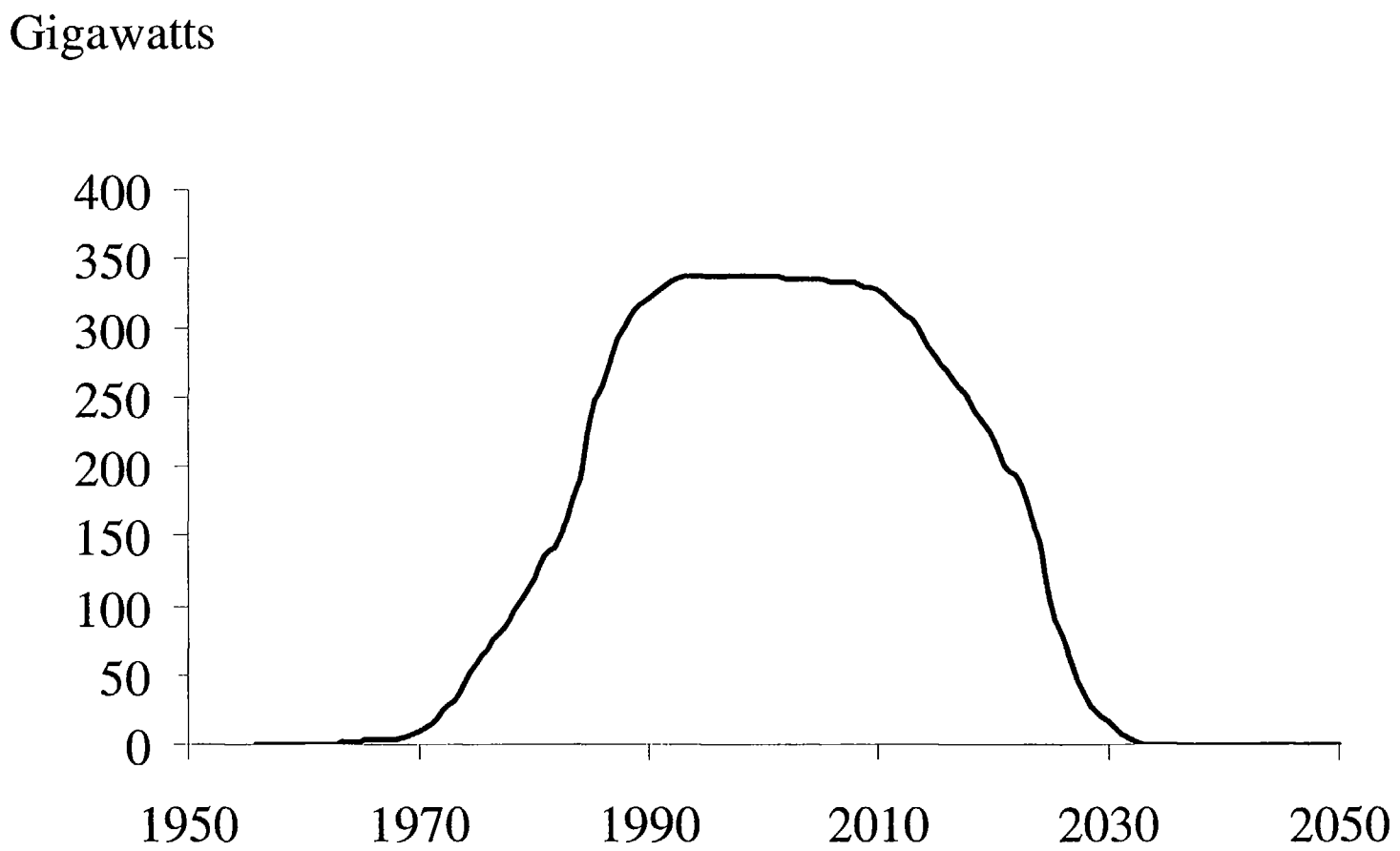



*Source: RIIA, Johnathan P Stern*

# Unconventional energy sources

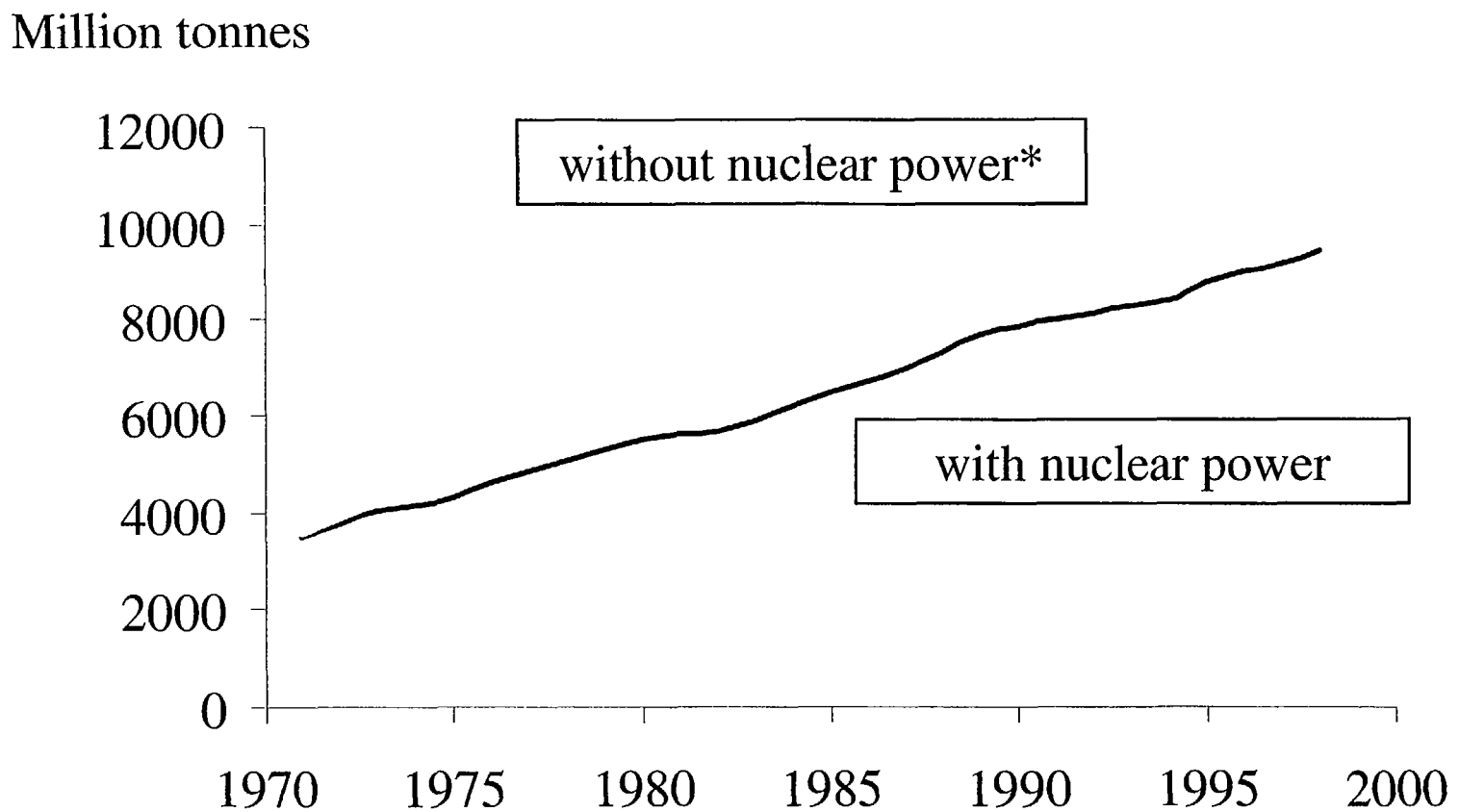


# World nuclear generating capacity




*Source: International Energy Agency*

# Global annual carbon dioxide emissions from the electricity sector




*Note * - Data based on prevailing fossil fuel mix*

# Scenarios for period to 2040

- Electricity growth 1.5% to 2020, then 1.0% to 2040
- Nuclear follows existing decommissioning timetable
- Hydro contributes at historical levels
- Any shortfalls that emerge are taken by extra gas generation

*Transitions*

- Coal/oil maintained at 1997 level for scenario period
- 'New' renewables contribute 5% by 2010, 10% by 2020 and mirrors electricity growth post 2020

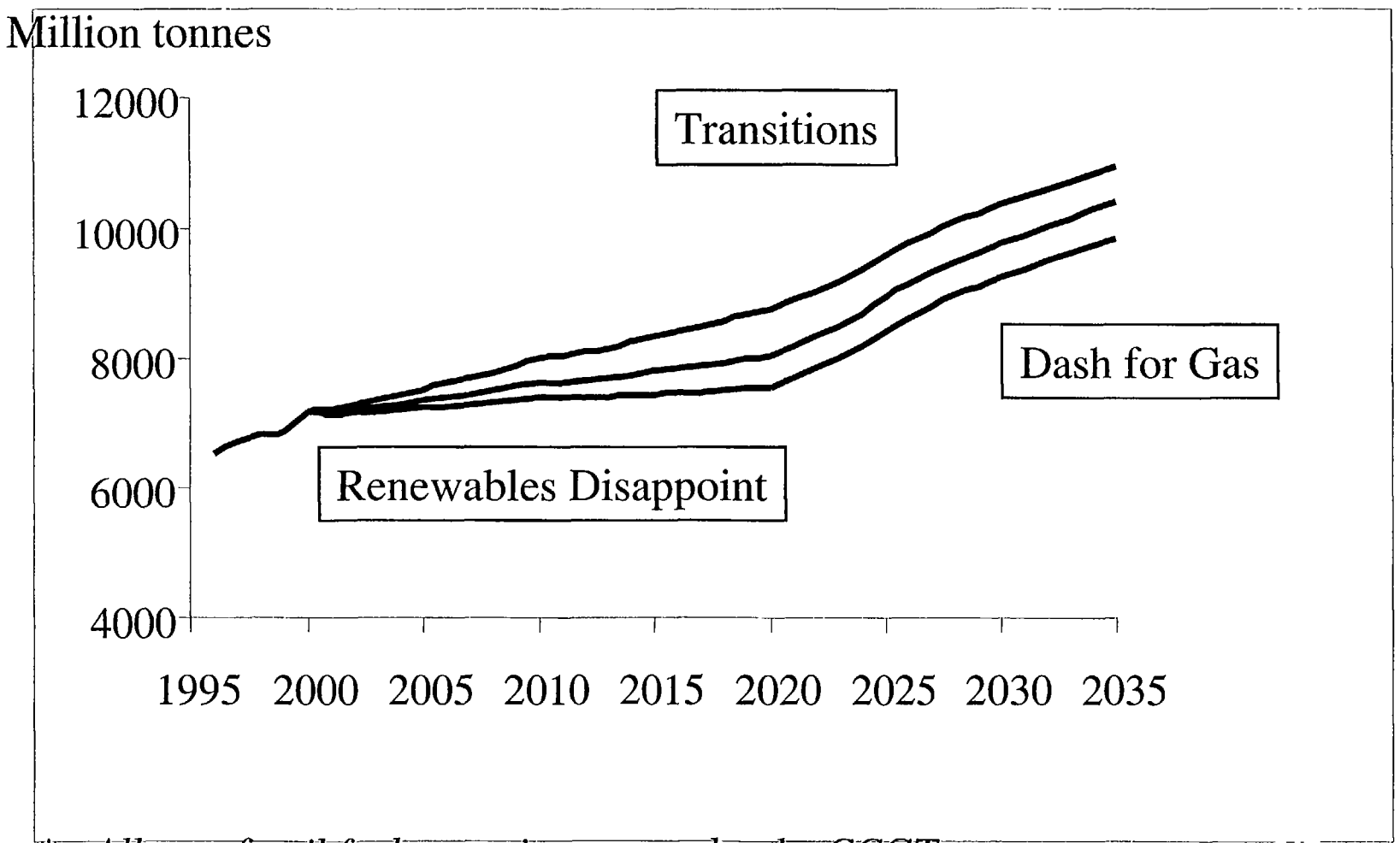
*Dash for Gas*

- Coal/oil gradually reduced to about one half 1997 value
- 'New' renewables contribute 5% by 2010, 10% by 2020 and mirrors electricity growth post 2020

*Renewables Disappoint*

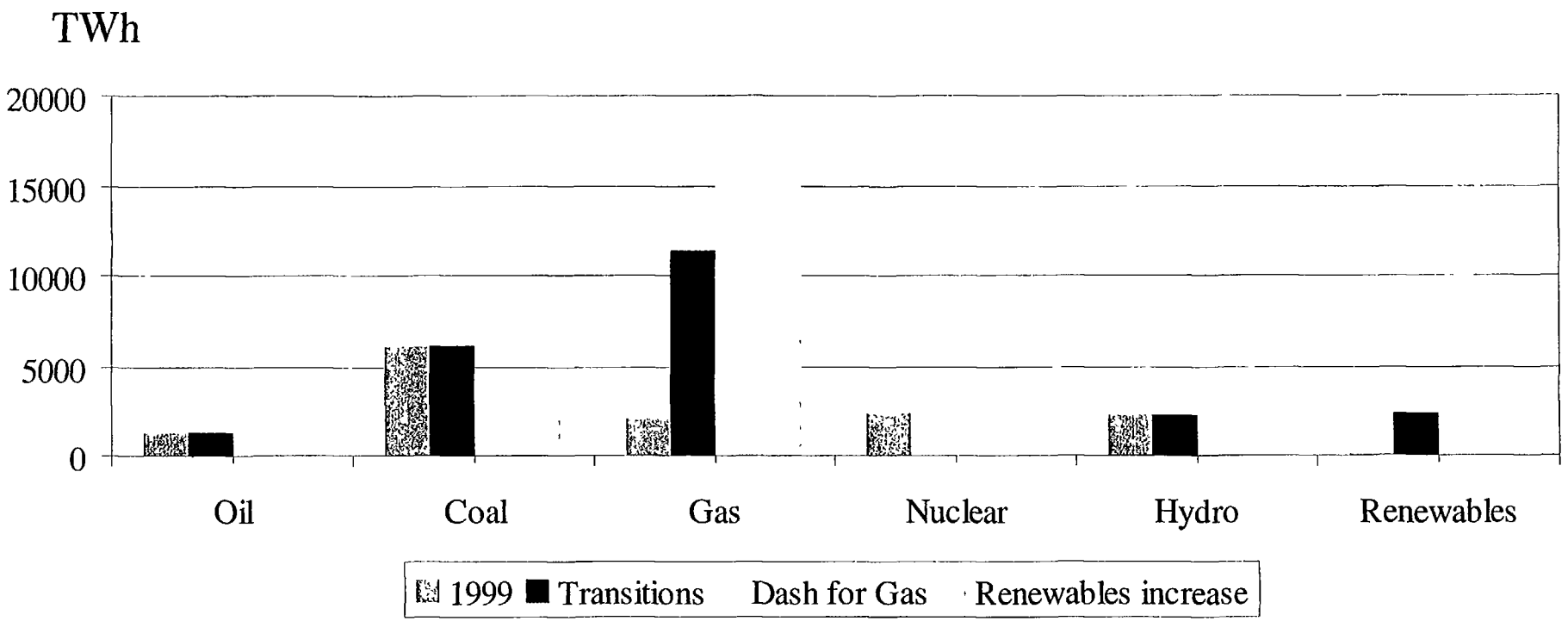
- Coal/oil gradually reduced to about one half 1997 value
- 'New' renewables contribute 2.5% by 2010, 5% by 2020 and mirrors electricity growth post 2020

# Carbon dioxide emissions*

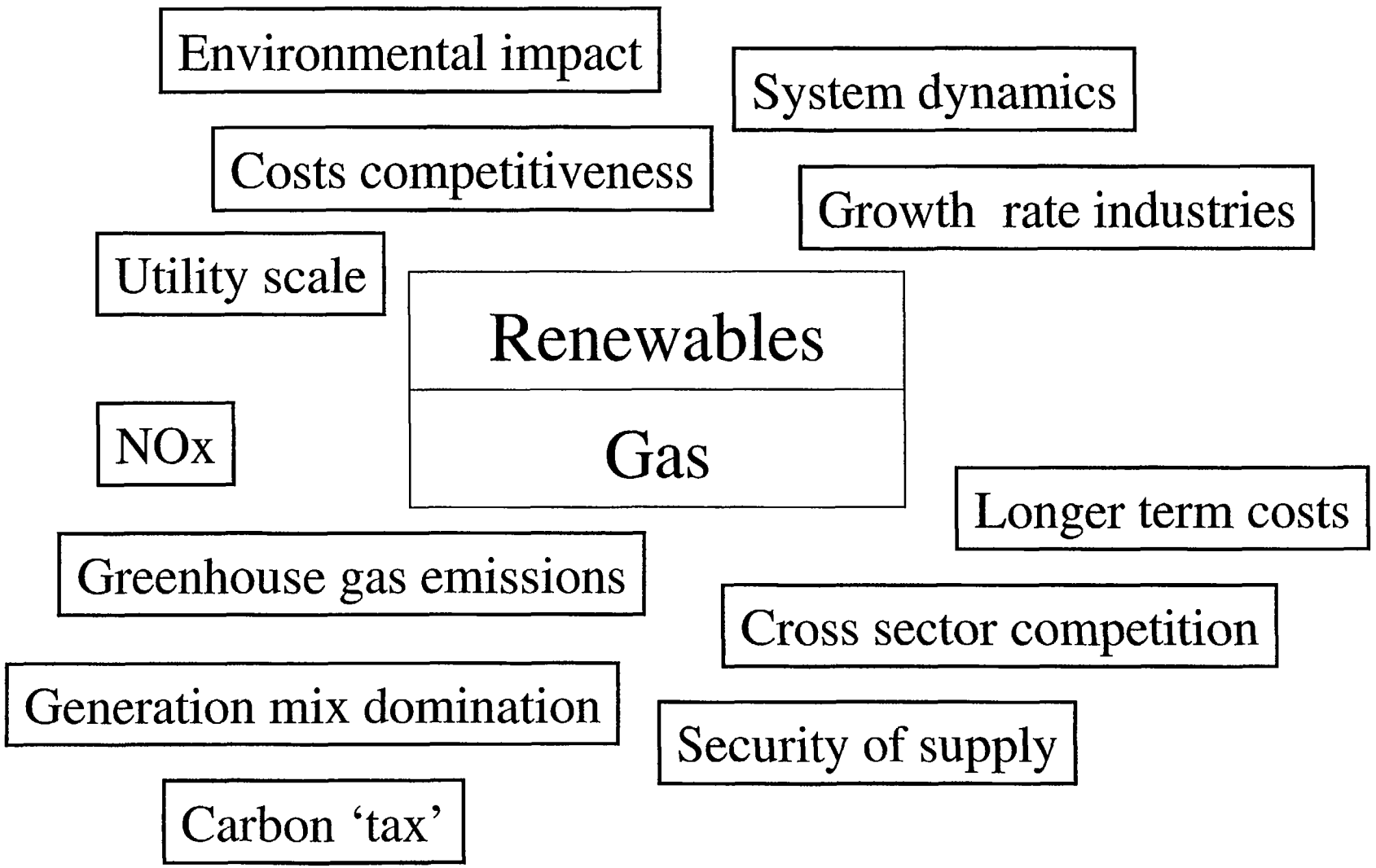



*Note* - All new fossil fuel capacity assumed to be CCGT*

# Electricity mix in the year 2040



# Key issues for emerging technologies



# Future nuclear contributions to primary energy

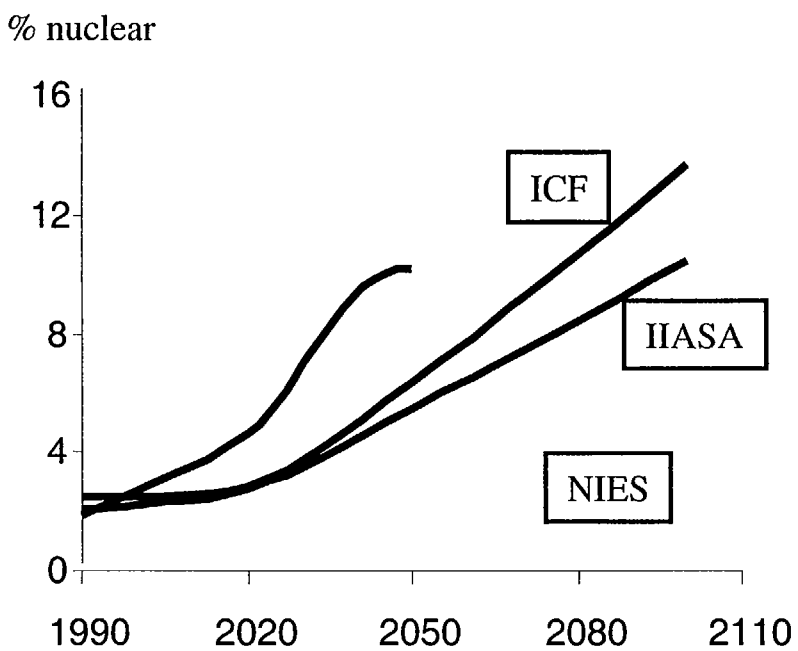



Figure 1: IPCC scenarios - Nuclear contribution to world primary energy

*Source:* *Draft IPCC special Report on Emissions Scenarios, 1998*

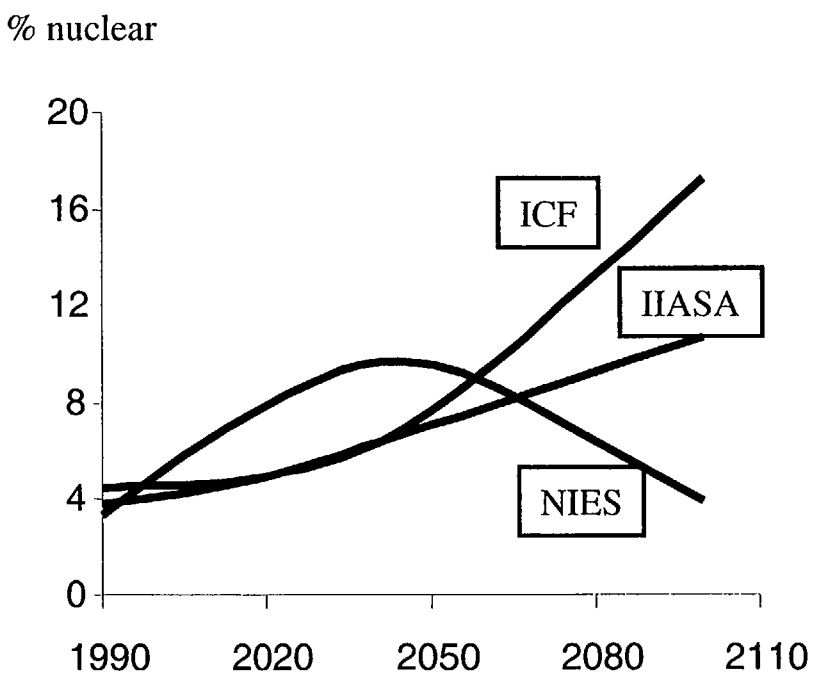



Figure 2: IPCC scenarios - Nuclear contribution to OECD primary energy

*Source:* *Draft IPCC special Report on Emissions Scenarios, 1998*

# NO global warming = YES nuclear energy!

## The International Nuclear Forum and the United Nations Framework Convention on Climate Change.

*Emma Cornish*

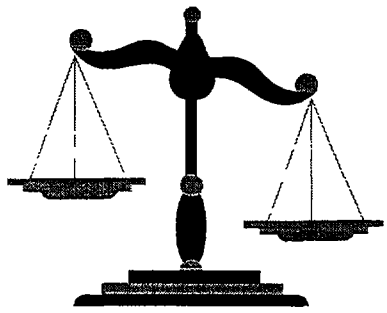
*Uranium Institute.*

Climate change: it's what so many industries are talking about, ours included. After all, the nuclear industry sits along side the renewable energy sector in its role as a non carbon emitting technology. But persuading international political leaders of this fact presents a challenge. Generating electricity from nuclear fuel avoids at least 2 billion tonnes of carbon dioxide every year through its 16% share of world wide electricity generation.

**Nuclear energy is essential to minimising greenhouse gas emissions.**

During this presentation I will:

- highlight the main **issues** resulting from the climate change negotiations that are highly relevant to the industry
- explain the activities of the **International Nuclear Forum** and our interaction with the **delegates** to the process
- outline our **future activities**: where we go next and how we wish to involve the **industry leaders and communicators.**



Through our efforts, we want to redress the balance of the public's attitude toward nuclear. Perceived problems include waste management, safety and economics. However, the world faces potential crisis with threatened global warming and nuclear offers an obvious alternative to fossil fuels.

SOME BACKGROUND:

**The International Nuclear Forum (INF)** was formed to provide a collective voice lobbying for nuclear at the climate change negotiations. It's internationally representative of the industry and comprises of: the Uranium Institute; the Nuclear Energy Institute; the Japan Atomic Industry Forum; the Canadian Nuclear Association; the European Nuclear Society, and Foratom. All are accredited non governmental observers to the negotiations of the United Nations Framework Convention on Climate Change.

**The United Nations Framework Convention on Climate Change (UNFCCC)** was negotiated from February 1991 to May 1992 and opened for signature at the June 1992 UN Conference on Environment and Development. Ninety days following receipt of the fiftieth ratification, the UNFCCC entered into force on 21 March 1994. The first meeting of the Conference of Parties (COP) to the FCCC took place in Berlin in Spring 1995. One protocol to the Convention, the Kyoto Protocol, has been drafted. Negotiators adopted the text at COP-3 in December 1997 in Kyoto, Japan. It will enter into force following 55 ratifications by Parties to the FCCC, accounting for 55% of the total carbon dioxide emissions for 1990.

# WASTE

# PSYCHOLOGISTS' STUDY ON HOW TO COMMUNICATE ON THE THEME OF NUCLEAR WASTE

**Christine GUILLOUX, SILLAGES, Paris**
**Psychologist-Psychotherapist, Trainer, Consultant & Coach**

You are curious about a "psychological" point of view on how to communicate on the theme of nuclear waste and how psychologists could view the communication that is being made by EDF.

First, as a consultant and a trainer in communication, management and personal efficiency in France and in other countries, more especially in the United States, I have been involved in several studies on communication and environmental issues since 1980. More recently, I have specialized as a coach and a psychotherapist, essentially in systemic analysis and brief therapy (model of Palo Alto) and in Ericksonian approaches. These approaches have a common basis to utilize the realities of the system, the values, the beliefs and the models of the world and to build from them.

In 1998, Jean-Pierre CHAUSSADE, EDF Senior Adviser, asked me to organize a study on how to communicate on the theme of nuclear waste to help understand why communication on this theme seems to be stuck. This study has involved many psychotherapists, psychologists and physicians from different schools of thought. Afterwards a team of internal and external consultants continued the work in 1999 and explored "the hidden aspects" of the communication that is made on nuclear waste. What are those aspects? What has to be taken into account in such a communication on a theme that is "absorbing", "strong", "invisible"? How to build a more efficient and relevant communication towards the public and the ecologists? How to buid a communication which opens up a dialogue and mutual understanding?

The first part of this qualitative study has been devoted to interviewing the psychotherapists in a non directive way on what are the representations and beliefs about waste in general, then about nuclear waste. The second part was centered on their reactions to a pamphlet "Nuclear waste in questions" (Les déchets nucléaires en questions) and a video document (of a presentation of a paper given on the subject). What is being presented below comes from this study and the work the team initiated afterwards. Gonzaque MASQUELIER, one of the psychotherapist interviewed, participated in the team work and the writing of this paper.

The most flagrant finding on this communication on the theme of nuclear waste is that we are at present in a stuck situation. In what ways is it so?

## 1/ IN THE HUMAN PSYCHE, THERE IS A LARGE PART OF "IRRATIONAL"

A cartesian or scientific mind may critize against this view. Nevertheless, many scientific discoveries have incubate and evolved while and because of dreaming. Do you remember how the famous "eurêka" appeared?

In every communication is an hidden message. Or, it would be better to say it this way, every communication is made of contents, what is so called the verbal language, the words, and of a package, what can be called the non verbal language, made by the tonality, the rhythym of the voice, the gestures and the postures that come with the words.

What is important is to take a step backwards to be able to understand why the communication is stuck: that is called meta-communication ("meta" in ancient Greek means "above"). Meta-communicating is "communicating on the communication itself".

Meta-communicating on the theme of nuclear waste doesn't mean to inform or to convince but to LISTEN. It means to show to the person I am talking to that I listen to him/her, that I am open and able to accept and welcome what he knows, what he doesn't know and what he doesn't want to tell me.

It is for us the only relevant position to unlock/release the communication on nuclear waste.

If we consider the proportion of "irrational" that fits in the hostility towards the current politics of running nuclear waste, we have to consider some mass fantasies:

### 1.1/ THE FANTASY OF THE "GROUP MACHINE"

This concept has been developped by René Kaess in order to illustrate how individuals fear that collective life invades individual life. For example, we experience this fear when in a large crowd, we begin to be conscious that, if there were a panic move, we could be trampled to death.

This fantasy seems to be well symbolized by nuclear energy: people know that, since Tchernobyl, in a nuclear plant, a reactor can explode and then there is nothing else to do but run away or be a victim.

Here this fantasy relies on the fact that this invisible condensed waste could diffuse in the air, in the water, in the ground without visible trace. How not to be terrified by this lack of mastery of the machine? Communicating on the storage of nuclear waste is more particularly difficult because it exceeds our perception, our sense of time. It's difficult for us to represent an historical reality of several centuries and to bury fissile material for several millions of years. - Can we dream of inventions or discoveries that could help in dealing with material that is so explosive and mysterious as nuclear waste is?

When our rational left brain is overwhelmed, it is our right brain, the one of imagination and of creativity that takes control. May be you are a parent. You know spontaneously how to take care and reassure your kid when he or she is woken up by a nightmare: you know how that it isn't very relevant to start by explaining that there is no wolf in the house or that witches doesn't exist. Spontaneously, we know that we have first to listen to the kid, to let him express his fear, his terror and the emotion associated with it before reassuring him and helping him to admit that there is no wolf under his bed.

Allowing ourselves to play with words, we can say that we have to let the emotion of the person you're talking to ex-press itself so that he can im-press the reassuring content of your message in his memory.

### 1.2/ THE FANTASY OF "IS THERE A PILOT IN THE PLANE?"

"Not only could the machine explode but is there a pilot mastering the plane?"

The public anxiety will remain, in our opinion, as long as the public has not clearly identified WHO IS RESPONSIBLE FOR WHAT. Yet the question on nuclear waste is a nebula where the public is lost.

It is already lost in the forest of the acronyms of the companies that are involved. Messages have always been focused on scientific and technical arguments and never focused on the human beings that are responsible for it. As long as the public doesn't know who is responsible for what, it perceives that there is an enormous bureaucracy without a head. On their part, ecologists are clearly identified, like Cohn Bendit, Voynet...

Moreover, for innovations and inventions in the past we focus our attention on key figures such as Blériot, Mermoz, Lindberg... We had to bypass, to go beyond natural forces; we had to satisfy the myth of flying. Those key figures show a pleasant picture of discoveries. What is there to bypass in creating a nuclear energy. What are the key figures in the history of energy? We have the figures of pitworkers, of oil prospectors that have been related by famous writers like Zola... What could be the key figures in the discoveries about energy. Is there a myth to find, a myth to create? But a myth can't be created from nothing.

Pierre and Marie Curie discovered radioactivity but at what cost and who continues their work? The image of the bomb is not positive. Today, who is responsible for what?

### 2/ THE DIFFERENCE THAT, WE, PSYCHOTHERAPISTS, MAKE BETWEEN ANGUISH AND ANXIETY

Anxiety is a physical and psychological symptom which has a clear and identified object. For example, I am anxious because I have to take an exam, this is of high value to me and I know I could fail.

Anguish is a phenomenon much more diffuse, more difficult to treat psychologically. Anguish can't be defined by an object, by a clear source. I can suffer important physical symptoms ("angustus" in Latin means "narrow"; when I suffer from a throat infection, I have a lump in my throat) and psychological symptoms so that I never feel comfortable, relaxed. In other words, one can be overwhelmed by anguish, only because one is in the world, mortal, responsible of one's act, etc.

As professionals, we can say that ANGUISH IS MUCH MORE DIFFICULT TO TREAT THAN ANXIETY for we can't grasp it, we don't know how to reach it.

Generally, nuclear energy has generated much anguish. It started when the atomic bomb was used in far away countries. Every one has a diffuse fear of out of control forces.

Step by step, the public has gone from this diffuse anguish to an anxiety focused on certain themes like nuclear waste. Most of the studies, at least in France, show that nuclear plants are well accepted as a way to get less pollution in terms of carbon dioxyde than with fossil energies and that their security is well mastered by EDF.

The public has evolved to an anxiety mainly focused on the nuclear accident, and incidentally on the misuse of fissile material, from nuclear plants or nuclear storage sites, for terrorism.

It's not pleasant for you who work on nuclear waste for you are especially the target, the focus of this anxiety. It isn't of any comfort to you. Nuclear plants are well considered, not nuclear waste. We have to RECOGNIZE THAT IT IS A SERIOUS SUBJET and that it is taken seriously.

Although it's not comfortable to be the focus, the scapegoat of anxiety, let us explore on what base you could rely on to diminish the level of this anxiety.

We see, as psychotherapists, three major ways to treat anxiety: LISTENING, PUTTING INTO PERSPECTIVE, CHOOSING.

LISTENING is essential. If we aim at convincing, reassuring without listening, the system remains stuck.

When a person feels that he/she is deeply understood in his/her values and his/her anxiety, we can help . him/her to put things into perspective, to adopt a meta-position. This means to imagine what could happen if the dreadful scenario really occured and what would be the consequences.

For example, while taking an exam, a student can imagine what could happen if he fails at his exam. He visualizes himself not finding his name on the list of the successful students, he seeks on how and where he could repeat his year, etc. It's important not to reassure him then but to let him find solutions himself, his "creative adjustment" to a problemn that could occur. The student can build his success in preparing his exam and also in considering different scenarii in case of failure: the student has the possibility to take action.

PUTTING INTO PERSPECTIVE nuclear waste consists in giving to the public information on what could happen if those anxious scenarii happened, like an earthquake, a nuclear explosion. Any attempt to reassure or convince is of no help.

Imagine a father who couldn't listen to the anxiety of his kid the day before the exam and who would harass him in saying that he will succeed, that it's easy, that, in his time, it was different, etc. This father would be of no help for his kid.

As we have said before, the student can take action, he has the CHOICE to take action in different ways to prepare himself for the exam and for the different scenarii of non success... and of success.

About nuclear waste, considering scenarii of non success would lead to taking into account the possible accident... and the different possible actions that could be taken then. For example, could it be possible to consider the range of first aid gestures?

Let us remember the experiments of Henri Laborit: rats that are submitted to electric shocks in their cage, without possible action, develop ulcers; rats that are submitted to electric shocks in their cage and that can action a control stick to stop the electric current are in good health; rats that are submitted to electric shocks in their cage and that can action a stick which is disconnected are in good health. When rats can take a possible action, rats don't develop ulcers.

Similarly, communities that have been interviewed on nuclear matters are much more open than the ones that have been faced with a fait accompli. They have had the choice to act rather than suffer. The public needs to be involved in taking action and in choosing. How do you involve the public so that people feel concerned and find ways to act, and become conscious that there are some courses of action.

### 3/ A THIRD ASPECT IS: COMMUNICATION PRESUPPOSES RECIPROCITY

Reciprocity means that the people that are in charge of communicating on waste from all the involved organizations like EDF, COGEMA, ANDRA, FRAMATOME, etc can be able to focus their attention on THEIR OWN FEARS and can be able to communicate about them.

In fact, those fears exist although different from the ones of the ecologists. Those fears exist otherwise we wouldn't be here to discuss about this theme today. What are your fears?

Our role is to invite you to bring those fears to light and to explore them. Maybe there is the fear that ecologists have too strong an influence on public opinion and political power; maybe there is the fear to lose your job, maybe the fear about a technology that is not so well mastered... Maybe the fear not to be recognized in your research, in your convictions, in your good faith...

In the same manner as psychotherapists make "work well" their clients when they are regularly under supervision, i.e. a process of control where they analyze their own resistances, their own affects towards a specific client, we think that you can't really communicate with people that are hostile to nuclear energy without an introspection of your own fears. Without it, you might project your own vision of the world, your own reality, your own values, your ways to behave in the world and you might be unable to access and understand other universes than yours. Then there are no ways to communicate.

### 4/ IN FRONT OF ANXIETY, ANY DEBATE IS A DISASTER

Whatever you say, whatever technical or scientific arguments you develop, they are unacceptable as soon as you let yourself engage in a debate.

Why is it so? Because you already represent power, technocratic decisions, money, monopoly of technology. It's David against Goliath in the imagination of the public.

As soon as your opponents bring you into the field of a debate, "they win every time" whatever your arguments. The public is always on the side of the smaller, the more creative one.

It is true in politics and, ecology parties know it very well, it is the same phenomenon in military or commercial strategy. See how Apple wins market share in front of the "big and nasty Microsoft". The public "sponsor" affectively the Mac computers although they don't buy them. But heart has its reasons that reason ignores.

The attitude of those of you who communicate on the theme of nuclear waste has to be one of calmness and listening. The speaker has to be pleasant, moderate, human; he/she has to show that he/she understands the arguments of the opponents and there, can induce respect for his/her human qualities more than by his/her aggressivity to castigate the opposite thesis. The "gestalt" is more important than the content. The non verbal language is more important than the verbal language.

So, the politic to oppose "fear against fear" which consists of arguing on how fossils energies increase the greenhouse effect, how windmill energy creates noise and aesthetic disturbances, is legitimate in a debate between specialists and experts to question about what good choices there are. Nevertheless it is very difficult to use in a public debate for it worsens aggresivity. Every one of us then imagines that each specialist wants to sell his/her technique, is not objective and hides the real issues.

### 5/ AN EFFICIENT MESSAGE NEEDS TO GET TO A MULTIREFERENTIAL LEVEL

The world is never binary: nothing is totally black or white. The shadow has always some photons of light. We know that since Tao, yin and yang.

Nuclear energy is not all bad or all good, as certain people would like to caricature.

The nuclear field, because of nuclear waste, leaves some ethical questions. We would consider the definition of ethics as "to work on finding the least worst possible solution". This definition relies on the idea that there is no perfect solution, that there are problems in all the possible options to produce electricity.

Scientifist are here to help the public and their elected representatives, i.e. the politicians, to choose "THE SOLUTION THAT IS THE LEAST WORST POSSIBLE". In other words, "THE SOLUTION THAT IS THE BEST COMPROMISE".

If this position is not clearly perceived by the public, the public rejects everything altogether, as soon as the tiniest difficulty appears.

If the people in favor of nuclear energy develop a binary communication policy such as "We have the only possible solution, we have scientific truth", then they are in a binary perspective which will be swept away at the first incident. If you place yourself on the ethical level, you present a range of different technological choices with their advantages and disavantages, then you let people use their own judgement.

It is a well-known and well-used tactic to force one's opponent to leave a multireferential position for a binary position. It's important not to get into this trap.

**TO CONCLUDE**

To conclude on this theme, let us remember that the communication of a company or an industrial field is not the business of the people in charge of communication, it's the business of everyone.

Communication is made day by day by all the personnel of a company so that every one supports the project. How is communication on nuclear waste made in each company that you represent?

# Siting of a deep repository for spent fuel – how are we communicating the risks?

*Monika Hammarström, Swedish Nuclear Fuel and Waste Management Co.*

## Introduction

During 1998 the strategy of the Swedish Nuclear Waste Management Company for the siting process was refined in order to strengthen the possibilities for implementing deep geological disposal of spent nuclear fuel. Our new organisation was formed to meet the demands of the strategy. The strategy implies focused activities in municipalities where we are performing so called feasibility studies. An important milestone for us is to be able to choose two sites for site investigations in 2001.

## Feasibility studies

The direct siting work for a deep repository started in 1992. This work is performed in parallel with the development of repository and encapsulation techniques. The siting process is based on voluntary participation and active participation from all parties in society.

A feasibility study includes compilation of geological data, land use, environmental aspects and also economical and social impacts of a deep repository. The study determines whether areas for further investigations, site investigations, exist.
We are at present performing six feasibility studies within the country. A local information office is established in each of these municipalities. Two studies in the northern part of Sweden were finalised in 1995 and in 1996. Referenda were held in both these municipalities. The question asked was if SKB should be allowed to continue looking for a site for deep geological disposal of spent fuel.
The results were 28% yes and 71 no in Storuman and 44% yes and 54 no in Malå.

We have learned many lessons from Storuman and Malå regarding the interaction with the public and communicating risks. Researchers in the fields of communication have interviewed residents in these municipalities both those in favour to continuing with site investigations and also those opposing to it.

In the beginning of the siting process we spent too little time on discussing the problem in itself (the waste exists) and the needs and responsibilities we all have to ensure a stable and safe solution for taking care of the waste in a long term perspective. There has been a tendency from SKB:s side to deliver a ready-made solution to a problem that many people did not consider to be of their concern.

## Ongoing activities

Our main goal for the next two years „Acceptance 2001", meaning we will have two sites for site investigations by the end of 2001 requires:

- Acceptance by the authorities of the technical/scientific background material, the method and the sites.
- Public and political acceptance to begin site investigations.

Some aspects and characteristics regarding status of the opinion, which are important for our work:

- An existing system för waste management very well operated with ha good technical/scientific reputation
- Strong local support for existing facilities and ongoing feasibility studies
- A somewhat unclear picture of the regional support
- Weak support and engagement on a national level.

SKB has to focus the work to get a majority of the public to be in favour to continue site investigation.

A strategy and communication plan for the years up to 2001 is guiding our work in the feasibility municipalities and the regions surrounding them as well as the work on a national level. A basic goal for our activities in the municipalities is to have a majority (at least 60%) in favour of letting SKB to continue the work with site investigations.
More specific goals are:

- 70% of the representatives in a municipal council are in favour of site investigations
- 60% of the population living close to a proposed investigation area is positive to have us continue site investigations
- a majority in the region is positive
- a majority of the Swedish people is positive

The goals will be measured every six months. The activities to be performed depend on the category of people we want to reach. The communication work can be described as follows:

**The message**

The main message we mediate contains three parts:

- **The problem** The waste exists and has to be taken care of in Sweden

- **The way we work** The work is performed in steps to ensure dialogue and changes and modifications if needed

- **The solution** The method is robust, a repository can be constructed in a reasonable time and ensure safety in a long-term perspective

**Our attitude**

Our attitude shall be characterised by high quality and competence in all aspects. Honesty and openness are key words. The fear that people feels regarding radioactive

waste shall be taken seriously. We are proud to be able to show an already existing waste management system and of our knowledge and experiences.

**How do we work?**

How is our message communicated in practice? How is the dialogue established? How do we engage our allies?

A series of activities are ongoing and planned:

- Visits to business firms, institutions and schools
- Visits to our facilities
- Exhibitions
- Articles, advertisement
- Information brochures, locally adapted
- Seminars with various interest-groups
- www
- Special courses to personnel working at the nuclear power plants

In parallel to all these information activities SKB runs an extensive technical and scientific programme to be able to demonstrate how a deep repository can be constructed how the different safety functions will work to ensure safety in a long term perspective . This work is performed in our hard rock laboratory and in our encapsulation laboratory. Real copper canisters are fabricated and tested and a number of them will be deposited in the rock laboratory. Heaters put into the canisters will simulate real conditions in a repository during a number of years.
A safety report has just recently been presented to the authorities. The report aims at demonstrating that the proposed method, KBS-3, meets safety requirements. The results show that the prospects for building a safe deep repository for spent nuclear fuel in Swedish bedrock are very good.
SKB arranged press conferences in several municipalities to present the results from the safety report to the political representatives and to the public. The response has been very positive. Opinion polls on both at national level and in the municipalities where the feasibility studies are being performed were presented in December 1999. The results from the polls shows that people have confidence in the work SKB is doing and that a majority can accept a deep repository in their own municipality if a safe place can be found.

**Conclusions**

The results so far from the various communication activities show that we are going in the right direction. The support we are gaining from various sectors in society together with our own motivation and clear objectives will, I'm sure, lead us to at least two sites for site investigations for a deep repository in Sweden by the end of 2001.

# PUBLIC PARTICIPATION IN DECISION-MAKING PROCESSES : ONDRAF/NIRAS' APPROACH TO THE DISPOSAL OF LOW-LEVEL AND SHORT-LIVED RADIOACTIVE WASTE

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January 16, 1998, is a milestone in the nuclear waste management in Belgium. On that day, the Belgian government effectively opted for a definitive or potentially definitive solution for the long-term management of low-level, short-lived radioactive waste. The government also wanted this solution to be implemented in a progressive, flexible, and reversible manner. It was thereby definitively abandoning the prolonged interim storage option, in favour of either surface disposal or deep geological disposal.

At the same time, the government entrusted new missions to ONDRAF/NIRAS, aimed at enabling it to make, around 2001–2002, the necessary technical and economic choice between surface disposal and deep geological disposal. ONDRAF/NIRAS had to develop, in particular, methods, including the management and dialogue structures, necessary to integrate a repository project at the local level. Furthermore, it had to restrict from then on its investigations to the four already existing nuclear zones in Belgium, namely those of Doel, Fleurus, Mol–Dessel, and Tihange, and to the local towns or villages having shown an interest in a preliminary field study.

Early in 1998, ONDRAF/NIRAS set up a new work programme and developed an entirely new work methodology. As we understood that the best way to take involved into account the interests of all parties, is to involve them in the decision making on the project, we developed the idea of the local partnerships. Any party that could be directly affected by a collective decision, must have a say in it. Another innovative aspect of this new methodology is that of integration: an integration at the local level which is meant to enable the development of draft repository projects creating new perspectives for the regions concerned.

Extending over four to five years, ONDRAF/NIRAS's new work programme assumes the active participation of all the interested local representatives. The following procedure was adopted:

Step 1. Localities with nuclear activities or that show an interest in the project, are screened to ascertain that the building of a safe repository is technically feasible.

Step 2. In the localities that pass this entrance exam, a local partnership is established with the mandate to work out, over a period of two years, the plans for the local project. The integrated project should fit into the development perspectives of the region, should reflect local needs and aspirations, and should secure optimum safety. To ensure that such is the case, the partnership involves local authorities, representatives of local economic and socio-cultural agents and an ONDRAF/NIRAS representative.

Step 4. The projects elaborated by the different partnerships are submitted to panels of experts who comment on the technical, economical, socio-cultural and ecological merits of the proposals.

Step 5. The national authority makes the final choice.

Presently, one partnership has been formed with the municipality of Dessel and two others are being formed. In each of the municipalities involved, a university research team of the Universitaire Instelling Antwerpen (UIA) and of the Fondation Universitaire Luxembourgeoise (FUL) conducts interviews to map the local social and economic structure. This will lead to a proposal on how the partnership should be constituted and on who could be asked to participate in the different working groups that will do the bulk of the work.

## The local partnerships are representative

The local partnerships proposed by ONDRAF/NIRAS bring together representatives from all the interested local representatives and ONDRAF/NIRAS. Except for the latter, which is an obligatory partner because of its legal mission and because it will take the final responsibility for the repository studies, potential partners have to be domiciled in the town(s) or village(s) concerned.

Local representatives are first of all the local councils, whether of an isolated town or village, or of an association of two or more towns or villages. Other potential partners are local associations with an ecological, professional, or socio-cultural character prepared to commit themselves to studying and developing a robust draft project and, as regards the existing nuclear zones, the nuclear operators. Groups or individuals who do not belong to the circle of local representatives have the possibility to contribute as associated members, and the local representatives, who are not partners, are able to contribute through the working groups.

Local partnerships, even though they might assume distinct legal forms because of differing local sensitivities, ideally have comparable structures. They total four levels, the precise designation of which will be determined by the partnership's legal form, and their functioning is entirely financed by ONDRAF/NIRAS, though within certain budgetary limits.

- The general assembly, gathering all the partners, represents and legitimizes the partnership.
- The management committee, the members of which are appointed by the general assembly, gathers representatives of the various partners.
- The project co-ordination, which gathers two people appointed by the management committee, manages and co-ordinates the partnership's activities on a day-to-day basis.
- Finally, the working groups are the real activists of the partnership. They work out the project proposal in concrete terms, propose and discuss the possible options among themselves, weigh up the pros and cons, and collect expert opinion. It is at their level that non-partners are able to contribute if they want to.

## The local partnerships are responsible for their projects

Given much freedom, the local partnerships serve as reflection and negotiation forums and encourage dialogue at the local level. They propose ideas and develop the corresponding draft projects. They are furthermore responsible for ensuring that the developed repository studies are integrated in global draft projects, which will have to be supported by a wide social consensus and will have to benefit the town or village concerned.

Prior to starting conceiving its draft project(s) for integrated disposal, each partnership will gather all the information necessary for a detailed evaluation of the town or village it represents and of its potential disposal site(s). It will do so with the help of the accompanying teams of the UIA, the FUL, and ONDRAF/NIRAS. It will then carry out an in-depth study of the technical, socio-economic,

environmental, and cultural data thus gathered, before working out one or possibly several draft projects of integrated repository.

The partners will then negotiate among themselves the various draft projects proposed. They will only proceed with a project and develop it up to the model stage if it complies with two conditions: to be considered safe by ONDRAF/NIRAS and to be seen as a strong enough socio-economic asset in the opinion of the other partners. If one of these two conditions is not met, the case will be closed. The partnership will also work out financial estimates and will draw up recommendations for the realization and the exploitation of its draft project(s). (If, because of their geology, certain towns or villages appear suitable for hosting both a surface and a deep repository, the partnership will indeed be entitled to develop two draft projects of integrated repository instead of one.) ONDRAF/NIRAS will of course be responsible for the technical aspects of the draft projects and will ensure their safety, thus fulfilling its double role of partner and expert.

The partnership as a whole, and not just ONDRAF/NIRAS, will decide on the priorities and take the decisions throughout the project. It will organize the dialogue and communication between partners and will be responsible for keeping the local population informed at all stages of its work, thereby reinforcing the consensus around it.

At the end of the process, each partnership will have developed one, or possibly two, draft projects for integrated disposal, together with their respective methods of implementation. After being evaluated by independent experts in terms of safety, socio-economic added value, and cost, they will have to be approved by the local councils concerned. They will then be submitted to the government, together with the corresponding advice, to enable it to decide, around 2001–2002, which one(s) it wants to develop further.

## Conclusions

Because it has understood that any party that could be directly affected by a collective decision must have a say in it, ONDRAF/NIRAS has accepted the need to question its past methodology. By proposing a work methodology based on local partnerships to come to a safe and acceptable solution for the long-term management of low-level, short-lived radioactive waste, more room is created to get local participants beyond the stage of boundless suspicion of anything that is 'nuclear'. The disposal project becomes an integrated development project with local interests at stake, rather than an externally imposed project.

ONDRAF/NIRAS now relies on the voluntary participation of the interested local communities. It wants them to be activists and not simply spectators, and will encourage them to be dynamic and innovative. In accordance with its legal mission, it will be responsible for the viability and the safety of the draft projects proposed and will provide its partners with the necessary financial means and technical support to develop their respective proposals. This approach should, or so it is hoped, enable the Belgian government to select, around 2001–2002, the draft project(s) of integrated repository that it wants to proceeed with. ONDRAF/NIRAS will of course take the final responsibility for the safety of the concept, but the concept's added value and integration at the local level, will be the result of the contributions and efforts of everyone involved.

By proposing this new work methodology ONDRAF/NIRAS acknowledges the possibility of a failure. It does indeed take the risk of ending up, in 2001–2002, without any viable draft project. Should the case arise, the Belgian government will have to decide on how to proceed further.

# Communication strategy for final disposal facility

Timo Seppälä & Osmo Kurki
Posiva Oy

## Background

In May 1999, Posiva filed an application for a policy decision to the Council of State on the construction of a final disposal facility for spent nuclear fuel in Olkiluoto in the municpality of Eurajoki. The decision to be made by the Council of State must be ratified by the Parliament. The precondition for a positive decision is that the preliminary statement on safety to be provided by STUK by the end of the year 1999 is in favour of Posiva continuing with its repository development programme, and that the Eurajoki municipality approves the project in its statement by the 28th of January 2000.

The policy decision by the Council of State is expected to be made in March followed by the ratification of the Parliament before the summer.

The policy decision alone will neither entail a construction license nor an operating license for the facility. It is also true that the final disposal facility will not be operational until after 20 years. A policy decision is needed to select the final disposal site where the research work will be concentrated.

These are the facts we are trying to clarify in our communication in such a way that the general idea of the importance of the policy decision is seen in proportion.

## Communication with decision-makers

Decision-maker oriented communication has several objectives. The main goal is, of course, that the Council of State and the Parliament are able to make a positive decision in 2000. In order to reach this goal, the decision makers need to have correct and sufficient information on final disposal and they must have understood Posiva's messages correctly. In an ideal situation Posiva is the major source of information regarding final disposal: easy to approach and to get acquainted with.

The difficulty with the strategy of communication directed to decision-makers, especially members of the Parliament, is how to inform them in an appropriate and sufficient way. It seems that the members of the Parliament don't know the basic concept of final disposal very well. It can also be assumed that when the time comes for the decision-making, the general opinion of the members of the Parliament is not determined only by the actual information available but also by the public image of final disposal. Therefore Posiva's communication has relied also on advertisements in addition to the traditional way of generating information.

"Toolbox" for communication

When trying to make the principle of final disposal understandable and acceptable to the decision-makers, the strategy is to use a varied range of methods in communication. The strategy is to generate information frequently and in different ways, segmented to different groups of decision-makers. Several means of communication have been adopted in order to reach as many persons in the target group as possible.

These "tools" in communication can be divided in the following way:

- Printed material (information folder, newspaper inserts)
- Face-to-face communication
  - visits of decision-makers to the repositories of LLW-and ILW-waste and to interim stores of spent fuel
  - seminars
  - prensentations in political occasions
- Advertisements
- Internet

Information folder

Printed material directed at the decision-makers is the traditional way to inform. In Posiva's communication we have produced a so called information folder on final disposal which has been delivered to the members of the Parliament, the relevant civil servants in the ministries, provincial and local authorities as well as decision-makers in the intended final disposal locality etc. The latest up-to-date version was issued at the same time as Posiva submitted an application for a Decision in Principle to the Council of State.

Newspaper annex

Apart from the information folder, also other printed material has been produced for the decision-makers. For example, Posiva's newspaper insert published 3-4 times a year in the site investigation municipalities, has also been delivered widely to the decision-makers. It contains up-to-date information on Posivas research work in the site municipalities as well as general information on nuclear waste and radioactivity.

Face-to-face communication

It is clear, however, that publishing material is only one part of the communication strategy. Contacts with decision-makers in different occasions and face-to-face discussions on substantial matters are at least as important as other forms of communication. Decision-makers have been invited to visit final disposal facilities of low and intermediate level waste as well as interim storage facilities of spent nuclear fuel located at the power plant sites. In this way we have been able to show concretely what spent nuclear fuel is all about.

Internet

As a final and a complementary method in communication there is our website, www.Posiva.fi, containing all the essential information on final disposal and on Posiva. It seems, however, that the Internet is of somewhat less significance than other methods of communication.

Conclusion

In a poll carried out among 350 decision-makers, less than 10 % of those who answered (134 persons) found Internet as the most important source of Posivaís information on final disposal. On the other hand, over 80 % of those who answered found the information folder as the most significant source of information. When considering all the information available on final disposal (TV, radio, newspapers, authorities, environmental organisations, etc.) Posiva was found to be the most significant source of information while newspapers and periodicals came second. In this case the environmental organisations seemed to have a minor role, as a result of not being too active in confrontation.

As a conclusive remark it can be assumed that because it is not only Posiva's information that is relevant to decision-makers, but the media also plays a significant role, the impression that decision-makers have of final disposal is based on a mixture of messages coming from Posiva and from the media. That is why the communication related to decision-makers is also communication with media, in order to ensure that the messages produced by the media support the information produced by Posiva.

# WILL THE WORLD SNF BE REPROCESSED IN RUSSIA?

**A.Gagarinski**
**Russian Research Centre**
**"Kurchatov Institute".**

Russia's possibilities in nuclear fuel reprocessing are well known. RT-1 plant with 400 tons/year in the Chelyabinsk region can provide reprocessing of fuel from Russian and Central European VVER-440 reactors, as well as from transport and research reactors. After reconstruction, it will be also able to reprocess fuel from "large" water-water reactors.

Former military complex Krasnoyarsk-26 with unique underground installations situated in rock galleries, already has an aqueous facility for storage of 6000 tons of SNF, half-built plant RT-2 for nuclear fuel reprocessing with 1500 tons/year capacity, as well as the projects of "dry" storage facility for 30000 tons of SNF and of MOX fuel production plant.

Russian nuclear specialists understand well, that the economic efficiency of nuclear fuel reprocessing industry shows itself only in case of large-scale production, which would require consolidation of the countries, which develop nuclear energy. They also understand, that Russia has all the possibilities to become one of the centers of such a consolidation and to use these possibilities for the benefit of the country.

The idea of foreign nuclear fuel reprocessing (for a long time realized for East and Central Europe countries, which operate Soviet-design reactors) has existed in the specialists' minds, and sometimes has appeared in the mass media.

For example, an interesting event was represented by a "Swiss wave", when in September of 1998 the Greenpeace has published a supposedly secret protocol of intentions concerning reprocessing of Swiss nuclear fuel in Russia, signed by representatives of the Russian Minatom and the Swiss nuclear industry. Then the Swiss TV channel SF1 has released an 'exciting" video showing removal of concrete blocks near a lake, with a comment on "radioactive waste burial in Russian manner", which was intended to persuade the TV audience, that they are witnessing the dumping of containers with "civil" radwaste in Russian waters. In reality, this video film, shot at the territory of the plant for military plutonium production (stopped in the end of the 80ies), was showing the closure of the Karachai lake, which has been used as storage pool for liquid waste of the military production.

By the way, rehabilitation of territories of nuclear fuel cycle enterprises in Russia continues, including the Karachai lake, which contains 120 million Curie of radioactivity. Unfortunately, Russia simply has no money for complete solution of the problems of radiation military legacy. The required amount - five-six billion USD - looks quite moderate if compared to the American plans to spend at least 250 billion

USD for liquidation of consequences of their own military programs. However, even such a sum cannot be found in the Russian budget.

And then, during discussion of the budget for 2000, the Russian Minatom has made a daring step. A real program, how to find money needed for solving the "radiation legacy" problem, was proposed. With this purpose, it was proposed to permit storage and further reprocessing of other countries' SNF on Russian territory. It is well known, that another countries' SNF is accepted for reprocessing by UK and France, and Russia itself accepts the spent fuel assemblies from Bulgarian, Hungarian, Slovak and Ukrainian VVERs, under the agreements signed in the 70-80ies.

It is quite obvious, that this initiative couldn't have been accepted immediately, moreover that today its way is blocked by the Law "On natural environment protection", adopted in the first months of "Russia's liberation from the Union".

Article 50 of the Law contains paragraph 3, which is characteristic, in its overwhelming simplicity, for the romantic period of "democracy's victory over common sense": "Import, for storage and disposal, of radioactive waste and materials from other countries, dumping and disposal in space of radioactive waste and **materials** are forbidden". Certainly, this legal clause, actually forbidding even the CIS nuclear warheads' return to Russia, leaving aside the international agreements on fuel return from NPPs built by the Union, began to shake under President's orders, governmental decisions, etc. - however, it still exists, though "the ice has begun to move".

State Duma deputies have submitted to the Parliament the bill "On industrial reprocessing and storage of spent nuclear fuel", which, for the first time in Russian legislation, removing the label of "nuclear waste" from SNF. This proposal has already been supported by Russian institutions, responsible for nuclear safety, population health and state of the environment: Gosatomnadzor, State Ecological Committee, Ministry of Health, Ministry of Foreign Affairs, and many others.

Certainly, this Minatom's initiative has resulted in a wave of negative emotions in the mass media, which, however, has very soon calmed. Main opponents - Professor A.Yablokov, former President's Advisor on Ecology, who behaves as "the country's chief ecologist", and T.Zlotnikova, Chairwoman of the State Duma's (lower chamber of the Parliament) Committee on Ecology - have both published sharp articles: "We don't need somebody's waste, we have enough waste of our own" (A.Yablokov) and "Minatom's activities ... are a threat for the country's national security" (T.Zlotnikova).

Nevertheless, "the caravan moves". 10 of Russian regions' Governors (from the total of 89 subjects of the Federation) have announced their support of "SNF import". Moreover, 40% of income from international "labour division" in SNF reprocessing, in accordance with the new draft law, would be used "to liquidate the negative consequences of previous nuclear enterprises' activities in Russia".

The final decision depends on the new Parliament, which will be elected on December 19, 1999, and on the public. The position of Russian nuclear specialists is clear. If our joint goal with ecologists will be to achieve the maximum possible reliability and safety of existing and future nuclear industries - we shall go the same way. If one of the parties has a goal of closing the nuclear power industry, and, to begin with - to ban nuclear fuel reprocessing, - we shall take another way. We are convinced that without nuclear energy the mankind has no future, and is (and will be) no normal ecology without it.

This is still more important for Russia, which has to solve the ecological problems of its cities, of fuel & energy complex, the problems of water and air purity, as well as the issues of territories' rehabilitation from the consequences of nuclear military activities. That's why we shall not cede our position to anyone. Sooner or later the country's public will understand and agree with such a conclusion.

# UK NATIONAL CONSENSUS CONFERENCE ON RADWASTE MANAGEMENT

**Andrew Craven-Howe**
**Lexicon Consulting**

## Summary

- UK CEED organised a consensus conference to debate radwaste disposal. It lasted from 21-24 May 1999. Among the witnesses called to give evidence were UKAEA, BNFL, Nuclear Industries' Inspectorate, Department of the Environment, Transport and the Regions, Friends of the Earth and Greenpeace.

- The end result was a report produced by the panel of members of the public, recording their views and recommendations. Conclusions are attached.

## What is the nature of the process?

What is a Consensus Conference? Often described as 'an exercise in democracy', a Consensus Conference is a forum at which a Citizens' Panel, selected from members of the public, questions 'experts' (or 'witnesses') on a particular topic. The Panel then assesses the responses, discusses the issues raised, and reports its conclusions at a press conference. These conferences are especially suited to dealing with controversial issues of public concern at a national level, which are often perceived as being too complex or expert-dominated. A distinctive feature of this approach is that the Citizens' Panel is the main actor throughout: it decides the key aspects of the debate, including the choice of questions and selection of the witnesses, and formulates its own conclusions. They undertake a high workload during the four days, and at the end, the Panel produces a report outlining its conclusions and recommendations, which is circulated to key decision makers in the government and industry and to other interested parties.

Although a number of countries on the European continent have considerable experience of this type of forum, it is a relatively novel in the UK (similarly referenda). Indeed, this was only the second such conference – the previous one held in 1994 to tease out issues (as perceived then) relating to genetically-modified food.

Aims of the Consensus Conference

- To contribute the views of informed citizens to the policy-making process for radioactive waste management;
- to gain an appreciation of the way in which the issues are framed and prioritised by the public;
- to identify key issues of concern as seen by the public and to recommend a process by which they might be examined and resolved;
- to expand the availability of reliable and high quality information for the public;
- to stimulate wider and better informed public debate on the issue.

This Consensus Conference was not:

- A replacement for the normal democratic decision-making processes – it is intended to enhance existing structures;
- about making detailed technical judgements on the treatment of radioactive waste or the merits of alternative repository sites;
- intended to give a view that is representative of the whole UK population;
- a public relations exercise on behalf of the nuclear industry or the anti-nuclear groups.

Who is funding the Conference? The idea of holding a national Consensus Conference on Radioactive Waste Management in the UK originally came from within the UK Centre for Economic and Environmental Development (UK CEED). UK CEED was responsible for securing funding for the project, the majority of which is from public sources – through a Public Understanding Grant from the Office of Science and Technology and from the Natural Environment Research Council. The remainder of the funding has been provided by NIREX, the company responsible for implementing national policy on the disposal of intermediate level radioactive waste in the UK.

Who are the Citizens' Panel? The Citizens' Panel is a group of 15 people from all regions of the country, reflecting a range of different backgrounds. The Panel is not intended to be statistically representative of the UK population, nor should its findings be taken as being representative of public opinion – rather, the Panel represents a genuine cross-section of the public who will give their opinion on the issues as they seem them, as members of the public. None of the Panel members have had any significant prior involvement in the area of radioactive waste management.

**Who were the witnesses and what were the questions?**

Here follows a copy of the programme.

| |
|---|
| **Question One:** What do you see as the primary advantages and disadvantages of deep disposal? What do you see as the primary advantages and disadvantages of shallow/surface storage? |
| **Witnesses:** |
| Dr Alan Hooper, Nirex<br>Mr Peter Beck, Royal Institute for International Affairs<br>Dr Kathleen Sullivan, Freelance Research Consultant<br>Mr David Holmes, British Geological Survey<br>Dr Rachel Western, Friends of the Earth<br>Mr Claes Thegerstrom, SKB |
| **Question Two:** What is the current/future policy with regard to monitoring companies other than BNFL who produce radioactive waste? |
| **Witnesses:** |
| Dr Steve Brown, Department of the Environment, Transport and the Regions<br>Mr Stan Gordelier, UKAEA<br>Mr Robert Smith, Environment Agency<br>Mr Laurence Williams, Chief Inspector of Nuclear Installations, Nuclear Installations Inspectorate |

| |
|---|
| **Question Three:** Currently, what Research and Development is there into nuclear waste treatment? |
| **Witnesses:** |
| Mr David Bonser, British Nuclear Fuels plc<br>Mr Peter Beck, Royal Institute for International Affairs<br>Dr Kathleen Sullivan, Freelance Research Consultant<br>Mr Malcolm Grimston, Imperial College |
| **Question Four:** Would privatisation mean that an integrated approach to dealing with the problem of radioactive waste management will be more difficult? How can you guarantee that shareholders' profits will not become more important than preserving current safety standards? |
| **Witnesses:** |
| Mr David Bonser, British Nuclear Fuels plc<br>Mr Brian Hibdige, Engineers and Managers Association<br>Mr Claes Thegerstrom, SKB |
| **Question Five:** What is the current/future policy with regard to informing the public about radioactive waste? |
| **Witnesses:** |
| Dr Steve Brown, Department of the Environment, Transport and the Regions<br>Lt Col Murphy, Gosforth Parish Action Group<br>Sir Francis Graham-Smith, Nuffield Radio Astronomy Laboratory, Jodrell Bank<br>Mr Gordon Thompson, Institute for Research and Security Studies |
| **Question Six:** What benefits do we gain from importing spent fuel for reprocessing? |
| **Witnesses:** |
| Sir Francis Graham-Smith, Nuffield Radio Astronomy Laboratory, Jodrell Bank<br>Ms Helen Leiser, Department of Trade and Industry<br>Dr Francis Livens, Department of Chemistry, Manchester University<br>Dr Derek Ockenden, Former BNFL Research Chemist<br>Dr Kathleen Sullivan, Freelance Research Consultant |
| **Question Seven:** What is your opinion on the continuation of nuclear power? What are the financial, environmental and social costs? |
| **Witnesses:** |
| Mr Alan Martin, Alan Martin Associates<br>Mr Jeremy Western, British Energy |
| **Question Eight:** Who supervises the military? How do we deal with decommissioned submarines? What research into 'lost' waste is currently being made (eg in the ocean, on Ministry of Defence land)? |
| **Witnesses:** |
| Dr John Connor, Chief Environment Officer, Ministry of Defence<br>Captain Mike Graves RN, Ships Support Agency, Ministry of Defence<br>Captain Peter Hurford RN, Chairman, Naval Nuclear Regulatory Panel |
| **Question Nine:** What are your opinions on the current terminology used for the classification of radioactive waste? |
| **Witnesses:** |
| Mr Colin Duncan, British Nuclear Fuels plc<br>Dr Kathleen Sullivan, Freelance Research Consultant<br>Dr Helen Wallace, Greenpeace |

**Comments on the Proceedings**

- *There was one clear anti-nuclear panel member who already seemed well acquainted with key 'greens'. All the others seemed more open-minded, either slightly anti or slightly pro.*

- As the event wore on, the tactics of the 'green' groups became obviously more and more irritating to the panel members.

- From private conversations with panel members and from observing the proceedings:

  - Kathleen Sullivan was chosen by the panel as an apparently independent consultant. She appeared as a witness on several questions. From the outset it was clear that she was a rabid anti-nuclear. There is no doubt the panel felt cheated.

  - The 'greens' treated audience questions as the opportunity to make long statements and irritated the panel. In one extreme case the organisers turned the microphone off but the questioner still insisted on continuing.

  - 'Green' witnesses did not keep to the panel question they were supposed to be answering. By Day 2 one of them was told bluntly, either answer the question or stop talking.

- The panel clearly misunderstood some of the witness's evidence. It is a complex and difficult subject.

**Comments on Tactics**

- Rachel Western (FoE)/Kathleen Sullivan asserted in their evidence that the FoE had forced the industry to admit during a previous public enquiry that the repository would leak. I don't think we spotted this early enough. In truth, of course, the whole repository safety case has always assumed that the engineered barriers would not last forever.

- The 'pro' lobby missed an opportunity to enlighten the panel on one major point. They failed to correct the misconception that, if the engineered barriers had failed, then so had the repository.

- 'Industry' witnesses and audience members played closely by the rules, in marked contrast to the 'anti' witnesses.

- The 'greens' tried to broaden the issue as much as possible. Their objective was to show:

  - there was no safe disposal possible; wastes should be kept above ground on the sites where they were produced.

  - therefore we should not allow the generation of further wastes.

  - therefore we should close all nuclear facilities, civil and military.

  It is probable that this lack of focus counted against them.

- In his response speech Charles Secrett (Director, FoE) deliberately bent and extended the panel's conclusions as far as he could to agree with the FoE position. You could see from the body language that the panel felt abused; the CEED chairman commented on this. It is not clear why he did this; possibly to persuade Michael Meacher they had reached different conclusions, perhaps to persuade the press.

- Secrett also, where he could not bend the conclusions, openly disagreed with the panel recommendations in a tone which suggested that the FoE were not willing to listen.

- In contrast, the industry reply (David Bonser, BNFL/Chris Murray, Nirex) chose to play a much softer line, avoiding open disagreement. This seemed to go down much better.

- In summary, I concluded that the 'antis' behaviour was often more directed at making a lot of noise than winning.

**Key Points from Speeches of Response (to the Report)**

Michael Meacher – Secretary of State for the Environment

He promised that the Report would be studied very carefully. He had seen the response to the House of Lords report, and committed to a government 'green paper' by the end of the year. He agrees with underground storage – with monitoring, since material will remain 'live' for a very, very long period, until the next ice age. He agrees that an independent body should select the site but stated that it is an acutely political issue. He sees the options as: Sellafield where it can be accepted, or persuading some other community which would be very difficult. He noted that reprocessing is a much more sensitive issue (and would possibly ignore it?). ILW waste has now accumulated to a colossal scale.

Lord Flowers

He repeated much of what is the earlier House of Lords report. Surface storage is necessary in the interim in any case. Panel do not like the word disposal since they want monitoring. He played down transmutation.

Prof Sir John Kreps, CEO, National Environmental Research Council

Four words in report that matter: science/risk/openness/independence. Should repeat the process, either with this or other panels, to maintain momentum. In a moment of levity he stated that from the point of view of geology, the London deep clay zone would make an ideal disposal sites. Technically he is correct, but the suggestion was greeted with laughter!

Charles Secrett, Director, FoE

Dealing with nuclear issues is extremely tricky and made much of public values (maybe because facts are inconvenient?). Feels the Report is good, with common sense shining through. He was pleased to see no deep repository (they did not say this) and no backfill. But he did disagree by saying that existing reprocessing contracts should be honoured. He said the Report's weaknesses are that it did not disallow radwaste transport, or insist on on-site storage, etc.

## Conclusions

1. Overall, the process worked better than some had expected. Although some of the conclusions were not perfectly logical, in the space of time available the panel did a good job.

2. The ample time for debate revealed the 'green' position to be shallow – strong on repetition and weak on evidence, with bigotry occasionally showing through.

3. This panel claimed they would like to continue to be involved, although this could be because this was their 'fifteen minutes of fame'. A number expressed the view (possibly with some justification) that in the real decision-making process, the Consensus Report would be conveniently disregarded.

4. Media coverage was disappointing. A short story in The Times was factually incorrect; the best report appearing in the Guardian.

# SITING NEW NPPS

# Environmental impact assessments of a fifth nuclear power plant unit in Finland

## RESULTS OF RESIDENT QUESTIONNAIRES AND MEDIA MONITORING OF PRESS CUTTINGS

**Jorma Aurela and Katarina Koivisto, Fortum**
**Tellervo Taipale, TVO**

Two years ago both Fortum Power and Heat Oy and Teollisuuden Voima Oy (TVO) launched their Environmental impact assessment (EIA) procedures of a new nuclear power unit in Finland.

The EIA procedures were launched to investigate the environmental impacts of a fifth nuclear power plant which possibly will be built in Loviisa or at Olkiluoto. In Finland there are four operating NPP units, two in Loviisa (Fortum) and two in Eurajoki, Olkiluoto (TVO).

In the EIA procedure citizens and various associations and authorities have an opportunity to express their views on the matters related to the project. The Ministry of Trade and Industry (MTI) as the co-ordination authority arranges the organisation of the EIA hearings and the collection of statements and opinions.

### Increased information

The focal aim of the power companies was to increase the information available to citizens and various interest groups and their participation opportunities. Thus, the EIA can contribute to reducing disagreements and helping in the creation of a dialogical connection.

The most important target groups of communication were various authorities, the residents of the area, and the media.

During the EIA procedures information was available through many channels i.e.

- so-called co-operation groups were established between the representatives of the municipalities of the impact areas, the project developer and the official experts
- several press conferences were organised
- EIA bulletins were delivered to all households of the impact areas
- information points in the visitor centres of the plants, public libraries of Loviisa and Eurajoki area were organized
- the EIA programmes and the reports were on display at the local municipal government offices
- for two-way interactions, groups and civic organisations were given an opportunity to invite representatives of Fortum and TVO to give information about the project, and the residents were able to put their views forward and tell about matters that they were worried about.
- information on the Loviisa project was also available in the Internet, (address http://www.ivogroup.com/loviisa/yva).

### National energy attitude

The views of the Loviisa and the Olkiluoto residents on nuclear power have been mapped out already since 1983. The questionnaire1999 includes some details concerning the information of the EIA procedures.

The results of the national energy attitude -questionnaire will be presented at the PIME meeting.

**Resident questionnaires**

The resident questionnaires only for those living in Loviisa and Olkiluoto areas and for the municipalities of the impact areas and for the summer residents were also organised.

Main results were the following:

- The people know what it is like to live next to a nuclear power plant, and several of them have experienced the construction stage of a plant and the related effects.
- On a general level, the expressions of the results were positive.
- The most important source of information turned out to be the local newspapers.
- Economic effects, such as the improvement of employment and the economy of the municipality were seen as the most significant beneficial effect, but also the viewpoint of the entire country, with the safeguarding of energy management and clean energy forms, was quite strongly represented. The increase in the possibility of an accident and the nuclear waste and local environmental effects were regarded as the most significant ill effects.
- In the Loviisa resident questionnaire all the population groups were mostly satisfied with the information they had got. Only those with a negative attitude towards nuclear power and also towards Fortum thought that they had not received enough information.
- In the Eurajoki resident questionnaire, 68 % of those who replied supported the building of a new nuclear power plant unit at Eurajoki. Support for the project was greater among the permanent residents than among holiday residents. Women were more critical towards the impacts.

**Feedback from the public**

During the programme stage, a few people a week had discussions with the expert at the information point in the public library.

Particularly the harmful effects of the warm cooling waters and the possible connection with the profuse algal inflorescence came up in the discussion. The residents were also interested in the relation between the zero option and the alternative forms of electricity generation.

As the spreading and effects of the cooling waters aroused so much interest, a small-scale seminar open for everyone was organised in Loviisa. This way, the residents were also able to put direct questions to the experts. Issues that raised a lot of questions included the effects on the ice conditions, the spreading of cooling waters west of the plant, and the suitability of the plant site in general.

**Media monitoring**

TVO has done a media monitoring about the press cuttings concerning the EIA process. The process consists of two stages: EIA programme and EIA report. The articles in the press cuttings are based on press releases issued by TVO. The primary object of the media monitoring was concentrated to the stage when the EIA report was submitted to the MTI.

The results of media monitoring will be presented at the PIME meeting.

**The EIA procedure**

The EIA procedure in Finland takes place in two stages. The first stage i.e. the EIA programme describes the project and presents the plan on how the environmental effects are investigated and assessed.

In the second stage the actual assessment of the environmental effects of the project will be submitted.

Thus, it is assessed in advance how the planned project would possibly affect the environment if it were implemented. But no decisions are made on the project, and no permission is given for the implementation of the project in connection with the procedure. The final permission is given by the Council of State and it has to be approved of by the Parliament.

Both Fortum and Teollisuuden Voima Oy (TVO) launched in spring 1998 their EIA procedures. The main alternative of

- the Loviisa 3 project includes two plant type alternatives. The size of the plant is between 1,000 MW and 1,700 MW.
- the extension project of the Olkiluoto NPP is to build a NPP unit of about 1,000 - 1,500 MW at Olkiluoto.

The EIA reports were submitted to the MTI in August 1999 and after that they were on display for two months for opinions and statements.

**More information**

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# Nuclear Power Development and Public Acceptance in Taiwan

**Sheng-Hisung Yu** and **Kwei-Luen Hwang**

Taiwan Power Company, Taiwan

Taiwan is an island with 22 million inhabitants in an area of 36,000 square kilometers. GNP growth in the past 20 years enjoyed an average annual rate of 7.2% p.a. The national economy has turned to industry and trade oriented. Energy demand kept at a pace of growth at 5.8% p.a. Energy resource is meager, endowed only with hydro potential of about 5,000 MW and limited coal resources. As high as 96% of the primary energy has to be imported. Energy policy dictates the importance of energy diversification in source and type. Electric power system has been rapidly expanded to 26,684 MW in installed capacity by 1998.

Nuclear power generation was first introduced in 1977. In accordance with the development an Atomic Energy Law aiming at peaceful use of nuclear energy was stipulated early in 1968. Manpower needed for planning, design, construction, operation and maintenance has been fostered by stages. Three nuclear power stations, each with two units, totaling 5,144 MW, constitute 19.3% of the power system capacity and 24.8% of the total energy generated in 1998. Nuclear power has greatly contributed to the system in lowering the overall generation cost ever since its operation especially during energy crises in 1980s . Four qualified nuclear sites were selected from a number of candidate sites. For the future, 5.1% p.a. electricity growth is expected. The 4th nuclear project which was approved in 1992 and had ever caused many protests is under construction and has accumulated about 30% completion. However, many people are still concern the nuclear safety and radioactive waste treatment. After implementing intense communication programs. Most of the people are convinced that nuclear power is safe, clean, and economical.

Opinion polls conducted in recent years showed steadily that about 55~60% of the interviewees were in favor of nuclear power, and 20~30% were against nuclear power. However right after the accidental blackout due to the 921 catastrophic earthquake in Sept. 21, 1999 in central Taiwan region, a poll showed that those in favor of nuclear power jumped to about 69.1% and those against dropped to about 15.3%.

## I. ECONOMY AND ENERGY OF TAIWAN

Taiwan has some 22 million habitants living in 36,000 square kilometers in area. Its rapid economic growth has created an economic miracle. In order to keep abreast of economic development, energy demand thus occasioned has to be well served. Energy consumption in Taiwan increased from 10 million kiloliters of oil equivalent in 1970 to 82 million kiloliters of oil equivalent in 1998. The annual average growth rate during this period was 5.8%, less than GNP growth rate of 7.2%.

However, Taiwan is in short of indigenous energy resources, annual coal production of about 0.1 million tons, less than 5,000 MW of potential hydro power, and very limited quantity of oil and natural gas reserves. In 1998, total energy supply reached 82 million kiloliters of oil equivalent. Among these , the indigenous energy accounted for only 4%, while about 96% of the primary energy had to be imported.

## II. TAIWAN POWER SYSTEM

Taiwan Power Company (Taipower), a state-owned power utility in Taiwan, has been rapidly expanded from 332 MW in 1952 to 26,684 MW in 1998 and generated 143.0 billion KWH of electricity annually.

The peak load and average load in 1998 were 23,830 MW and 20,207 MW respectively. The generation is sold through an isolated grid to more than 10 million customers. The power demand growth rate has been maintain in a stable pace of averaging nearly 5.8% over the past 20 years. Taking into account the nation-wide economic development and load management factors, future average load and peak load growth rates for the next 10 years are predicted to be at 4.7 and 5.1 respectively. This means that Taipower has to install about 18,425 MW of additional capacity over the next decade.

**Status of Existing Power Installation**

| Type of Plant | MW | % in MW | % in KWH |
|---|---|---|---|
| Hydro | 4,420 | 16.6 | 7.4 |
| Thermal Coal Fired | 8,100 | 30.4 | 38.3 |
| Oil Fired | 5,090 | 19.0 | 17.6 |
| LNG | 3,930 | 14.7 | 11.9 |
| Nuclear | 5,144 | 19.3 | 24.8 |
| Total | 26,684 | 100.0 | 100.0 |

## III. TAIWAN NUCLEAR POLICY

The Atomic Energy Law was enacted and stipulated in 1968, for the purpose of peaceful utilization of nuclear energy. According to the law, the Atomic Energy Council (AEC), is the regulatory and administrative body for nuclear activities, and is responsible for licensing and regulating nuclear facilities and the support research. The atomic regulatory follows closely with American regulatory. However, in implementing the law and regulations, AEC adapts U.S. codes, criteria, and standards to local conditions, particularly in the aspect of nuclear safety.

Nuclear power was firstly introduced to Taiwan in late 1970s. However in order to ensure proper use of atomic energy for power generation, there are a series of evaluations and examination in the process of project planning and implementation. To apply for approval of a nuclear power project, Taipower is required to submit three repots for government review, namely Site Selection Report (SSR),Feasibility Report (FR), and Environmental Impact Assessment Report (EIA). In accordance with the EIA review procedure, public hearings at the proposed sit are indispensable. Even after the project is approved, a two-step licensing process is still needed for plant construction and operation. A Preliminary Safety Analysis Report (PSAR) and a Final Safety Analysis Report (FSAR) have to be prepared and submitted to AEC for a construction permit and operation permit respectively.

## IV. NUCLEAR POWER PLANT SITING

In accordance with nuclear power development plan, Taipower initiated plant siting in 1964. However, Taipower has to take poor site conditions into account such as dense population, numerous mountains, weak geologic formation, strong seismicity, and frequent typhoon. Over the past years, siting activities were continuously performed throughout the island. Foreign experts, including those from IAEA and experienced engineering consultants, were invited to participate in siting investigation and study. The past study indicates that both the western coast and eastern coast of Taiwan are not suitable for a nuclear plant site mainly due to poor foundation conditions, high seismicity, and unfavorable conditions for cooling water intake system. Therefore potential site locations are confined to the area around the north and south regions of Taiwan.

A number of potential sites in both regions were investigated intensively in accordance with USNRC siting criteria. Up to now, there are only four qualified sites. The first three sites have already been developed for initial two units installation. At this moment, the construction of the 4th one was about 30% done. The space of the four sites can ultimately accommodate twenty units.

| Site Name | Nuclear Power Station | Installed Units | Area (hectare) | No of units to be installed in the future |
|---|---|---|---|---|
| Chinshan | 1st NPP | 2¡Ñ 636MW BWR | 339 | 2 |
| Kuosheng | 2nd NPP | 2¡Ñ 985MW BWR | 216 | 2 |
| Maanshan | 3rd NPP | 2¡Ñ 951MW PWR | 338 | 4 |
| Yenliao | 4th NPP | 2¡Ñ1350MW ABWR | 480 | 4 |

## V. TAIWAN NPPS CONSTRUCTION AND OPERATION

As early as 1968, Taipower made a comprehensive feasibility study on the first nuclear power project. Experts from IAEA had assisted Taipower in siting appraisal, and experienced foreign consulting engineers had actively participated in the preparation of SSR, FR and loan application document. LWR was selected after considering the proven technology, predictable construction cost, estimated operation economics, and possible suppliers of nuclear units. The six nuclear units with a total capacity of 5,144 MW have been successfully installed in three nuclear power plants.

The six units in operation have been showing good performance since their startup. Each year, about 35 billion KWH of electricity is generated. It contributes not only in enhancing system supply capability but also in saving about eight million kiloliters of crude oil each year. Nuclear generation cost is lower than the thermal power generation in Taiwan. Record production cost, including the back end cost for nuclear, are shown below. In the long-term aspect, with stable nuclear fuel cost and effective operational management, nuclear power will remain to be an economical type of power generation in Taiwan.

| | | Production Cost NT$/KWH | | | 1US dollar=31.7NT$ |
|---|---|---|---|---|---|
| Year | System | Nuclear | Coal | Oil | LNG |
| 1997 | 1.20 | 0.88 | 0.99 | 1.39 | 2.03 |
| 1998 | 1.22 | 0.84 | 0.96 | 1.50 | 2.17 |

In the past years, in addition to the regular plant inspection by IAEA, Taipower had ever invited foreign nuclear experts including those from INPO and WANO to review the nuclear power plant operational performance. All of the comments addressed were taken seriously by Taipower so as to improve the nuclear power plant operation. Generally speaking, Taipower's operation record is higher than the world average performance. Nevertheless, Taipower is still endeavoring to upgrade its nuclear power plant operation in the aspects of operation availability, safety operation and radioactive dose control.

## VI. PUBLIC ACCEPTANCE IN TAIWAN

To install six nuclear units in the past 13 years (1972 to 1985) could be quite a challenge in Taiwan. Taipower has made substantial progress in the areas of public education and communication. However, fast pace in both economic and power growth as well as rapidly changing society have brought its side effect, syndrome of growth pain, to Taipower. There are some problems Taipower facing.

### (1) Not In My Backyard Nightmare

Taiwan is moving in great stride toward democratization in recent years. Unfortunately, consciousness of democracy and a series of environmental protection has created an attitude of "**I want electricity but I don't like to have a power stations in my backyard**". This attitude has produced tremendous impact on the execution of long range power development program. Several proposed power projects have to be delayed. As a result, the system reserve margin of Taipower's generation capacity declined to 14% in 1989 and further down to 7.7% in 1998, which are far below the reasonable reserve margin originally set at 20% for our system. Therefore Taipower has to work out some ways to remove the hedge ahead and accelerate power development.

### (2) Public Acceptance of Nuclear Power

After the lifting of the Martial Law in 1988, the news media in Taiwan became a fashionable news carrier. Due to news oriented in natural and radical competion in the business, the news media prone to attract their customer as mush as they can. Therefore some minor nuclear power plant incidents are exaggerated. The reports not only influences environmentalists, scholars, people representatives, law makers but also the general public and government officials. As a result, people are confused about the issues concerning nuclear safety, economy, decommissioning, radwaste treatment etc. Under this circumstances, local people, who are so close to plant site, oppose the construction of a nuclear power plant. Compared to utilities in other countries, Taipower has to fight its own way out alone, without assistance from related nuclear industry.

However, TMI and Chernobyl accidents brought deep public concern over the nuclear safety. Resident near the power plant and radioactive waste disposal sites expressed opposition to the installation. Intense communication program was implemented to enhance public acceptance. Most of the people are convinced that nuclear is the safe, clean, and economical energy resource.

### (3)What We Have Done

In order to strengthen public acceptance in nuclear power, Taipower established a regular communication organization "Nuclear Communication Center (NCC)" in 1994, which consists of about 20s members. The center recruited its crews from different departments, including Public Affairs, Nuclear Operation, Nuclear Engineering Department, and NPPs. The target is to calm down the anti-nuclear activities and to keep the 4th NPP in smooth progress.

NCC has a formal annual communication plan, and the communication activities are divided by communication target and communication approach as follows:

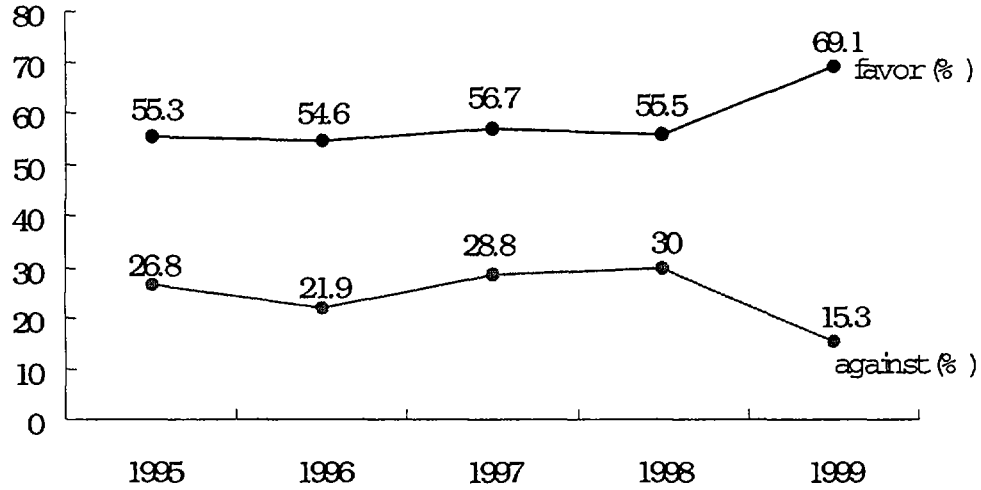
| Communication Target | Communication Approach |
|---|---|
| a.resident in site area<br>b.congressmen<br>c.news media<br>d.academic groups<br>e.activists<br>f.teachers and students<br>g.general public | a.Direct Dialogue : visit and discussion.<br>b.Indirect Dialogue:<br>¡ Ecall-in radio programs<br>¡ Enarrative promotion films<br>¡ ETV advertisement<br>¡ Epropaganda in student's homework reference books and stationaries<br>¡ Earticles contribution<br>¡ Ejournal report on the activities of the site township<br>¡ Epropaganda materials specifically on nuclear safety related topics |

There are 6 parts included in the plan:

**(A)Opinion Polls**

In the past, several nationwide opinion polls had been done. The results showed steadily that about 55~60% of the interviewees were in favor of nuclear power, and 20~30% were against nuclear power. However right after the accidental blackout due to the 921 catastrophic earthquake (7.3-magnitude) in Sept. 21, 1999 in central Taiwan region, a poll showed that those in favor of nuclear power jumped to about 69.1% and those against dropped to about 15.3%. The reasons for this special favority are mainly due to recognition of power insufficiency, while most people are still concern about radioactive waste treatment, construction quality, local communication. After the 921 earthquake, 54.8% people have confidence of NPPs safety compare with 20% for no confidence of NPPs safety. This is a very serious warning sign to Taipower which has nuclear power for 20 years. This also reveal the difficulties Taipower has to overcome.

**OPINION POLLS ON NPP 4TH IN TAIWAN**



### (B)Modern Energy Workshops

Since 1982, Taipower offered modern energy workshops to high school and elementary school teachers during winter and summer vacations every year. The courses for the workshops are designed not only to introduce the principles of nuclear energy, but also extend to other energy sectors.

### (C)Scholars and Experts

Transparency is always the fundamental of communication. We find people nowadays are prone to suspect unless they see it themselves. Therefore in order to ease the public from doubts, we invite elegant public leaders to visit NPPs. Besides onsite tours, we setup several toll free hotlines to answer all kinds of questions related to Taipower. We also invite professors in universities to visit NPPs and exchange viewpoint. We hope that the negative feeling regarding nuclear can be eased somehow through the visiting program.

### (D)Lobbying

Since Taipower is one of the state-owned enterprises, budget for power development projects should be subjected to the approval of the Congress. Our targets in the Congress are not only the Legislators, but also their assistants. In addition to supporting many kinds of information regarding electric power, we offer them services for electricity supply in order to solve the problems at their precincts.

### (E)Feedback Program at Site Vicinities

According to current feedback program, 1% of construction cost and generation income will be withdrawn to subsidize the development of sites vicinities. A foundation was established to appropriate the budget to the townships vicinal to a powerplant according to the installed capacity and annual generation of the power plant. The budget is used for financing household electric tariff, local infrastructures and educational or culture activities.

### (F)Local Communities

Local Communities vicinal to the 4th NPP site is the vital target in our communication program. The construction department of the 4th NPP revised their communication strategy by conducting door to door visit and providing services. after 1994. No public opinion poll has ever been performed since then. Yet the communication atmosphere seems to be much improved. We expect the public will realize the benefit of the 4th NPP to the communities and turn their unfriendly attitude to join the supervision of the construction.

## VII. FUTURE PROSPECT

Taipower believes that nuclear power, a clean energy that does not release carbon dioxides, sulphur dioxides and nitrogen oxides, is a vital choice for power generation in Taiwan.

# Anti-Nuclear Activities and Critics concerning Nuclear Power Plant Sites

We-Beg Rhee
Executive Vice President of OKAEA

Republic of Korea has set out an alternative energy policy strongly along with nuclear power plant construction program since 1970s' two oil crises. Now, Korea that has dynamic nuclear power expansion programs operates 16 nuclear units totaled 13,710MW in 4 different sites. Last year, nuclear power supplied over 40% of national total electricity demands.

Korean government has announced the plan designating 11 candidate sites to carry nuclear power plant construction program smoothly in early 1980s'. Of such sites, Ulchin and Younggwang have been developed as planned, and still the rest 9 sites bounding to nuclear power plant sites have not been utilized for any other purpose. Residents in that area, accordingly have continued to make public complaints about limitation of their property right.

In 1998, Korean government initiated re-designation work investigating circumstance changes to rule out the unnecessary sites in consideration of a long-term power supply. The important re-designation principles of the government were first headed for any voluntary areas and secondly for higher rankings by results from circumstance changes.

Therefore, central officials visited local heads and parliaments in the 9 candidate areas suggesting central supports including local development plan. But, they have confirmed that the residents did not intend to accept nuclear power plant in their town.

However, Ulchin county that has a candidate site proposed to expand existing nuclear power plant site in condition of designation withdrawal. And also mayor of Woolju county, non-candidate, hope to be a host of voluntary plant site. Korean government has accordingly determined to expand the Ulchin site and to designate one point of Woolju county as a new candidate site, and ruled out the rest 8 candidate sites at the end of 1998.

About such a governmental measure, the two areas show different reactions. Ulchin where nuclear power plant has been operated safely for about 10 years was likely to accept the governmental determination even for some opposition and called for several financial supports for local development. Woolju county, however, showed a strong opposition among local environmental groups and autonomic politicians, and they presented a variety of anti-nuclear activities including signing and demonstration mainly at the neighbouring metropolis, Ulsan city.

Ulsan city is one of the representative cities to herald economic growth of Korea where you may know has been developed to industrialized country very rapidly during last 30 years. And it is regarded that Ulsan citizens have some kind of dislike to any industrial facility as well as nuclear power plant in the fear of environmental destruction.

Some of citizens and environmental groups organized called "Pan Ulsan Citizens Confederation against Nuclear Power Plant" and presented a variety of anti-nuclear activities with 6 main reasons.

1) Residents in peripheral areas are the first victims in case of atomic explosion(they insist that Chernoville accident resulted in more the 10,000 deads and residents within 30Km had to move out of the hometown)

2) Tremendous warm water releasing from nuclear power plant causes peripheral fish parks ruined and ecological chain system broken off.

3) Agricultural and marine products will be turned down in markets because of radioactive contamination.

4) The constructing nuclear power plant will be vulnerable to earthquake because an active fault belt is located in Woolju area.

5) United States and most European countries do not construct nuclear power plants any more and even shut down the existing nuclear power plants

6) Nuclear power is not environment-friendly energy without technical method to manage the radioactive wastes safely.

OKAEA and Korean government make all efforts to prove that the insistences of "Pan Ulsan Citizens Confederation against Nuclear Power Plant" are not based on the truth and presents several promotions to increase their understandings about the inevitability of nuclear power plant.

I'll further explain about the cases of anti-atomic activities and nuclear power-friendly promotions in the main contribution.

# THE INES SCALE REVISITED

# 10th ANNIVERSARY OF THE INTERNATIONAL NUCLEAR EVENT SCALE (INES)

Z.Kriz, D.Ruatti,
International Atomic Energy Agency,Vienna

## 1. Introduction

During the 80's effective communication between the nuclear community and the public and media became an important factor for further sucessful development of nuclear power programmes in many countries. This need was felt mainly in the communication of incidents or accidents at nuclear or radiation facilities. The Chernobyl accident in March 1986 confirmed this fact in a very dramatic way. For this reason several countries (France, Japan, UK) initiated the preparation of a scale for the classification of events.

In 1989 the IAEA and NEA/OECD jointly started the development of an international scale, which could be used to improve the effectiveness and consistency of communication of the significance of nuclear and radiation events to the public and the media. In 1990 the International Nuclear Event Scale (INES) was put into trial operation In 1992 the INES User's Manual was officially published and INES became a tool used to communicate information regarding nuclear and radiation events world-wide on an official level.

The INES Advisory Committee was established to review event ratings and to make proposals for further improvement of the scale. During regular annual meetings of participating countries the INES National Officers relate their experience with the application of the scale.

In 1998 the participating countries decided to issue an updated INES User's Manual, which will represent the experience accummulated with the scale over the past ten years. The new manual is planned to be published in 2000.

## 2. Main features of INES

The INES is a means for prompt communication to the public and the media in consistent terms the safety significance of events reported at nuclear/radiation facilities and during transport activities. By putting the events into their proper perspective, the scale is to facilitate a common understanding between the nuclear community, the media and the public.

The scale has the following features:

Simplicity

Simplicity of the scale is crucial for easy understanding of the public and the media the safety significance of events. Safety significance of events is classified by the INES at seven levels (1-7). Events ,which are not safety significant, but safety relevant are rated below scale, at level 0. The safety significance is expressed by a single number.

Technical basis

In spite of its simplicity, the scale is based on clear technical criteria to achieve consistency in use and to ensure that event ratings are understood technically. Internationally accepted principles of nuclear safety and radiation protection are the basis for the scale.

Promptness

The simplicity of the scale allows it to be applied quickly to all types of events. Long delays between the occurrence of an event and the announcement of a rating could severely reduce the relevance and use of the information. INES reporting requirements (within 24 hours for events rated at level 2 and higher, and also at lower levels, if these events attract public or media interest ) are in accordance with intentions to provide quick and objective information.

Full range of events

The scale covers a full range of events from events of very small safety significance (anomalies - level 1) up to catastrophic situations (major accident - level 7).

The scale is, in principal, exponential. Each level is about ten times higher than the level below in terms of severity.

Full variety of events

The current scale allows its application to all events, which may occur at nuclear power plants, research reactors, fuel cycle facilities (mining, milling, fuel fabrication, reprocessing), radiation facilities (radiation sources, irradiators etc.) and to events during transport of nuclear and radioactive materials.

Official status

The national responsibility for reporting and rating of events is with the National INES Officer, who is, as a rule, a staff member of the national regulatory authority. By these means objectivity and credibility of rating and reporting of events is ensured.

Due to its purpose and background the scale should not conflict with the provisions made in emergency situations and systems for reporting of events established by the national authorities. INES should also not be used to compare performance between countries of between different reactors or reactor types. It is merely a communication tool and not a means of event analysis and feedback.

**3. Principles of the scale.**

Events are classified at seven levels. The lower levels (1-3) are termed incidents and the upper levels (4-7) are termed accidents. Events, which have no safety significance are classified " below scale" (level 0) and events, which have no safety relevance to nuclear or radiological safety (e.g.industrial accidents) are termed "out of scale".

Three separate types of impact are used for event classification and rating:

- off-site impact is expressed in the amount of radioactive material released or doses to the public due to the release of radioactive material to the atmosphere (or cases of lost radioactive sources, or transport events) (levels 3-7);

- on-site impact is expressed in the extent of the degradation of the reactor core, doses to workers or contamination inside a facility (levels 2-5);

- impact on defence-in-depth provisions of a facility (events with or without initiator, or impaired safety layers) (levels 1-3).

An event, which can be rated by more than one type of impact, is classified at the highest level achieved by any of those impact types. The INES User's Manual provides a comprehensive description of the criteria for each level and gives detailed guidance on how to rate an event, including many examples.

**4. Experience with the application of the scale**

As of 1 January 2000 there are 60 countries and 6 international organisations using INES. Since 1990 more than 560 events were reported to INES and only one event was rated as high as level 4. In many cases the INES played an important role in the quick and objective distribution and understanding of the safety significance of the event (the incident at Sosnovy Bor NPP in 1992, the fire at Narora NPP in 1993, the radiation incident in Turkey in 1999 and lately the accident at Tokai fuel processing plant in 1999). Participating countries are satisfied with the operation of INES, since it provides them with an effective tool for communication with the public and the media.

Apart from this, INES serves as a good example of international co-operation in the area of nuclear safety and radiation protection.

FIGURE 1:

**Basic Structure of the Scale**

*(Criteria given in the matrix are broad indicators only)*

| | AREA OF IMPACT | | |
|---|---|---|---|
| | OFF-SITE IMPACT | ON-SITE IMPACT | IMPACT ON DEFENCE-IN-DEPTH |
| 7<br>MAJOR ACCIDENT | MAJOR RELEASE:<br>WIDESPREAD HEALTH AND ENVIRONMENTAL EFFECTS | | |
| 6<br>SERIOUS ACCIDENT | SIGNIFICANT RELEASE:<br>LIKELY TO REQUIRE FULL IMPLEMENTATION OF PLANNED COUNTERMEASURES | | |
| 5<br>ACCIDENT WITH OFF-SITE RISK | LIMITED RELEASE:<br>LIKELY TO REQUIRE PARTIAL IMPLEMENTATION OF PLANNED COUNTERMEASURES | SEVERE DAMAGE TO REACTOR CORE/RADIOLOGICAL BARRIERS | |
| 4<br>ACCIDENT WITHOUT SIGNIFICANT OFF-SITE RISK | MINOR RELEASE:<br>PUBLIC EXPOSURE OF THE ORDER OF PRESCRIBED LIMITS | SIGNIFICANT DAMAGE TO REACTOR CORE/RADIOLOGICAL BARRIERS/FATAL EXPOSURE OF A WORKER | |
| 3<br>SERIOUS INCIDENT | VERY SMALL RELEASE:<br>PUBLIC EXPOSURE AT A FRACTION OF PRESCRIBED LIMITS | SEVERE SPREAD OF CONTAMINATION/ACUTE HEALTH EFFECTS TO A WORKER | NEAR ACCIDENT<br>NO SAFETY LAYERS REMAINING |
| 2<br>INCIDENT | | SIGNIFICANT SPREAD OF CONTAMINATION/ OVEREXPOSURE OF A WORKER | INCIDENTS WITH SIGNIFICANT FAILURES IN SAFETY PROVISIONS |
| 1<br>ANOMALY | | | ANOMALY BEYOND THE AUTHORIZED OPERATING REGIME |
| 0<br>DEVIATION | NO SAFETY SIGNIFICANCE | | |

FIGURE 2

# The International Nuclear Event Scale

## *For prompt communication of safety significance*

| LEVEL/ DESCRIPTOR | NATURE OF THE EVENTS | EXAMPLES |
|---|---|---|
| 7<br>MAJOR ACCIDENT | External release of a large fraction of the radioactive material in a large facility (e g the core of a power reactor) This would typically involve a mixture of short and long-lived radioactive fission products (in quantities radiologically equivalent to more than tens of thousands of terabecquerels of iodine 131). Such a release would result in the possibility of acute health effects, delayed health effects over a wide area, possibly involving more than one country, long-term environmental consequences | Chernobyl NPP, USSR (now in Ukraine), 1986 |
| 6<br>SERIOUS ACCIDENT | External release of radioactive material (in quantities radiologically equivalent to the order of thousands to tens of thousands of terabecquerels of iodine-131) Such a release would be likely to result in full implementation of countermeasures covered by local emergency plans to limit serious health effects | Kyshtym Reprocessing Plant, USSR (now in Russia), 1957 |
| 5<br>ACCIDENT WITH OFF-SITE RISK | External release of radioactive material (in quantities radiologically equivalent to the order of hundreds to thousands of terabecquerels of iodine-131) Such a release would be likely to result in partial implementation of countermeasures covered by emergency plans to lessen the likelihood of health effects<br><br>Severe damage to the installation. This may involve severe damage to a large fraction of the core of a power reactor, a major criticality accident or a major fire or explosion releasing large quantities of radioactivity within the installation | Windscale Pile, UK, 1957<br><br>Three Mile Island, NPP, USA, 1979 |
| 4<br>ACCIDENT WITHOUT SIGNIFICANT OFF-SITE RISK | External release of radioactivity resulting in a dose to the critical group of the order of a few millisieverts * With such a release the need for off-site protective actions would be generally unlikely except possibly for local food control<br><br>Significant damage to the installation Such an accident might include damage leading to major on site recovery problems such as partial core melt in a power reactor and comparable events at non-reactor installations<br><br>Irradiation of one or more workers resulting in an overexposure where a high probability of early death occurs. | <br><br>Windscale Reprocessing Plant, UK, 1973<br>Saint Laurent NPP, France, 1980<br><br>Buenos Aires Critical Assembly Argentina, 1983 |
| 3<br>SERIOUS INCIDENT | External release of radioactivity resulting in a dose to the critical group of the order of tenths of millisievert * With such a release, off-site protective measures may not be needed<br><br>On-site events resulting in doses to workers sufficient to cause acute health effects and/or an event resulting in a severe spread of contamination for example a few thousand terabecquerels of activity released in a secondary containment where the material can be returned to a satisfactory storage area<br><br>- Incidents in which a further failure of safety systems could lead to accident conditions, or a situation in which safety systems would be unable to prevent an accident if certain initiators were to occur | <br><br><br><br>Vandellos NPP, Spain, 1989 |
| 2<br>INCIDENT | Incidents with significant failure in safety provisions but with sufficient defence-in-depth remaining to cope with additional failures These include events where the actual failures would be rated at level 1 but which reveal significant additional organizational inadequacies or safety culture deficiencies<br><br>An event resulting in a dose to a worker exceeding a statutory annual dose limit and/or an event which leads to the presence of significant quantities of radioactivity in the installation in areas not expected by design and which require corrective action | |
| 1<br>ANOMALY | Anomaly beyond the authorised regime but with significant defence-in-depth remaining This may be due to equipment failure, human error or procedural inadequacies and may occur in any area covered by the scale, e g plant operation, transport of radioactive material, fuel handling, waste storage Examples include breaches of technical specifications or transport regulations, incidents without direct safety consequences that reveal inadequacies in the organizational system or safety culture minor defects in pipework beyond the expectations of the surveillance programme | |
| DEVIATION<br>0 | Deviations where operational limits and conditions are not exceeded and which are properly managed in accordance with adequate procedures Examples include a single random failure in a redundant system discovered during periodic inspections or tests, a planned reactor trip proceeding normally, spurious initiation of protection systems without significant consequences, leakages within the operational limits, minor spreads of contamination within controlled areas without wider implications for safety culture | |

** The doses are expressed in terms of effective dose equivalent (whole dose body) Those criteria where appropriate can also be expressed in terms of corresponding annual effluent discharge limits authorized by National authorities*

FIGURE 3

# THE INTERNATIONAL NUCLEAR EVENT SCALE (INES)

## *EVENT RATING FORM (ERF)*

TO BE SENT TO THE INES CO-ORDINATOR

• FAX· +43-1-2600 29723
• E-MAIL Z.KRIZ@IAEA.ORG
D.RUATTI@IAEA.ORG

IAEA, WAGRAMERSTRASSE 5, P.O. BOX, 100 A-1400 VIENNA, AUSTRIA • PHONE +43-1-2600 26068 Or 26079

| EVENT TITLE | | EVENT DATE |
|---|---|---|
| | | |

| RATING | RATING DATE | OUT OF SCALE | BELOW SCALE | ON SCALE | | | | | | | SAFETY ATTRIBUTES | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROVISIONAL ☐ | | | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | DEGR. DEFENCE IN-DEPTH | ☐ |
| FINAL ☐ | | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ON-SITE IMPACT | ☐ |
| | | | | | | | | | | | | OFF-SITE IMPACT | ☐ |

| COUNTRY | | FACILITY NAME | | FACILITY TYPE | MW(e) |
|---|---|---|---|---|---|
| | | | | | |

**ASPECT OF SIGNIFICANCE TO THE PUBLIC:**

| | YES | NO |
|---|---|---|
| ACCIDENT ☐ INCIDENT ☐ DEVIATION ☐ | | |
| RADIOACTIVE RELEASES OFF-SITE | ☐ | ☐ |
| RADIOACTIVE RELEASES ON-SITE | ☐ | ☐ |
| WORKERS INJURED BY RADIATION | ☐ | ☐ |
| WORKERS INJURED PHYSICALLY | ☐ | ☐ |
| PLANT SAFETY IS NOT UNDER CONTROL | ☐ | ☐ |
| THE EVENT REPORTED IS THE DISCOVERY OF A DEFICIENCY BY ROUTINE SURVEILLANCE | ☐ | ☐ |
| A PRESS RELEASE WAS MADE (IF YES, PLEASE ATTACH IT) | ☐ | ☐ |

SHORT DESCRIPTION OF THE EVENT:

| CONTACT PERSON FOR FURTHER INFORMATION | | |
|---|---|---|
| | NAME | |
| | ADDRESS | |
| | PHONE | |
| | FAX | |
| | E-MAIL | |

* PLEASE ATTACH ADDITIONAL INFORMATION ON JUSTIFICATION OF THE EVENT RATING AND DIFFICULTIES ENCOUNTERED IF NEEDED

# HOW MUCH DO REGULATORS SPEAK TO EACH OTHER AND THE PUBLIC?

# EXCHANGE OF INFORMATION BETWEEN NUCLEAR SAFETY AUTHORITIES : POLICY OF THE FRENCH REGULATOR

**Michel Asty, DSIN**

The decree setting up the Nuclear Safety Authority in 1973 entrusted it with international assignments whose objectives are still valid :

- develop exchanges of information with foreign counterparts on regulatory systems and practices, on problems encountered in the nuclear safety field and on provisions made, with a view to enhancing its approach, and :
  - becoming better acquainted with the actual operating practice of these Safety Authorities from which lessons could be learned for its own working procedures ;
  - improving its position in the technical discussions with the French operators, since its arguments would be strengthened by practical knowledge of conditions abroad ;
- make known and explain the French approach and practices in the nuclear safety field and provide information on measures taken to deal with the problems encountered. This approach has several objectives :
  - promote the circulation of information on French positions on certain issues, such as very low level waste, for instance ;
  - assist some countries wishing to create or modify their Nuclear Safety Authority, such as countries of the former USSR, the Central and Eastern European countries, and emerging countries on other continents ;
  - help, when requested, foreign Safety Authorities required to issue permits for nuclear equipment of French origin ;
- provide the countries concerned with all relevant information on French nuclear installations located near their frontiers.

Examples are given on the way the French Nuclear Safety Authority implements these objectives.

# The SKI Communication Programme


**Susanne Carlberg**
**Swedish Nuclear Power Inspectorate, SKI**

*Sweden has, since many years, an ongoing debate on nuclear power in general and nuclear safety and nuclear waste in particular. SKI is not the only part who wants to communicate about these subjects. The nuclear power plants, other authorities, the anti-nuclear groups and the politicians are other parts on the communication scene. The role of SKI is to provide the Swedish public with objective and prompt information based on facts.*

## Openness

The Swedish constitution gives the public access to authority documents. This principle was formed already in the Freedom of the Press Act of 1766. In short the principle states that anyone has the right to obtain information contained in almost any official document handled by Swedish authorities. There are very few exceptions to this principle.

Any official document shall be made available to be read – or listened to if it is a recording – at the place where it is kept. This shall be made possible immediately or as soon as possible – and free of charge. Anyone asking for information has the right to remain anonymous.

There is a paragraph about public insight in the law of nuclear activities. The Government appoints a local safety committee in every community with a nuclear facility. The members in these committees are elected among the local politicians. The committees are granted a small fund from the Government each year for their activities. The licensees are obliged to give these committees insight in the safety and radiation protection activities at the plants. SKI also provides them with information during regular meetings.

In the SKI charter is stated the obligation for SKI to keep the public informed on matters related to nuclear safety and risk.

## The SKI communication policy

The goal of the communication activities is to provide the Swedish public with objective, prompt information based on facts about nuclear safety and risk, and that every incident shall be made public.

Another goal is that the SKI staff shall be well informed about activities at SKI as well as about activities in the nuclear field outside SKI.

The Swedish people, through its parliament and Government, has given SKI the task to supervise the safety of Swedish nuclear installations on their behalf. Therefore, SKI is accountable to the Swedish people and obliged to report back to them. This is a responsibility not only for the management and the department of communication, but also for every member of the SKI staff.

The communication aspects are an integrated part of all SKI activities. This means that the department of communication is involved in important supervisory activities from the beginning – and is not only being used to communicate decisions that are already made.

**Media relations**

The department of communication is responsible for contacts with the media. But SKI expects all experts – not only the public relations officers – to take part in the public communication. This means that the experts must be trained in handling relations with the media and the public. Training courses are therefore held once a year.

SKI does not write very many press releases but has media contacts almost every day. Press conferences are arranged during major incidents and when important decisions or reports are made public.

The incident information is the most important part of the communication with the media. The public interest in nuclear events is always alert and the way SKI handles such situations is of vital importance for the credibility.

SKI gives the utilities the option to be the first to inform when an incident has occurred. There is, however, also a need for prompt media information from SKI with an independent judgement on the safety significance of the event and on any regulatory actions taken.

In order to be able to give prompt information the department of communication, as well as a technical expert, is available around the clock.

During incidents the department of communication works in close contact with the technical experts. Before communicating major decisions to media, strategy meetings are held with the SKI staff involved. The goal is to decide a strategy on *how* to communicate and to decide what messages should be spread. One principal spokesman is selected. He or she is then responsible for most of the contacts with the media during this specific event. Working together in this way is very fruitful and effective. The communication experts learn a lot from the technical experts and vice versa.

**Communication networks**

As there are other government authorities and ministries that may be contacted by the media about the same nuclear issue, co-ordination and exchange of information is important.

SKI has established check lists and information routines which are followed during incidents, but also when rumours are spread. As there are two regulatory authorities in Sweden – SKI for technical safety and the Swedish Radiation Protection Institute (SSI) for radiation safety – the co-ordination with SSI is especially important. The two authorities have close contact during incident and rumours but also in everyday life.

Networks are formed with the local safety committees in the communities with nuclear installations as well as with communities taking part in the investigations to find a safe place for the final repository for the spent nuclear fuel. SKI participates in many local meetings with politicians and the public.

A special network exists with members from the communication departments at the safety and radiation authorities in the Scandinavian countries. This network is used during incidents and rumours.

**Publications, information material and web site**
Even though the best impact of communication efforts is reached through personal contacts, other channels must also be used:

*Tertial reports* on plant operation, significant events and regulatory actions.

*Nucleus* magazine reports four times a year on results from research in the nuclear field.

*Annual reports* to the Government on the safety and radiation status of the Swedish nuclear power plants (together with SSI).

*Fact sheets* and *brochures* on different subjects.

Special *information material for schools.*

*SKI Report* with results from research in the nuclear field financed by SKI.

The web site *www.ski.se* which contains news, decisions and reports in pdf format, background information and a possibility to order publications.

*Internal paper* and *Intranet* for an effective internal communication.

**Evaluation**
SKI follows the media and evaluates press clipping on a daily basis. After major incidents SKI lets professional communication consultants review what role the authority was given in the media. A public opinion poll on how known SKI is to the public is made every two years.

Results from these evaluations are used to improve the communication activities.

# THE REGULATOR AS NUCLEAR COMMUNICATOR

William Beecher, Director, Office of Public Affairs, U.S. Nuclear Regulatory Commission

Early last year the Nuclear Regulatory Commission decided on a sea-change in the way it inspects and evaluates the safety performance of the 103 commercial nuclear power reactors in the United States, which together produce about 20 percent of the nation's electricity.

The new program takes into account the improvements in performance of the U.S. nuclear industry over the past 20 years and the NRC's desire to apply more objective, timely, safety-significant criteria in assessing performance, as well as the need to effectively regulate at a time of shrinking staff and budgets.

There also was a desire to increase efficiency and reduce unnecessary regulatory burden on plant operators as they begin to transition from their traditional postures as regional monopolies, with rates fixed by local public utility commissions, into a highly competitive deregulated energy marketplace.

After an exhaustive study by an outside consultant, the Commission decided to do away with the principal measurement tool used since the early 1980s, the so-called SALP report, which stood for Systematic Assessment of Licensee Performance. Each plant had been given a SALP scorecard every 18-24 months in four categories: plant operations, maintenance, engineering, and plant support.

But the SALP reports were found wanting, not only by the consultant, but by both the industry and by public interest groups, as sometimes being out-of-date when issued, focusing not just on safety but also non-safety issues, being at times subjective, and failing to predict emerging problems as opposed to cataloging old and sometimes already resolved issues.

At the same time, the Commission also decided to abandon the semi-annual listing of the poorest performing plants, the so-called problem plant list.

But the SALP reports and the problem plant lists were the two principal performance yardsticks which reporters and members of the public alike had come to depend upon to judge the quality of nuclear power plants, as seen by the regulator. To suddenly abandon both would inevitably raise questions about whether the NRC was lowering its regulatory standards, whether it was caving in to the nuclear power industry and its friends in Congress.

This was coming at a time when critics of the NRC were warning that, as the era of deregulation was dawning, the agency was in danger of becoming a lapdog rather than a watchdog.

A pilot project was decided upon to test the new approach at thirteen power plants at nine sites. At first the pilot was to have run six months, but this was subsequently extended. The current timetable, which itself is subject to change, would review the results of the pilot program, make prudent adjustments, and apply it to the entire industry this spring.

To explain the entirely new procedures, the technical staff produced a thick document which Albert Einstein–on his best day–would have had trouble understanding.

Thus we found ourselves on the verge of what might have been a public perception disaster–undermining faith that the NRC was determined to fulfill our transcendent mission and responsibility to protect public health and safety in the application of nuclear power.

The first thing we required was a relatively brief, plain language translation–and I use that term advisedly--of the highly technical staff paper into something any interested member of the public could readily understand. We urgently needed a clear and simple primer to explain the new program, its rationale, and its advantages over the old approach. Drafted by one of my senior public affairs officers and edited by me, the resulting 10-page primer became an instant „best seller." Ten thousand have been printed so far by the NRC, and the U.S. Government Printing Office is printing more. Copies of the primer have been distributed at public meetings, conducted in the vicinity of all 13 power plants in the pilot program, to interested individuals and organizations. It was also placed on the NRC's Internet site.

Copies are available here so you can see for yourself what was done.

The primer has won praise from both nuclear enthusiasts and critics for its clarity and simplicity. As the pilot program evolved, changes were made which were reflected in a second version of the document. Still another update will be done when the pilot program concludes and is evaluated, the plan modified, and an industry-wide application made.

In addition to this document, as I've already noted, a series of public meetings have been held to explain the new system and answer questions.

We're also posting the results of inspections and performance indicator reports for the pilot plants on our website every three months. These are color coded so the public can instantly see whether performance remains strong, shown as green and calling for only a baseline of NRC inspections; white, showing some slippage from expected performance; yellow, raising a cautionary flag and occasioning an increase in NRC inspections and oversight; and finally, red, unacceptable performance calling for plant shutdown until all safety problems have been addressed and corrected.

We're soliciting public comments and suggestions, not only at the public meetings, but also from those checking our website.

In designing the new assessment program and in monitoring its evolution in the pilot study, the NRC formed an advisory panel of interested individuals, including representatives of the regulated industry and of public interest groups.

In the latter category is David Lochbaum, a widely respected nuclear safety engineer from the Union of Concerned Scientists, an often critical watchdog group. He had spent 17 years as a safety engineer at various nuclear plants before assuming his current position a few years ago. Lochbaum generally favors the new approach, while cautioning that the proof of the pudding is in the eating, that is, in the effective implementation of the program.

But he was quoted in a recent news story as citing the following benefits of the revamped oversight system:

–About 20 areas of safety performance are evaluated, as opposed to four broad categories in the past.

–Assessments are required and posted publicly every three months, as opposed to every 18-24 months.

–Under the new approach, plants whose performance falls into the red band are considered unsafe and must shut down. Under the old system, the poorest performing plants were not necessarily required to cease operations.

–Specific intervention from the NRC is required in reaction to falling performance. He felt the old system was more subjective and responses were less predictable.

Bear in mind, these are the overview comments of a long-time critic, as reported in an upstate New York newspaper interview.

In conclusion, I would say that a potential public affairs disaster was turned into a positive opportunity for forthright, calming exposition. Public confidence, instead of being undermined, has been bolstered.

# The Romanian nuclear regulatory body as a nuclear communicator

**Cristina Ciuculescu, National Commission for Nuclear Activities Control, Romania**

## 1. Introduction

Daily life is a risky business. People can understand risks resulted from a voluntary choice, like traveling, working or drinking alcohol and smoking, but radiation risk perception is different. The gap between the public perception and the specialist evaluation is growing wider. A misunderstood risk that cannot be explained creates difficulties of communication between experts and public. Association with unhappy events, like Three Mile Island or Chernobyl, increases the concerns of the public, and nuclear industry are spending relevant resources to rebuilt the confidence for the peaceful uses of nuclear energy. A comprehensive nuclear law environment could be a relevant tool to promote greater confidence in the nuclear energy.

## 2. Legislative framework

Romania has had laws in place governing the regulation of nuclear activities since 1974, which remained in force throughout and subsequent to the national constitutional changes. Up to December 1996, the CNCAN activities were based on Law No. 61/1974 for the development of the nuclear activities in Romania and Law No. 6/1982 on the quality assurance of the nuclear facilities and nuclear power plants.

The Nuclear Safety legislation has been enacted in November 1974 (Law No. 61/1974) and it followed as closely as possible (for that time) the US Atomic Energy Act of 1954, as amended subsequently.

This law had a specific chapter dealing with nuclear liability. The main provisions were:

- The responsibility belongs to the license holders;
- The license holder must institutes an insurance or any other financial guarantee to cover his liability;
- The right of compensation is prescribed if an action is not brought within 10 years from the date on which the victim had knowledge of the damage.

In 1990, the preparations of a new law on safe conduct of nuclear activities were started. On 26 December 1996 the Law on the Safe Conduct of Nuclear Activities (Law No. 111/1996) entered into force. The Law abrogates the previous laws governing nuclear activities, i.e. Law No. 61/1974 regulating all nuclear activities in Romania together with Law No. 6/1982 dealing with quality assurance in respect with all installations as well as all other regulation contrary to the Law. Beginning with January 1998 new important amendments to the Law No. 111/1996 entered into force.

The objective of nuclear low 111/1996 republished is the safe deployment of nuclear activities to exclusive peaceful purpose so that they should meet the nuclear safety conditions set for the protection of the professionally exposed personnel, of the population, of the environment, and the propriety, with minimal risk provided by regulations and observance of the obligations proceeding from agreement and conventions to which Romania is party

The republished Law no.111/1996 take into account:

- Changes in political and economic environment, including free market economy, democracy and separation of powers;
- Regulatory experience gained in Romania through the implementation of the Laws No.61/1974 and 6/1982;
- New legal developments observed in other countries;
- Recommendations of the IAEA expert mission, including provisions dealing with radioactive wastes and facilities decommissioning;
- Strengthening the law enforcement provisions.

The Romanian nuclear regulatory body, called National Commission for Nuclear Activities Control (CNCAN) is a governmental organization responsible for the development of the regulatory framework, the control of its implementation and for the licensing of nuclear facilities.
In 1998, the Government approved the new CNCAN organizational structure and additionally duties. In this new structure are included 4 divisions: General Division of Nuclear Power Plants and Fuel Cycle, General Division of Ionizing Radiation Applications, General Division of Monitoring the Environmental Radioactivity and General Division of Development and Resources. This structure reflects the activity fields of CNCAN.

### 3. Regulatory body activities focused on relation with mass media

An important issue of CNCAN is to provide the correct and reasoning information to the public.
This exchange of information is done through:

- Weekly information to the Department of Public Information at Government, about the most important activities performed by nuclear regulatory body;
- Periodical press communicate to mass media;
- Special press conference are organized at the most important events (for example granting the Commercial License for Cernavoda Nuclear Power Plants Unit 1, followed by press conference)
- Special press communicate to inform correct the public related with the speculation about nuclear activities (for example, during the ware in the formal Yugoslavia several press communicate, related to the normal level of environment radioactivity were released, Y2K statement at Cernavoda NPP Unit 1);
- Discussion with ecological formations;
- At the solicitude of the mass-media, the president of CNCAN granting press interview;

The most important topics focused on nuclear activities for the interest of mass media in Romania are:

- Radioactive waste management;
- The cost and benefit of nuclear energy compared by conventional energy;
- The conditions for transportation of radioactive materials;
- The consequences of a suppositional nuclear accidents;
- The safety in operation for nuclear installations.

In 1999, CNCAN participated as observatory to different exercise to:

- Cernavod Nuclear Power Plants, Unit 1
- Institute for Nuclear Research, Pitesti
- Nuclear Research and Development Institute – Magurele
- Emergency exercise „OLTENIA 99" was done in Craiova and Bechet aria, during the period 25-26 May 1999 and had the subject the protection measurement and intervention in case of a nuclear accident at Kozlodui NPP.

The person qualified to give the interview to mass media is the president of National Commission for Nuclear Activities Control. The weekly information about the regulatory body activities is prepared by the two press representatives one from the General Division for Nuclear Power Plants and Fuel Cycle Installations and one from the General Division of Ionizing Radiation Applications.
The CNCAN policy towards the mass media implicit for the public is focused to surveillance of nuclear installations and the environmental radioactivity for complete and prompt information regarding the nuclear activities developed in Romania. Other important task is to explain very clear the meaning of any nuclear incidents that could occur in Romania or in other countries.
An important task for regulatory bodies is also the contact point for INES events. The person responsible for INES information is Mr.Dan Serbanescu – Director of Nuclear Safety Division.
To achieve the main task for caring out the public health, starting with 1998, the environmental radiation monitoring network where incorporated into regulatory body structure. The level of radiation is monitored 24 hours per day in 45 point in Romania territory. Up to now the radiation level were inside the limits established for normal level of radiation.

## 4. Conclusions:

The information provided to press and public by regulatory body is clearly and well structured. The target is to clearly explain to mass media and the public should understand very well the difference between the meaning of a nuclear accident, nuclear incident or nuclear event.
CNCAN monitories and surveys the operation in safe conditions the nuclear facilities and plants, the protection against nuclear radiation of the professionally exposed personnel, of the population, of the environment and the material goods. It is also controlled and monitorised the physical protection, the records, preservation, and transportation of radioactive materials and specific fissionable materials as well as the management of radioactive waste.
An opened communication is an important task for regulatory body to gain the public thrust and acceptance.
The implication of regulatory body in emergency exercises is also an important factor for current mass-media information.

# Public Relations in the State Office for Nuclear Safety

**Radka Prochazkova, State Office for Nuclear Safety, Czech Republic**

## 1. Introduction and Mission of SONS:

The State Office for Nuclear Safety (SONS) is a government agency. The Office is headed by a chairperson who is appointed by the Czech Government. The Office has got its own budget and reports directly to the Czech Government. SONS was established in 1993 and continued activities of the former Czechoslovak Commission for Atomic Energy.

SONS main activity is the central administration and supervision of the peaceful utilization of nuclear power and ionizing radiation and in the field of radiation protection. SONS is regulated mainly by the Atomic Act.

## 2. Establishment of Public Relations

A separate department of Public Relations was established last year in SONS especially due to the enactment of the statutory obligation of government agencies to render information.

## 3. P.R. Strategy

The aim is not the mere compliance with the statutory obligation, but especially the improvement of awareness in the public of SONS activities and formation of an information and communication open organization both inside and outside the Office.

Main P.R. fields include:

- Internal communication - focused on employees and their families;
- External communication - focused on the public, mass media representatives and visual presentation of the Office;
- Crisis communication - a plan for emergency situations.

The long-term and conceptual activity is based on the pro-active approach to all target groups.

## 4. Means of External Communication

Basic P.R. communication means in the field of external communication include:

- Information Center;
- Internet
- Press Releases;
- Publications – publishing regularly or for topical events;
- Seminars;
- Meetings;
- Press conferences;
- Editorial articles;
- Answering questions;

## 5. Establishment of the Information Center:

The preparation of the Information Center had started in 1999, and the Center was established in this year.
The target groups include both the lay and professional public.
The main mission of the Information Center is to render basic or specialized information from the field of SONS activities.

## 6. Structure of Information:

The Information Center consists of three basic parts:

1) Information panels containing graphically attractive texts which synoptically offer basic information about SONS:
   - basic data about SONS including its history and reasons of its establishment;
   - legislation;
   - SONS activities;
   - international cooperation;
   - the most important nuclear installations and workplaces with sources of ionizing radiation;
   - SONS regional centers;
   - form of rendered information;
   - place where and conditions how information can be received;
   - topical information.

2) Two PC's:
   - One PC is connected to the Internet, it makes it possible to search information on selected Internet addresses;
   - The other PC is connected to SONS database and makes it possible to search by a predetermined key all public available documents and printed materials.

3) Printed materials and publications:
   - for study on the premises;
   - available free (all documents can be copied or printed for a fee).

## 7. Information Center Promotion:

The planned supportive activities for the opening and operation of the Information Center include:
- publishing of an information leaflet for the Center opening;
- preparation of posters and invitation-cards;
- invitation of representatives of the public, mass media and cooperating organizations;
- ceremonial opening of the Center under the presence and support of SONS management;
- information on the Internet;
- continual identification of needs of visitors to the Center by means of questionnaires.

# INTEGRATION OF THE NUCLEAR SECTOR IN ARGENTINA: COMPETITIVENESS AND ACCEPTANCE

Hector Espejo, CNEA, Argentina


## SUMMARY

After the end of Second World War, it was necessary to show clear evidences that the energy value of the nuclear reaction which had been observed, had to be channeled towards other purposes. These purposes were to promote innovations, technologies and applications with the fundamental goals of reducing economic inequities and improving the quality of life.

In particular, the nuclear power option was also inserted in the frame of these ideas, and its competence as a safe energy supply had been consolidated and extended at a large scale due to the innovative technology using a new and different fuel.

Very early, Argentina initiated activities in this sense and, as a matter of fact, this year it attains half a century of sustained and constant efforts in order to strengthen the rol of nuclear activities, both at the national and international levels.

This is a reasonable period of time in which a general overview could be made over the technological achievements reached, as well as about the insertion of the nuclear issue in the public opinion.


## INTRODUCTION

The development of nuclear activities in Argentina was conducted by the Atomic Energy Commission (CNEA). Since its establishment in 1950, CNEA activities have been performed in a period where the most spectacular scientific and technological advancement was experienced worldwide. In this period Argentina has been strongly involved in the promotion of peaceful applications of nuclear energy aimed at promoting social and economic development.
This was clearly stated in the first document related to this matters issued by the Argentine Government at that time (Decree Nr. 10946, 1950): "Progress in research related to atomic energy cannot be ignored by the National Government, considering the multiple derivations of public benefits that its practical applications will or may involve in the future". It was then that the functions of the responsible agency were established.

During such period, nuclear activities were carried out within a framework of a very ambitious project involving the local development and assimilation of technologies. The results were successful obtaining wide national and international recognition.

The involvement of local industry, the progress attained in the training of human resources with a high specialization level, the rational use of public funds and the efficient planning and execution of the different projects provided CNEA with the acknowledgement of public opinion.

As a developing country, the landmarks attained in the nuclear field became highly significant and may be considered an important contribution to the country's growth.

Five well defined stages can be visualized along with these five decades of nuclear development in Argentina:

a) '50s - '60s: Gestation. planning, policy making, construction of laboratories, IAEA's foundational support.

b) '60s - '70s: Enhancement of activities. Decisions concerning nuclear power generation as a contribution to national development

c) '70s - '80s: Definition of industrial activities in the nuclear fuel cycle.First nuclear power plant. Introduction of nuclear quality in local industry. First exports

d) '80s - '90s: Consolidation of industrial activities. Second nuclear power plant. Expansion of self generated development. Enhancement of the country's position in the international nuclear community.

e) '90s-2000: Redefinition of strategy. Political statements and commitments concerning non-proliferation. Increase in exports. The Argentinean nuclear sector is composed today by: * The Atomic Energy Commission (CNEA)

* The Nuclear Regulatory Agency (ARN)
* Nucleoelectrica Argentina Sociedad Anónima (NASA)
(a state company in charge of the operation of the two nuclear power plants and the third one under construction)
* Combustibles Nucleares Argentinos (CONUAR)
(a joint venture between CNEA and a private industrial group, manufacturers of fuel elements for nuclear power plants)
* Fábrica de Aleaciones Especiales SA (FAE)
(a similar association as the previous one, manufactures zircalloy tubes and special alloys)
* Empresa Neuquina de Servicios de Ingeniería (ENSI)
(an association between CNEA and the province of Neuquén, produces heavy water in its Arroyito plant in that province)
* Dioxitek
(a company fully owned by CNEA, produces uranium oxide in Córdoba province)
* Nuclear Mendoza (NM)
(in cooperation with the province of Mendoza, an uranium mining company also involved in the provision of a number of other services related to nuclear technology)
* Investigaciones Aplicadas (INVAP)
(in cooperation with the province of Rio Negro, a high technology company that has exported research reactors to Egypt and Algeria and produces also nuclear medicine equipment and aerospace systems)
There are also 1743 centers of radioisotope applications throughout the country mostly in the are of nuclear medicine but also especializing in agricultural and industrial applications. The nuclear sector provides 6000 full time jobs and export its products to 13 countries.

**PUBLIC OPINION**

Argentine nuclear activities have benefited over the last five decades from active governmental support both politically and financially.

The country's decision to attain a substantial degree of independence in the nuclear field was attractive both to politicians and the common citizen for many years. One aspect of nuclear independence is the desire to manage the whole fuel cycle using largely indigenous technology. Activities related to medical, agricultural and industrial applications plus important "spin offs" from the nuclear industry into other sectors reinforced a sense of "technological nationalism" that was very strong from the '50s to the '80s and is still alive, to a certain extent, today. On account of this, nuclear activities enjoyed great prestige in the country during this period.

However, due to changes in the local political scene in the '80s and also due to international events such as the Chernobyl accident in 1986 and the strengthening of antinuclear groups, especially in Europe, public support for nuclear activities declined gradually. This can be seen particularly in the younger generation and in the creation of a number of antinuclear NGO's, some of them local and others imported from abroad. Similarly to what happens in other countries, this organizations are very effective in transmitting their message to the press generating very efficient opinion shapers.

In 1996 CNEA contracted a public opinion poll on nuclear matters. The number of people interviewed were 2100 in the Greater Buenos Aires region and the following cities: Córdoba, Mendoza, Rosario, Neuquén, Trelew, San Rafael, San Carlos de Bariloche, Mar del Plata, Salta, Resistencia and General Roca. Cities were CNEA has permanent activities are over-represented in this poll.

Some of the results obtained are:

a) 47% thought that solar energy was going to be the most used and cheaper energy in the future.
b) 69% knew that nuclear energy was used in medicine.
c) 52% knew that there were nuclear power plants in Argentina.
d) In a scale of 1 to 10 nuclear power plants safety was rated between 5 and 7 by 49%.

e) 38% are against new nuclear power plants.
f) 67% consider that radioactive waste is an important problem
g) 58% knew that the Atomic Energy Commission existed.It would be beyond the scope of the present work to try to describe in detail these results. Some of the statistics presented could be misleading if details are not discussed thoroughly. Bearing in mind those restrictions the following conclusions can be taken from this poll:
- The results obtained are not unexpected and are quite similar to those obtained in other countries.
- In general there is a large lack of information and, in many cases, this information is incorrect. Most important is the fact that nuclear issues (as observed also with environmental issues) are often taken lightly, as evidenced by contradictions in many of the answers.
- Even taking into account these contradictions, the general feeling in the population is not completely anti-nuclear. Under these conditions, a well organized and intense public opinion campaign can have important results.
- The important role played by schools and the media in shaping public opinion is well substantiated.
- CNEA's image is acceptable especially if it is compared with other governmental institutions.

**PUBLIC OPINION ACTIVITIES**

Public opinion activities have always been a part of CNEA efforts, their extent and characteristics having changed in different periods.

The major tools used are:
- A Press Department that is responsible for contacts with the media.
- Courses and seminars for journalists including visits to nuclear installations.
- Courses, seminars and presentations in educational institutions in all levels (primary, secondary and university). Around 6000 students visit our installations each year.
- Publications on different aspects of nuclear activities directed at different age groups as well as to groups with various technical backgrounds.
- Joint projects with NGO's, especially in environmental issues.
- Permanent contacts with politicians at the National, Provincial and Municipal levels.
- Active participation in private organization related to the nuclear activities (Chambers of commerce, industrial federations, trade unions, etc.)
- Coordination of activities with other institutions and companies in the nuclear sector.
- Participation in TV and radio programs.
- Use of electronic media to reach the public: Internet and e-mail.
- Maintaining an answering service for citizens that have questions on nuclear matters.
- "Open house days" in differents nuclear centres

The activities briefly described above are designed to provide a general background of information to the public in general. Some activities in which CNEA is engaged require special attention because of their special characteristics. Some of them are described below:
- In the 80's, CNEA performed preliminary studies for the installation of a high level waste disposal installation in Chubut Province in the south of the country. This project lasted until 1990. Even if initially the project had the acceptance of the population in the '90s, a strong reaction against this installation appeared, largely because of the action of NGO's and also for political reasons. Even if only some perforations were drilled in the town of Gastre there have been permanent accusations that radioactive waste has been effectively buried in that area.
This is of great importance since CNEA is now, by law, responsible for radioactive waste management and is preparing a National Radioactive Waste Management Strategic Plan that includes the construction of high, medium and low levels radioactive waste sites. The adverse perception of public opinion developed as a consequence of the Gastre project can jeopardize any attempt to have the National Plan approved in Congress and, even if this is obtained, it can have a negative influence on attempts to put this plan in practice. For that reason, great attention

is paid to this problem. CNEA is presently oncentrating a great deal of effort in explaining the strategy of waste management to all levels of government and the general population.
- An important area of conflict with public opinion arises from the need to move an uranium oxide plant, managed by Dioxitek S.A., a CNEA owned company, from it's present location close to the downtown area in the city of Córdoba. The town of Despeñaderos has been chosen for that purpose with great support from municipal authorities. However, a very well organized campaign organized by some NGO's generated reaction to the project and a proposal to declare Despeñaderos "Non nuclear zone" was presented in City Council. A very intense action by Dioxitek and CNEA ended in the proposal not being accepted. However, there are still many problems to be solved concerning public opinion acceptance if this move is to take place as planned. Even greater problems are induced by the need to transport waste from the present location to aclosed uranium mine close to Córdoba. Also, some groups have been claiming high levels of contamination in Embalse Río Tercero due to the operation of Embalse Nuclear Power Plant. For these reasons, Córdoba is a very special
concern in our efforts to get acceptance for nuclear activities.

**CONCLUSIONS**

Public acceptance of nuclear activities has deteriorated in the last two decades and can jeopardize the future of nuclear industry in Argentina. However, the situation does not seem to be irreversible since some of the initial attitudes towards nuclear matters are still alive in the population.

A very intensive public opinion campaign will be necessary in the next few years in order to ensure that peaceful applications of nuclear energy are still an option for industrial development in the years to come.

For that reason, CNEA is reorganising its activities in this field by asigning a larger amount of human and material resources and, at the same time, seeking the cooperation of the other organizations and companies in the nuclear industrial sector. It should be understood that this is a problem that should be dealt with by the nuclear sector as a whole in a coordinated and sistematic way with long range results in mind taking into account that
the social perception of nuclear activities, especially of the possible risks pertaining thereto, should be properly evaluated considering the advantages that society can derive from the establishment of such activity in the country, with the direct and indirect benefits thereof, but mostly with the full comprehension of the technical information on nuclear safety, regulatories standards and full environmental control.
Under this exclusive premises and taking into account the national experience accumulated during fifty years, we can assure that competitiveness of the investment in nuclear matter at national level will follow a positive rate and the public opinion will manifest another positive overturning if they are properly informed since it can be a formidable source or new jobs and help the development of other economic activities in the country trying to resolve many inequities in the social and economical problems.

Intensive work with journalists, public opinion formers and politicians, for a normal balanced contacts, is the main jobs to support the reaction and negative opinion towards nuclear power and radiation and isotopes applications not even when nuclear present a lot of advantages.

It is very important to be prepared to use the best arguments on the beneficials uses of nuclear energy whenever a debate arises. This is our active compromise.

# Nuclear Academy for Journalists

Zoltán Szönyi, Ernö Bújdosó, Hungarian Atomic Energy Authority

Ferenc Komornik, Association of Hungarian Scientific and Industrial Editors

A comprehensive nuclear training program has been launched for journalists of newspapers of wide range.
The aim of the Academy is to gain the journalists for the objective interpretation and - for this reason - to give them a large-scale knowledge and experience in connection with nuclear energy.
The Academy consists of 10 all day long programs monthly, containing lectures, discussions, debates and technical visits to the Paks NPP, research and training reactors, institutions and facilities of waste disposal, etc.
The Academy started at the Hungarian Atomic Energy Authority in October 1999, and the closing ceremony will take place at the same place in June 2000.
The journalists with active "output" and regular attendance will have diplomas, which authorise them to use the "Nuclear Journalist" title.
The slogan of the Academy is: "To gain and give objective information!"

The frame of detailed Program of the Academy

**1st day October, 1999**

Headquarters of the Hungarian Atomic Energy Authority

Opening address given by the General Director of HAEA
(bases of nuclear energy, necessity and importance of the Academy, and of the dialogue with the representatives of the public)

Lectures on

⇒ the energy production and the risk

⇒ international conventions serving the nuclear safety

⇒ the roles of regulatory bodies in guaranteeing the nuclear safety

⇒ kinds and sources of radiation surrounding the human being

Visit to the CERTA (Center for Emergency Response, Training and Analysis) located in the building of HQ.

**2nd and 3rd day November, 1999**

Paks Nuclear Power Plant

Visit to the

⇒ Visitors' Centre of NPP

⇒ operating units

⇒ Educational and Maintenance Training Centre (observation of a training)

⇒ Interim Storage of Spent Fuels

Lecture on the activity of Hungarian Atom Forum.

**4th day December, 1999**

Visit to the KFKI (Atomic Energy Research Institute Budapest);

and the Budapest Research Reactor of KFKI;

visit to the Institute of Nuclear Techniques BME (Technical University of Budapest)

and the Training Reactor of BME

Lectures on

⇒ the role and importance of R&D in enhancing the safety

⇒ activity of research institutes

⇒ situation and perspectives of the education for Hungarian experts of nuclear sphere

Activity of the Hungarian Nuclear Society.

**5th day January, 2000**

Visit to OSSKI
"Frédéric Joliot-Curie" National Research Institute for Radiobiology and Radiohygiene, Budapest

Lectures on

⇒ current issues of research activity of radiobiology

⇒ tasks and regulatory role of OSSKI

Introductory lecture on NucNet

(essence and possibilities in making the best of NucNet services).

**6th day February, 2000**

Visit to PURAM
(Public Agency for Radioactive Waste Management)

Lectures on

⇒ sources and management of radioactive wastes

⇒ interim and final disposal of wastes

⇒ final disposal of spent fuels

Visit to the Püspökszilágy Disposal Site

**7th day March, 2000**

Visit to VEIKI
(Institute for Electric Power Research)

Interpretation of studies

⇒ on nuclear accidents (course of events, the used codes)

⇒ on managing the ageing of NPPs

Visit to the Secretariat of the GCNEP
(Governmental Committee for Nuclear Emergency Preparedness)

Lecture on the structure and activity of system of the GCNEP, the importance of international exercises.

Visit to the Emergency Information Centre.

**8th day April, 2000**

Environmental Protection

Visit to the local office of the Supreme Inspectorate for Environmental Protection

Lectures on the regulatory control of environment in the vicinity of PAKS NPP. (activity of laboratories)

Visit to the Mecsek Uranium Mine
(handling the left Uranium Mine and rehabilitation of the site)

**9th day May, 2000**

International outlook

Visit to Mohi NPP in Slovakia

Visit to the IAEA, in Vienna

**10th day June, 2000**

Headquarters of the Hungarian Atomic Energy Authority

Closing ceremony of the Academy

# FROM THE EXPERIENCE OF SPOKESMAN'S INTERACTIONS WITH JOURNALISTS

**Stanislaw Latek - National Atomic Energy Agency, Warsaw, Poland**

The majority of public communication experts almost unanimously claim that modern media, unlike science or technology, measure their success by the ability to draw immediate attention of the public and to maintain its interest in a certain selected event. The rules are quite different from those in reliable science or technology. Anti-nuclear movements have been able to pass their message in the form perfectly matched to media expectations. Unfortunately, this is not the case with nuclear industry spokesmen, who are restrained, aloof and quite often afraid of the media as well as of their bosses. Sometimes they happen to be arrogant, incompetent and taciturn. This black-and-white picture does not always or everywhere give an adequate description of the relationship between the spokesman and journalists, as in reality we have to deal not only with the simple distinction between proponents and opponents of nuclear power.

In Poland, the relations between the nuclear community (and its spokesmen) and the media are rather special, as the nuclear energy industry does not exist. Since the withdrawal from nuclear power plant construction in Zarnowiec (in 1990), which was forced by firm public opposition against the application of Russian technology in Poland, nuclear community relations with media have been focused mainly on convincing journalists that it is necessary to familiarize the public with ionizing radiation. All sociological studies indicate that Poles associate the radiation (and nuclear energy) with hazards for human health and environment. The situation is further complicated by the fact that Poland borders Russia, Lithuania and Ukraine, i.e. the countries where RBMK reactors are in operation, which - especially after the Chernobyl disaster - has been the reason of grave public concerns. The fears of radiation hazards probably account for the aversion of the majority of Poles to nuclear power in our country and for their susceptibility to various unfounded (and often improbable) rumours of nuclear accidents in the neighbouring countries (see PIME-97 communiqué by this author).

A way to overcome the fear of nuclear is to demonstrate the benefits gained from nuclear technologies and to show by personal testimony that nuclear reactors are no more dangerous than other industrial facilities are. Journalists have a special role to play here, as their readers, listeners and viewers trust them more than representatives of nuclear sector. Thus, before journalists decided to persuade the public, it was necessary to persuade the journalists themselves. While seeking journalists' co-operation, efforts have been taken to avoid the mistakes and attitudes mentioned

earlier. The process started with establishing personal contacts with the journalists, trying to win their confidence and to meet their needs and expectations.

Visits to nuclear power plants (NPP) and to nuclear research centers organized for the journalists proved to be very useful. The facilities visited included nuclear power plants in Loviisa, Sosnovyj Bor, Mochovce, Rovno, Brockdorf and Ignalina and the research centers in Dubna (Joint Institute for Nuclear Research), Geneva (CERN) and Hamburg (DESY). A total of about 100 journalists from news agencies, newspapers, radio and television participated in those visits. The visits resulted in over 150 various publications (articles, notes, correspondences and interviews) and in about 50 radio and television broadcasts.

The journalists visiting nuclear power plants focused mainly on the safety of the installations, working conditions, the scope of modernization and potential risk for Poland (some of those NPPs, e.g. Ignalina, Rovno, Mochovce, are sited less than 250 km from the Polish border). In case of some influential media those visits created a friendly - or at least not hostile - climate for nuclear energy sector. Journalists got acquainted with nuclear industry, they understand it quite well and - most importantly - they are not fearful of nor prejudiced against ionizing radiation and its applications. It seems that if the program of NPP construction in Poland were to be launched, the group of journalists shaped and educated by such visits and other NAEA activities, could be very helpful.

This statement may be confirmed by the fact, that after the announcement (in November 1999) of the preliminary guidelines for the national energy policy up to year 2020, the media responded with a few articles written in a very matter-of-fact manner, objectively, presenting the grounds for introducing the nuclear option into the Polish electricity generation system. A sample of the relevant headlines is given below: „Poland will need nuclear energy", „Nuclear Poland", „Atom needed", „Government don't exclude, that NPPs will be constructed".

However, the implementation of a governmental power program, which includes the nuclear power option, depends on the economic growth and is rather remote in time. This may be the reason for a relatively calm media reaction to the announcement of the dawn of nuclear power era in Poland.

The debate on the siting of a radioactive waste disposal facility are much more heated. Expert studies and analyses indicate that for future waste disposal sites should be looked for in the central part of Poland, where loam and salt deposits are found. Unfortunately, despite economically motivating press announcements, the municipalities which have been preliminarily selected as possible sites, one by one refuse their consent to such a project. It is the local media which seem to deter the inhabitants from taking positive decisions. This fact may demonstrate that the more specific and realistic the project is, the more difficult it is to gain acceptance for it. Moreover, the power of the NIMBY (not-in-my-backyard) syndrome in Poland is still enormous.

Contacts with the media should not be limited to instances when something is happening, when decisions are being taken. The spokesperson of a governmental agency or industrial company should co-operate with the media on day-to-day basis. In case of the Polish NAEA journalists are invited to press conferences, to more interesting seminars, scientific conferences, and meetings with experts (domestic and foreign). They are supplied with written information on major events in nuclear and radiation protection sectors. The spokesman, as well as the Agency management, are available for comments on or explanations of all issues interesting to the media.

Certainly, contacts with the media also involve disturbances. Some information published in printed form, or in electronic media, is misrepresented or even distorted. Journalists are not always interested in the events, which do not fall into the „news" category. Moreover, the spokesman maintains the contact with a rather narrow group of journalists. There is the lack of broader contacts with the television and environmental media, however some efforts to establish closer relations with those groups have been undertaken. Sometimes we should excuse the errors, lapses or inaccuracies made by the journalists who are important to us. Some experts are very strict and reproach media representatives for slightest transgressions, thus discouraging them from dealing with nuclear issues.

Another serious problem, affecting the co-operation between the nuclear community and the media, results from the inconsistency of views (lack of unanimity) within the community itself. Some frustrated scientists are not always honest, they fight against each other and present quite divergent opinions (e.g. on linear and no-threshold hypothesis, the impact of Y2K bug on nuclear safety, and others). Such behaviour undermines the authority of both the community and its spokesman.

Finally one should mention the role of coincidence, or rather the role of political or technological events, unfavorable for nuclear power industry (e.g. in Tokaimura). The evident rise in distrust towards the nuclear industry caused by the incident mentioned should be balanced with something positive. In our case it means efforts to publicize and popularize a method of purification of flue gases from coal-fired power plants, which uses electron beams and is currently implemented on industrial scale and to bestow the prestigious title of Golden Engineer 1999 on one of its authors.

From my personal experience I can say that the following factors are important in the contacts with the media: prompt, accurate and specific answers, the respondent's authority, honesty, truthfulness and knowledge, and - as far as possible - „face to face" communication. The ability to supply additional background information is also valuable, as well as that to communicate in a language easily understandable to non-specialists.

# *Nuclear Energy and Public Opinion.*

## *Chilean Nuclear Energy Commission (CCHEN) Dissemination and Extension Program*

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In Chile, demand for electricity will soon exceed water resources. The country will then face severe energy dependence, with very little control over generation costs, and with increasing emission of contaminating gases into the atmosphere. Nuclear energy may be considered an appropriate and stabilizing alternative for the system in the medium term, the benefits of nuclear generation to be thus extended to a country which has a moderate demand for electricity.

This new scenario will require an additional technical and regulating effort by CCHEN and by the state, as well as re-orientation of their activities in connection with public opinion.

The Public Nuclear Energy Education Program, initiated in 1976 by CCHEN, has been developed for purposes of achieving public acceptance of nuclear energy as a way of facilitating development of various activities which pertain to CCHEN's scope of action, and of creating a climate which is favorable to acceptance of nuclear energy as an alternative source of energy. Thus, the object is that the public draw informed conclusions on the benefits and risks implicit in the use of isotopes, radiation, and nuclear power generation.

The Program consists of activities for high school students aimed at vocational orientation of those who stand out in the science area, training and extension activities for teachers, journalists, and professionals, a program of guided tours of the nuclear centers, a publicity campaign conducted in the various media and, since 1980, massive distribution of brochures and magazines.

There are no declared anti-nuclear movements in Chile. Nevertheless, there are opinions against nuclear power in different relevant sectors. Lately, the social communication media have preferred CCHEN as their source of information, a fact which makes it possible for the latter to have access to good coverage of its activities.

### *1.0 Introduction*

Nuclear development plans and programs are faced with public rejection to a greater or lesser degree, due to use of nuclear energy for war purposes, to the circumstances surrounding radioactive waste, to nuclear testing, and to accidents which have occurred in some nuclear plants.

Achievement of public acceptance of nuclear energy is a priority task for those who are convinced that nuclear energy constitutes an active part of the processes which are destined to improve living conditions for the country's population and also a way to make greater progress and well-being possible.

### *2.0 Purpose of CCHEN's Dissemination Program*

The purpose of the program is to achieve public acceptance of nuclear energy. The program is structured so that public acceptance of nuclear energy may facilitate development of CCHEN's activities and create a favorable climate towards acceptance of nuclear energy as an alternative source of energy. Target population segments of the program are as follows: Elementary and high school students and the general public; higher education students and professionals; journalists of the various communication media; the national productive sector; and authorities of the Central, Regional, and Legislative Branch of Government.

### *3.0 Organization and Human Resources*

The Chilean Nuclear Energy Commission's (CCHEN) Dissemination and Extension Program has been structured to satisfy the needs of our country's 15 million inhabitants, taking into account location of the same in the extreme southwest of the American continent. Chile's continental and island territory covers an area of 756,626 $km^2$. Its geographical configuration is characterized by a length of more than 4,400 km.
The Chilean Nuclear Energy Commission, with a staff of 336, is an institution which forms part of Chile's scientific-technological system, and was legally created in September of 1965, for purposes of „attending to problems related to production, acquisition, transfer, transport, and peaceful use of nuclear energy".

CCHEN's physical infrastructure consists of the La Reina Nuclear Center, the Lo Aguirre Nuclear Center, and various Laboratories.

The Commission has a Dissemination and Extension unit for purposes of design and execution of the Dissemination and Extension Program. The unit is directly dependent on the Executive Director.

### *3.1 Human Dissemination and Extension Resources*

Two Engineering Technicians with graduate training in nuclear engineering, one University trained Administration Technician, two Physics Professors, two Executive Secretaries, and 1 part-time Journalist.

### *3.2 Financial Resources available for Execution of the Program*

To date, expenses have exceeded an average of US$ 130,000 annually.

### *4.0 Dissemination*

***4.1 For Students and Teachers:*** a) A permanent exhibit room; b) An itinerant exhibit; c) Tours of CCHEN's Nuclear Centers; d) Use of videos; e) Talks to schools; f) Massive distribution brochures; g) Web pages.

***4.2 For Journalists:*** a) Videos on loan; b) Institutional folder; c) Web pages; d) Press bulletins; e) Press conferences.

***4.3 For Professionals:*** a) Annual Executive Report; b) Nucleo-technical magazine; c) Sponsoring Institutions (Carpeta Institucional) d) Videos on loan; e) Participation in Sector Fairs; f) Visits to the Nuclear Centers; g) Directory Service Advertisements; h) Web Pages.

***4.4 For the General Public:*** a) Permanent exhibit room; b) Itinerant exhibit; c) Annual Executive Summary; d) Massive distribution brochures; e) Radio Advertising Campaigns; f) Contracted space in newspapers and magazine; g) Web pages.

| Period | Public | Permanent Exhibit | Itinerant Exhibit | Tours to Centers | Videos on Loan | Talks | Fairs |
|---|---|---|---|---|---|---|---|
| 1996/1999 | Institutions<br>Persons | 243<br>28 334 | 23<br>39,143 | 216<br>5,279 | -<br>176 | 37<br>4,645 | -<br>50,000 |

| Period | Annual Executive Summary (samples) | Nucleo-technical Magazine (samples) | Directory (advertisements) | Brochures (samples) |
|---|---|---|---|---|
| 1996/1999 | 8,000 | 8,000 | 24 | 234,000 |

### 5.0 Extension

***5.1 For Students:*** a) National Gathering of Young Talent; b) Experimental Physics Laboratory for High School Students.

***5.2 For Teachers:*** a) Workshop: Nuclear Energy in Education: A Didactic Approach; b) Mini-course on uses and applications of nuclear energy.

***5.3 For Journalists and Communicators:*** a) Seminar on Nuclear Energy.

***5.4 For Professionals:*** a) Courses on Radiological Protection.

Statistics on courses offered during the past four years:

| Courses on Radiological Protection | 1996 | 1997 | 1998 | 1999 | Total |
|---|---|---|---|---|---|
| Course· Elements of Operational Radiological Protection (CEPRO) | 72 | 96 | 104 | 68 | 340 |
| Basic Course on Radiological Protection (CUBEPRO) | 47 | 72 | 41 | 167 | 327 |
| Basic Course on Radiological Protection in the Health Sector (CASS) | 37 | 37 | 31 | 37 | 142 |
| Basic Course on Radiological Protection for Policemen | 8 | | 33 | 23 | 64 |
| Basic Course on Radiological Protection for Firemen | | 34 | 24 | 29 | 87 |
| Basic Course on Radiological Protection for Chile's Investigations Department | | | 47 | 29 | 76 |
| Sub-Totals per year | 164 | 239 | 280 | 253 | 1046 |

b) Specialized Seminars

***6.0 Publicity:***

a) Directories; b) Sponsoring Institutions (Carpeta Institucional); c) Radio advertising campaigns; d) Posters in the Santiago sub-way; e) Contracted space in newspapers and magazines.

| Period | Mini-Radio Programs (2 Radio Stations) | Press Notes | Press Bulletins |
|---|---|---|---|
| 1996/ 1999 | 23 | 26 | 25 |

Note: During 1996, Mini-Radio Programs were aired at two radio stations (Portales and Minería). In 1999, they were aired only at Radio Portales.

***7.0 Evaluation***

a) Increased interest on the part of journalists to become acquainted with peaceful uses of nuclear energy as well as to report on the same has become noticeable, together with an increase in articles published on nuclear topics.
b) There is increased interest and motivation on the part of the general public to become more acquainted with applications of nuclear energy.
c) There has been a significant increase in requests for information on nuclear topics from students, teachers, schools, universities, and the general public, both in the Metropolitan Region as well as in the rest of the country.
d) There has been an increase in requests for information from public as well as private companies, either in connection with services rendered by the Institution or in connection with bibliographical support material.

***8.0 Projections of the Dissemination Program***

***8.1 International:*** The program has been presented at several international meetings in countries of the Region and in IOAS (OIEA). Chile has offered its collaboration in this field to countries in the Region.

***8.2 Internal in the short term***

CCHEN's Dissemination program satisfies information demand from the target population segments and has succeeded in committing official participation in educational activities for universities and organizations which are dependent on the Ministry of Education.

Activities to be developed will be aimed at allowing the national population to increasingly accept nuclear or conventional technology derived from execution of the national nuclear development program, and to incorporate the same into its processes.

### *9.0 Coordination with Government Authorities in delivery of information to Public Opinion*

A major portion of information arising in the nuclear field, to which public opinion is particularly sensitive, has technical and political components.

This fact makes handling of information difficult, given the fact that technical opinion is subordinated to political authority.

In this sense, and to prevent public confusion in connection with the matter, CCHEN is extremely careful to ensure that there is only one official position in connection with the nuclear topic.

### *10.0 Dealing with representatives of mass communication media*

Representatives of the mass communication media constitute undoubtedly one of the key actors in management of public opinion in the nuclear field.
Given the above, CCHEN has placed great importance on its relationship with the mass communication media.

### *11.0 Conclusions*

Nuclear development in Chile has until now been associated with the use of isotopes and radiation. In the field of energy, the nuclear power alternative is not expected to materialize in the short term.

In general, public opinion towards development of nuclear activity has been favorable, a situation which could change drastically if Chile opts for nuclear power generation. CCHEN is working on facing this probable new scenario.

# HOW TO TARGET YOUR AUDIENCE

# Communications Strategy for the Chornobyl* Centre

Mykola Kurilchik (International Chornobyl Centre)
Len Green (NNC)

## Introduction

This Communications Strategy was developed for the International Chornobyl Centre (ICC) as part of a joint UK/Ukraine project, sponsored by the Department of Trade and Industry and NNC Limited. The Plan was developed during four weeks of workshop discussions in the UK between staff from the centre and experienced PR Professionals from NNC Limited.

The requirements for a sustained communications activity at the ICC go much further than simply enhancing or promoting the Centre's scientific and technical activities. Raising sufficient awareness of the Centre among potential funding agents and commercial partners is critical to its future development as a major Centre for international co-operation and research. It is only through establishing and developing effective communications that the Centre will become well enough known and understood both within the Ukraine, and internationally, to secure its long term future.

However, as the workshop programme unfolded, it also became clear that communications was in itself a legitimate and necessary **function** of the Centre, and part of the foundations of its existence. The Centre has a fundamental role as an 'information exchange', collecting and communicating information from within the Ukraine to the rest of the world, and interpreting world interest and attitudes to the Ukraine Government and nuclear industry. As such it compliments the efforts of individual power plant and corporate PR functions within the Ukraine nuclear energy sector.

## Developing the Strategy

Implementing a communications programme both to Ukraine and international audiences is seen as a vital objective to establish the Centre and to secure its long term stability and growth. Indeed, the effective flow of reliable and credible information both from the International community into the Ukraine, and from the Ukraine to the rest of the world is part of the very lifeblood of the Centre.

To develop the Communications Strategy it was necessary for everyone to:

- Be absolutely clear on the role and purpose of the Chornobyl Centre.
- Honestly identify our Strengths, Weaknesses, Opportunities and Threats.
- Identify who our 'target' audiences were.
- Decide what messages we need to communicate
- Determine how to communicate them

Having determined **who** to tell, **what** to tell, **why** to tell and **how** to tell, the workshop participants developed an 'ideal' strategy required.

## Communications objectives

- Raise awareness of the Chornobyl Centre nationally and internationally
- Promote understanding of, and support for, the Centre's purpose and role(s)
- Establish the Centre's credibility as a technical authority for Chornobyl-related research and development

* 'Chornobyl' is the Ukraine spelling

- Help share information about Chornobyl throughout the world. Develop a reliable and technically credible 'information exchange' between national and international audiences
- Create a strong image and identity for the Centre
- Foster partnerships with international nuclear utilities, companies and contractors, and to understand clearly the needs, motivations and cultural differences of partners in the West
- Seek customers for the Chornobyl Centre's scientific and research capabilities, both in the Ukraine and internationally
- Win support from international funding agencies, and those who can influence funding decisions
- Foster a spirit of co-operation within the Ukraine, and counter misperceptions from some quarters. To facilitate information exchange within the Ukraine
- Advise Ukraine and international governments on Chornobyl-related issues
- Establish a system of in-house communications
- Identify the resources needed to execute communications activities.

## Recommended communications activities

The following communications activities and initiatives were identified to meet the Centre's objectives and to communicate key messages to the appropriate target audiences:

- Develop a strong **corporate identity**
- The Centre should carry out a planned and sustained **media relations** programme to encourage the media to adopt a positive attitude towards the Centre, and to use the media to deliver key messages to the Centre's target audiences.
- Establish a **World Wide Web site** for the Centre. A phased approach is recommended, which begins by designing and producing a basic site that explains the role and purpose of the Centre to international audiences.
- Develop a sustained and **pro-active briefing role** to priority national and international audiences. That means that the Centre does not just wait for others to enquire about certain issues and events, but that it takes the lead to establish its 'information exchange' role. A number of related activities could be developed as part of a package, aimed at giving regular and reliable briefings to a core target audience. These could include:
    1. Regular briefing sheets or newsletters
    2. Cuttings service
    3. Seminars
    4. Acting as a trade association
       Ukraine does not have an equivalent trade association to for example, the UK's BNIF. As such it will act as a central point to exchange market information between member companies. This activity would help the Centre to establish its role as a central co-ordinator and win friends and influence positive perceptions within the Ukraine industry.
- Produce a range of Publications.
  Of those considered, two issues of the ICC's international news magazine 'Insight' have been produced. These were funded by the UK 's DT I under its programme of support for the project. The strategy is aimed at making the magazine, which will be published quarterly, self-financing. The Centre also proposes a professional journal; a Ukraine industry directory; promotional brochures; an overall marketing/capability brochure; technical capability sheets and annual reports.
- To underpin its pro-active promotional work, aimed at attracting international funding agencies and commercial partners, a programme of visit and contact planning will be developed.

- Exhibitions, seminars, and Road shows

- Internal communications including a programme of team briefing.

## How much can we really achieve?

From the start, it was clear that the resources available to support these communications objectives are severely limited. Implementing the strategy is left to middle managers as an additional task to their specified duties. As such, time spent on this task has to compete with the demands and pressures of other functions. Creative solutions are therefore, needed to identify ways of delivering the communications activities that are so essential to the Centre's future. It is clear that achieving all the objectives outlined with the current resources is very difficult, if not impossible.

To match aspirations to resources therefore, ICC must:

- Recognise that creative approaches and 'lateral thinking' are required if major communications initiatives are to be resourced
- Encourage a positive attitude in its staff based on 'how can we make the most of what we have got?' - a 'can-do' culture - rather than seeing barriers or obstacles to progress, based on having no time nor money
- Identify low-cost, high impact PR activities that can be accommodated within existing resources
- Be realistic in its aspirations of what is achievable within the short and medium term.

## How much have we achieved so far?

At the time of this conference the centre is making good progress towards achieving its communications objectives. It has produced two issues of its duel language magazine 'Insight' (one in UK and one in Ukraine) and distributed them world-wide. The third issue is being prepared. Three ICC international conferences have been held in Slavutych, near Chornobyl. These have attracted delegates from countries such as Austria, Japan, USA, UK Germany, France, Russia and Ukraine. The centre will soon have its own web site up and running. This will give information on the current status of Chornobyl and international efforts there, the capabilities of the Centre's Slavutych laboratories, the entrepreneurial opportunities in the town of Slavutych together with news about the Ukraine nuclear industry as a whole.

To develop as it wishes, the Centre is now adopting a more pro-active 'marketing' role to sell itself, to attract, encourage and 'make friends' with potential funding agents, and those contracting organisers who influence their decisions. By becoming self-sustaining the Centre can take more control over its destiny, rather than wait for others to decide its future direction and activities.
The communications team is also adopting a strategy aimed at becoming self-sustaining within two to three years. This will enable full-time dedicated communications professionals to be employed and secure strong ownership of the strategy.

## Telling the world how it is

The world wants to know what is going at Chornobyl and ICC has many positive achievements to report. These achievements have significant implications both within the industry and for the wider population. But there are also many problems arising from the legacy of the Chornobyl accident that Ukraine cannot resolve alone. ICC has a central role to play, not only in co-ordinating international efforts but also in telling the world how it is.

# PUBLIC RELATIONS POLICY: THE ELETRONUCLEAR EXPERIENCE

**Luiz Soares, Electronuclear - Eletrobrás Termonuclear S.A.**

## 1. Electrical Sector in Brazil: Historical and Cultural Aspects

As well known, any kind of technical issue is difficult to be discussed with the general public for itself. Thick and numerous walls separate the public opinion from the technicians. When it comes to industries, the Electrical Generation Sector is no exception. And when it comes to the Brazilian case, there are some historical and cultural aspects that must be considered for the understanding of its peculiarity. Although they are not this simple, we can divide them in four categories: social, economical, political and technological.

For providing a better comprehension of the mentioned scenario, we should first identify those categories back in the 60's, when the background of the initial growth of the Electrical sector in Brazil was established. By that time, Latin America's largest country had only 6,000 MW installed. But the massive on going industrialization process demanded many more. And this desire of expansion was not exclusively from the Government: it was also claimed by the majority of the society. This social support was indeed one of the most important characteristics of that decade.

Another important factor was the economical conjuncture. Internally, the total revenue from the unified energy tax was invested in the development of the Electrical Sector. Externally, the international financing banks demonstrated to be just as much interested in it. To complete the favorable atmosphere for its growth, the Military Rule, that took over the country in 1964, excluded even the possibility of negative manifestation from the media and the society in general, since the decisions were taken without their participation. In addition, we should mention that the technological focus in every career was enormous: it was the beginning of a new era.

From the first step to nowadays, almost four decades have passed. Now, Brazil has 60,000 MW installed. Although it's ten times larger than in the 60's, it's still not enough. Politically and socially, democracy recovered the society's participation, and the media's just followed it. As both of them press the Government to take developmental attitudes, considering the globalization context and all the implications that come from it - such as unemployment -, the demand of electric energy increases again. But the economical resources are not the same, constituting another problem for its development. And the *green conscience* prohibits us to separate technology from the environmental questions. Thus, nuclear energy appears as one of the reasonable possibilities for electricity production in the near future.

## 2. Nuclear Power and Public Acceptance in Brazil

Despite the regular problems that historically involve nuclear energy all over the world (its use for nuclear weapons, radioactive waste storage etc.), aggravated by the TMI (1979) and Chernobyl (1986) accidents, the Brazilian case has once more its peculiarities. Oddly enough, the accident with Cesium-137 source at an abandoned hospital in Goiania (1987) brought more negative consequences to the use of nuclear energy for electrical generation than for medical activities. This accident shocked the public opinion and helped to create prejudices and myths hard to be removed.

Within this frame, the whole nuclear area in Brazil decided to articulate, creating a true web of relationships. This web included the Nuclear Department of FURNAS Centrais Elétricas, which, later on, became part of ELETRONUCLEAR - the Governmental company that owns the Angra

Nuclear Station. Initiatives from every segment became visible. A good example is the *Brasil Nuclear* magazine, published by ABEN (Brazilian Association of Nuclear Energy) - that, by the way, was the first organization in the sector to hire a professional press agent. In this magazine, all the aspects of nuclear energy's use in Brazil are discussed and it reaches more than 10,000 subscribers for free. Another big step was a simple discovery: Brazilian society believes people are more important than enterprises or institutions. Therefore, the strategy turned to be the approach to opinion makers (universities, research institutes, governmental authorities, great consumers and professional associations) either when nothing bad or something good happens. The objective is to clear up their minds and try to make alliances, promoting activities with them or just establishing connections, aiming at a long term commitment with concrete effects.

When the subject is public opinion, the press is certainly an important element. The coordinated involvement of technicians and directors gives a positive impression to the media. Another good strategy is the supervised visits to the Nuclear Plant, in Angra dos Reis. Dealing well with the Press constitutes an important part of the building of a company's positive image. **Environmental concern**, **technological quality** and **the energetic issue** became the basis of ELETRONUCLEAR's speech, presented coordinately by the above mentioned technicians and directors. Speculations or conflicts should be avoided. And last year's numbers proved the chosen strategy was a good one: the balance between the positive and negative news in 1998 amounted to US$ 2,5 million, in regard to the cost of advertising space. Some examples can also confirm these numbers:

***Fig. 2.1.***

**The chances of Angra 3**

This one third of page article, written by renowned columnist George Widor, shows ELETRONUCLEAR as a lucrative company, that will generate enough financial resources to build a third nuclear power plant in Angra.

***In: O GLOBO***

From the above three main issues - **environmental concern, technological quality** and **the energetic issue** - , we can point out the environmental concern as the decisive one. Following this thought, the financial support to several activities such as the reforestation over Angra dos Reis region, the creation of marine farms and other sustainable development projects, as well as research programs developed in the area by Universities, became a tactic.

The targets established at the Kyoto Conference are opening the doors to the generation of electric energy by nuclear plants. Numbers such as the decrease of 10% in the $CO_2$ emission attained by the operation of nuclear power stations should be always remembered. The advertisements published by ELETRONUCLEAR in the newspapers illustrate the company's *green side*, as the example below may demonstrate:

An itinerant exhibition developed for school students - first in Rio, and to be shown in many other cities - has also been supporting this speech. Almost 10,000 children and teenagers have already seen videos, heard presentations made by the technicians and enjoyed themselves with multimedia games over five different schools. They've also proposed names for the new

ELETRONUCLEAR mascot, with a prize being given to the student who won the contest. A permanent exhibition also with videos and presentations made by trained personnel is available at ELETRONUCLEAR Information Centers in Itaorna and downtown Angra dos Reis, as will be detailed later on.

Both exhibitions have another important attraction: ELETRONUCLEAR folders and illustrated books. Each of them has its target and talks about some particular aspect of the company. One of them was created specially for school students, using a language closer to the theirs. *Almirante Álvaro Alberto Nuclear Power Plant*, as the name suggests, introduces the public to Angra power plants. The series composed by four folders - with four pages each one - explains easily, with illustrations, some of the most important aspects of ELETRONUCLEAR: Safety, Information Centers, Environmental Monitoring Laboratory and Staff Training. *Get to know what a nuclear power plant is* is a comic book that explores nuclear energy in all its aspects - including historical data -, making a tour through Angra 1. *Angra: an environmental commitment* makes sure that every environmental issue of ELETRONUCLEAR is discussed.

This last 34 pages illustrated brochure, prepared in support of the Angra 2 environmental licensing procedure, has a correspondent five minutes video, with the same objectives and information, also shown during the exhibitions. Another important video is *An Ecological Visit to Angra*, 1997 winner of the Media Award given by the Latin
American Section of American Nuclear Society. In 15 minutes, Brazilian actor Paulo Cintura (known by his connection with health and nature-related issues) shows the Angra site and nuclear plant areas. Made originally to a TV show, due to its colloquial language, the story ended up as an important communication product for the company, that acquired its rights of exhibition and distribution.

A very special video has also been used in the exhibitions. Based on Brazilian laws of incentive to cultural activities, ELETRONUCLEAR sponsored the documentary *Angra of the Sea* (*Angra do Mar*, Brazil, 1999; 35'). Director Paulo Costa tries to explain the sinking of Aquidaban - historical ship of the Brazilian Navy that sunk along Angra's coast. But this video ends up showing also the beauty and the economical importance of the sea for that region, telling a little bit of Angra's history - which ELETRONUCLEAR is part of. A cocktail at a historical site- Customs Island, one of the most beautiful and significant to Brazilian history, only ten minutes away from downtown Rio de Janeiro, marked the preview of the documentary. Among the invited, of course, the Press. This sponsoring policy, as in the case of *Angra of the sea*, has its focus on projects about or from the Angra region. Another examples are the support given to a senior swimmer and several other athletes from there, as well as the sponsorship of ecological books for children and a CD-ROM.

Another important instrument of communication is ELETRONUCLEAR Home Page. Created in December'98, it has an estimated average of thirty visits a day. Around 10% of the visitors e-mail the company - most times to ask questions, some others just to compliment the site. As the Internet is a mark of a new world with no frontiers, it symbolizes the wideness of ELETRONUCLEAR project. But, even before reaching the world, the company needs to conquer the local population.

### 3. Community Activities

ELETRONUCLEAR has a special Regional Programs and Emergency Planning Department whose function is to promote activities with or for the communities of Angra dos Reis region. The public information program implemented by this department goes back to 1994, when Furnas Centrais Elétricas - by that time, as mentioned before, the company responsible for the operation of the Angra Plant - decided to prepare a Plan to coordinate the activities to be

developed by the Institutional, Public Affairs and Regional areas, involving technicians from the technical and the communication areas - from both the Central Office and the Nuclear Plant.

The principal objective was to open up the company doors to the society in general, that, as we also mentioned before, has been kept away from the nuclear area in Brazil for a long time. But the local community deserved a special treatment, as the population itself had been demanding since the Nuclear Plant construction.

Following this thought, in 1995, ELETRONUCLEAR installed an Information Center in downtown Angra dos Reis, amplifying and complementing the activities of the Itaorna Information Center, located next to the Angra Plant and offering a panoramic view of the site, which was created in 1981. Both of these ICs have an auditorium for seminars and offer informative materials, such as folders, videos and plant models, as well as trained personnel to explain ELETRONUCLEAR activities. Everything is available for the community to use as convenient and, as explained before, those spaces house also a permanent exhibition, as well as temporary special ones, such as EXPO NUCLEAR, which certainly are an important part of the company strategies.

In 1996, a proposal for a Public Relations Plan was prepared specifically for the nuclear area, systemizing the actions that were already being developed and defining others to cover possible spaces left by those. In 1997, after the fusion between the engineering company Nuclen and the Nuclear Directorate of Furnas, originating ELETRONUCLEAR, the mentioned Regional Programs Department (AIR.O) was created. This Department, located in the Nuclear Plant area, enhanced and diversified the company relationship with the community. With the support of the Institutional Relations (Public Affairs) Coordination, the Regional Programs Department developed actions that may be subdivided in two major lines:

3.1. Public Relations Actions:

Information Centers
Visitors Program to the Plant
Programs developed with local schools
Public information campaigns about the Emergency Plan
Angra 2 EIA/RIMA (environmental licensing) seminars

3.2. AIR.O Specific Actions:

Medical assistance to the population at Praia Brava Hospital
Support to schools situated in the Residential Villages
Training courses offered to the community
Support Agreement with the Angra dos Reis and Paraty counties
Support Agreement with the State Civil Defense
Support to local projects promoting Sustainable Development

Numbers such as the 16,295 visitors to the Nuclear Plant last year (1998) or the 2,5 thousand students reached by the *Knowledge at Schools* program demonstrate the success of the actions promoted by Regional Programs Department. But it's certainly just the beginning. From now on, ELETRONUCLEAR has clearly in its mind that the walls built in so many years of distance from the public must be totally removed. This target includes the myths created over the use of nuclear energy for electricity production and, with it, the local population rejection to the Nuclear Plant. As we have demonstrated, there's only one way out: holding hands with the society.

# SUNRAY PROJECT — A LONG-TERM NATIONWIDE EDUCATIONAL PROCESS

**Anneli Nikula, Teollisuuden Voima Oy**

**The Sunray project is a nationwide educational process co-ordinated by the Economic Information Bureau (TaT Group) for ninth graders in Finnish comprehensive schools. The project aims at giving thorough and versatile information on radiation within the framework of various subjects (physics, biology, domestic science, history, European languages, mother tongue, health education etc.).**

The Sunray project covers all ninth graders of the existing 600 Finnish comprehensive schools; in all involving some 65 000 pupils. The project, which has been repeated five times, was initiated as part of the European Science and Technology week in 1995. During the first two years it was strongly linked with the science week as natural sciences were seen as a good framework for the chosen perspective. Since 1997, the project has been run as an event in its own right.

The project has applied the method of processing integrated groups of themes, which is an objective of the comprehensive school system and the experimental method of science. As schools make their own decisions about the educational programmes to be adopted every semester, the project has been marketed to schools at the beginning of May. The TaT Group has arranged marketing events in some 10 localities in Finland.

## Different theme every year

Each year Sunray has encouraged schools to explore radiation from different perspectives. This idea of changing annual themes is to give teachers new dimensions to the subject and at the same time increase their knowledge about radiation and nuclear power in general. In the first year, the theme of radon was a very useful way to capture the interest of teachers as well as that of the media. Since radon is the largest source of radiation in Finland, the Radiation and Nuclear Safety Authority (STUK) offered schools a radon detection measurement free-of-charge. This was carried out in 200 schools.

In 1996, the theme was light. This common natural phenomenon was studied in great detail. Biological themes comprised e.g. chloroplasts, plant susceptibility to light, and bioluminescence. Printed material was drafted on the chemistry of colour, and experimental proposals made for carrying out lessons in physics and geography.

The third theme involved risks in normal life. Material previously delivered to schools was complemented by additional material related to everyday risks, a risk game and a set of articles. The teacher's risk manual comprises several articles and includes student exercises. The articles examine risks associated with flying, energy generation and the home. An article on safety and electricity was drafted by the Safety Technology Authority (Turvatekniikan keskus). The University of Helsinki provided an item on climate changes. The Federation of Finnish Insurance Companies (Vakuutusyhtiöiden tiedotuskeskus) wrote about risks concerning the young and the airline Finnair about the risks of flying. The material also includes articles on natural radiation in the environment and environmental health.

In addition to natural sciences, the theme of risk was approached from other angles. On a philosophical level, an article entitled **"The one who fears does not play or Is it sensible to take risks?"** was drafted. Perspectives on this theme were provided by Professor Ilkka Niiniluoto in his writing **"The ease of being and the burden of risks"** and academician Pekka Jauho's essay **"Risks and safety in modern society"**.

In 1997, the project produced a game called **The Age of Risk** in which the players evaluated and learned about the share of possible risks one might face. The game includes boards, dice and other material for five groups. It was delivered to 700 comprehensive schools.

In 1998, an information package on radiation produced by the EU Commission was translated into Finnish and distributed to Finnish comprehensive schools. The Radiation and Nuclear Safety Authority (STUK) was responsible for the translation. Altogether, 1000 packages were produced and mailed to the schools which had ordered them. All packages were subscribed for.

Last year, a decision was made to reiterate the basic facts concerning radiation. A brochure " Radiation is all around" and overhead slides on this theme were produced. Additional articles about the environmental effects of uranium mines, uranium resources and a description of the uranium cycle from mine to fuel were included.

**Videos to Inspire Discussion**

It is a challenge to produce a video directed at schools. The video must naturally take into account pupils' points of view. At the same time, however, it must be sufficiently based on facts for the teacher to accept it as valid teaching material. Finnish teachers really pay attention to the teaching material. Entertaining or manipulative material is generally not shown during lessons. So far, three videos have been produced for the project; the first provides information on radiation in nuclear power plants, the second concerns nuclear waste management, and the third deals with climate change.

These videos are loaned to schools free of charge, a service provided by the Economic Information Bureau which is linked to the project. The videos are aimed at inspiring discussion during lessons. All videos have been approved by the teachers. Teacher feedback indicates that this aspect of the project has been a success. According to library data, some 10 000 pupils nationwide have seen the video in class. The videos have also been used to provide information at nuclear power plants.

**"Are you glowing?"**

Pupils from three schools have assessed the video "Are you glowing?". The pupils were in the age group 14-16 and represented three municipalities from various parts of Finland. An overall impression was sought using grades 4 to 10. The average grade for the video was 7.7. This can be regarded as very good considering the critical attitude of this age group. The video was most liked in northern Finland and less liked in Helsinki. Girls differed from boys such that their assessments from the various schools were equal whereas boys in northern Finland graded the video 1,5 points higher than their counterparts in the south.

The video received positive feedback thanks to the young people who played in it. In addition, the facts were told in an interesting, non-traditional way which was easy to understand and made the children feel relaxed. The video was specifically directed at kids. It was made with humour, and in a fresh, truthful, modern way without forgetting the negative aspects. The fact that nuclear waste will be disposed of in deep bedrock got a positive response.

Negative comments were clearly fewer than positive comments. According to the children, e.g. the music, the indistinct voices of actors, the use of unprofessional actors, artificiality, exaggerated expression, and the lack of female actors negatively affected the grade. Some felt that the nuclear theme was treated superficially, that it was too positive, and that it was underestimating the risks. Doubts were also expressed that the facts were presented from one side only with the objective of showing nuclear energy in a favourable light.

The aim of the video was an approach different from previous nuclear videos produced by TaT. Based on the written responses, this objective succeeded. The following comments from the pupils support this: "It is different from conventional teaching videos", "it is different from the usual video", "a better teaching video than previous ones I have seen" and "fairly good for a teaching video".

**"From Bedrock to Bedrock"**

"Nuclear waste is a big threat to future generations and therefore the use of nuclear power is not acceptable". This is what many young people in Finland think. Children in comprehensive schools do not have much information on nuclear power or nuclear waste management in their textbooks. However, both matters have been described in some secondary school textbooks. Sunray III had as its main theme "risks". The goal of the new video was such that the child who attends a comprehensive school should formulate an opinion on nuclear waste risks after having seen the video. The Sunray project also sought to market the new video in comprehensive schools.

The video deals with three youths who are making a video about the final disposal of nuclear waste. In this way, facts are introduced in the language and discussions of youth. The main points introduced are:

- nuclear waste is under continuous care and surveillance
- Finland is capable of handling the final disposal of nuclear waste and waste is being handled with care
- a major environmental catastrophe can never arise from nuclear waste

In 1998, "From Bedrock to Bedrock" was awarded second prize in the Finnish Media Message competition in the "Training and motivation programmes" section. The citation stated that the video succeeded in fulfilling a teaching programme on a difficult subject without adopting trickery.

**"Change in the Atmosphere"**

So far, Finnish school textbooks have provided virtually no information on climate changes. As the positive message of nuclear power is related to changes in the atmosphere and since nuclear power is emission free, a teaching video about the facts associated with climate change was produced as part of the Sunray project. A point of departure for the video was that the matter remains unclear to most teachers as well. A factual and narrative style was adopted. The goal was to show why emission reductions are more difficult for Finland than for other countries as well as to describe what can be done and on what time schedule, taking into account savings, change of fuel types, the increase in renewable fuels and nuclear power.

Matters concerning the increasing greenhouse effect were presented in the video: What effect does climate change have globally and for Finland? What are greenhouse gases and how are they generated? The video assesses international agreements, their goals, time schedules and claims for emission reductions. In addition, the video describes both the current measures and the future potential to reduce emissions in Finland.

Proof of successful and objective presentation in the climate change video was received when the Finnish TV approved the video and played it several times in the School TV.

**The Sunray Project as part of the education discussion in Parliament**

In 1998, current Minister for the Environment and green party MP Satu Hassi, jointly with a green colleague, introduced the question: "How does the Government handle the objective dissemination of information in schools on politically sensitive issues". The question referred to the Sunray material drafted for the upper level of comprehensive schools. At the same time, five citizens' organisations requested that the Consumer Ombudsman investigate whether the school project of the industry and power companies is legal. They considered the material as one-sided, contrary to ethical teaching norms and demanded that it should be withdrawn.

On behalf of the Government, Minister of Culture Claes Andersson indicated that the Sunray project had no connection whatsoever to the nuclear power campaign. In a written response to parliament, Andersson stated that the best available experts authored the project material and that transparency and objectivity had been adopted in both its preparation and presentation. The minister especially emphasised that the material could be ordered by teachers and that it had not been sent to pupils. The minister's address was prepared by the Ministry of Education.

To guarantee project success, it has been important to co-operate with training professionals from the very beginning. Experts from teacher training institutions and practising teachers have taken part in material preparation. Among them is Maija Ahtee, professor in didactics and a senior lecturer in physics. In her reply she wrote, e.g. "Written submissions concerning the Sunray project show that the professionalism of the teachers who have graduated from institutes of higher learning is not valued". Criticism directed at the Sunray project generates discussion and a positive evaluation by the Ministry of Education encourages furtherance of the project.

**Project participants**

The Economic Information Bureau of Finland coordinates the project and in 1995-2000 the Radiation and Nuclear Safety Authority (STUK), the Finnish Energy Industries' Federation, the Finnish Electricity Association, Fortum Oyj and Teollisuuden Voima Oy have participated in the project.

# Overcome of radiophobia in conditions of pre-election campaign

Alexander Barinov, Sergey Shmelev
MosNPO "Radon", Russia

Radiophobia is a fear before the radiation. This fear is caused by a phobia to everything connected to the phenomenon of radioactivity, use of radioactive substances in the nuclear science.

Today the radiophobia has seized broad masses of the population. But this phenomenon can not be called a new one. The phobia of radiation has appeared almost at once after the phenomenon of radioactivity and detection of unfavorable effect of radiation, i.e. over a century back.. But then the people have invented indispensable means of guard and safety measures.

The end of 40th became the following crisis moment in development of the radiophobia. It was stipulated by creation of an atomic bomb, explosions in Japanese cities Hiroshima and Nagasaki, and a little later by appearance of nuclear weapons in the Soviet Union, in the state, which in the period of "cool war" was called not differently as "empire of evil".

With the beginning of a nuclear energy use in peaceful purposes the wave of radiophobia has abated for some time. But in 1986 there was an accident at the Chernobyl NPP. And it was the third rise of the radiophobia phenomenon. Maybe, the most powerful and long-time. With its fatal consequences, if to speak about activity of the enterprise "Radon", we are faced nowadays.

Let me to remind, that Moscow "Radon" is the enterprise, which is located in Moscow and Sergiev Posad (not far from Moscow). "Radon" is engaged in the collecting, transportation, reprocessing and disposal of radioactive waste.

The phenomenon of radiophobia became a severe impact for many enterprises in Russia. The construction of new NPP, the second sequential queue of the enterprise on reprocessing nuclear fuel was stalled, there were antinuclear demonstrations of "greens", and the heaviest impact became that during one of them a brick was thrown into the director of local NPP.

The experts of MosNPO "Radon" have confronted the radiophobia at the end of 80th and the beginning of 90th, in the period of making democracy in Russia. In this period a lot of information on radiation failures and accidents has fallen onto a simple philistine. In main it was an information about the incidents which have occurred even in the totalitarian Russia and being before completely secret. The modern information was given by Mass Media in the exaggerated hysterical form and only aggravated the radiophobous moods.

The experts of enterprise had to begin work with the population to change public opinion for the benefit of "Radon". Since then fluctuations of a radiophobia level in the region of our enterprise location have acquired particular logical nature.

The first stage of radiophobia rise in the region of "Radon" location in Sergiev Posad region was came on the second half eightieth, i.e. in period of perestroyka . It was a post-Chernobyl stage and it was characterized by two moments. The first moment, that part of inhabitants of district, which did not know yet about the vicinity of "Radon", suddenly has found out about it from the reports in Mass Media and talks in the urban bus. The second one, the people have unexpectedly discovered that this theme can be freely discussed and even criticized and to make protest demarches.

This time in the Soviet press the first articles about activity of "Radon" have appeared. The experts of our enterprise preformed the part of them. Naturally, they contained more competent information.

The following stage of radiophobia around "Radon" was artificially aroused. It was provoked by candidates in Russian Parliament ( Duma) and has came, in main, on the pre-election campaign in 1990-1991. Some candidates promised to stop the activity of "Radon". There were attempts to organize pickets on roads. Fortunately or unfortunately, having come in the parliament such deputies (parliamentarians) have overlooked about the promises, as well as about other their promises.

We have already been preparing beforehand for the next pre-election campaign in the middle of 90th. It was apparent, that each pre-election campaign brings to us a substantial danger. The gambling in the attitude of «Radon» was possible from candidates for parliamentarians. But this campaign has passed more even and quietly. Mainly because there were no facts of radiation failures and accidents in the activity of "Radon". And still because the economic situation in Russia has worsened and ecological problems came to the second plan for the population.

Now we experience the next pre-election campaign. "Radon" was not exposed to severe attacks. Let's try to make analysis why. The observation display: region ecologists have taken the policy of wait-and-see, realizing the monitoring of the enterprise activity. But we also conducted a counter work in the range of "public relations". The department on public relations of "Radon" actively cooperates to the regional press. We deliver the reliable information, avoiding provocative themes and moments of misunderstanding. As a result the journalists are objective to the activity of "Radon", helping to stop the publications of hysterical nature.

We also take into account, that Russian people are mistrustful and love to recollect a saying "Better once to see, than hundred times to hear". Therefore we have begun to organize excursions to the polygon, where the repositories of radioactive waste are disposed. Believe me, it is very difficult for the closed before enterprise. But recently the journalists, doctors, teacher, trade-union representatives and other visitors have come to our enterprise.

It was not very easy to solve the problem with organization of excursions for the teenagers. The Russian Duma has accepted the Law allowing to the pupils of higher classes to visit objects of an atomic energy use only at the end of 1996. About two years was required to acquaint with this law all bureaucrats, which prohibited such excursions.

But now we regularly arrange children's excursions too. In completion of excursions both for the teenagers, and for adults we appeal for the visitors to tell about their visit to "Radon», as it is possible for a lot of the people.

We also conduct the necessary work with the representatives of administration of Sergiev Posad region. Because the best way not to quarrel is to be friends. And it is already possible to speak about friendship with the authorities of region.

Thus, we can mark out some social groups in our region, with which we conduct a constant work, we use direct and indirect contacts: administration, representatives of emergency service, journalists of regional Mass Media, representatives of public organizations, population.

And we try to conduct a frank talk with all and with each, to deliver the truthful information on the activity of "Radon". Our society becomes more and more transparent from the informational point of view. There are pluses and minuses in that. But it is better, than the totalitarian rules of the Soviet times. And by these new rules we study to play now.

# ETHICS AND NUCLEAR ENERGY

# THE ENERGY SOURCES AND NUCLEAR ENERGY

**The point of view of the Belgian Catholic Church**
**by**
**Dr Christian Hoenraet**
**Chairman of the "Working group for Ethics and Nuclear Energy"**
**of the Diocese of Bruges**

The problems related to the environment are reported regularly to the public by means of the newspapers, on radio and television. The story is the product of a journalistic process and in general does not bear much resemblance to the original event. The rate and type of reportage depend not only on the body of data available to the journalist but on the information sources the journalist chosen to use. The same story is reported in a positive or negative way. Finally people are overwhelmed by contradictory information and became uncertain or frightened.

Getting objective information is very important. Therefore to have a clear view concerning the use of the energy sources and in particular nuclear energy, the Lord Bishop of Bruges, his Lordship Roger Vangheluwe, decided to set up a special working group to evaluate the problems concerning energy production, especially nuclear production. I was appointed by his Lordship as chairman of the working group. The working group was made up of experts from different disciplines such as science, theology and philosophy, teachers and representatives of the general public. The "Working Group for Ethics and Nuclear Energy" of the Diocese of Bruges made a comparative study of all energy sources and submitted the results to ethical Christian standards. Today the working group is still active.

In order to provide the general public with objective information about nuclear energy in particular and to made a statement about the position of the Belgian Catholic Church concerning this matter, the results of the study were published in Dutch under the form of a book with the title "The Energy Sources and Nuclear Energy - Comparative analysis and ethical thoughts" written by myself, by order of the Lord Bishop of Bruges. The French and English versions are in preparation. The Dutch version of the book is published by ACCO (Academic Co-operative) - Leuven (Belgium).

My aim here is to give a short survey of the results of the study and to present the point of view of the Belgian Catholic Church in the energy debate.

Energy is a *universal wealth* the divine Providence has provided to the whole of mankind, regardless of the continent. Energy sources can not be used without respecting moral laws. We must take care of the quality of life of our fellow men, as well as that of the future generations. We can not make the future intolerable, but neither can we contain it excessively due to a small number of damaging effects.

We can not take unfounded risks for man and his environment when producing energy. Risks must be kept as low as reasonably possible (the ALARA principle: As Low As Reasonably Achievable), nowadays and in the future. The same risk norms must be applied to both the present and future generations. Respect for human life and the environment is one of the main requirements linked to any human activity.

The production of energy exploits *raw materials* that are *not inexhaustible*. On the basis of the demonstrated reserves (they comprise the identified layers that can be exploited in a sound technical and economic way using modern technology) and the consumption of energy in 1995, there should be enough different types of energy reserves left for about one century. This conclusion draws a rather dark picture for the future. The uranium reserves are also limited, but depending on the consumption options, the reserves of fissile materials could be extended significantly (even by a factor of 50 to 60 when exploiting breeder reactors). The thorium reserves are as large as those for uranium and should also be taken into account. Fissile materials, including thorium, could play an important role in the production of electricity in the future.
We must *deal carefully with energy and raw materials*. It is our duty to make sure that the future generations will dispose of sufficient raw materials and technology to fulfil the demand for energy. This generation must solve the current energy problems and perform the necessary research and investments so as

not to shift the problems to the coming generations. We must, without delay, use energy rationally: it is the *ethical obligation of our generation* because energy shortage involves economic decline and poverty.

One of the energy sources that influence our way of life is *electricity*. We only realise what it really means when it is accidentally lacking, when there is a power failure for example. The three following primary energy sources are up to now being used to produce electricity :

- fossil fuels such as coal, natural gas and mineral oil;
- mineral materials that use nuclear fission in heavy metals such as uranium and thorium;
- renewable energy sources such as water, wind and sun.

The fossil fuels remain the primary source of the total energy supply in the world.

The world-wide consumption lies as high as 8 billion toe a year, of which 87% are fossil fuels, *6% nuclear energy* and 7% hydraulic and renewable energy sources. The electricity makes up 36% of this total and is split up into 10% mineral oil, 16% natural gas, 38% coal, *17% nuclear energy* and 19% hydraulic and renewable energy sources.
The geographic distribution of consumption allows us to draw a very sharp picture of the energy problem. North America and Europe cover more that 50% of this consumption in comparison with, for example, Africa with a mere 3% and which has a strongly growing population.
It is clear that the difference in energy consumption between the involved continents goes together with a difference in welfare. But we must also pay attention to the substantial cultural differences between the continents. Maybe these populations do not wish to live in the same way as we do. It is their full right to decide themselves on this matter. It is, however, our duty to provide them with the possibility to make use of our achievements on the level of hygiene, health, safety and material comfort which are essential conditions to achieve welfare and well-being.
In addition, the growth of the population during the next hundred years will exclusively take place in these already underdeveloped continents. It could mean that the present six billion people on this earth could double.
Considering these elements, the energy demand could, compared to the current situation, increase by 300 % over the next century. Can our planet cope with this?

Let us now analyse *the impact on the environment* that is incurred by this increase in energy. Through the energy production on a large scale, substances are freed into the environment in liquid, gas or solid form, which can have negative effects for mankind. The combustion of fossil fuels mainly puts a burden on the air, a vital source of life for mankind. $CO_2$, $NO_x$, $SO_2$, fly ashes, and dust are elements which all have a specific negative effect. $CO_2$ is related to the change of climate due to the greenhouse effect. The gases $CO_2$, $NO_x$, $SO_2$, fly ashes, and dust can cause cancer and lung diseases. These gases are responsible for acid rain that has a major negative influence on the state of the forests and disturbs the balance in the $CO_2$ household.

The combustion of fossil fuels gives off yearly around 27 billion tonnes of $CO_2$ in the atmosphere. The production of electricity is responsible for about 30% of this. The contribution of nuclear energy in the world production of electricity amounts to 17%. This prevents the emission of around 2 billion tonnes of $CO_2$. Between 1990 and 1995, the annual emission of $CO_2$ increased by about 12%. All the measurements carried out up to now show a strong increase in the concentration of greenhouse gases in the atmosphere. Human activities influence the environment 90 to 100 times faster than nature. The accelerated increase of the carbon dioxide concentration is worrying. The rapidity with which the human being affects the environment, as well as the degree of this disturbance, justify the fear of an irrevocable climate change. *The accelerated increase of the concentration of carbon dioxide is a problem that must be solved primarily and on world-level.*

*The production of electricity using nuclear energy,* does not cause acid rain and does not increase the greenhouse effect. Under normal circumstances, it leads to small emissions of radioactive substances in the environment and very low levels of radiation for the population. The natural background radiation which we are exposed to annually and which comes from natural sources, is only increased by one or two thousandths unit through electronuclear production. Can we continue to be blind to the probable real risk of climate change as a result of the emission caused by the combustion of fossil fuels?

The use of nuclear energy to produce electricity generates radioactive waste, but in relatively small quantities. The modern technologies allow the safe storage and disposal of the volumes of radioactive waste that are being produced without any danger of contact with the environment and the human being. With time, radioactivity decreases naturally. A good deal of this waste actually loses its radioactivity in a relatively short period of time. The problem caused by radioactive waste, is from a technical point of view, not bigger than the problems raised by industrial or household waste. Radioactive waste has no difficulty in sustaining the comparison with chemical and mineral toxicity's such as heavy metals which are dumped in nature. *The real problem is mainly political and psychological, it concerns the acceptance by the public of the disposal of radioactive waste.*
For Belgium which is a large consumer of nuclear energy (60% of the total electricity production), the annual electronuclear production per inhabitant only results in the quantity of a small can of beer of low-level waste and a thimbleful of high-level waste. Does the management of this limited quantity of waste weigh enough so as to give up nuclear energy?

In comparison with other industrial activities and taking into account the massive use of nuclear energy (at the end of 1997: 437 nuclear reactors in service producing 17% of the electricity consumed in the world), we can say that the security balance is very positive. In the Western countries, the nuclear industry heads the other industries security-wise. No other industry manages the risks as well. There exists, moreover, a real *„safety culture"* in those countries. The preoccupation to ensure the security comes first and is present everywhere. A zero risk does, however, not exist and there remains a potential for incidents and accidents within this safety culture. But this safety culture does ensure that the impact of these incidents or accidents is reduced as much as possible.

Nuclear energy is justified from an economic point of view, as it can be used to produce electricity at a stable and relatively low cost. The price for the kWh covers, moreover, all of the costs, including the dismantling of the facilities, the management and the safe disposal of the waste.

Nuclear energy is given a biased approach, evaluated and found wanting for reasons which are not applied to other industrial activities. *Is the disapproval of nuclear energy morally justified for the future generations?*

The combustion of fossil materials is a waste. Coal, mineral oil and especially natural gas are first of all raw materials used for food, staple crops, medicines, etc. The future generations will blame us strongly for having squandered those precious raw materials in this manner. Uranium and thorium, however, can only be used for the production of energy. Is it not appropriate to retain nuclear energy so as not to exclude any possibility in the future?

Banning military applications of nuclear energy does not justify its banning for civil applications. Giving up civil nuclear energy does not remove the risks of proliferation.

*The debate about nuclear energy must be placed in the global context of „energy supply and means of production"*. The reaction during debates is often instinctive, in other words, immediate and based on prejudices with a strong emotional content. It shows our involvement and commitment, but it does not free us from looking for an objective judgement based on precise facts and information.

Creating a radical and exclusive opposition between nuclear energy and respect for the human being and the environment, is wrong. All the technologies, which are used to produce electricity, whatever the energy source, have both advantages and disadvantages and carry certain risks. It is sufficient to compare them. Nuclear energy sustains this comparison very well.

Nuclear energy belongs to the potentials of this world. Mankind is responsible for using it in an ethical responsible manner. Safety constitutes a priority in this case.
*The choice is up to us based on a thorough knowledge of the problem!*

# Reclaiming some Moral High Ground – ethical aspects in nuclear communications

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Public communication about nuclear energy needs to relate to the cultural undercurrents which determine how people perceive the environment. The paper discusses some of these and suggests ways of responding to them. It also outlines major ethical considerations relevant to uranium mining and nuclear energy and hence which are relevant to communication about both. Competent discourse about values is fundamental.

## 1. INTRODUCTION

Why would anyone object to nuclear energy? I wonder if we have really spent enough time answering that question, rather than us simply reacting to particular points raised?

The question is pushed up into high profile by the apparent *prima facie* assumption of so-called ethical trusts that uranium mining and nuclear energy should fall outside their criteria, something which needs challenging. While it may reflect the moral pride and pedantic self-righteousness of particular interest groups, any challenge to it must avoid the same traits, because we are just as prone to them.

A review of environmentalism and of people's attitudes to nuclear power over the last fifty years is instructive. But the roots are deeper than that in Western culture. The aesthetic and Romantic attachment to the green and pleasant land, or to the unspoiled bush, is strong and real, even if it allows little place for all that sustains our standard of living and ability to enjoy such.

Public communication about nuclear energy needs to start further back that simply addressing the four topics of radiation, wastes, safety and proliferation. It needs to be tuned to the presuppositions of identified target groups, as well as being very open.

## 2. TWO PARADIGMS

A study of the dynamics of the environmental movement as it has matured over the last 30 years from my perspective (in the kind of industry which has brought us all out of the caves since Neolithic times) suggests that there is clearly a tension between two paradigms, whereby the environment is perceived predominantly as either:

- **a physical construct**, understood and approached scientifically and rationally, and having instrumental values, or
- **a moral construct**, "nature", understood metaphysically and having aesthetic and spiritual values, which are intrinsic.

There are obviously those who identify with each, and because the second is economically marginalised and radical, it throws up passionate and committed advocates who feel that they have a monopoly on ethics. But **perhaps most people span both paradigms to some degree**. Operationally they accept the first, but with reservations which make them open to the rhetoric of the second, and seeking the vicarious satisfaction of some alignment or flirtation with it. Perhaps also they are attracted by a certain quixotic element associated with it.

Another way of looking at the question is in terms of Maslow's hierarchy, with people's basic needs being abundantly met in the western world, so that their attention turns to self-actualisation and all the diverse elements which may be involved, particularly anything related to quality of life. I assume in fact that all of us are motivated in some degree to pursue the common good even if this involves some personal sacrifice and effort beyond narrow self-interest. But any individual's perception of the common good is not always widely shared.

Probably some reservations about the first paradigm arise from observing people who operate entirely on the basis of it, and whose values are limited to instrumental rather than aesthetic appreciation of nature, or who espouse "a doctrine of freedom with the ethics squeezed out". If they depend on those people for their physical welfare and comfort there is perhaps a guilt dimension as well. Many see the environment as a factor of social critique and perhaps dissent, the latter taking the form of some degree of simplified lifestyle.

Other writers see postmaterialism as the engine of environmentalism in countries such as Sweden and Netherlands, while Japan and Norway stand out as having a more pragmatic conception of nature, with greater reliance on technology in their approach to environmental quality. The result is clearly seen in respective approaches to whaling - the Romantic tradition seeking bans, the rational, favouring controlled harvest.

Another writer notes a propensity by a large part of the environmental movement to use the concept of the 'environment' in a political and instrumental manner in order to talk about something else and to evoke certain political attitudes. He suggests that it is a deliberate tactic rather than a straightforward expression of values. For instance he sees Deep Ecology as a political theory based in faulty science and pop psychology, rather than being an expression of environmental ethics, and he quotes advocates of it who refer to its "metaphysical teachings".

There is no lack of writers who see green extremism as incorrigible and hostile to both democracy and western civilisation, and "no company should underestimate the moral righteousness that motivates so many in the [green] movement". But this is an aside.

**Our challenge is to enable people to feel more positive about what they know to be practical and necessary.** Life becomes an unsatisfactory compromise if one lives in the real world but is persuaded that ethical virtue lies in either the monk's cell or in tree hugging and coercive utopianism.

Ethically the two paradigms contrast mankind as steward (benign, but definitely over nature) and mankind as the enemy of nature, leading to deep ecology or biocentrism in which the ecosystem rules and where it is (wrongly) seen as epitomising balance and stability. The contrast extends to technology being *prima facie* positive, with nature subordinate on the one hand, and nature (as ecosystems, not individuals) paramount with technology generally suspect on the other. Any human disturbance of nature, upsetting its stability or polluting it, is then morally wrong.

This leads one to question to what extent the following truisms (to us) are understood by those in the middle ground, influenced by the deep green or biocentric paradigm:

- the environment can be measured and understood scientifically
- it is constantly changing on its own
- it can and must be managed
- management may be for nature conservation and/or other purposes
- the environment can be rehabilitated when disturbed or degraded
- it has recuperative capacity on its own in relation to some (much?) pollution
- it has value with reference to human needs (including recreation and aesthetic)
- it can and should be utilised economically
- our living standards depend absolutely on that utilisation
- mineral resources are much more abundant than commonly realised
- nuclear energy is the only large-scale technology widely available for generating electricity without greenhouse gas emissions
- wastes from nuclear generation are contained and managed, not released to the environment
- environmental management needs to be based on science, not folklore or ideology
- science has been consistently abused in environmental debates
- the above observations arise from obser-vation and thoughtful reflection, not hubris.

While the two-paradigm model may help us discern where others are coming from, it needs to be said that on certain issues, simple misrepresentation is often what we are immediately contending with.

And moving further afield, or downstream, fear plus folklore are the stock in trade of the anti-nuclear activist. But the self-righteousness, the moral momentum and the disdain for civil society reveal the underlying paradigm all too clearly.

## 3. FEAR, RISK AND RADIATION

Another major dimension of thinking about the two paradigms relates to fear of risk, particularly risk which is imposed.

The word "Chernobyl" is enough to rule all further thought or discussion superfluous for many people. The fact that they themselves are actively and passively exposed to demonstrably greater risks than is any member of the public from nuclear energy is beside the point.

Perhaps one key to getting to grips with the question is to focus on radiation. X-rays are accepted, uranium tailings are not. Smoke detectors are OK in the home, but as low-level waste buried in a remote part of one's own country they are not OK. Microwave ovens, a cheaply mass-produced consumer item, are safe in our homes while radiation in other contexts, where no expense is spared on safety, is not. Activist groups have got away with murder in purporting to quote (and actually misquoting[1]) ICRP that "there is no safe level of radiation", but I have yet to hear them assert with the same logic that there is no safe level of air pollution or no safe level of caffeine or alcohol intake, though these might equally be guidelines for public health.

People readily accept any level of risk associated with medical procedures using radiation, but are intolerant of any risk from the same radiation in another, unfamiliar context. In nuclear medicine, ICRP60 is a credible and conservative reassurance, but regarding nuclear power, it is an unjustified licence to endanger people. Same science, different perception. To a large extent the question comes down to trust. People trust doctors but when did they last meet a nuclear engineer? - or any engineer in a context where they sought or knowingly relied on his or her services? So perhaps they default to Homer Simpson.

A starting point may be NORM[2], coupled with smoke detectors. A plutonium derivative (Am-241), depending entirely on nuclear reactors, is not only a life-saver, its use is now compulsory. And as more kitchens get granite bench tops, ...

## 4. PERCEPTION AND COMMUNICATION

What are the values which work against our industry?

Moral perceptions (tending to rule nuclear out of contention without further thought) include:

- Nuclear power is too dangerous
- The nuclear establishment is not trustworthy
- It is immoral to produce nuclear wastes and plutonium
- There is an inexorable link with weapons
- We ought to be able to rely on renewables
- Big is bad

Ethical perceptions ("OK, we need the electricity but...")

- The end doesn't justify the means

Where the moral positions are strongly held as part of the second paradigm discussed above, they are impervious to reason or change, just as many of our own strong convictions are. But within the sphere of influence of such people and ideas, **the perceptions are often effectively unchallenged** and there is a great deal of scope to change them.

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[1] confusing a conservative principle guiding radiation protection with a fact (or conclusion based on the clear weight of scientific evidence).

[2] Naturally-Occurring Radioactive Materials.

What about postmodernism with its distinctive epistemology and outlook?

The nuclear industry is big (ie its main projects cost $1-10 billion), involving long-term political and economic commitment, highly technological, highly organised, relatively inscrutable and sometimes even secretive, and inexorably reasonable in depending on hard scientific knowledge to deliver energy outcomes for consumers. It is anchored to absolute values and is justified by what it delivers.

Thus it is the very antithesis of folksy, human/cottage scale, subjective-oriented, flexible, short-term ways of organisation (?) which value dissent and marginal voices for their own sake, sometimes with an indifference to the distinction between fact and fiction, and where relativism reigns supreme.

We have to deal with:
- feeling rather than truth
- problematical distinction between fact and fiction
- vibes not veracity
- more concern with feeling comfortable about something than whether it makes sense
- individual choice replacing the 'grand narrative'
- no expectation of progress as a core social value
- scepticism stronger than faith in the future
- the savings book being replaced by the credit card
- little commitment or acceptance of responsibility.

If these crude and perhaps extreme generalisations are accepted then the problem of developing any major technological enterprise in a world where many political processes are under the influence of postmodernism is clear, and we return to the two paradigms:

Our colleagues, conforming to a rational modernist view of the world, ask:
**What is the best way to supply a lot of electricity?** [3]
- at acceptable cost
- at low risk
- environmentally clean

Others in the developed world, who take for granted comfortable abundance and who have never known serious shortage of anything, ask:
**What makes me feel good? What <u>ought</u> to be true?** but:
- at acceptable cost
- with no imposed risk
- environmentally clean
- minimum level of technology

Here the two mindsets or the two extremes of the paradigms contrast:
- Rational, fact-based, logical, management, *with:*
- Subjective, possibly even disconnected from logic and reality, romantic (emphasise what they think <u>should</u> be and proceeding as if it were true), relativist.

This suggests a broad communications agenda which is designed to help people feel more comfortable about what they know is practical and necessary. Of course it may achieve more than simply addressing nuclear energy on its own. The problem is that much of the two paradigms problem goes back to the educational philosophy and sometimes folklore in which students are immersed at school, and tackling this is clearly a starting point.

But more immediate lessons may be to:
- identify with salient environmental concerns

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[3] WEC's new study addresses three goals for energy: Availability - security of supply, Acceptability - on environmental grounds, and Accessibility - by suitable pricing and policies.

- talk the language of aesthetics and values
- articulate and display values other than economics and technology/technique
- talk up smoke detectors and NORM
- articulate ethical principles
- show how these are most effectively addressed from "our" side
- focus on simple but not simplistic messages.

So, what is our message?
- the world increasingly needs electricity
- nuclear energy is a sensible way to produce it on a large scale (GWd not kWh).
- Safety, waste and proliferation issues are managed more than adequately.
- nuclear is environmentally benign, notably regarding greenhouse concerns.
- sustainable development must involve nuclear energy.

## 5. SOME ETHICAL ASPECTS OF URANIUM MINING AND NUCLEAR ENERGY

Moving on from immediate problems of communication to the wider social context, nuclear energy raises a number of quite proper ethical questions. Most are individually not unique to nuclear energy, but coupled with cultural attitudes to technology and an association with atom bombs and the cold war, they coalesce powerfully.

By ethical questions I mean more than simply personal opinions. Ethical views must be supported with reasons, whereas biases and preferences need no justification. Furthermore, ethical views result in action, or at least guide action and behaviour, so therefore require thought about the consequences of that behaviour. I am prepared to argue that it is immoral not to consider properly the consequences of policies and actions, and that particularly includes policies whose only real benefit is to make people feel good about green ideals.

The following is an attempt to open up a range of issues to ethical scrutiny and discourse. It is based on a conviction that we have nothing to hide nor fear from such scrutiny, but rather that it may erode negative presuppositions.

(1) To what extent is a well-endowed country such as Australia morally obliged to provide resources through trade to other countries? In particular: energy resources for electricity production?
(2) What priority should be given to enabling the provision of energy at realistic prices in a developed country's economy? Or for developing countries?
(3) How important is sustainable development? How much should we strive to utilise co-products and by-products? What preference should be given to utilising abundant rather than less abundant energy resources? Those with no significant other uses rather than those which are versatile? Those with least environmental impact due to wastes?
(4) How does our generation minimise any burden or imposition on future generations, arising from our activities? How do we maximise the benefits passed on to our grandchildren?
(5) What priority should be given to minimising pollution, greenhouse gas emissions and land clearance (albeit temporary) for mines? How is environmental stewardship in a broad sense best exercised?
(6) How important is job creation in a particular country (assuming it is in legal and proper enterprises)?
(7) To what extent is development of remote areas important in countries such as Australia? How can this be coupled with improved environmental management in those areas?
(8) What are legitimate expectations regarding the safety of industrial processes, for workers and the general public? How is safety reasonably maximised in energy production? How is harm from radiation avoided? How is fear of low-level radiation avoided or dealt with?
(9) If nuclear energy is intended for electricity and not weapons, how is any contribution to weapons proliferation avoided? Now and for the future? How is the legacy of the Cold War, in weapons stockpiles etc, best removed?
(10) How is respect for democracy and the better functioning of democracy fostered through addressing energy issues? What are the civil implications of various energy options in terms of concentration of power, civil liberties, authoritarian systems?

(11) What are the implications for Aboriginal or traditional land and mineral rights of mining, export and use of different fuels? How are rights and responsibilities defined? Who actually has relevant rights, and how are these balanced?
(12) How is rational debate about energy issues facilitated while avoiding misrepresentation and ensuring wide access to relevant facts?

The above points might form a useful discussion agenda with those who classify sharemarket investments into categories, purporting to identify whether they are "ethical' or not. They are not exhaustive.

Some points, notably # 1-5, would be useable in public discourse, advocacy advertising, etc. In fact arguably they should be the core of advocacy for the industry. Point 4 about future generations was usefully elaborated in a recent NEA Newsletter (#1/99). What is set out there would form a useful agenda for discussion with government and public interest groups on the question of high-level waste disposal. The NEA points would not appear to be contentious, and would help to expose and isolate the ideologues for whom opposition to nuclear energy is more important than dealing properly with wastes. These therefore assert that indefinite surface storage of wastes under supervision is preferable to geological disposal, since progressing such waste disposal would simply give encouragement to continued use and expansion of nuclear energy.

## 6. CONCLUSIONS

In order to tune in to the values of our target audiences we need to become capable of discourse in areas which have not been the traditional practical and technocratic ground of the industry. This is in order to challenge the quite unjustified grabbing of moral authority by the industry's detractors in relation to those target audiences.

- What assumptions are we making about our hearers and their motivation?
- Have we sufficiently been addressing questions of value, purpose and meaning?
- Have we even been making the most of arguments about environmental quality?
- How do we grapple with the question of risk, especially its outrage component?
- Can we occupy, carefully and not too assertively, some of the moral high ground?

As I said in PIME paper three years ago, "The notion of a sense of stewardship of the earth and its resources is one which seems to me to have much more potential than we have yet utilised. This may be .... based on the sense of responsibility to future generations, as in the Brundtland Report and the ongoing ethic of sustainable development. It will, or should, result in a measure of humility in the application of technology, and also in the elevation of ethical considerations.

"Questions of sustainable development, conservation, as well as values, purpose and moral perspective, can all be encompassed in the area of ethics. It is vital that people in the nuclear industry are able to engage competently in ethical discourse. We are kidding ourselves if we think that we can counter moral stances simply with practical arguments, perhaps it is ultimately even counterproductive.

"Our messages need to be congruent with higher order items on Maslow's hierarchy and/or with the broader liberal concerns of prosperous, content societies. Most people in Western societies donít want to hear that they need nuclear energy for secure electricity supplies. They have grown up to assume that electricity will always be provided somehow. Whether or not they are correct in this assumption, their felt concerns are altogether different."

If we understand the public perceptions of nuclear energy better, we can communicate better, and that is a task for all of us.

Public perceptions have deep roots and are formed from impressions more than facts. But with reference to the two paradigms, people's actual values are arguably shown by their behaviour more than their words. How do we persuade those living in the modern world but idealising some greener vision that there is both virtue and good sense in sustainable development which in practical terms

delivers more environmental benefits than countercultural alternatives? How do we help people feel more positive about what they know to be practical and necessary?

We need to recognise, debate and communicate values (without preaching or hectoring). Idealism and altruism can be practical and consistent with the efficient provision of all people's needs.

The nuclear industry, including uranium mining, should be able to withstand intense ethical scrutiny without the need to be defensive, and that is the basis upon which we can address the middle ground in our communication.

Should we also write and subscribe to an ethical code of some kind beyond those relating to safeguards etc which are already imposed?

*NB. This is a condensed version of a fuller paper which is available from the author. Ted Mole of WEC has greatly assisted in its writing.*

# Modern Community Care program

**Staffan Nordin**
Former Executive Vice-President, Vattenfall AB
**Chairman**
**European Nuclear Council**

Going into the next millenium do we see nuclear energy? Yes we will see an expanding nuclear sector in the modern community. The modern community that cares for people, health and environment needs nuclear.

**Energy saves lives. Electricity is efficient use of energy**

The whole development of the society is to a large extent due to the availability of easy-to-use energy sources. With no available energy to use the negative impact is great on human lives, as the natural environment becomes a threat, food is wasted, health care poor and education possibilities non-existing. Energy production and use in any form also has some impact on the environment. When energy sources are chosen for today and in the future all kind of impacts must be taken into account. Of course impacts from the whole life cycle should be included in the assessments. Nuclear energy has very low impact on the environment and can make an important contribution towards a sustainable energy supply for our common future.

The only energy related environmental issue where a global consensus has been reached is on limitation of gaseous emissions contributing to the greenhouse effect. Today and in the near future it is not possible to decrease the release of greenhouse gases globally without using nuclear energy. Nuclear energy is an essential part of the solution to limit carbon dioxide releases to the atmosphere.

**Energy will be the key to a sustainable society**

Some day in the future when the energy from the sun can be used efficiently or when we fully control the nuclear fusion process, the same nuclear reaction as in the sun, we will have access to clean and inexhaustive energy supply which provides us with all the energy we need. At that time, we will also be able to clean up many accumulated environmental problems by using highly energy-intensive purification and restructuring processes. We will then also reach the third step in the human path:

Mankind arose a million years ago, at a time when we didn't use any energy and the environment always possessed a threat to us, the first step in the human path. This changed with the second step, a few hundred thousand years ago, when we made use of energy to control the natural environment and made environment a much smaller threat to us, but we are now becoming a threat to the environment. There will be a change again when we start to use energy in a more responsible way, living in balance with nature.

This third step has already started. The UN framework convention on climate change working on further development of the results from Kyoto 1997. The hope is to establish firm commitment for reducing gases contributing to the climate change. Many countries are already keeping releases down by using nuclear energy. Nuclear energy replaces burning of fossil fuels and in that way decreases already the releases of carbondioxide by 10% globally.

**Energy is life. Nuclear energy protects the environment.**

It is of extreme global value that countries with efficient nuclear and hydropower programmes maintain and improve these production systems. These are the only energy sources which today contribute significantly to the global electricity generation and at the same time have practically zero releases.

## Level the playing field

We need to normalise the situation for nuclear industry, we need to keep nuclear energy as an option for the future globally and we need to develop the nuclear share in the expanding electricity sector world-wide. Nuclear should be an integral part of the modern community. A modern community that cares for people, health and environment.

The most possible scenario at the moment is not politically decided, spreading large-scale closures of nuclear power plants in several countries. If nothing is forcefully done by the nuclear industry, the most probable scenario would rather be that of a subtle ad-hoc process of national decisions creating increasing taxation and regulatory harassment for the industry aiming at making nuclear power less accepted by the public and the political sector on the one hand, and uncompetitive on the other. We foresee a spiral whereby each raised taxation notch or regulatory initiative in one country will be taken as an argument in others – and utilised as such by opponents. In Europe this harassment scenario is already quite obvious.

The effects for the nuclear industry of the harassment scenario transpiring would be decreased investments (except maintenance), decreased top management attention, reduced funds for R&D and a general deterioration of morale among workforce. Increasing difficulties in recruiting highly qualified staff would create a both costs and a stigma problem.

## Nuclear is an integral part of the modern community caring for people, health and environment.

The modern community uses energy efficiently and responsibly and electricity is the easy to use form of energy. The modern community cares for people, health and environment. Nuclear is modern community care. This goes two ways:

- **A modern community caring for people, health and environment needs nuclear.**

Electricity is the life nerve of a modern society, including healthcare systems, education, communication and development. Nuclear energy can provide large amounts of electricity with very small negative impact on health and environment compared to most energy sources.

- **Nuclear energy acts as a part of the modern community.**

Most facts are to our favour but this is not perceived by the society. By being honest, open and clear the nuclear industry will have the possibility to build alliances, take active part in forming the debate, set the agenda and by being proactive the nuclear industry will enhance its integrity and become a legitimate part of the society.

The European nuclear industry initiative **Modern Community Care** is intended to make a difference. Of course it will also take some time and efforts to do the changes. We are in a much better position than the chemical industry when they started their Responsible Care program. They had to make both a cultural revolution and to change reality. They had to lower releases, put quality assurance systems in force and implement waste handling systems. And they had to communicate and behave ethically correct.

## The dynamics of the public opinion-forming process and its effects on the nuclear industry

Today, there is an increasing mixture of the national and cross-border/international element in journalism, public policy discussions and policy formulation within Europe and globally. This process is not consistent with formal roles and responsibilities of national governments.

A perceived problem or reported attitude problem related to the nuclear industry in one country can lead to public opinion setbacks in other individual countries, thereby changing the agenda of what is regarded as „politically possible". Such a negative spiral is strengthened due to the rapidity of the media and because of the internationally organised efforts of certain nuclear energy opponents. There are no instruments in existence at present that are substantial enough to create and spread positive spirals for the nuclear industry. Instruments, for example, that would demonstrate where the public has overcome its anxiety surrounding a nuclear-related aspect still prevailing in another country – or that would counter-balance the allegations made internationally by nuclear opponents based on what they claim to be the situation in one individual country.

The deregulation and more focused consumer-orientation of utility companies will lead many of these towards communicating primarily „electricity", „reliability" and „cost efficiency" to their customers. The market mechanism does not, in itself, offer support for the nuclear industry. However, even if the utility companies select the above strategy for their marketing communication, customers must nevertheless, directly or indirectly, be addressed about nuclear energy in their role as citizens. This may lead to a situation in which a variety of senders of communication are needed – nationally as well as internationally.

The objective of utility companies in their capacity as asset owners of the nuclear industry is to ensure that they will always have the option of selecting and using this form of energy from their „energy source portfolios". Exercising this option also enables the acquisition of utility companies in other countries that have nuclear plants in their portfolio, as well as acquiring individual nuclear plants in non-domestic markets. Suppliers to utilities are even further away from direct consumers of electricity, but nevertheless rely on the public as a stakeholder.

This process (the „harassment scenario") demands more in the sense of analysing the situation and responding at an early stage, than does an evident, high-profiled political attempt to initiate large-scale closures (the „referendum scenario").

The economic effects for asset owners of the nuclear industry (and the supplier chain) of the harassment scenario transpiring, would be the valuation of their nuclear assets (business) being downgraded (based on an estimation of future cash-flow and tax risk) by the investment community (directly or indirectly through public ownership ratings). Furthermore, reduced liquidity of nuclear assets on the balance sheets of utility companies would decrease investment and disinvestment flexibility. This can lead to reduced competitiveness compared to utility companies that do not have nuclear power in their energy source portfolios. The chances of receiving expropriation settlements would not be possible in the event of such a scenario transpiring.

**The challenge of the global nuclear industry**

A vision for the nuclear industry and its overall communications objective should be to normalise the industry's image: Nuclear industry is one of the leading high-technology sectors, offering high environmental qualities and serving its customers as well as the local, national and regional communities. The investment in new plants is the ultimate goal of this vision. Whether or not nuclear power will actually witness expansion worldwide does not only depend on its acceptance on a public and political level, but also on market structure. From a political and communications perspective, the term „level playing field" is the evaluation point of this vision - whether nuclear has the same rules by which to live (taxes, regulations and expansion opportunities) as other sources of energy.

**Current communications strategy and its consequences**

The current communications strategy of the nuclear industry (implicit) can be described as directing small but high quality resources to monitor and influence policy makers within the formal frameworks of the EU and international institutions (Foratom and Uranium Institute). In addition to both this and to a high quality news service (Nucnet), the nuclear industry relies totally on national organisations and companies for building and

preserving its image. There are numerous examples across the world of skilfully designed and executed communications programmes regarding different aspects of nuclear power, as well as bodies such as ENS offering a forum for the exchange of experiences. However, there are few signs indicating that these activities contribute to enhancing the overall image of the nuclear industry. The current communications strategy will not significantly reduce the risk of the harassment scenario transpiring, nor will it lead to achieving the vision (normalisation).

**Processes in the society with its own logic**

Within society and the political processes there are logical steps following each other and an inherent force pushing the decision-making process forward. Already when a political party takes an anti-nuclear programme and profile this should be an alert signal and actions should be taken by the nuclear community. With weakened political parties the nuclear issue can too easily become an issue in the political power game. Decisions will follow and it will be harder and harder to stop the process even if most of the involved actors would like to revoke the process and keep nuclear energy.

**The perception goal**

The nuclear industry must be perceived in certain ways in order to move towards achieving the vision and avoiding the harassment scenario. Each perception goal does not bear the same function within the communications process. However, the following perception goal umbrella can be established:

*Economical*

- Nuclear is a very economical way of producing electricity (with a levelled playing field this is true also for building new plants)
- Nuclear technology and industry have a future

*Environmental*

- Nuclear power is safe, as is the handling of its waste
- Nuclear plays a positive environmental role

*Ethical*

- Nuclear companies act responsibly and have an open attitude

The nuclear industry has to achieve legitimacy in its capacity as an interesting agenda-setter for problems and as an expert

Public acceptance and composition

- Before taking intensified external action, the nuclear industry must analyse the various constituents of „public acceptance" and „political acceptance/strength" in order to find the most efficient starting point from which these perception goals can be approached

- In plain terms, it can be said that *Public acceptance* is composed of seven constituents:
- *Perceived necessity* (for society or the individual) – decreasing due to a more complex market situation and the indirect customer relation and the vision of renewable sources of energy
- *Perceived performance* (of the nuclear industry in an objectively verifiable manner) – scrutinised in detail by opponents all over (failing to manage waste safely, plants representing a safety risk, public being at risk due to transports, uncompetitive)
- *Perceived environmental characteristics* (of the whole nuclear fuel cycle) – being environmentally acceptable and correct in the long term
- *Perceived integrity* (of the industry, its will and ability to voluntarily set and implement standards, and its ability to self-regulate in a broad manner)

*These four aspects add to enhancing the general credibility of „the sender" in the communications process. They define and provide the attractiveness of the industry in the fifth aspect:*

- *Alliances*

*The last two aspects are:*

- *Communication skills*
- *Resources*

There is a certain hierarchy in the above listing. „Bad reality" concerning necessity, performance or integrity can not be resolved by communication skills or resources. A good example of this in recent years is the tobacco industry. We identify that there is such a „reality problem" presented by the European nuclear industry where the integrity aspect is concerned. Resolving this forms a natural (and the most efficient) starting point. The most immediate problem of the nuclear sector is its general integrity, rather than its ability to find intellectually and scientifically viable arguments.

**Communication Charter**

To establish a „Communication/Ethical Charter" based on principles of *openness, honesty, clarity* on a global level, leading to company certification, would be a very possible and effective step.

Other aspects of a „Communication/Ethical Charter" would be accepting the legitimacy of the public as stakeholders (in their role as citizens) of the nuclear industry, understanding and accepting that the historical attitude in communication of the industry has not always fostered public confidence and accepted to take questions and fears seriously. This „Communications Charter" would not constitute an industry-wide proclamation, but something „merited" and awarded on a company-by-company basis. To earn the Communication/Ethical Charter Certificate, a company would have to demonstrate that it has the ability, management focus and systems in place to support the charter (the same basic structure as quality certificates). This would create a positive process within the nuclear industry, also bearing external effects on public and political acceptance.

As mentioned above, one of the key perception goals is the nuclear industry's ability to „formulate problems" in the political process. A player that only has the role of defence in the political process will, over time, also lose this capacity.

The nuclear industry can start enhancing its public acceptance by strengthening the real and perceived integrity of the industry. The process of introducing and certifying according to a „Communications Charter" could be one such vital, initial step.

- As mentioned above, the nuclear industry must be able to work in a very broad communicative environment. In order to render the nuclear industry such an interesting, constructive and respected player – a legitimate agenda-setter – it must be able to offer an entity; internationally, domestically and cross-domestically, which can assume this role. In practice, this means having an organisation that moves away from the concept of „representation" (to a specific international forum) to a concept of „think-tank".

The concept of a think-tank (which would be built as a funded foundation with an agenda of its own), means that all funders are not bound by the research documents or publicity of the think-tank. This entity can sometimes take on more outspoken positions, and be granted a greater extent of freedom. A think-tank could create a platform for a wide variety of topics surrounding the energy issue as a whole, as well as inviting „guest writers". The flexibility and ability of raising questions in the direction currently needed is also far greater than any traditional organisation. Within the think-tank the nuclear industry could be able to present and interpret public opinion polls on various aspects of nuclear on an overall level. The think-tank culture and its achievements are well understood in the US and is also utilised in UK and we think the time is ripe for such a concept for the nuclear community.

Todays industrial organisations have to satisfy the needs of all stakeholders – customers, employees, owners and society at large. I believe that we in the nuclear industry fulfil all these requirements in the safe, clean and competitive production of electricity. We have a technology, which is environmentally friendly, we take care of the waste generated in a responsible way and we provide a much needed and environmentally clean product -electricity.

As the nuclear industry is one of the keys to a sustainable society, it must achieve legitimacy in its capacity as an interesting agenda-setter for tackling problems and as an expert. We have to build our communication activities on an open and honest attitude and we have to establish trust and confidence. We must also prove our ability and performance. If we manage to do this, I am sure we will get the option for the future.

# POSTERS

# Good Acceptance: Public Opinion about Nuclear Energy in Slovenia

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**Introduction**

Nuclear Training Centre Milan Čopič at the Jožef Stefan Institute in Ljubljana is performing extensive public information activities. All the elementary and high schools in Slovenia are invited to visit our permanent exhibition and attend the lecture about the nuclear energy or radioactive waste disposal. In the year 1998 7427 visitors visited us. Most of them are from the $7^{th}$ and $8^{th}$ grade of elementary school, age 14 to 15.

Every year in the spring we ask several hundred of visitors the same set of questions about their knowledge and opinion about nuclear energy. They are polled before they listen to the lecture or visit the exhibition. In that way we are trying to obtain their opinion based on the knowledge they obtain in everyday life.

**Result of the 1999 Poll**

With this set of questions we are trying to evaluate understanding and opinion about the nuclear energy. They were defined already some years ago, when there was substantially stronger anti-nuclear movement in our country.

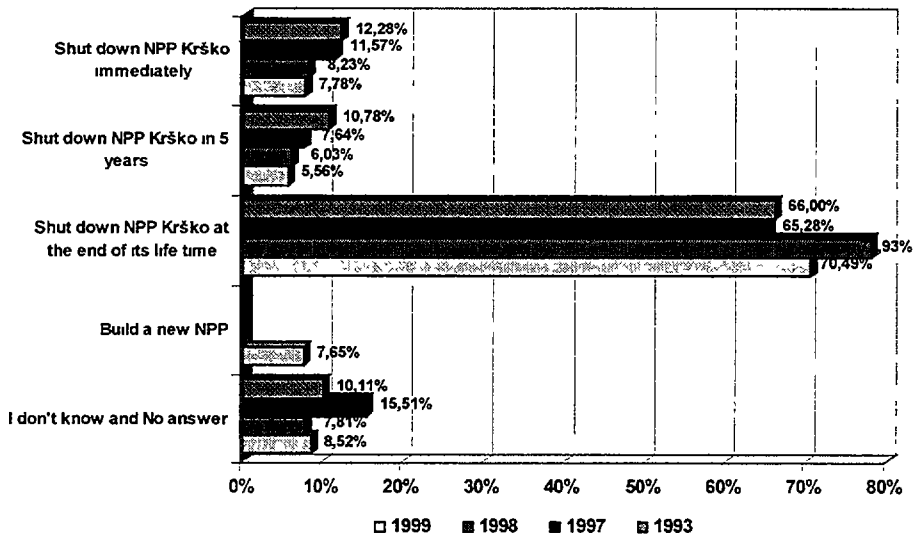
From the answers to the question **What are the reasons for the use of nuclear energy?** we can conclude that there was a shift in positive direction regarding the understanding of environmental friendliness of the nuclear energy.

From the answers to the similar question **What are the reasons against the use of nuclear energy** we can see that the disposal of the waste and radiation from NPPs are only slightly loosing on importance. We can observe that more people are aware about the possibility of an accident in the NPP.

Next question was **What will be stored in the low-level radioactive waste repository?** It is obvious from the answers that there is considerable misunderstanding of the facts. There were several answers possible.

This year we have slightly changed the last question in this group. Until last year we were asking about the future of the NPP Krško: When should NPP Krško be shut down? Possible answers were: immediately, in five years, at the end of its life time and I don't know. This question was prepared in the beginning of nineties when there was serious threat from green government to shut down NPP Krško in next 5 years. Since there is no such threat anymore, the question was becoming irrelevant.

The new formulation for this question is the following: **What should be the future of nuclear energy in Slovenia?** Possible answers were: shut down NPP Krško immediately, shut down NPP Krško in five years, operate NPP Krško until the end of its life time, build a new NPP to replace old fossil plants and I don't know. Assuming that those for the new plant are also for the continued operation of the NPP Krško, we can still compare results over the years.




**What should be the future of nuclear energy in Slovenia?**

This year we can see the fourth year of the drop in the number of people against nuclear power. For the new nuclear power plant were 7.65 % of polled population. If we add that to 70.49 % of those, that think the NPP Krško should operate until the end of its life time, we get slightly higher number of supporters than last year (78.14 % compared to 77.33 % last year)

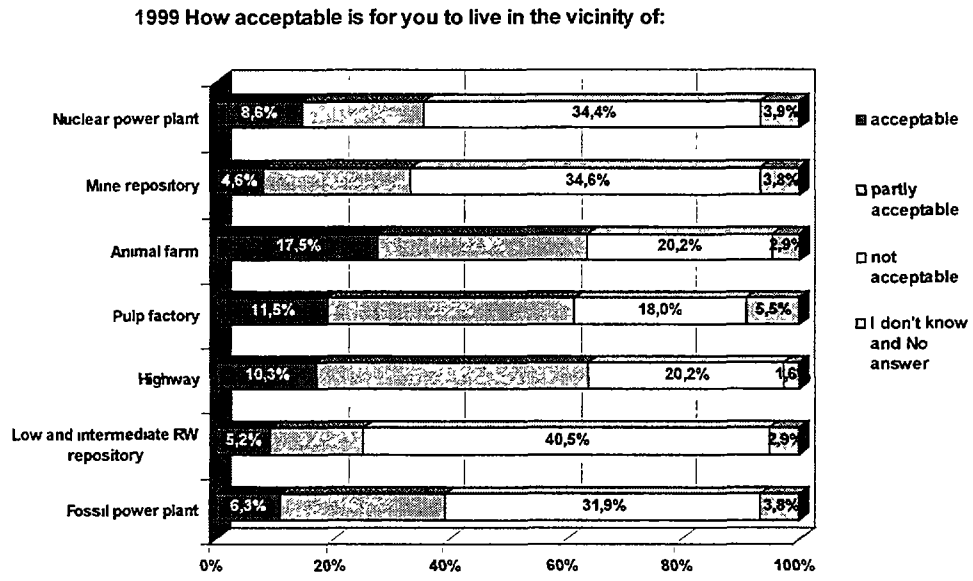
**Questions about the environment**

With these two questions we are trying to determine what is the relationship of the person towards the general environmental issues.

From the answer to the question ***What is most harmful to the environment?*** we can see how media are influencing perception about importance of environmental problems. Several years ago everybody was talking about ozone holes, so this problem has attracted more concerns. Today ozone holes are less discussed in the media; therefore they have lost on importance among the polled population.

The positive trend can be observed from the answer describing the fear of radiation from NPPs. It has fallen from 12.79 % in 1993 to 8.1 % in 1999. However, one of the major public concerns about nuclear energy is permanently gaining on importance: number of people, who consider radioactive waste to be a major concern for the environment is steadily increasing (from 13.64 % in 1993 to 18.6 % this year). This year that was even the major concern of all other issues.

Finally, we are asking every year our visitors about their acceptance to live close to some industrial or otherwise disturbing facility. Regrettably, this year again people are more afraid of the radwaste repository than of the operating nuclear power plant. Last year was the first time this has changed. But that was obviously not a beginning of the longer trend.




## Conclusions

Comparison of the results with previous years shows stable and steadily improving public acceptance of nuclear energy in Slovenia. The following conclusions can be obtained:

- Cleanliness of nuclear power is not well understood and should be stressed in information activities
- Radioactive waste is still considered as a major problem of our industry and is even gaining on importance.
- Percentage of people believing that NPP Krško should operate until the end of its lifetime is high and steady.
- For the first time we have determined, that almost 8 % of people would accept a new nuclear power plant in the country.
- No correlation between social environment and understanding of nuclear energy could be found.

But, relatively favourable public acceptance can change over night. Therefore a permanent information activity is essential.

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# PROVIDING PUBLIC INFORMATION IN THE SLOVENIAN NUCLEAR SAFETY ADMINISTRATION

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Good safety culture is strongly related to transparent and timely information. Experience has shown that radiation and nuclear safety are under continuous surveillance by the public.

The provision of open and authentic information to the public is a fundamental policy of the SNSA. The SNSA endeavors to provide substantial and reliable information to the interested institutions, mass media and to the citizens through press conferences, public statements, media discussions, and active participation in domestic and international meetings, symposia and congresses, through publications, the Internet and direct contacts with the interested public.

The SNSA regularly provides information on nuclear safety to the Government, the National Assembly and the citizens of the Republic of Slovenia.

The Annual Report on Nuclear and Radiation Safety is published in Poroèevalec (Reporter) - the publication of the National Assembly – in autumn, and is available in public libraries throughout Slovenia.

Annual Report is available also on the Internet (http://www.sigov.si/ursjv/uvod.html) in Slovene and English. Access to data of the Central Radiation Early Warning System of Slovenia (CROSS), recording the real time (at half-hour intervals) gamma dose rate levels, is also available through Internet.

The report in English is sent every year to Slovenian embassies world-wide, to certain foreign embassies in Slovenia and to other organizations participating in the activities in the nuclear and radiological field.

Reports on the SNSA activities are also published in the bulletin Okolje in prostor (Environment and Spatial Planning), published by the Ministry of Environment and Spatial Planning. The SNSA regularly contributes articles on courses, seminars and symposia attended at home and abroad.

The articles are intended to give basic information on training and the names of contact persons to provide additional information on certain topics to those interested. More than half of these activities were organized by the IAEA.

For several years the SNSA has been endeavoring to maintain continuity in translating some of the basic IAEA publications stated below:
Code on the Safety on Nuclear Power Plants: Siting, , Code on the Safety of Nuclear Power Plants : Quality Assurance, Code on safety of Nuclear Power Plants: Operation, Code on safety of Nuclear Power Plants: Design, Code on safety of Nuclear Power Plants:

Governmental Organization, The safety Nuclear Installations, Intervention Criteria in a Nuclear or Radiation Emergency, ; Establishing s National system for Radioactive Waste Management, The Principles of Radioactive Management, Radiation Protection and the Safety of Radiation Sources, International Basic Safety Standards for Protection Against Ionizing Radiation and for the Safety of radiation Sources.

This publications are distributed free of charge to the institutions concerned.

The SNSA also continues sending data to the international network in the field of nuclear and radiation safety NucNet and distributing the NucNet data to the interested media in Slovenia.

Every year the SNSA, the distributor for Slovenia, investigates the interest of media and others in this kind of information and updates the list of receivers.

All research work and studies being financed by the SNSA are public and available at the SNSA Library , and the international missions' reports are available from the National and University Library, the Central Technical Library, Ljubljana and the University Library, Maribor.

# INTERNAL COMMUNICATION WITHIN SLOVAK NUCLEAR REGULATORY AUTHORITY

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One of the primary objectives of the Slovak Nuclear Regulatory Authority (UJD) Public Relations Program is to make available to the public full and complete information on UJD activities to assist the public in making informed judgments regarding UJD activities. The primary means of keeping the public informed about the regulatory activities and programs of the UJD is through the news media.

A central state administration body, the UJD provides on request within its province in particular information on operational safety of nuclear energy installations independently of those responsible for the nuclear programme, thereby allowing the public and the media to control data and information on nuclear installations. A major element of providing information is the demonstration that the area of nuclear energy uses has its binding rules in the Slovak Republic and the observance thereof is controlled by the state through an independent institution – UJD. As early as 1995 were laid on the UJD the foundations of the concept of broadly keeping the public informed on UJD activity and the safety of nuclear installations by opening the UJD Information Centre. Information Centre provides by its activity communications with the public and mass media, which is instrumental in creating in the public a favourable picture of the independent state nuclear regulation.

Internal and external communications are equally important. An effective internal communications programme will strive to make the organization a team that clearly understands and respects one another´s different yet equally important roles. This will contribute to a more effective organization that can better serve the public interest. An effective external communications programme will represent the opinions and experience of the organization to external audiences thereby reducing or preventing misunderstanding and thus increasing safety. The programme will also try to understand and to present the opinions and findings of these external audiences within the safety authority so that these opinions are reflected in the final service offered to society by the regulatory authority.

Every member of the UJD staff has a crucial role to play in communication with the exterior. For the UJD, high priority must be given ensuring that internal and external

information is synchronised and coherent. The level of public relations is in our society one of decisive factors of nuclear energy acceptability at present as well as in the future.

A clear communications policy is the key to credibility and credibility is earned, not created. It is based on perceptions which give rise to varying levels of confidence. It has been consistently found in opinion research that credibility is the single most powerful persuasive force. Public communication programmes are the principal currency for the Regulatory Authority to inform the public on issues of cost, benefit, need and risk. For each issue the information needs differ and this must be reflected in the Regulatory´s Authority communication programmes.

UJD as the state authority provides information related to its competence, namely information on safety of operation of nuclear installations, independently from nuclear operation and it enables the public and media to examine information on nuclear installations.

More active Public Information activities of the UJD will significantly contribute to the public understanding on different aspects of the uses of nuclear energy and will increase the public treats in this area. Using most modern and effective tools like the internet but also by presenting different and high quality materials and publications the IAEA and other international Agencies could accelerate the process of public´s positive attitude with respect to nuclear energy.

Public involvement in the UJD´s activities is a cornerstone of strong, fair regulation of the nuclear installations. The UJD recognize the public´s interest in the proper regulation of nuclear activities and provides opportunities for citizens to make their opinions known. The UJD seeks to elicit public involvement early in the regulatory process so that safety concerns that may affected a community can be resolved in a timely and practical manner. This process is considered vital to assuring the public that the UJD is making sound, balanced decisions about nuclear safety.

In the UJD, good internal communication within the authority forms the basis of good external communication. This is especially important, as the UJD is located both in Bratislava and in Trnava sites. Day-to-day information exchange between the two sites had been established. Daily faxes are sent from the Inspection branch at Trnava to the headquarters office every day. They deal with the status of the operations at the NPP sites. E-mail is also used for internal and external information by computer networks. As to other improvements of internal information it was noted that especially all staff meetings are held at regular

intervals. This is an excellent form of internal information and for discussing external information matters.

The public relations are understood as attempts to establish, keep and improve UJD's good relations to its neighbours through purposeful informing. Parallel such communication also means to follow particular ethical principles and independence which are precondition to attain a respect of the national supervision for nuclear safety in Slovakia.

The UJD already in its origins laid the foundation of a policy of keeping the public broadly informed on all activities and the safety of nuclear installations in the Slovak Republic by opening the UJD Information Centre. Catering to public & media relations, the Information Centre is instrumental in forming a favourable picture of independent state supervision on nuclear safety.

Professionally, the public relations at the UJD are responsibility of the Public Information Manager who is at the same time the press officer of the UJD . Of course, his close co-operation with all staff members is absolutely necessary. The Manager co-ordinates all public relations activities and he also personally prepares press releases, writes articles, organises press conferences and communicates with TV, radio and journalists. He also monitors news in various media on subjects interesting for the UJD.

*The basis rules for internal communication within UJD are as follows:*

- Activity of the UJD Information Centre – providing materials, consultancy, assistance in two theses, co-operation with Technical Universities
- Daily information exchange, faxes, e-mail reports and materials among localities in Bratislava and Trnava
- Processing and providing 3-4 times a week current information and reports from STORIN Agency, and from NucNet reports via a PC network for all UJD executives
- Department PR prepared and gave out UJD Bulletins on domestic and foreign activities of the UJD and its personnel
- Department PR monitored daily press and prepared daily reports and information on notice boards for both localities in Trnava and Bratislava
- Department PR prepared and published for UJD staffs and visits photographic sets (notice boards and albums) on major UJD events and prominent domestic and foreign visits to the UJD
- Department PR prepared and provided every year some meetings of UJD staffs
- Department PR regularly contributed round the year to selected chapters of the Internet site on the UJD
- WEB Internet site of UJD activities (http://www.ujd.gov.sk)

UJD intends to serve the public true, systematic, qualified, understandable and independent information regarding nuclear safety of nuclear power plants, as well as regarding methods and results of UJD work. Generally, public information is considered as significant contribution to the creation of confidence into the regulatory work.

# EXPERIENCE OF WORK WITH POPULATION CONCERNING THE PROBLEM ON STATE OF THE OBJECTS RADIOECOLOGICALLY DANGEROUS LOCATED CLOSE BY THE MINSK-CITY, THE CAPITAL OF BELARUS

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Belarus has no operating reactors at present. But the Chernobyl syndrome has roused the increased and morbid interest of the population for the state of nuclear- and radiation dangerous objects located in the settlement Sosny being at 8 km from Minsk-city where Academician Science and Technical Complex (ASTC) «Sosny» is situated. The interest for the radioecologically dangerous objects of the industrial site of ASTC «Sosny» is explained by the fact that this site was belonged to the Institute of Nuclear Power Engineering/Academy of Sciences of Belarus till 1991. The Institute was engaged in creation of nuclear power plants with a new type of coolant. Nuclear reactors unique in Belarus were operated here, such as the research reactor IRT-M with the capacity of 5000 kW (it was under operation from 1962 to 1986), and from 1985 to 1987 a pilot small-sized mobile NPP with the electric capacity of 630 kW was tested, as well as the complex of nuclear engineering benches was under operation, such as loop installations of large scale for testing fuel elements, and critical assemblies. Moreover, the only point for storing radioactive waste in Belarus is situated in immediate proximity (1 km) to ASTC «Sosny» where solid radioactive waste, sources of ionizing irradiation and fission materials with the total activity of more than 80000 Ci are stored with violation of international standards. Thus, the presence of nuclear materials in Belarus is associated with execution of scientific and technical programme of investigations in the field of nuclear power engineering in 1964-1988 using the research reactor, the mobile nuclear power plant, critical assemblies and «hot» chambers. Because of closing down the programme of research the nuclear fuel was partially passed to Russia, and the rest one was discharged from the reactor systems and placed into the storage facility for fresh and irradiated fuel in the territory of ASTC «Sosny». There is uranium of the following enrichment: 90, 75, 45, 36, 21 and 10% in these two storage facilities. The enriched uranium of 423.4 kg, natural uranium of 957.4 kg, the depleted uranium of 459.4 kg, thorium of 1.8 kg and plutonium of 14.4 kg are being stored in all. The spent fuel assemblies (FA) from the mobile reactor are mainly placed in the storage facility of the irradiated fuel «Iskra». The storage facility for the irradiated fuel is designed for local obtaining and sending of nuclear materials and consists of two ponds with the dimensions of 5.25x0.82x4.2 m. Up to date 105 fuel assemblies of the mobile reactor in hexagonal cases made of stainless steel with fuel elements (each fuel assembly contains about 380 g of uranium of 45% enrichment) are in the cooling pond No1, as well as 6 cylindrical containers with other different nuclear materials, such a 34 fuel elements of the research reactor(they contain about 2.6 kg of uranium of 10% enrichment), 15 experimental spherical fuel elements (36 and 45% enrichment) and waste of spherical fuel elements.

In 1998 after the visit of the President of the Republic of Belarus Lukashenko A.G. some journalists have made statements at a non-qualification level in their transmissions by television, publications in newspapers about the fact that there are two tons of weapons plutonium and highly enriched uranium in nuclear storage facilities of ASTC «Sosny».

Taking into account that not more than 3 kg of plutonium are necessary for creation of an atomic bomb, such amount of nuclear material is enough for manufacturing 600 atomic bombs. In this connection in one of TV reportings Belarus, being the country which possesses definite technologies and fissile materials has been related to the rank of «near-nuclear» or «threshold» countries having technical scope for creation of nuclear weapons quickly alongside with such countries as Pakistan, India and Israel. This sensation statement on which the leading TV channels of Russia responded immediately has nothing with reality. Firstly, as it is seen from the above-stated, plutonium and highly enriched uranium are stored in rather small quantities at ASTC «Sosny». Secondly, a special technology, equipment and specialists are necessary for execution of weapons or energetic plutonium. ASTC «Sosny» has not possessed and does not possess them. Any specialist who knows this problem can be convinced of that.

Five years ago our state joined a very important international act, such as the Treaty on the Non-Proliferation of Nuclear Weapons. Commitments were accepted not to produce nuclear weapons and not to use fissile material, which is used in peaceful activity, for nuclear weapons production, as well as other explosive devices. Then Belarus joined the International Convention on Physical Protection of Nuclear Materials. This agreement is integrally connected with the Treaty on the Non-Proliferation of Nuclear Weapons. Nuclear materials are stored under «the foreign lock» under supervision of the IAEA from 1996. Signing by Belarus the Agreement on Guarantees with the IAEA in 1995 stimulated the creation of the State system of accounting, monitoring and physical protection of nuclear materials, which answers the International demands. In the framework of the coordinated plan on support of the Republic of Belarus by the IAEA in execution of the Treaty on the Non-Proliferation of Nuclear Weapons the system of physical protection of nuclear materials storing in the territory of ASTC «Sosny» has been created with assistance of Japan, the USA and Sweden. Storage facilities at ASTC «Sosny» in such view as they were put under the IAEA guarantees fully answered the IAEA demands in storing, monitoring and accounting of nuclear materials. The only point for storing radioactive waste in Belarus is situated in immediate proximity (1 km) to ASTC «Sosny» where solid radioactive waste, sources of ionizing irradiation and fission materials with the total activity of more than 80000 Ci are stored.

Placement of RDWD organized in 1963 near the settlement Sosny has a number of drawbacks at present, namely:

- PDWD is practically situated on the suburbs of Minsk;
- PDWD is located in the area of sources of two small rivers - Trostyanka and Slousta which are already now pressed with a considerable anthropogenic load;
- PDWD is located in a feeding area of pressure aquifers by fresh water scoops in Minsk city;
- PDWD is located at a distance of 2.5 km from Minsk urban water scoop «Drazhnya» and in the zone of its effect;
- the aeration zone on PDWD area consists of sandy grounds well permeable.

Ten containers with the irradiated nuclear materials were stored in the near-surface storage facility of PDWD. They contained 2178.28 g of uranium of various enrichment as to $^{235}U$ (natural, 45%, 90%). «Storage» of containers with nuclear materials at PDWD which has not

been designed for these purposes according to its normative status and construction is a violation of the acting normative documentation and does not ensure long-duration radiation and nuclear safety.

It is naturally that the presence of a large PDWD near Minsk-city rises alarm in population. At present the project on PDWD reconstruction has been carried out. When developing the strategy on RAW treatment we proceeded from the IAEA recommendations and the international experience that creation of large disposal sites organized and equipped in a proper way is more preferable in comparison with the majority of small sites. In this connection the actuality of PDWD reconstruction existing in Sosny settlement near Minsk-city aiming at creation of PDWD on its base, answering the modern international standards and having the developed infrastructure is out of doubt. Safety of RAW storage in the project of PDWD reconstruction is ensured by creation of the system of engineer barriers along the way of radionuclides migration by the way of waste treatment and their containerization before placing into concrete constructions for storing; the possibility of RAW extraction is envisaged for a final disposal. The concept of long-duration storage of RAW has been accepted for PDWD reconstruction till the permission (the license) on final RAW disposal is got by the enterprise. Decision on giving such permission must be accepted (or not be accepted) by regulatory bodies in accordance with established order on the basis of the analysis on estimation of safety of storages existing now, as well as PDWD after reconstruction. The analysis of safety must be done in accordance with the demands of international norms and the IAEA recommendations (IAEA-TECDOC-789, 853 and others). In this aspect it is very important that the possibility of waste discharge for disposing anew is envisaged in the project on PDWD reconstruction.

More than 375000 kg of solid radioactive waste (SRAW) with the activity of approximately of 15000 Ci «are stored» in two existing storage facilities of PDWD. Isotope composition of SRAW is presented by more than 35 radioisotopes, about 70% activity of which falls on $^{135}Cs$, 25% - $^{3}H$, 0.4% - $^{90}Sr$ and 0.3% - $^{239}Pu$. The whole RAW nomenclature is considered with division into the following groups, such as compacted, non-compacted, organic, inorganic. It has been estimated, that the mass of the compacted SRAW is 10680 kg with the volume of 356.1 $m^3$, and the non-compacted ones - correspondingly, 268200 kg and 89.4 $m^3$, i.e. with the mass of the compacted waste by $\approx$ 2.5 folds smaller in comparison with the non-compacted ones, the volume of the first ones is higher by a factor of 4 and occupies a considerable part of capacitance of storage facilities. Besides the creation of protective barriers when RAW storing, discharge and compactness of SRAW out from the filled cells of storage facilities at present give the possibility to make more than 400 $m^3$ of their useful volume available for storing.

The project of PDWD reconstruction has passed through the ecological examination according to the order accepted in Belarus and has been discussed in various departments and bodies of local authorities.

# Technological catastrophes and Public reactions

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## 1. Energy demands and anti-nuclear movement

The mankind energy demands are expected to be in 2050 more than twice of present level. But a World Conference on Environment in Kyoto is expressed the concern about the releases of greenhouses gases which could cause the climate changes. Accordingly the contamination of the atmosphere by the greenhouse gases is becoming of an urgent problem of our civilisa-tion. Obviously a nuclear energy is assumed to be a main aid of solving such energy problem.

But everybody knows the society is in a conflict situation- there is a powerful movement of «green» forces against the nuclear power. Some people are trying firmly to stop or even to ban the development of the nuclear power in some countries.

An analysis of the ground causes of such social phenomenon as anti-nuclear movement can assist us in its management and future actions for development of nuclear power.

## 2. The roots of anti-nuclear movement

It is possible to distinguish economical, social, scientific roots of nuclear opposition. Economical basis of nuclear energy stagnation is in not very successful competition of nuclear engineering with fossil energy production technologies. It was caused not only by discovering and utilisation of huge deposits of the cheep gas, but also by continuing complication of safety systems of NPPs under the pressure of control authorities. The right way for nuclear power to win in economic struggle- a simplification of the outlines the nuclear power plants, securing the safety with more effective methods. It is important also to use the more reliable items on the plants for reduction a cost of maintenance, inspection and repair of equipment.

Social roots of the opposition are linked with a bad impression of the public with demonstration of the nuclear energy. The explosions of atomic bombs, nuclear arm tests, misfortunes with TMI-2 and Chernobyl have created a stable enmity and non-acceptance of the all connected with «atom». From other side it is known that all consequences of the accidents on NPPs are extremely exaggerated. Great influence of Chernobyl accident has been attached with the actions of authorities, who have arranged a massive relocation of the inhabitants of the contaminated territories. Besides there has been introduced the compensation for living on contaminated areas, which payments among people were called as «grave money». It has disgusted an aversion for atomic energy.

Scientific roots of nuclear opposition are connected with very conservative approach in radiology and radiation protection, where it was declared, that irradiation is a risky effect without threshold and radiation detriment is proportional the doses.

## 3. Role of mass media in development of the public anti-nuclear mood

People are facing with various severe technological accidents or natural catastrophes. Aeroplane crashes, traffic accidents, earthquakes, fires are being caused the losses of many lives annually. But the reactions of public on such events differ significantly. Usually very risky activities but with small consequences are considered as acceptable.

Besides there are military, religious conflicts, which usually are being lasted a long time, because they are caused by disturbances of basic real or fictitious interest. But all losses in such conflicts are considered as had been justified.

The mass media have strongly promoted the dissemination of the fear of some events, of radiation exposures particularly. It is specific character of that occupation to pay attention on negative aspects of the life and aggravate many times any small effects to be noticed. As a result a lot of terrible stories have been written and presented in cinema to frighten the public of the awful consequences of uses of atomic energy.

The most well-known case of strong influence on public perception of nuclear power hazards is a film «China Syndrome », where dramatic struggle of group with different interests on the NPP is described. The examples of big exaggerations of Chernobyl story are discussed in the paper [1].

These concentrated media pressure on population caused a great social amplification of irradiation risk, created stable fear of radiation and as a consequence- non-acceptance of nuclear energy.

It is warrant to recall, that scientific community has discussed the results and consequences of Chernobyl accident on the International Conference «One Decade After Chernobyl» in 1996 [2], and it was recognized, that the real medical detriment is much less expected one. But it is not influenced significantly on a public attitude to the atomic energy.

**4. Scientific roots of nuclear opposition**

There is also an influence on the public perception of radiation risk by the general radiation protection rules via the declaration of the linear no-threshold (LNT) dependence of the radiation detriments and dose of exposures. That concept is based on an unwarranted extrapolation of data of A-bombardment of Hiroshima and Nagasaki with high levels and high rate of the exposition to very low levels and very low rates of irradiation typical for population exposure after NPP accident. A reflection of such approach is in a wide spread understanding that «no level radiation exposure is safe». Such conservative idea which ignore the adoptive features of all living and has to be used only for designing purposes, has been misinterpreted in mass media as a biological law.

Early some medical experts [3, 4] have declared and tried to convince others, that effects of small and great doses are distinguished very much because the small doses irradiation does not injure the immune system of bodies, does not kill the cells, but in contrary can stimulate the opposing reactions of organs of bodies. The high radiation doses are killing the cells and creating the niduses of the potential cancers. Such efforts faced a strong resistance of radiation regulator bodies, which representatives declared that LNT approach is prudent, simple and conservative, and they say that « a non-LNT dose-response would lead to an unmanageable regulatory regime». Their efforts resulted in dissemination misinformation of the last 40 years that low-level radiation is hazardous at any dose, while the data show that low doses are more likely to be essential to life.

It is warrant to mention, that French Academy of Science and American Nuclear Society didn't agree with the linear no-threshold approach [5 ,6]. Now in some journals and scientific societies an intense debates and discussion are started about LNT validity [7].

Indeed, radiation-induced malignant diseases are the most important late somatic effect in exposed human populations by high doses caused the life-shortening. But a large body of scientific evidence exists that low level radiation is harmless or beneficial.

**5. Some technological catastrophes and Public reactions**

It is interested to evaluate public reactions on various natural and technological events. Most informative material for such analysis might be in the newspapers. If we consider the frequency of discussion some events (earthquakes, airplane crashes and so on) on the pages of newspapers, it will be discovered that average time of attention to these events in the newspapers is less then

couple weeks. The newspapers as a very sensitive public devise could not keep information about such events longer.

But discussion around TMI-2 and Chernobyl cases have lasted many years! Number of victims of these catastrophes are insignificant small in comparison with Bhopal and other known technological events. But an influence of these nuclear accidents on the public was enormous. And after these events a very negative attitude to nuclear energy have wide spread in the society. Such public reaction was called as a radiophobia or more exactly «post-accident traumatic stress» . All such public mental disorders are very complicated for treatment.

## 6. Future of nuclear energy -in restoration public trust in its safety and effectiveness

Nobody doubts that a public acceptance is a key point for future nuclear energy. Recent anti-nuclear problems can be solved by calm confident interaction with public, by careful substitution of old troublesome image of the nuclear power on view of modern controllable technology with high level of safety and protection of environment.

In such actions very important to convince of public that the such modern requirements of the nuclear safety as -no large radioactive release, no emergency evacuation, no permanent relocation of population, no restrictions on food consumption- are implemented in the correspondent design decisions based on defence-in-depth concept. And everybody have to know that in the case of any operational incident all consequences of disturbances will be mitigated and real risks will be scornful small. Problem of the plants decommissioning is a very serious. But it has to be solved on the base of optimisation of money expenses and the land uses. It is important to convince the public, that problems of waste management are being solved by the efforts of scientists, that there are the modern technologies for handling, treatment and conditioning, for the reliable storage and disposal of the all types of radioactive waste. That was confirmed on the International Symposium in Taejon, Korea [8]. It is also very important to assure the public that the non- proliferation of atomic arms are guaranteed by international actions.

All PR activities have to be performed with slogan: «Without a good image in the public a nuclear power will never recover».

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# VUJE Trnava a.s. activities in the field of nuclear safety increase

**Daniel Danis, VUJE, Slovakia**

Analysis of operating events
- analyse events in plant operation
- feedback from operating experience

Nuclear safety concepts
- the development of conceptual problems
- the presentation of NPP as a future energy

Probabilistic safety assessment
- reliability analyses of systems and equipment
- PSA at level 1 and 2

Thermo-hydraulic computer analysis
- transients processes
- accident situations in primary and sec. systems

Measurements
- neutronics
- thermo-physical parameters

# Risks of Insufficient Information Communication During the Post-accident Period of the Chernobyl accident

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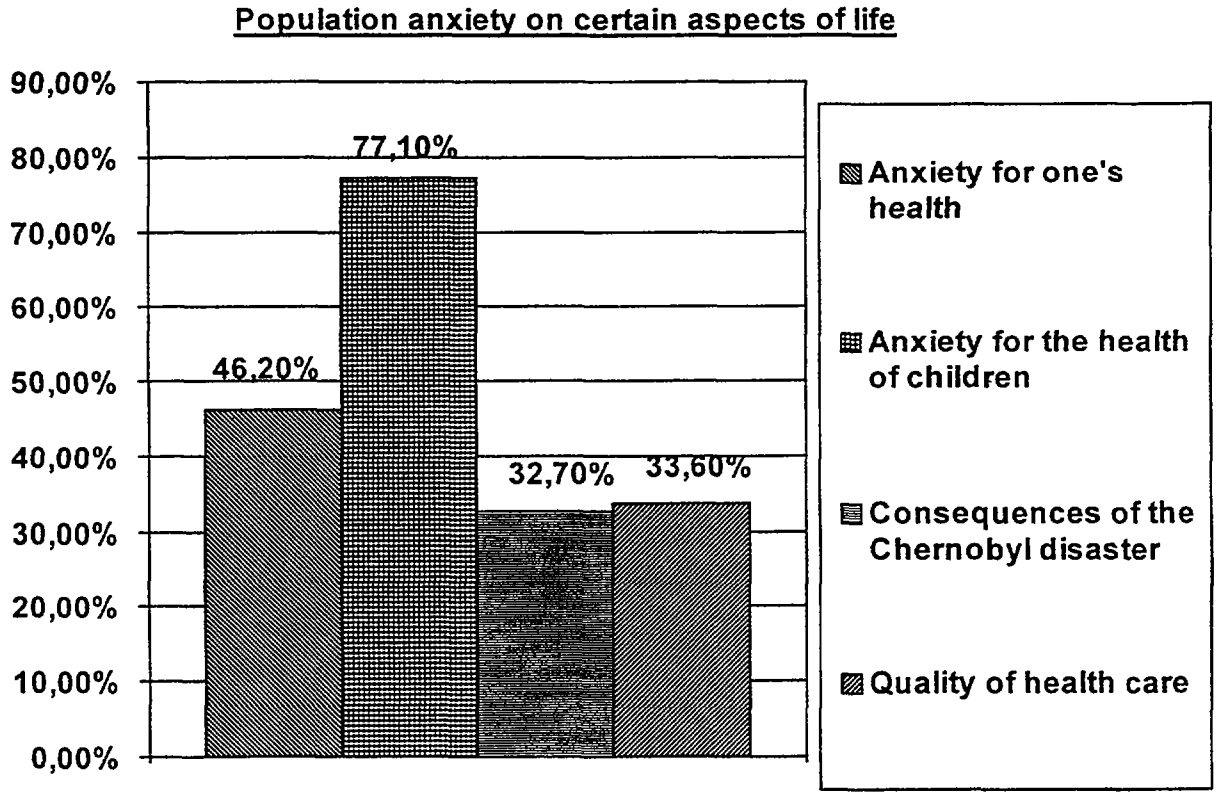
Dr. Igor V. Rolevich
Ministry of Emergencies of the Republic of Belarus

The modified psychological climate and increased social-psychological pressure in the population, affected as a result of the Chernobyl accident, emerged partially because of insufficient information provided to the population with respect to the radiation and ecological conditions. Such situation resulted in development of chronic psychological stress in the majority of the population residing on the affected areas. The post-accidental stress, which appeared in many people, is characterized by its extraordinary stability. Up to 74% of the affected population were subjected to stress. In 1986 the depressing condition of anxiety was observed in 50% of those examined. By 1998 this number increased up to 76%. Aggravation of health condition still remains in the center of anxiety reasons for the majority of those examined, when in the areas contaminated greater the number of those anxious is much higher than in others.




Besides, the urban population is more concerned in unsatisfactory solution of the problem of liquidation of the Chernobyl accident consequences, than village inhabitants (88,5 and 79,7% accordingly). Noteworthy, that 43% of the urban population and only 25,2% of the

village settlers is concerned in small efficiency of rehabilitation activities on the radioactive contaminated territories. Respondents-women (86,1%) are more anxious than men (84,2%). Besides, almost three quarters of the respondents (74,5%) for last three years became more anxious for their future and future of their children, which leads to greater worries. At the same time it is necessary to take into account, that 7% of the respondents expressed apathy and indifference to everything, and at 7,5% have the feeling of hopelessness.

Another negative tendency exposed in the population, affected by the Chernobyl accident is the reduction of trust to the authorities and governmental bodies, reduction of satisfaction by the activity of local authorities. Only 60,6% of the interrogated characterize their relations with local authorities as satisfactorily, when 37,7% of the people are not satisfied by the level of such mutual relations.

One can make a conclusion, that half of the population, residing on the affected territories, has adapted to conditions of residing in post-catastrophic-extreme situation. The seriousness of the social and psychological problems caused by the consequences of the Chernobyl accident, their aggravation and deepening in conditions of the economic situation in general, require work focused on strengthening social and psychological assistance to the affected population. Qualified psychological support is necessary to the people to help them cope with the difficulties of adaptation, reorient themselves to the new image of life, to help in overcoming of the post-catastrophic stress condition. For this purpose it is necessary to carry out a complex of measures on social and psychological rehabilitation of the population, supporting the measures with the most focussed and personal character whenever possible. It is important to improve the activity of the centers of social and psychological rehabilitation, especially established together with UNESCO to assist people affected by the Chernobyl catastrophe consequences.

# PUBLIC ACCEPTANCE OF PROSPECTS OF NUCLEAR POWER DEVELOPMENT IN BELARUS

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The issue of constructing a nuclear power plant (NPP) in Belarus is far from being new. The Republic was oriented to development of nuclear power industry by the Energy Programme adopted in the former USSR. In 1983 the construction of the Minsk Nuclear Heat & Power Plant (NHPP) with a projected output of 2 mln kW was initiated, planned was the construction of the Belarussian NPP with an output of 6 mln KW. The Chernobyl accident however shut down all on-going projects in nuclear power engineering.

After the collapse of the interconnected power system that united the republics of the former USSR, Belarus found itself in the energy crisis. By the time of acquiring independence the Republic had a powerful energy-consuming industry and a power-intensive agriculture not supported, however, with an appropriate base. The portion of the fuel resources owned by Belarus makes up only 15 per cent of an overall power consumption, therefore the Republic is compelled to buy power resources abroad, mainly, in Russia. In the volume of imports their quantity in terms of money would reach 60 per cent that constitutes about 2 bln USD and is commensurable with the size of the state annual budget.

„Major Avenues for Energy Policy in the Republic of Belarus before 2010" and the Republican Programme "Energy Saving" approved by the Belarus Government in 1996 specified the ways of recourse from a fuel and energy crisis. The documents highlight the following possibilities:

- using the energy saving potential available in the Republic;
- maximum involvement of local fuel resources and alternative renewable energy sources in the power balance;
- upgrading the available and construction of new electrical power stations and boiler-houses operated on an organic fuel through introducing up-to-date efficient gas-turbine and steam-turbine plants;
- exploring the possibility of introducing a nuclear fuel energy source into the structure of the electric power industry in the Republic.

The nuclear power industry is thus considered to be one of the possible ways for solving the energy problems, which are nowadays intensively discussed through mass media. The prospects of developing the fuel and energy park and the nuclear power in particular, are subjected to various and sometimes contradictory comments.

One of the major arguments spoke out by nuclear power opponents is the Chernobyl syndrome, which is incident to a significant portion of the population. The public opinion regarding the prospects of developing the energy park and specifically the nuclear power in the Republic of Belarus is of an apparent interest against the background of the energy problems and the Chernobyl syndrome.

The sociological monitoring of the public opinion is carried out for revealing the attitude of the population to the suggested ways of overcoming the energy crisis and the prospects of developing the nuclear power industry in the Republic. During the period of 1995-1998 three sociological studies were accomplished.

The first sociological study was undertaken during August - September 1995. The extent of poll sampling covered 999 individuals.

The question: "Should Belarus accept the project of constructing NPP?" was responded in the following way: 40.9 per cent supported the idea, 39 per cent spoke against it and 19.2 per cent reacted with " I am at a loss to answer at the moment". Therewith it appeared, that 89.1 per cent of the population regard their awareness on the issues of the nuclear power safety as most insufficient; thus the study revealed the necessity of providing a steady bilateral feedback scheme rather then just informing the population on the specified issues. Monitoring the public opinion on the prospects of developing the nuclear power can prove to be an efficient tool for developing such a link. One of the monitoring objectives should be specifying authoritative categories of the population, whose position could decisively influence the public opinion. The detailed polling of these categories in combination with analysis of their attitude towards the issue in question could be helpful for working out a further strategy of forming an adequate attitude among the population to the opportunity of developing the nuclear power.

In subsequent sociological studies, which covered «experts» (1997) and mass media professionals (1998) alongside with the general public, the efforts were focused on that particular objective.

The second sociological study was conducted during September - November, 1997. The poll covered general public and «experts» while the latter implied the representatives of scientific community, educationalists, managers of various levels etc.

At polling the general public the size of sampling made up 1048 individuals.

The public polls among the population and experts have demonstrated the following responses:

- regarding the ways of providing electric power supply and energy sources the population and experts almost equally supported the upgrading and construction of large power stations on an organic fuel (37.5 per cent and 30.3 per cent respectively) as well as making an intensive use of local and alternative energy sources (55.4 per cent and 51.2 per cent accordingly), but appeared to be in discord with each other on estimation of the prospects of constructing a nuclear fuelled electric power stations (17.3 per cent and 61.0 per cent, respectively )and the use of an energy saving potential (34.2 per cent and 53.9 percent, accordingly). Facing the alternative of nuclear power or organic fuels, local energy sources and energy saving the general public give an obvious preference to the latter option, that is quite natural in the post-Chernobyl situation, while the experts put the construction of NPP first. This is confirmed by a growing support of construction NPP by the population (up to 28 per cent) provided this project to be cost-effective, and up to 40 per cent if provided with data that a quarter of the electric power consumed in Belarus is generated by the NPP in the frontier countries. As we can see the rating for support of the NPP construction is reaching the level of that in the first study;
- in exploring the conditions, acceptable for general public and experts for rendering their support to the NPP construction project, it appeared, that only every third among the population (33.8 per cent would support NPP construction under no conditions, and among the experts the convinced opponents made up 13.8 per cent of the respondents. The rest could support the project provided it met the requirements, basically associated with ensuring an accident-free operation of NPP and safety of the population;
- in the context of providing information to the population a sharp rise in support of a potential construction of NPP by the population calls for a special attention (from 17.3 percent to 40.7 percent); this rise is based on awareness that the quarter of the electric power consumed in Belarus is generated at the NPP in the frontier countries, while the experts keep rendering their support to NPP at whatever formulation of the question (68.5 per cent). Therewith in the group of experts this opinion is expressed by power engineers (78.7 per

cent), specialists in the field of technical and physico-mathematical sciences ( 68.2 per cent), ecologists (56.4 per cent), scholars ( 53.8 per cent), state managers and economists (79.3 per cent).

In continuation of monitoring the public opinion on solution of energy issues in Belarus and possibility of developing nuclear power, the third sociological study was conducted autumn 1998 which polled both mass media professionals and general public.

In polling the population the size of sampling run up to 993 individuals.

In polling mass media professionals a special concern was given to embracing all related categories. In total 151 questionnaire were analysed. Among the respondents 67.5 per cent made up professionals involved in publishing, 32.5 per cent were TV and Radio Broadcasting specialists.

In general the public poll provided the results consistent with the data obtained the previous studies. Polling the mass media professionals revealed their stiff and rather bellicose attitude to possible construction of NPP. While among the population only every third respondent can be related to the convinced opponents of the NPP construction (that coincides fairly well with the results of the previous studies) and among the experts such make up 13.8 per cent, then 60.3 per cent of mass media respondents demonstrate a negative attitude towards the issue.

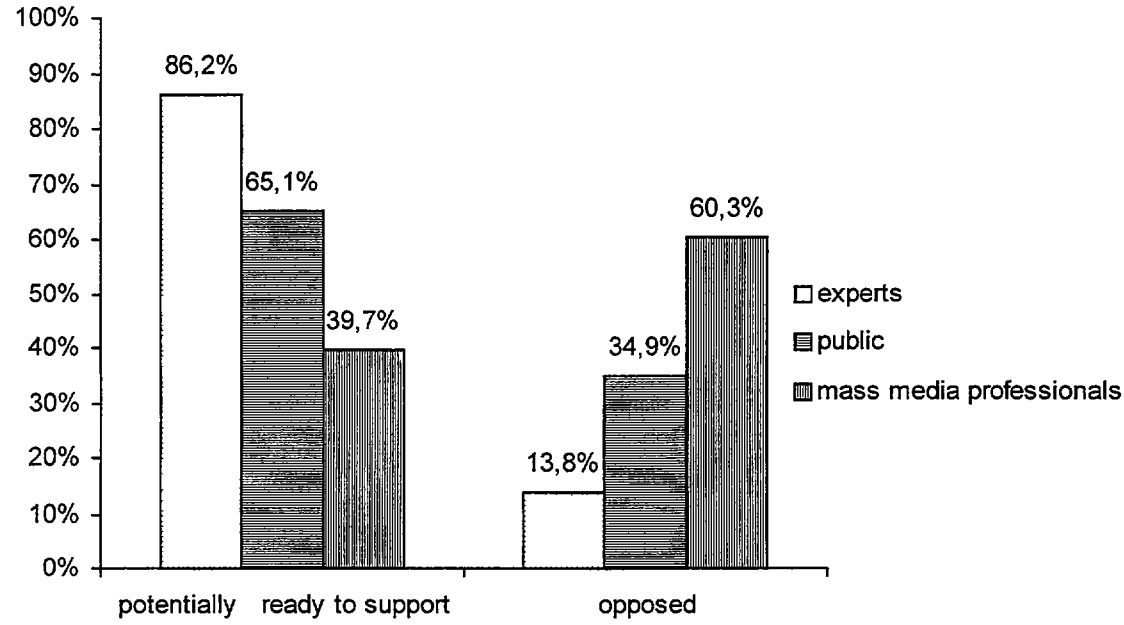


Fig. The portion of respondents of various categories:
potentially ready to support and those who are unalterably opposed the construction of NPP in Belarus

It is thus shown that such categories of the population as mass media professionals and the experts have exact antipodes of opinion on the issue of possible construction of NPP and the extent of their influence on shaping the public opinion calls for a further study. At large the studies undertaken indicate that in the period since 1995 up to 1998 the attitude of the population to the possibility of constructing NPP has not changed essentially. Third of the population is unalterably opposed the construction, while the rest are potentially ready to support it provided a number of conditions, associated with the safety of the population and accident-free operation of NPP are observed.

# The European Nuclear Society Young Generation Network : five years of networking experience

**Gaston Meskens, Chairman, ENS Young Generation Network**

Organisation

In 1995, Mr Jan Runermark (Sweden), aware of a need for an exchange of knowledge from the older to the younger generation, came up with the idea of starting a European Nuclear Society Young Generation Network. A first network was formed with Sweden, the Netherlands, Spain, Finland, Germany and Belgium. The ENSYGN is now affiliated to the European Nuclear Society and brings together young students and professionals from 21 member countries : *Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Netherlands, Poland, Romania, Russia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Ukraine, and United Kingdom.* The ENSYGN Core group meets (at least) twice a year and elects its own chair and cochair for a term of two years. The ENSYGN chair has a seat in the ENS Steering Committee and in the ENS Board. The ENSYGN works closely together with other young generation networks from the US, Australia, Japan and South America. ENSYGN organises workshops and courses on European level, takes part in international meetings (f.i. UNFCCC, OECD) and stimulates networking on national level.

Priorities

Transfer of Know-how
Communication on Nuclear
Assistance to National YG Networks

Spirit

Tuning young into know-how

The people who built today's nuclear industry and know-how are starting to retire. It is essential to ensure transfer of knowledge to the next generations ... *That's why YGN stands for positive measures to recruit and educate young people as engineers, technicians and skilled staff in Nuclear S&T : from school to university and in the industry itself*

Acting nationally

The YGN seeks to bring together young people working in the nuclear field at a local and national level ... *That's why YGN stands for active participation of young people in the national nuclear societies, particulary in leadership positions*

Networking internationally

The nuclear business is an international one. Tomorrow's professionals must have an international perspective and should meet their colleagues in other

countries. *That's why YGN stands for bringing together all national YGN's across borders*

Thinking environmentally

Climate change and long-term energy strategies are world-scale common concerns, and decisions taken now will have an important impact on the quality of life of future generations. *That's why YGN wants to continue the debate by saying nuclear is a part of the solution. We want to do in 'in style' : without being defensive and with a bit more pop art and phylosophy added to the scientific background.*

Communicating with empathy

Why do debates on nuclear issues always end heatedly, full of irrational and emotional arguments ? Thinking emotionally about nuclear is not wrong, but there has to be a balance of the heart and the mind. *That's why YGN wants to bring some empathy into the nuclear debate ...*

Contact

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# VIDEO SUMMARIES

# Repository site selection - informing the public

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The Agency for Radioactive Management started a new site selection procedure in 1996. This is a complex technical process which needs strong communication support; but the major problem is in gaining public acceptability.

According to the expert recommendation, a so called combined or mixed mode approach to the site selection was chosen. This mode incorporates negotiations with the host area/community, which guarantee high public involvement. Only if the negotiations are successful, and the further steps are agreed with the local community, than the desk investigations be followed by more detailed research including field investigations to assess the suitability of the potential location.

Communication with the local municipalities is established by inviting them to participate in the site selection process through an independent mediator who conducts the negotiations between the community and the investor. In this demanding phase the mediator, who has to have sufficient public credibility and adequate authorization for negotiations, has to reestablish relations with local communities and also present to them the technical approach for the construction of the repository.

In order to provide the mediator with suitable material for the first information on repository design the RAO Agency started to prepare comprehensive communication tools. In adition to design documentation for the generic near-surface LILW repository - in which two different disposal options were considered - different public relation materials were also prepared. Information on the approach to repository design was given in leaflets, special posters, with presentations and on the Internet. As a part of communication service a special video film about the basic engineering design of the repository and its layout has been produced, and will also be presented at the conference.

# Mochovce Nuclear Power Plant

Rastislav Petrech & Robert Holy, Slovenske elektrarne a.s. - Mochovce NPP, Slovakia

This video was produced on the occasion of Mochovce NPP unit 1 commissioning (unit 2 has been the last one commissioned - phased to the grid on 20 Dec 1999 at 20.20 p.m. - in the previous Millennium). This 13-minute film was created for the general public and says in common words about the energy, gives a simple and clear justification of the need to complete the power plant and provides a comprehensive tour of the history of Mochovce NPP project from the very beginning to the finals - unit 1 commissioning in 1998. This video was specially designed for POWER GEN '99 exhibition in Frankfurt am/Main, Germany, however its structure allows for a broad use for the general public both as a presentation as well as invitation video to come & see the plant.

# THE TOKAI-MURA JCO CRITICALITY ACCIDENT AND THE ACTIVITIES OF THE ACCIDENT COUNTERMEASURE SUPPORT TEAM OF ELECTRIC POWER COMPANIES, JAPAN

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A criticality accident occurred at the JCO Tokai-mura nuclear fuel processing plant on September 30, 1999. This accident brought the damages which were unrivaled in the history of atomic energy development in Japan, seriously influencing the citizen life to such an extent as requesting for 320,000 inhabitants within 10 kilometers radius to stay indoors for as long as 18 hours. However, it could be said that though three workers suffered fatal injuries, no substantial hazards were made upon the regional inhabitants due to little release of radioactive substances.

This video recorded the activities of the Accident Countermeasure Support Team of the Electric Power Companies immediately after the accident occurred, showing the chronological overview of the particulars of the accident..

## THE PARTICULARS FROM ACCIDNT OCCURRENCE TO WITHDRAWAL OF EVACUATION REQUEST

September 30
10:35 Accident occurred
11:15 JCO reported an accident occurrence to the related organizations.
12:15 Tokai-mura local government established Disasters Countermeasure Headquarters
12:30 Tokai-mura started public announcements via emergency radio system throughout the village
14:30 The Science and Technology Agency established Accident Countermeasure Headquarters.
15:00 Evacuation was requested of the inhabitants within 350m from the spot.
15:30 The Atomic Energy Safety Committee decided to call the Technical Advisory Council of Emergencies
16:00 Ibaraki Prefecture established Accident Countermeasure Headquarters
21:00 The Government decided to establish Accident Countermeasure Headquarters
22:30 Ibaraki Prefecture requested the inhabitants within 10 km radius of the facilities to stay indoors

October 1
2:54 Preparations started for draining the cooling water out of the precipitation tank
4:00 The neutron dose rate at the site boundary of the facilities begun to decrease around this time.
6:30 The criticality situation was ended by completion of draining the cooling water.
8:40 The injection of the neutron absorbing boric acid solution into the precipitation tank started
16:40 Ibaraki Prefecture withdrew its request of indoor stay for the inhabitants within 10km radius

October 2
18:30 Ibaraki Prefecture withdrew its request of evacuation for the inhabitants within 350m from the spot.

## THE CAUSE OF ACCIDENT

JCO is in charge of the UF6-to-UO2 re-conversion of uranium in the nuclear fuel cycle. Most of the products of JCO are low-enriched uranium (2-5% enriched in U235) to be made into fuels for nuclear power plants. It was a special process to manufacture the uranium solution of the fast breeder experimental reactor "Jyoyo" that the criticality accident took place at this time. More rigorous attention should have been paid in comparison with the usual work, because they were processing 18.8% U235 enriched uranium solution.

JCO could plan and conduct their operations, seeing that, as far as they observed the procedures permitted by the Science and Technology Agency, criticality could not happen owing to the criticality-safe equipment. But, a uranium solution was prepared in a bucket at their actual operations, instead of the accident preventive equipment in use. And yet they tried to directly put and stir the bucketful solution into a 45cm diameter precipitation tank. This additional solution was poured into the precipitation tank where uranium solutions had already been collected. The uranium solutions exceeded the permissible quantity to be collected in the tank, and, as a result, a criticality condition was established. In other words, it was an accident where the device of the safety function was set aside, and a manual operation was in place.

## THE ACTIVITIES OF THE ACCIDENT COUNTERMEASURE SUPPORT TEAM OF ELECTRIC POWER COMPANIES

Immediately following the accident, the Government requested the Federation of Electric Utilities to extend its supports, such as on-site radiation monitoring. 11 companies, namely, 9 domestic electric power companies, and Japan Nuclear Fuel Ltd. and The Japan Atomic Power Co.(JAPC), organized the JCO Countermeasure Electric Power Team with JAPC assigned as their coordinator.

The Headquarters of the Electric Power Team was soon set up at the Public Relations Center of JAPC (Japan Atomic Power Co.), Tokai Tera Park. It began to receive Team members from all over the nation. Total number of the supporters amounted to 700, and 11 monitoring cars arrived one after another at the site, and they were mobilized, responding to the requests of the local governmental bodies. Tokyo Electric Power Co. team started its monitoring work early in the day after the accident.

Each of other electric power teams decided its responsible area respectively, too. Radiation monitoring activities of the 11 companies were well coordinated. Every corner of the areas, like public facilities, schools, nurseries, farms, parks, etc. were monitored in response to the request from the self-governing bodies.

The JAPC President Sumi encouraged the Electric Power teams at Tokai-mura. Monitoring was done for the whole area within 350m from the accident spot. Monitoring of the neighboring residents was done at the Tokai-mura Central Community Center to personally serve every citizen who was feared of any accidental effects. Prime Minister Obuchi inspected Tokai-mura on October 6. These activities were reported by the Electric Power Team representative, and he gave a word of appreciation.

The number of the dispatched people was about 2600 cumulative for the one week activities since October 1. All the measurements stayed in the range of normal values, and no decontamination work was required.

With respect to our immediate emergency responses to the requests by the Government and the local self-governing bodies, the solidarity of the joint teams was so great that the team members shared the feeling of achievement for the concerted tasks, with some future lessons also learned.