



## ASSESSMENT OF THE EFFECTIVENESS OF THE HUNGARIAN NUCLEAR SAFETY REGULATORY AUTHORITY BY INTERNATIONAL EXPERT TEAMS

**VÖRÖSS, L., LÓRÁND, F.**

Hungarian Atomic Energy Authority Nuclear Safety Directorate (HAEA NSD),

H-1539 Budapest 114. Pf.: 676, Hungary

Fax: (36-1) 355-1591; Email: voross@haea.gov.hu

### Abstract

On the bases of the role nuclear regulatory authorities (NRA) have to fulfil and the new challenges affecting them, in the paper an overview is made on how the Hungarian NRA has evaluated and utilised the results of different international efforts in the enhancement of its effectiveness and efficiency.

The reviews have been conducted by different groups of experts organised by highly recognised international organisations (e.g. IAEA, EC) and highly competent foreign regulatory bodies. The different reviews of activities and working conditions of the HAEA NSD have resulted in a generally positive picture however, revealed also weaknesses as well. They recognised the developments made in the recent years and also appreciated the overall favourable level of nuclear safety in Hungary, identified 'good practices' and made recommendations and suggestions for the most important and most efficient ways of the future improvements. These are cited or referenced in the paper. At the end, some recommendations have been formed based on the experiences gained from the review missions and from our self-assessment.

### 1. INTRODUCTION

It is an evidence, but today also widely recognised by the public that nuclear safety is an issue which can not and should not be managed in national framework exclusively. It is resulted by effects of hypothetical severe nuclear accidents which may spread through national borders, but not less by spreading psychological reactions and feelings of the human being in our globalised, covered by media and more and more open world.

Nowadays, the official trustees of the nuclear safety are the nuclear regulatory authorities of different countries working within the framework of their national legal system. The international responsibility for nuclear safety is realised via international co-operation. This co-operation has a number of different levels, but beside the state level, and even prevailed by its intensity the most crucial part is performed by the co-operation among the operators of nuclear facilities and regulators with their partner organisations and international associations.

The role of the nuclear safety authorities is rising in guaranteeing the safety of nuclear facilities. This role has been on the increase for the past ten years and may be justified by several factors. First could be mentioned the market liberalisation in Western countries, which has forced the atomic energy industry to compete as well by extending to the sphere of energy production. The second significant event is the privatisation, posing safety challenges both in terms of ownership change and attempting to achieve maximum profits. The third factor is the disintegration of the Soviet Union, coupled with radical economic and political changes in the successor states and in Eastern-Central European countries, which latter make efforts to join the European Union. Finally, (beside the nuclear power plant operators) the nuclear safety authorities are challenged by the recent success of antinuclear movements, the phase out — for political reasons — of nuclear power plants in some Western European countries (Sweden, the Netherlands), the moratorium of further nuclear power plant construction (Belgium, Spain, Italy, Germany), and declared antinuclear Western European countries

(Austria, Portugal, Ireland, Denmark, Luxembourg, Greece) since the slightest failure or incident is magnified in the media, sometimes even producing hysterical reactions, when their task is not only the enforcement of the justified safety requirements of the public, but simultaneously also to ease the fears having no reasons. (The situation is hardly alleviated by the lifetime extension movement initiated and spreading in the USA or the unbroken nuclear power plant construction program of Far Eastern countries.)

Changes affecting authorities are detailed in a 1998 study of OECD-NEA (Nuclear Energy Agency) [1], the statements and recommendations of which form a basis for the activities of the NEA Committee of Nuclear Regulatory Activities (CNRA), in which the Hungarian nuclear safety regulatory body also takes an active part.

As the role of the nuclear regulatory authorities (NRA) grows, there is an increasing demand for NRA's quality improvement. Effectiveness ('to do the right job') and efficiency ('to do the job right') are both scrutinised and emphasised. International assessment comprises an examination of the safety levels of nuclear power plants operating in the country concerned together with the quality of NRA's actions as there is a close interrelation between the two.

In most countries in the world, the operating organisation is primarily responsible for safety by law. Opinions differ, however, whether the NRA should take over some of this responsibility and how the added value to safety provided by the authority can be measured. The opinion is spreading that if the nuclear regulations of a country are strict enough and the authority is sufficiently independent, competent, and strong enough to be able to enforce its (sufficiently strict) requirements, the safety level of nuclear facilities supervised by the NRA shall be adequate. Authority independence and resources shall be provided by national governments, undertaken as an international obligation by the Vienna Convention on Nuclear Safety. (Hungary was one of the first countries to sign the Convention.) Therefore the quality of NRA's activities is determined and nuclear power plant safety is guaranteed jointly by the respective nuclear regulation system and the actual operation level of the NRA.

Adequate safety, however, is also difficult to define: all operating power plants have an operating licence issued by the national authority, therefore they are deemed to be safe enough. Nevertheless, not all nuclear power plants are identically safe and safety level of some units is considered internationally as unacceptable. These units, however, are in operation as licensed by the respective national authorities and the countries mentioned could even not be managed without them in the short term. In these countries the authorities concerned are not in the position to make requirements substantially stricter as this would involve the need of shutdown of these units which are indispensable in short term. Therefore authority activity standards are strongly affected by the country conditions, primarily economic and political ones.

## **2. FORMS OF CO-OPERATION OF NUCLEAR SAFETY AUTHORITIES**

Nuclear safety authorities are utilising several means to ensure and demonstrate the required and continuously enhanced level of their work.

The authorities have realised that in line with application of different quality assurance/management systems only with quick and effective utilisation of the experiences accumulated internationally, with co-operation they can expect success, therefore they have established several international forums.

From among these forums the following is a listing of those only with participation of the representative of the Hungarian safety authority:

- (a) OECD-NEA, CNRA (Committee on Nuclear Regulatory Activities);
- (b) CONCERT group – a group established by the European Commission (EC) comprising the nuclear safety authorities of all Western and Eastern European countries;

- (c) Nuclear Regulatory Working Group (NRWG) — a working group pertaining to the EC, involved in special issues;
- (d) European Nuclear Installation Safety Group (ENIS-G) — also established by the EC recently and involving authority representatives as well as a representative from the nuclear industry of each participant country, and with task to prepare applicant countries to accession to European Union (EU);
- (e) Network of Regulators of Countries with Small Nuclear Programmes (NERS, comprising Argentina, Belgium, Brazil, the Czech Republic, Republic of South Africa, Finland, the Netherlands, Hungary, Switzerland, Slovakia, Slovenia), its main objective is to provide ‘cross-assistance’ to authorities if there is a lack of professional expertise somewhere to solve a problem suddenly appearing;
- (f) Forum of WWER-Regulators (Bulgaria, the Czech Republic, Finland, Hungary, Russia, Armenia, Slovakia, the Ukraine) operating working groups as well, and having the objective to discuss common phenomena related to VVER reactors and to promote solution methods.

Such extensive international co-operation is justified by the fact that authority work differs by countries, there is no unified international system of requirements for nuclear safety. Therefore ‘best international practices’ are deemed to be observed, which are constantly developing and improving as experiences are utilised. Participation in such forums is essential for the international appreciation of national authorities, shown by the fact that major international organisations such as the International Atomic Energy Agency (IAEA), NEA, and the EC send representatives to each of these forums. One of the important factors of authority appreciation is international recognition and acknowledgement.

Another not less important authority assessment tool is represented by international missions, sent by particular organisations at request or without being requested but received cordially for substantial reasons of interest. These missions include ones in frame of assistance programs (e.g. in Hungary the RAMG project of several years, completed in two phases with participation of the Finnish, Belgian, and Spanish regulators in the framework of the EC PHARE program), self-initiated evaluations by the Western European Regulators' Association (WENRA), and reviews performed by various organisations and expert groups commissioned by the EC. In accordance with the expanding international practice the IAEA sent a mission at our own request. In the form of its regular service in May of 2000 an International Regulatory Review Team (IRRT) carried out the review of the Hungarian nuclear safety regulatory body, the HAEA NSD.

### **3. REVIEW RESULTS OF THE HUNGARIAN AUTHORITY**

The Nuclear Safety Directorate of the Hungarian Atomic Energy Authority (HAEA NSD) has undergone several international review processes in recent years. The direct or indirect objective of all of these was to assess the degree of maturity of the Hungarian nuclear authority from the viewpoint of Western countries to guarantee EU accession even with a nuclear power plant of Soviet design. The reviews included areas of both nuclear legislation and authority quality, i.e. its effectiveness and efficiency. The latter was assessed on the basis of licensing, inspection, and enforcement practices.

The first major review was performed in May 1998, when a delegation of respected Western European professors visited Hungary on behalf of the EC. The group was headed by J. P. Contzen, personal advisor of the foreign affairs commissioner of the EC and former director of the Ispra research centre. The direct objective of the visit was to assess the effectiveness of EU assistance programme, but much broader demand for information was perceivable. The group visited each of the countries eligible for accession in the middle term and in the longer run, providing a separate evaluation of each of them in their report. Hungary was deemed to be the most mature for accession.

The most comprehensive inspection was performed in the framework of the IRRT mission.

The IRRT mission was requested officially from IAEA in 1999. Preparations took about a year: in the meantime, internal subproject leaders were appointed, reference materials were prepared, and we ourselves also made preparations in the form of presentations as well as by collecting further information materials and organising professional visit programs. The preparatory meeting, held on December 2/3 with an IAEA representative attending, finalised the program and the professional materials list.

The IRRT mission itself was carried out between May 22 and June 2, 2000. It was a full scope mission, only transport of radioactive materials was excluded; furthermore, in the decentralised Hungarian regulatory system comprising a number of public authorities it was limited to the activities of HAEA NSD only. The international group of eight members headed by Mr. J. Misak (IAEA) consisted of American, Belgian, British, Finnish, French, German, and Slovakian experts examining ten different professional areas. The draft report of the group was prepared by the end of the second week, evaluating authority performance in detail: it defined the elements considered to be 'good practices' and recommended to others as well, and provided recommendations and suggestions to improve the authority work.

The short one-page summary of the report states that HAEA is a highly competent organisation with the technical and regulatory capabilities required to complete the responsibilities assigned to it. HAEA has made several initiatives recently in order to improve its efficiency, including the development of an extensive guideline system, the self-evaluation of the organisation and working methods of HAEA NSD, and the improvement of emergency preparedness roles and qualification of the staff. The group also noted the new organisational structure and rules of operation as a result of self-evaluation.

The mission considers the following areas to improve authority work most efficiently:

- (a) legal framework and overall independence of the regulatory authority (role of the government member supervising the authority, as well as their independence from energy promoters; ownership of nuclear facilities and waste disposal sites; limitation of the timeframe for authority decisions);
- (b) effectiveness, competence, and staffing conditions of the nuclear authority (incompatibility of authority and ownership roles within HAEA; co-ordination between authorities; internal quality assurance; financial and staffing conditions of the authority);
- (c) preparation and completion of inspections by site supervisors (training program for supervisors; integrated, planned, and recorded inspections);
- (d) decommissioning, radiation protection, and waste management of nuclear facilities (waste optimisation evaluation; implementation of the ALARA principle; co-ordination with partner authorities; training on guidelines; integration of radiation protection inspection into authority activities);
- (e) authority management of accident prevention (information to general public, training, national level practice initiatives).

At the same time, the report [2] provided best authority practices to be followed, as listed below:

- (a) establishment of the Nuclear Financial Fund;
- (b) requirement for regular review of legal framework;
- (c) self-assessment performed by HAEA NSD (organisational improvements, emergency preparedness);
- (d) licensing activities of HAEA NSD being modern, efficient, and well organised;
- (e) establishment of flexible and effective co-operation with technical support organisations;
- (f) publication of annual HAEA NSD event analysis report on the Internet;
- (g) development of diverse computerised codes — different from those applied in industry — to perform authority evaluation of design bases accidents (DBAs) and beyond DBAs;
- (h) tendency towards an open and transparent authority activity as a result of HAEA NSD policies, and reflected in regulations and guidelines.

Although it is inevitable for the report to contain also subjective elements and some misinterpretations and misunderstanding due to the relatively short time provided for review, we do agree with most of

the statements. An action plan has been developed to implement proposals; the follow up mission to assess the measures taken is planned to take place in about one and a half years.

Another important evaluation of the Hungarian NRA is included in the second WENRA report published in October 2000.

A first assessment report by WENRA was published previously, in March 1999, the summary of which contains the following about the Hungary and the Hungarian NRA: "Legislation and other regulations are up-to-date, and compare favourably with the principles applied in Western countries. HAEA is also sufficiently independent from the organisations promoting nuclear energy." [3].

In the second report, WENRA again examined the seven applicant countries to EU operating at least one nuclear power plant unit, namely Bulgaria, the Czech Republic, Hungary, Lithuania, Romania, Slovakia and Slovenia. The NRA and the nuclear power plants operated have been evaluated in separate chapters for each country. (The Annex presents the general safety characteristics of RBMK and VVER type units.) Hungary was evaluated by experts from the Finnish and Belgian authorities, who had acquired in-depth knowledge about us in the course of the RAMG project of several years mentioned above. However, the report was approved by all WENRA members (heads of the Belgian, Finnish, French, German, Italian, Spanish, Swedish, Swiss, and British nuclear authority).

The report makes highly favourable statements about the Hungarian authority; however, it includes critical remarks as well:

"The Hungarian approach to licensing, regulating and controlling nuclear facilities has developed strongly in the last ten years. A proper licensing process is in place. Legislation and regulations are up-to-date, and the Hungarian regulatory practices are comparable with those of Western European countries.

Issues that need to be considered by the Hungarian Government are the following:

- the fact that the Minister of Energy Affairs is also the HAEC President creates an apparent conflict of interest, even though the formal mandate of HAEC President precludes this,;
- the number of different authorities with direct responsibilities in the regulation of nuclear facilities increases the risk that important issues may be overlooked, and decreases the efficiency of the regulatory work.

The NSD needs to continue its efforts to develop the inspection approach towards process oriented comprehensive team inspections." [4]

With a view to the fact that antinuclear EU Member States consider WENRA to be biased towards nuclear energy, they demand independent and impartial reviews in order to assess the nuclear safety levels of applicant countries. For this purpose, the EC concluded an agreement with a consortium headed by the Austrian company ENCONET, which has produced a report recently. It is to be finalised after the ENIS-G meeting of January 19, 2001.

A new and important initiative has been made very recently under the umbrella of the Atomic Questions Group of the EU which established an ad hoc Working Party on Nuclear Safety (WPNS) with the aim to reach independent conclusions on the candidate countries' current situation and perspectives with regard to a 'high level of nuclear safety'. The WPNS investigates both regulatory framework and nuclear facilities. The report will be based mainly on the statements of the WENRA-report, but it will be updated with additional information provided by the respective countries.

Presently it is still not known what role will be assigned to those reports issued on the nuclear safety assessment of the countries awaiting EU accession; however, the above may support our opinion that there is no need to be afraid of the results as regards Hungary.

#### **4. SUMMARY AND RECOMMENDATIONS**

Changes in the world, particularly in the Eastern and Central European region in the course of the past ten years have resulted in an increasing role of nuclear regulatory authorities in guaranteeing reactor

safety. NRAs should meet this expectation by improving their quality. Nuclear legislation and authority quality have been reviewed by several international groups with particular regard to countries applying for EU membership. Evaluations for Hungary have all produced positive results. This is promising from the viewpoint of Hungary, but it does not mean that authority effectiveness and efficiency development may be interrupted. As it is a permanent task to improve the safety of nuclear power plants, so is the continuous modernisation of the regulatory system, which is to be performed using feedback from international assessments, from the domestic and international experiences. Besides authority efforts, however, the Government also has tasks to perform having responsibility in the fields of legislation and providing resources for the authorities, which are specified in the Vienna Convention on Nuclear Safety and are precedent to the NRA being able to fulfil its mission according to the increased requirements and being challenged by changing environment of the electricity production.

As for a long time, the international co-operation has given support for the HAEA NSD, while the international experiences and 'good practice' serve as a mirror and in certain sense also as a scale, and the same time they facilitate our further development. Our practice — partly referred to the above — proves, that the IAEA and its services, programmes within the framework of the regional technical co-operation constitute a substantial component in this process.

Based on our experiences we recommend to the NRAs:

- (a) to use widely international missions for assessment of their regulatory effectiveness and efficiency;
- (b) to develop and operate internal quality assurance/management system;
- (c) to contribute to development of a set of indicators to be used for monitoring quality of authority activities;
- (d) to contribute to investigate added value of nuclear safety provided by NRAs;
- (e) to feed back experiences to the IAEA gained from IRRRT missions to improve its efficiency.

#### References

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