Bakgrund is published by the Analysgroup at
Kärnkraftsäkerhet och Utbildning AB (KSU)
(Nuclear Training and Safety Center)
P.O.Box 1039 SE - 611 29 NYKÖPING
Phone +46155 26 35 00 Fax +46155 26 30 74
Secretariat/distribution
E-mail: hel@ksu.se Internet: www.analys.se

ANALYSGRUPPEN
Bakgrund

Number 4
December 2006
Volume 19

The Convention on Nuclear Safety

Advancing international nuclear safety

The International Convention on Nuclear Safety is an important component in the work on strengthening and expanding international nuclear safety cooperation that was triggered by the Chernobyl accident in 1986. World wide cooperation on nuclear safety took on new forms, exemplified by the formation of WANO (see presentation on page 8) for quality and safety cooperation between the world's nuclear power operators, and by the expansion of the IAEA's safety activities. Moreover, various review services were set up for member countries to utilise.

In the context of this enhanced international cooperation, the Convention on Nuclear Safety provides a unique, legally binding framework for a global overview and mutual assessment of safety work in all countries having civil nuclear power plants. It has, in this way, acted as a driving force for safety activities, and contributed to substantial improvements in the safety of many of the world's nuclear power reactors.

The following pages describe why the Convention was established, its objectives and the experience gained from the three Review Meetings that have been held since 1999. Other important components in the expanded safety cooperation – not least within the enlarged EU – are briefly described in separate fact sections. In general, the perspective in the text is international, but experience specific to Sweden is summarised in a short section

Why was the Convention established?

The explosion of reactor number 4 at the Chernobyl power station in April 1986 provided an unequivocal demonstration to governments - in particular in Europe - of the severe consequences in the vicinity of a nuclear power plant after a serious reactor accident, also providing them with hands-on experience of the public concerns caused by transboundary effects.

The accident brought home to politicians the need for more powerful international agreements in the field of nuclear safety than provided by general technical cooperation within the framework of the International Atomic Energy Agency (IAEA) and the OECD Nuclear Energy Agency.

The immediate results were the International Convention on Early Notification of a Nuclear Accident, which came into force as early as October 1986, and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, which came into force in February 1987. The decisions to establish these conventions were taken within the framework of the IAEA.

The break up of the Soviet Union accelerated development

The break up of the former Soviet Union over the period 1989-1991 resulted in a substantial increase in cooperation in the field of nuclear safety with the countries of central and eastern Europe.

The new openness provided greater insight into the need for safety improvements. Weaknesses in both the Soviet reactor designs and in the safety management and safety cultures within the Soviet Union had to be addressed.

The role and organisation of the regulatory authorities were also important issues, as the government structures and forms of ownership of the nuclear power plants changed, following the democratisation process and the move towards a market economy in the former Soviet Union and its satellite states.

A common view of fundamental safety principles emerges

The new openness, together with the widened exchange of information, also paved the way for more consensus among experts concerning fundamental safety principles. These principles were now based on good professional practice, rather than on a 'lowest common denominator' approach resulting from political compromise.

Two reports in particular can be seen as milestones in this process. The first was 'Basic Safety Principles for Nuclear Power Plants', published by the IAEA's independent expert group INSAG (International Nuclear Safety Advisory Group) in 1988.

This in turn provided the basis for the IAEA 'Safety Fundamentals – The Safety of Nuclear Installations' publication, published in 1993 after formal approval by the IAEA Board.

A 1991 IAEA conference gave the starting signal

The overall effect of the above was a push towards more binding international agreements in the field of nuclear safety, as a result of the combination of an increasing recognition of the need for such agreements at the political level and a growing consensus at expert level concerning fundamental safety principles.

Content

ISSN 1101-5268 **ISRN** KSU AGR B 06/4-ENG-SE

Such was the background to the IAEA conference in the autumn of 1991 which became the starting point for work on the Convention on Nuclear Safety.

In a number of ways, Sweden pushed this work forward. By 1994, the preparatory work had reached the point where a convention text could be agreed.

By the summer of 1996, a sufficient number of states had ratified the Convention to enable it to enter into force, which occurred on 24th October 1996.

The Presiding Panel at the concluding plenary session of the 1994 Diplomatic Conference, when the text of the international Convention on Nuclear Safety was finally agreed. (Photo: IAEA)

What are the obligations under the Convention?

The most important obligations in the Convention on Nuclear Safety can be summarised as follows:

- Each Party to the Convention shall establish and maintain a legislative and regulatory framework to govern the safety of nuclear installations and an organisation for regulatory supervision of nuclear installations.

The regulatory framework shall be so structured that it ensures clear assignment of responsibilities and an independent and competent regulatory authority.

- In its national safety work, each Party shall apply certain fundamental principles, set out in more detail in the Convention. In all significant aspects, these principles concur with those set out in the previously quoted IAEA Safety Fundamentals publication.

- Each party shall ensure that the safety of its existing nuclear power reactors is reviewed as soon as possible after the Convention has come into force. Any necessary safety improvements according to the obligations of the Convention shall be carried out as a matter of urgency, as far as it is reasonably practicable.

If such necessary safety upgrading cannot be achieved, plans should be implemented to shut down the nuclear installation as soon as practically possible, taking into account the social, environmental and economic impact.

- Each Party shall submit for review, prior to each Review Meeting under the Convention, a report on the measures it has taken to implement each of the obligations of the Convention. Such Review Meetings shall be held at intervals of no more than three years.

- Each Party shall participate in the Review Meetings, and in other meetings under the terms of the Convention.

A basic concept underpinning the Convention is to provide a push for development and improvement of national safety work, regardless of the level from which a country starts. Thereby a situation is avoided where national parties focus on formally fulfilling certain minimum requirements, implying that nothing beyond that needs to be discussed.

The Convention is not based on the establishment of an international inspection system, such as that for the IAEA control of fissile materials, nor does it provide for any sanctions against parties failing to meet their obligations. Instead, the review process (see page 6) is intended to create a strong professional group pressure making every Party strive to correct any national conditions that have been questioned at a review meeting.

The review process also encourages voluntary national application of various international expert review services, such as those provided by the IAEA and WANO (World Association of Nuclear Operators).

The Convention applies only to civil nuclear power reactors. In accordance with the wishes of Sweden and several other countries, it was followed some years later by a similar convention covering the management of spent fuel and radioactive waste.

Physical protection of the reactors, including protection against sabotage, is governed internationally through the 'Convention on Physical Protection of Nuclear Material and Nuclear Facilities'.

This convention was reviewed and its scope expanded over the period 2001 2005, and the revised text is now in the process of ratification.

What are the effects of the Convention?

The Convention can be said to have two main objectives, namely, to establish a world wide framework for reactor safety, and to act as a driving force for safety in all countries that have acceded to the Convention.

Three review meetings have so far been held, in 1999, 2002 and 2005. What conclusions can be drawn from them regarding:

- How the Convention's objectives have been achieved?
- What effects that the Convention has had in terms of improved safety?

A framework for reactor safety

As of April 2005, 56 states had ratified the Convention, as well as the European Commission in its capacity as representative of the EURATOM Community. All countries having civil nuclear power reactors have acceded to the Convention.

This shows clearly that the Convention has been a success in establishing a world wide framework for reactor safety, based on common safety principles and mutual expert review.

The concept of common safety principles was clarified at the Third Review Meeting by a statement that the Parties agree that current editions of the IAEA's Safety Standards – Safety Requirements Series are useful as a common reference and can be used as supporting material in the review process.

A driving force for national safety work

Has the Convention also been a success with regard to advancing safety work by the Contracting Parties?

Here, too, the answer is Yes, although the Convention should be seen as one of several factors working together to contribute to concrete safety improvements in the world's nuclear power plants.

Constant improvement encouraged by the review process

After three review meetings, it is very clear that each country's self-assessment of its national safety work in its national report, together with the review meetings, has resulted in many countries taking steps better to fulfil their obligations under the Convention. This applies also to western countries having well established nuclear safety programmes.

Countries not having nuclear power production have also welcomed the greater insights that they have obtained into safety issues, and into how such issues are addressed in other countries.

Generally, the review meetings have provided an important forum for taking stock of international nuclear power safety cooperation. The exchanges of views at the meetings have been open and constructive, marked by a willingness to learn from each other.

As the discussions have been held mainly between safety experts, the meetings have provided professional group pressure towards positive learning and development.

The meetings also contribute to creating and sharing a common picture of what are strategically important safety matters.

Even though the final reports from the meetings express satisfaction with results achieved, they also emphasise that there is no room for complacency. All parties must continue to work on constant improvements of safety.

Clear legislation and effective regulatory supervision

The Convention is an agreement between states and their governments. Clear legislation and safety regulations, together with effective regulatory supervision, are the tools used by the states to monitor the safety of their nuclear power plants. Consequently, the three review meetings have paid considerable attention to legislation and regulatory supervision.

The first meeting focussed on issues relating to the independence and competence of the regulatory authorities, on assured funding for safety work, both at the authorities and the nuclear utilities, and on the requirements for safety improvements of reactors designed and built to earlier safety standards.

Periodic national safety reviews of all reactors were emphasised as an important tool to maintain and improve the safety of reactors throughout their entire lifetime.

In the above areas, later review meetings have been able to observe substantial progress in many countries in which the regulatory authorities had previously been weak, and not sufficiently separated from the national ownership of the power plants. In some countries, improvements still remain to be made, so the pressure to implement them is maintained.

The later review meetings have conducted more in depth discussions of various regulatory supervision strategies, including the use of probabilistic analyses (PSA) and safety indicators.

They also addressed how issues relating to the utilities' internal safety cultures and safety management were dealt with in the overall regulatory activities.

These latter issues were particularly emphasised in consideration of the changes in the electricity markets in some countries, such as deregulation, change of ownership and increased competition. Issues relating to quality management systems for the regulatory authorities themselves were also highlighted.

A topic of current interest at the latest review meeting was harmonisation of national safety requirements with international reference levels, particularly the IAEA's new series of safety standards. A number of countries presented reports on ongoing projects in this area, including the benchmarking study carried out by WENRA (see page 9) of safety requirements for existing reactors in all countries within the enlarged EU.

Finally, it can be noted that the maintenance of a high level of competence in nuclear technology is still a major concern in many countries, considering the generation change and changes in nuclear power programmes.

Several countries described their current action programmes for dealing with this issue in both the nuclear industry and the regulatory authorities.

Safety improvements in nuclear power plants

In their national reports, most countries described substantial improvements in the safety of their nuclear power plants as the result of programmes completed or in progress. However, there are several areas that require continued attention according to the review meetings.

About 65 % of the world's nuclear reactors are more than 20 years old.

Programmes for addressing degradation caused by ageing, as well as for upholding the motivation of plant staff facing a decision to close the plant, are therefore particularly important to maintain the safety of the older reactors.

General features of safety management systems also remain a central theme of the discussions.

All parties agree that the nuclear utilities must have well developed safety management systems combined with active self-assessments.

It is also important to continue to pay attention to how effectively international feedback of experience is applied in preventive work, considering a number of events that have occurred. In this context, the importance of WANO reviews was emphasised in many national reports as well as in the Summary Reports from the meetings.

It is clear that it is considered to be good practice under the Convention that nuclear utilities make active use of the review service from WANO.

It is also, of course, good practice to use the IAEA's various review services covering both utilities and the regulatory authorities.

In this way, the Convention plays an important part in encouraging the effective use of the various international expert review services, thereby creating pressure on safety work at a more detailed level than the Convention's review meetings.

The European perspective

As far as concrete safety improvements at nuclear power plants are concerned, the Convention is often only one of several contributing factors. This is not least true in a European perspective.

Thus, with regard to safety improvements in nuclear power plants in central and eastern Europe, the various joint programmes that were introduced after the Chernobyl accident, and which were intensified after the break-up of the Soviet Union, were particularly important.

This work has been carried out both bilaterally, as in Sweden's cooperation with Lithuania concerning safety at Ignalina, and via international organisations such as the EU, the IAEA and the European Bank for Reconstruction and Development (EBRD).

The central and eastern European countries that have now joined the EU formed a special case, as described on pages 6-7.

Within the EU, WENRA is now operating a long term programme aimed at bringing all nuclear power reactors within the EU up to a high and comparable safety level (see page 9).

WENRA describes the reference levels applied in different areas as closely equivalent to the best 25 % of existing national requirements.

What has Sweden learned?

The following short summary of what Sweden has learned from the three review meetings may serve as an example of national experience. In general, Sweden has received good marks in the review meetings. The numbers of written questions submitted on the Swedish reports have been relatively low, considering the size of the Swedish nuclear power programme.

Many of the questions have consisted of requests for clarifications or minor additional information, as well as for descriptions of actual experience.

A strong feature of the Swedish programme, noted at the latest review meeting, was the existence of clear legislation with a clear assignment of responsibilities between the nuclear utilities and the regulatory authorities, combined with a constructive dialogue between the parties.

In addition, the nuclear utilities have ambitious programmes on technical upgrading, despite the continued political uncertainty concerning future operation. There are clear regulations concerning safety management and analysis of organisational changes. The nuclear utilities have integrated safety management systems and safety culture programmes. Regulatory supervision has developed through new regulations, new methods of working and new quality management systems.

At the national level, there is a systematic programme supporting university level education and research.

As good practices were noted the integration of the interaction between man/technology/organisation into regulatory supervision activities, and the open and active information strategy implemented by both authorities and industry.

The challenges facing Sweden over the next few years were also pointed out. The two separate licensing processes according to nuclear law and environmental law require attention to avoid conflicting messages.

The concentration to fewer manufacturers and service companies should be evaluated in terms of possible safety consequences, e.g. in the form of longer waiting times for access to special services. Programmes for dealing with the ageing of plants need to be evaluated in a broad perspective. The nuclear utilities need to pay more attention to self-assessment of their safety programmes, taking into account, for example, events that have occurred in recent years.

The authorities should ensure that the necessary resources and plans are in place to meet the workload in coming years.

Attention should be paid to the continued generation change and associated transfer of knowledge within the industry. A national initiative is needed to ensure the future availability of radiological experts.

Some summarising conclusions

International cooperation in nuclear safety has been substantially expanded and strengthened after the Chernobyl accident in 1986. Cooperation between countries in the western world had already been strengthened after the Three Mile Island accident in 1979, not least within the framework of the OECD Nuclear Energy Agency.

However, after 1986, this cooperation became global in new ways, such as through the establishment of WANO for quality and safety cooperation between the world's nuclear utilities.

In addition, the IAEA expanded its safety related activities, including the establishment of various review services available to member states.

Safety cooperation was also strengthened at the regional level. New forms of cooperation were developed within Europe after the break-up of the Soviet Union, and in connection with the enlargement of the EU, in order to avoid future accidents and thus strengthen confidence in nuclear power.

In the perspective of this widened international cooperation, as shown in the diagram below, the Convention on Nuclear Safety provides a unique and legally binding framework for a global overview and mutual assessment of safety work in all countries with civil nuclear power plants.

It is not least important that big countries such as India and China, with plans for large nuclear power programmes, play an active part. In this manner the Convention works, as was intended, as a driving force in global safety work.

It is clear that the safety of nuclear power plants has been substantially improved in most parts of the world since the Chernobyl accident, not least within the new EU member states. The Convention has contributed to this in a number of ways, both directly and indirectly.

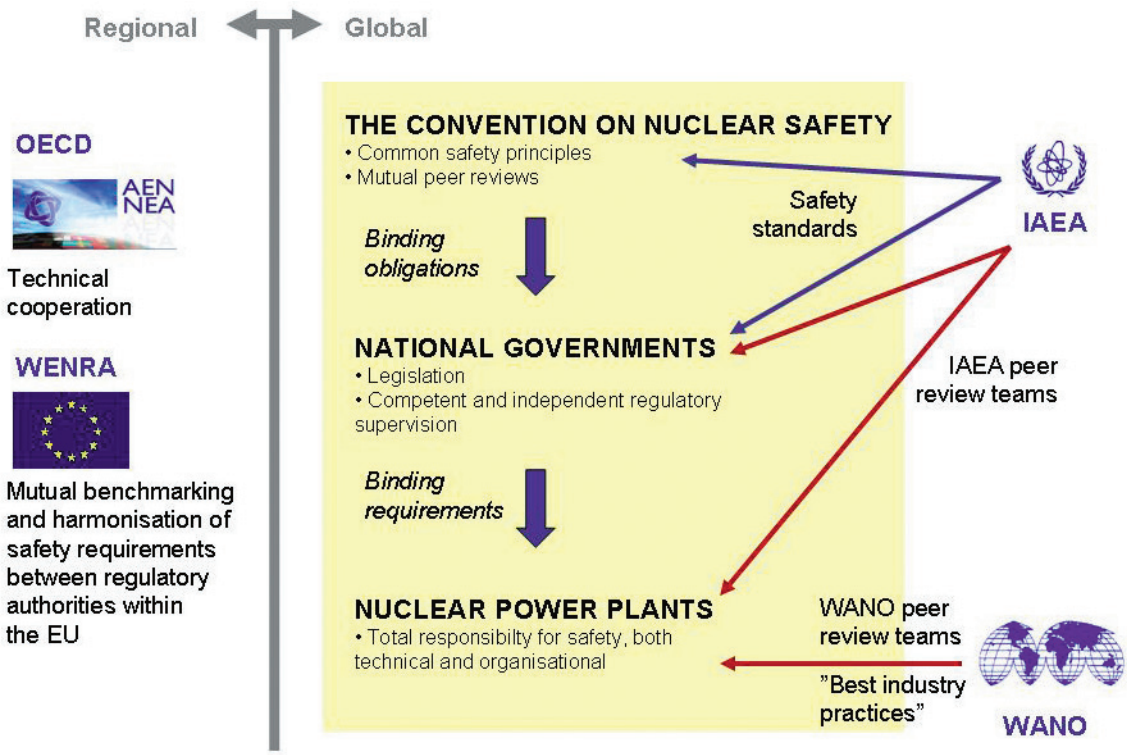
At the same time, there is no room for complacency, neither at the nuclear utilities nor at the regulatory authorities. Instead, the work on constant improvements of safety must continue.

In this respect, the pressure exerted by the Convention will continue to be of great importance.

Lars Högberg
Director General of the Swedish Nuclear Power Inspectorate, 1989-1999.

See also page 10 for further details of the author's international work.

Main components of the current global safety regime



What is a convention?

An international convention is a legally binding agreement, under the terms of which the states that have acceded to the convention (the parties) have undertaken to fulfil the obligations set out in the convention.

Fulfilling these obligations may require actions that include new or amended national legislation. The legal implications of a convention can therefore be such that, before a country can formally accede to (ratify) a convention, such ratification must be approved by the country's legislative assembly.

For a convention to enter into force (i.e. become binding on the parties), it must normally have been ratified by a sufficient number of states. This number is defined in the convention text.

Moreover, it is common that the text of the convention prescribes that the parties shall hold regular review meetings to monitor compliance with the convention.

The review process

The review process is of key importance for how well the objectives of the Convention are achieved. The details of the review procedure have been successively refined since 1997 based on experience gained . The main elements of the procedure applied at present are:

- The national reports shall be distributed to the parties not later than six months prior to each review meeting. Not later than three months prior to the meeting, parties shall have submitted written questions and comments on other parties' national reports. The parties shall then provide written replies to the questions and comments that they have received not later than two weeks before the start of the meeting.
- Most of the review work before and during the meeting is carried out in smaller national groups, of which there are at present six. These groups meet in parallel during the review meeting. The groups discuss how each country has fulfilled its obligations. Normally, a whole day is assigned for discussion of each nuclear power country, while countries not having nuclear power plants share one day of discussions.
- The conclusions from the discussion of each country are summarised by a rapporteur for each group. These conclusions identify both strengths and weaknesses. The strengths may serve as good examples for others, while the weaknesses indicate where the group would welcome further information for future meetings.
- The specific conclusions for each country are presented and discussed at the final plenary sessions of the meeting. The country-specific conclusions are documented so that they can be followed up at the next review meeting.
- Based on what has emerged from the presentations and discussions of the country group reports, a Summary Report is prepared and made public after the report has been discussed and approved by the meeting.

The Summary Report formulates important general conclusions from the meeting, including issues that need to be considered at the next review meeting. However, the report does not name individual countries or reactor designs.

Transparency and confidentiality

Under the terms of the Convention, all documents in the review process, apart from the final Summary Report from each review meeting, are confidential, unless the parties concerned have stated that the documents may be published.

Within this framework, Sweden and a number of other countries have pressed for greater transparency in the review process. As a result, the following is now accepted as good (but not mandatory) practice in the guidelines for the review process:

- Each country should put its national report in the public domain, preferably on the Internet.
- Each country should make available to its citizens the questions and comments it has received on its national report, together with the replies that have been given, however without indicating from which countries the questions have come.

This procedure satisfies what are perhaps the most fundamental areas of public interest, namely that the citizens in each country should be well informed of the outcome of the review for their country, and how their government and public authorities respond to the issues raised.

Generally, Sweden and several other countries point to openness and transparency as an important means of creating and maintaining confidence in both the regulatory authorities and the nuclear power industry.

Thus, the Swedish national reports, together with the conclusions from the review meetings, are published on the website of the Swedish Nuclear Power Inspectorate (SKI), www.ski.se

The Convention and the enlargement of the EU

The Convention on Nuclear Safety played an important part, both directly and indirectly, in the negotiations concerning the enlargement of the EU with twelve new member states in central and eastern Europe. Between them, seven of these candidate countries had 25 nuclear power reactors in operation, most of them being of Soviet design. A basic requirement for EU membership was that the candidate countries should have acceded to the Convention, which all had. The next step was that the EU Council of Ministers wanted to ensure that the candidate countries would achieve a level of safety comparable with that in the then EU member countries having nuclear power plants.

This required identification and evaluation of deviations from a type of 'average level' within the then EU - the Council of Ministers had stated that it was unreasonable to require higher safety levels from the candidate countries than in the existing member states. Design, operation, legislation and regulatory supervision would all be evaluated. And the entire process had to be carried out quickly, in order not to delay the enlargement.

The evaluation became a delicate matter, as the EU did not have (and still does not have) any common safety regulations for nuclear power plants. Sweden got the task to manage the evaluation, which was carried out during the period of the Swedish presidency of the EU in the spring of 2001.

In this context, the Convention proved highly useful in an indirect way. Firstly, a review procedure based on the Convention was chosen, with the areas and safety principles described in the Convention forming the starting point of the work.

Moreover, the work was performed by a number of expert groups working in parallel; each group reviewing a subset of candidate countries. The groups included representatives from the then EU states, both with and without nuclear power. The groups then met in joint plenary meetings to reach agreement on their conclusions in a common final report.

The adherence to a well established international review procedure avoided a long debate on procedural matters, which is otherwise not uncommon in international work. The question that each expert in the review group had to answer was as follows:

What improvements in safety would be reasonable to require as a condition for a continued operating licence if these reactors were situated in my own country?

The experts could then check with colleagues whether this corresponded to requirements widely applied within the EU.

This work was facilitated by the fact that extensive technical background material was available in the form of IAEA reports and information from various bilateral cooperation activities with the candidate countries. This material had also been summarised and evaluated in a WENRA report from autumn of 2000.

But the material had now to be transformed into concrete recommendations on specific measures that each candidate country should commit itself to implement as a condition for membership of the EU.

The work succeeded beyond expectations. The evaluation group's report included over 20 recommendations for improvements, distributed among the seven candidate states' nuclear power plants, covering everything from legislation to the reactor containment functions. The Council of Ministers approved the report in June 2001, to be used as a basis for the enlargement process.

After having six months to study the report, the candidate countries accepted all the recommendations. Most of these have now been implemented in accordance with agreed time schedules, and the regulatory authorities in the new EU member states are now members of WENRA.

Five years later, in 2006, after a benchmarking study, WENRA can state that the new EU countries may in some areas even outperform 'old' EU countries in complying with the WENRA reference safety levels.

It is hard to imagine that these results could have been achieved if the Convention on Nuclear Safety had not been used as a reference framework.

International organisations in the field of nuclear safety

IAEA

The International Atomic Energy Agency is the nuclear energy organisation within the UN family, with its headquarters in Vienna.

The IAEA Secretariat has a staff of about 2300 employees. IAEA is the most important international body for cooperation within the field of nuclear energy, with emphasis on the following three application areas:

· ***Reactor safety, nuclear security and radiation protection***

· ***Research and technical development for peaceful uses of nuclear energy in all areas***

· ***International control of fissile materials in accordance with the Non Proliferation Treaty.***

As far as reactor safety and radiation protection are concerned, the objective of the IAEA's work is to establish, maintain and develop basic international standards for safety and radiation protection in all types of nuclear reactors, transport of radioactive materials and storage of nuclear waste.

In the area of nuclear security, the IAEA shall promote the development and application of methods for protecting nuclear power plants, transport of radioactive materials and other nuclear activities against sabotage and terrorist attacks.

The IAEA reports its activities to the 141 (as of 2006) member states. The highest decision-making body is the IAEA General Conference, consisting of representatives from all member states. The General Conference meets at least once a year.

The IAEA Board of Governors consists of representatives from 35 member states, of which Sweden is one during 2005-2006. The Board meets several times a year for executive decision-making at policy level.

The IAEA was set up in 1957 as the world's 'Atoms for Peace' organisation under the UN umbrella.

The Director General of the IAEA since 1997 has been Mohamed ElBaradei from Egypt, succeeding Hans Blix who held the post from 1981 to 1997. Before him, another Swede, Sigvard Eklund, had been the Director General from 1961 to 1981.

In 2005, the IAEA and its Director General, Mohamed ElBaradei, were awarded the Nobel Peace Prize "*for their efforts to prevent nuclear energy from being used for military purposes and to ensure that nuclear energy for peaceful purposes is used in the safest possible way.*"

Informative website: www.iaea.org

AEN NEA Agence pour l'énergie nucléaire Nuclear Energy Agency

NEA, the Nuclear Energy Agency, is an intergovernmental nuclear energy organisation for OECD countries. NEA is based in Paris. Its most important working areas are as follows:

- ***Nuclear safety and regulation.***
- ***Nuclear energy development, including future uranium supply.***
- ***Radioactive waste management.***
- ***Radiation protection.***
- ***Nuclear law and liability.***
- ***Nuclear science and technology development.***

The NEA does not have any supranational functions, and also has only limited expert resources of its own. Instead, it uses the services of leading nuclear energy experts from industry and public authorities in its member states in order to arrive at common positions and recommendations in important working areas.

In this way, it benefits from the fact that its member states, which are also members of OECD, constitute a homogenous group with roughly the same types of problems and knowledge levels, in contrast to the situation within the IAEA membership.

The NEA members also cooperate in joint research projects in various constellations, in which also non-OECD states, including Russia, participate.

As far as nuclear safety is concerned, the NEA attaches particular importance to the analysis of generic problems and trends that can affect the long term safety of nuclear power plants and nuclear waste installations. In addition, it attempts to identify safety problems associated with new reactor designs.

An important working form within the NEA is that of committees or working groups consisting of experts from its member states. Within the field of reactor safety, there are two such committees:

· Committee on the Safety of Nuclear Installations (CSNI)
· Committee on Nuclear Regulatory Activities (CNRA).

Founded in 1958 as a European organisation, the NEA now has a staff of about 70. In 1972, Japan was the first non European country to join, later followed by Australia, Canada, Mexico, South Korea and the USA.

In addition, the European Commission participates in the NEA's work, and Russia is an observer on several committees. The cooperation with the IAEA is well developed.

NEA has an informative website, from which many of its publications can be downloaded: www.nea.fr

W A N O

WANO (World Association of Nuclear Operators) is an organisation created to improve the safety of all the world's nuclear power reactors. It was established by the nuclear power industry in 1989 after the Chernobyl accident, as all parties realised that international cooperation was essential in order to avoid similar accidents in the future.

With only a few exceptions, all the world's nuclear power operators are members of WANO. The organisation aims to achieve total internal openness, in order that all parties can learn from other member companies' mistakes and good examples. The purpose of the cooperation is continued development of high safety levels and good operational performance in nuclear power plants.

WANO's main duty is to assist its members in addressing practical operations and maintenance issues within the fields of Man/Technology/Organisation (MTO), safety culture and decision making.

WANO also provides support through the following four programmes:

· ***Peer reviews, carried out by groups of experts from other member companies, performing critical and constructive reviews of safety at nuclear power plants.***

· ***Feedback of experience, i.e. open reporting and analysis of all significant incidents.***

· ***Technical support and exchange of information.***

· ***Professional and technical development.***

INPO
Institute of Nuclear Power Operations

The model for WANO is the Institute of Nuclear Power Operations (INPO), which was founded by the nuclear utilities in USA after the Three Mile Island acci-dent in 1979.

INPO and WANO work closely together, in common areas, but INPO is in addition deeply involved in training of staff at the US nuclear power plants.

INPO's activities have strongly contributed to the remarkable positive development in the reliability and availability of the US power reactors after the Three Mile Island accident, thereby increasing their electricity production.

This is one of the main reasons why it has up to now been unnecessary to build any new reactors in the US.

WANO has an informative website: www.wano.info

Western European
WENRA
Nuclear Regulator´s Association

WENRA was founded in 1999 as a voluntary professional association for co-operation between the heads of nuclear safety authorities from those EU countries having nuclear power plants. Switzerland is also a member. Today, membership of WENRA has increased from the original 10 countries to 17.

Among the reasons to establish WENRA was that equivalent levels of nuclear safety was one of the criteria for EU enlargement. In this context, WENRA's main objectives were to develop a common approach to safety issues, and to provide an independent capability to examine safety in the candidate countries for membership of the EU.

Two reports were published, comparing technical designs, legislation and the work of public authorities in the candidate countries with corresponding features in the then EU member countries. The reports then provided a basis for EU negotiations with the applicant states (see page 6).

These countries then took steps to fulfil the safety requirements that were specified in the negotiations. In the case of three countries (Bulgaria, Lithuania and Slovakia) it was not considered as technically or economically feasible to bring the safety of some of their nuclear power plants up to a satisfactory level, and so these countries had to promise to close them.

Another driving force behind WENRA is the wish of the national authorities to demonstrate that there is no need for the EU to create a supranational authority in the field of nuclear safety. This is one of the reasons why, since 2003, two groups have been working on the harmonisation of safety requirements within Europe; one group in the field of reactor safety, and one in the fields of nuclear waste and decommissioning of nuclear facilities.

The working groups have analysed safety levels in the various countries, and compared them with the IAEA safety standards, identified differences in national requirements and their actual application to plants, and then prepared proposals for common reference levels for requirements.

These new requirements are being discussed at national level in 2006, with the aim of improving and harmonising national requirements by 2010, with the common reference levels as the minimum requirements. It may then take a few more years before all individual power plants have been brought into line with the new requirements.

WENRA members have undertaken to submit periodic progress reports to the organisation. The work of WENRA can be followed on its extensive website, www.wenra.org

References

1. "Basic Safety Principles for Nuclear Power Plants"; A report by the International Nuclear Safety Advisory Group; Safety Series No. 75-INSAG-3; IAEA, Wien 1988. (Reviderad utgåva INSAG-12, 1999)
2. "Safety Fundamentals – The Safety of Nuclear Installations"; Safety Series No. 110; IAEA, Wien 1993.
3. Convention on Nuclear Safety, IAEA Legal Series No.16; IAEA, Wien 1994
4. Convention on Nuclear Safety – Summary Report of the First Review Meeting of the Contracting Parties 12-23 April 1999, Vienna, Austria; CNS-RM-99/021
5. Convention on Nuclear Safety – Summary Report of the Second Review Meeting of the Contracting Parties 15-26 April 2002, Vienna, Austria; CNS-RM-2002/02
6. Convention on Nuclear Safety – Summary Report of the Third Review Meeting of the Contracting Parties 11-22 April 2005, Vienna, Austria; CNS-RM-2005/08.
7. Experience of the first review process under the Convention of Nuclear Safety; SKI-PM 99-32, reference no. 1.519-981384 (in Swedish).
8. Experience of the second review process under the Convention of Nuclear Safety; SKI-PM 02-06, reference no. 1.519-010013 (in Swedish).
9. Experience of the third review process under the Convention of Nuclear Safety; SKI-PM 05-12, reference no. 1.519-040112 (in Swedish)
10. Harmonization of Reactor Safety in WENRA Countries; Report by the WENRA Harmonization Working Group; January 2006; see also WENRA press release of 9th February 2006.

All references can be downloaded from the relevant websites (www.iaea.org; www.ski.se; www.wenra.org)

Further notes on the author's international work

"It is hard for me to find a more suitable person than Lars to describe and discuss the role of the Convention on Nuclear Safety in worldwide nuclear safety.

Having contributed to safety improvements after the TMI-accident and managing the consequences in Sweden of the Chernobyl accident, he saw early on the need to enhance nuclear safety worldwide.

It was for him obvious that the world needed a legally binding instrument to support openness, continuous sharing of experience and safety improvements.

Lars was one of the main contributors to the establishment of the Convention and in developing the continuous improvements from one review meeting to the next. Therefore, the choice of Chairman for the first review meeting of the Convention fell naturally on him.

Lars is a person who is known and appreciated all over the world due to his competence, his ability to find solutions in difficult situations and he is a great colleague and friend.

He has significantly contributed to the IAEA safety work. He is a person who sees opportunities in the challenges that nuclear safety faces and I am convinced he will continue to support nuclear safety worldwide.

In addition, I would like to mention that I have enjoyed work with Lars also in other constellations, particularly in the establishment of INRA, the International Nuclear Regulatory Association, which is an organisation for cooperation among heads of major nuclear power countries."

Tomihoro Taniguchi
Deputy Director General
Dept. of Nuclear Safety and Security
International Atomic Energy Agency, IAEA

Kärnkraftsäkerhet och Utbildning AB (KSU), Nuclear Training and Safety Center

KSU is the general training and simulator training centre for the Swedish nuclear power industry. A significant part of the competence of Swedish nuclear power operators is built up and maintained by KSU's training programmes. The company also produces and administers educational material needed for its training activities.

KSU analyses operational experience from nuclear power stations all over the world and shares the results to all the Swedish nuclear power plant operators. KSU's Analysis Group provides society's decision-makers and the media with information on nuclear power safety, ionising radiation and risk assessments and comparisons between different energy sources.

Founded in 1972, the company, which is part of the Vattenfall Group, is jointly owned by Barsebäck Kraft AB, Forsmarks Kraftgrupp AB, OKG AB and Ringhals AB. KSU holds the WANO membership for the Swedish nuclear utilities and belongs to the WANO Paris region.

KSU's headquarters are situated at Studsvik, with local centres at Ringhals, Forsmark and Oskarshamn NPP´s.

The Analysis Group

The Backgrounders and Facts Series of publications are published by the Analysis Group of KSU.

The Group's main working objective is to collect and analyse data concerning points raised in the public debate on reactor safety, radiation protection, radiobiology and research into risks.

They, and other reports, can be downloaded from the Group's web site, www.analys.se which also carries links to an extensive range of national and international research organisations, nuclear power authorities and power utilities.

Hans Ehdwall, responsible for feedback of operating experience, KSU.
Yngve Flodin, reactor safety expert, Vattenfall Power Consultant AB.
Jenny Gode, project manager, environmental matters, Swedish Association of Electrical Utilities.
Martin Luthander, public affairs, Generation Nordic, Vattenfall AB.
Mats Harms Ringdahl, professor of radiation biology, University of Stockholm
Gunnar Hovsenius, consultant, energy/environmental matters.
Carl Göran Lindvall, manager, Radiation Protection Department, Barsebäck Kraft AB.
Anders Pechan, information consultant.
Agneta Rising, Vice President Environment, Vattenfall AB.
Carl Erik Wikdahl, consultant, Energikommunikation AB.

Mail KSU P.O.Box 1039 SE-611 29 NYKÖPING **Phone** +46 155 26 35 00 **Fax** 26 30 74 **E-mail** analys@ksu.se **www**.analys.se