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REPORT OF THE

INTERNATIONAL REGULATORY REVIEW TEAM (IRRT)

TO

Hungary

(Follow-up Mission)

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INTERNATIONAL REGULATORY REVIEW TEAM
Conducted under IAEA Technical Co-operation Project HUN/9/022
Support for Nuclear Safety Review Missions

DEPARTMENT OF TECHNICAL CO-OPERATION
Division for Europe, Latin America and West Asia

DEPARTMENT OF NUCLEAR SAFETY
Division of Nuclear Installation Safety

FOREWORD

by the

Director General

The IAEA International Regulatory Review Team (IRRT) programme assists Member States to enhance the organization and performance of their nuclear safety regulatory body. Such a regulatory body must work within the framework of its national legal system which in turn should ensure both the independence and the legal powers available to the regulatory body. Additionally the national administrative and legislative system should ensure that the regulatory body has sufficient funding and resources to carry out its functions of reviewing and assessing safety submissions; licensing or authorizing nuclear safety activities, establishing regulations and criteria; inspecting nuclear facilities and enforcing national legislation. The regulatory body should be resourced and staffed by capable and experienced people to a level commensurate with the national nuclear programme. IRRT missions focus on all these aspects in assessing the regulatory body's safety effectiveness. Comparisons with successful practices in other countries are made and ideas for improving safety are exchanged at the working level.

An IRRT mission is made only at the request of a Member State. It is not an inspection to determine compliance with national legislation, rather an objective review of nuclear regulatory practices with respect to international guidelines. The evaluation can complement national efforts by providing an independent, international assessment of work processes that may identify areas for improvement. Through the IRRT programme, the IAEA facilitates the exchange of knowledge and experience between international experts and regulatory body personnel. Such advice and assistance will enhance nuclear safety in all nuclear countries. An IRRT mission is also a good training ground for observers from newly formed regulatory bodies in developing countries who follow the evaluation process. This approach, based on voluntary co-operation, contributes to the attainment of international standards of excellence in nuclear safety at the regulatory body level.

Essential features of the work of the IRRT experts and their regulatory body counterparts are the comparisons of regulatory practices with international guidelines and best practices, and a joint search for areas where practices can be enhanced. The implementation of any recommendations or suggestions, after consideration by the regulatory body, is entirely voluntary.

The number of recommendations, suggestions and good practices is in no way a measure of the status of the regulatory body. Comparisons of such numbers between IRRT reports from different countries should not be attempted.

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SUMMARY

At the request of the Hungarian Government authorities, in May – June 2000 an IAEA (International Atomic Energy Agency) team of eight experts visited the Hungarian Atomic Energy Authority (HAEA) to conduct an International Regulatory Review Team (IRRT) mission. The purpose of the mission was to review the effectiveness of the HAEA-Nuclear Safety Directorate (NSD) as the regulatory body of Hungary and to exchange information and experience in the regulation of nuclear, radioactive waste and radiation safety.

The IRRT mission in 2000 realized that the HAEA-NSD is a highly competent organisation, which has the technical capability to deal with the regulatory and technical areas for which it is responsible and that there were a number of initiatives in progress or planned to improve its effectiveness. The mission also identified several items as priorities having the most significant positive effect on the future performance of the Hungarian regulatory body. These items included improvements in the legal basis and overall independence of the regulatory body, further steps towards effective co-ordination of activities among all the authorities involved in the oversight of nuclear facilities, preparation for and performing inspections and training of site inspectors, and implementation of all assigned responsibilities in the area of radioactive waste management, decommissioning and radiation protection (RP).

In compliance with the established IRRT guidelines, the Hungarian Government in 2001 invited a follow-up IRRT mission with the main objective to review progress in implementing improvements resulting from IRRT mission recommendations and suggestions and to provide further reviews in areas where significant changes have occurred since the mission. A team of four experts, one observer and the IAEA team leader visited the HAEA from 9 to 18 February 2003. The mission was asked to review the same areas as in 2000. It is the view of the team members that NSD has addressed the recommendations and suggestions from 2000 and significant progress has been made in most of the areas. The achievements include steps towards better legislative arrangements, strengthening regulatory independence, development of regulations and guidelines, introducing personnel training programmes, preparation and performance of team inspections, establishment of enforcement policy, extension of emergency response rights and capabilities including better co-ordination with co-authorities, and introducing an internal quality management system in accordance with recently obtained ISO (International Organization for Standardization) 9001:2000 certificate.

The mission also identified several areas where the existing momentum should be maintained to improve further the effectiveness of the regulatory body. These areas include mainly coordination in regulatory responsibilities with co-authorities and effective separation of promotional and supervising functions of the HAEA. New recommendations and suggestions are made to an organization, which is seeking to improve its performance, and many of them are related to areas in which the HAEA has already implemented a programme for change. Similarly as in 2000, the follow-up mission identified a number of good practices, which have been recorded for the benefit of other nuclear regulatory bodies. Examples of good practices included an integrated electronic office system well accepted and adopted by the staff, the development of extensive safety performance indicators for nuclear power plant (NPP) and implementation of a Quality Management (QA) system.

The HAEA-NSD staff put considerable effort in the preparation of the mission. During the review there was full cooperation and openness during technical discussions with the HAEA-NSD personnel and the organization and administrative support was very good. The HAEA-NSD counterparts were enthusiastic and interested in obtaining international advice, and team members appreciated the opportunity to identify lessons for their own organizations from the HAEA-NSD practices.

INTRODUCTION

At the request of the Hungarian Government authorities, an IAEA team visited the Hungarian Atomic Energy Authority (HAEA) to conduct a Follow-up International Regulatory Review Team (IRRT) mission. The purpose of the mission was to review the progress towards improvement of effectiveness of the regulatory body of Hungary in the response to the previous 2000 IRRT mission recommendations and suggestions, and to exchange information and experience in the regulation of nuclear, radiation, and radioactive waste safety in the specific predetermined areas. As in 2000 these areas included: legislative and governmental responsibilities; authority, responsibilities and functions of the regulatory body; organization of the regulatory body; authorization process; review and assessment; inspection and enforcement; development of regulations and guides; emergency preparedness; radioactive waste management in nuclear facilities and decommissioning of nuclear facilities; and technical radiation protection in nuclear facilities. At the request of the HAEA, radioactive waste management, decommissioning, radiation protection, and emergency preparedness were reviewed only to the extent, within the responsibility of the HAEA-NSD.

The follow-up mission was conducted by a team of four international experts, one observer and the IAEA team leader from 9 to 18 February 2003. Before taking part in the mission the experts reviewed the Advanced Reference Material provided by the HAEA-NSD. The material included both descriptive material and a table summarizing the response of the HAEA-NSD to the set of recommendations and suggestions made in the report of the previous IRRT mission. During the mission, the HAEA-NSD made available to the team a number of additional documents. The IAEA team completed a systematic review of the predetermined areas using study of available documents, interviews with staff and direct observation of working practices.

Most of the IRRT activities took place at the new HAEA headquarters in Budapest. During the mission three members of the team visited the Paks NPP to observe inspection practices and regulatory participation in site emergencies. Members of the team visiting the Paks NPP spent also time with the managers of the NPP and discussed issues related to interfaces between the regulatory body and the operator. There was also a visit to the Centre for Emergency Response, Training and Analysis (CERTA) at the HAEA headquarters.

The scope of the mission was focused primarily on the responsibilities of the NSD of the HAEA. However, responsibilities of the HAEA directly related to the NSD (Nuclear Safety Directorate) activities were also addressed.

The results of the Follow-up IRRT mission are described in this report. The report follows the structure of the 2000 IRRT mission report. There is one section of the report devoted to each of the review areas. For each of the subsections of the previous report, where either recommendations or suggestions were made, the present report contains the brief summary of the situation in 2000, a copy of recommendations and suggestions made in 2000, changes implemented by the HAEA-NSD since the previous mission, evaluation by the team of the progress and level of implementation, and formulation of new recommendations, suggestions or good practices, if appropriate. The complete list of the most important documents used for the review is given in Annex I. The synopsis of new recommendations, suggestions, and good practices is provided in Annex II. The composition of the Follow-up IRRT mission is given in Annex III.

1. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES

Expert: G. Giersch

1.1. PRINCIPAL LAWS OR OTHER LEGAL PROVISIONS

Since 1997 the peaceful use of nuclear energy in Hungary has been governed by the Act on Atomic Energy (AAE). The hierarchy of the legislative framework follows the lines of a pyramid. Governmental/ministerial decrees supplement the AAE regarding the implementation of the AAE requirements, and they are followed by legally binding Nuclear Safety Regulations. At the lowest level of the hierarchy, the Director General (DG) of the HAEA is entitled to issue Safety Guidelines in order to provide guidance how to comply with and how to implement the mandatory requirements of the regulations. Regulations have to be reviewed every five years and modified if necessary. The development of nuclear safety guidelines is an ongoing process, which follows technical progress and practice.

As a result of the previous IRRT mission in 2000 the experts noted that the Hungarian legal framework and governmental mechanisms generally meet the prerequisites for the nuclear safety and nuclear activities in Hungary. However, areas were identified where the legislative framework should be improved and/or amended.

Changes since the 2000 IRRT mission

Since completion of the previous IRRT mission, the HAEA has started, proposed and/or supported the following legislative initiatives:

- Modifications and/or amendments to the AAE that:

  - Determine annual supervisory fees to the HAEA payable by the Public Agency for Radioactive Waste Management (PURAM), since 15 February 2003;
  - Reallocate the authorities on the governmental and ministerial level to issue decrees with regard to the radiation monitoring systems in Hungary (already in force);
  - Dissolve the Hungarian Atomic Energy Commission (HAEC) by replacing it with a newly established Atomic Energy Co-ordinating Council, which is expected to be in force by middle of 2003;
  - Stipulate, that in the field of the peaceful uses of atomic energy, the HAEA is a central public administration organization having nationwide jurisdiction with autonomous tasks and regulatory authorities (RA), operating under the management of the Government and specify that its supervision is exercised by the minister appointed by the Prime Minister (expected to be in force by middle of 2003);
  - Stipulate the need for Parliament's preliminary approval before the initiation of a licensing process for a new nuclear facility, a radioactive waste disposal facility or the extension of a licensed reactor site with additional reactor units (expected to be in force by middle of 2003).

- Modifications and/or amendments to the Governmental Decree on the Procedures of the Hungarian Atomic Energy Authority in Nuclear Safety Regulatory Matters (Decree 108/1997 (VI. 25.)) dealing among others with:

  - The authorization procedures to transfer nuclear facilities from the operating to decommissioning phase (expected to be in force by middle of 2003).

- A periodic review and modifications to the Nuclear Safety Regulations (Attachments to Governmental Decree 108/1997 (VI. 25.) regulating:

  - The license transfer procedure in the case of changing license holder (expected to be in force by middle of 2003);
  - Procedures for lifetime extension of nuclear facilities (expected to be in force by middle of 2003);
  - In volume 6 ("Safety Regulations for the Spent Nuclear Fuel Interim Storage Facility") requirements related to interim spent fuel storage.

- Update and development of new Safety Guidelines; since the 2000 IRRT mission, 22 new guidelines and 8 updated versions have been issued.

The specific impact of the above mentioned changes on the progress in the response to 2000 IRRT mission recommendations and suggestions will be discussed further in the relevant Sections/Subsections of this report.

1.2. LEGAL DEFINITION AND POSITION OF THE REGULATORY BODY

The AAE specifies that licensing and inspections of nuclear facilities shall be under control of the HAEA for all stages of the facility lifetime. Since the promulgation of Governmental Decree 108/1997 (VI. 25.) the nuclear safety authority scope of responsibilities of the first instance have been executed by the NSD, a separate organizational unit within the HAEA.

Storages of radioactive wastes are not considered in Hungary as nuclear facilities, thus the role of the safety authority regarding storage of radioactive waste is not within the responsibility of the HAEA, but it rests with organizations subordinated to the Ministry of Health, Social and Family Affairs.

The fulfilment of the operator's obligations related to interim storage, final disposal of radioactive waste as well as the interim storage and final disposal of spent fuel and the decommissioning of nuclear facilities is legally considered a matter of national interest. The AAE stipulates that the responsibility for performing these obligations...*"shall be the responsibility of an organization designated by the government..."* In order to fulfil this legal requirement the DG of the HAEA established, with the authorization of the Government, the PURAM. In relation to the PURAM the DG is exercising the rights of a Founder of the PURAM. The Manager of the Central Nuclear Financial Fund is the HAEA in accordance with Hungarian law. The supervision of the Fund is exercised by the designated minister supervising the HAEA. At the same time, the DG of the HAEA administers the scope of responsibilities of the nuclear safety as the authority of second instance whereas NSD represents the authority of first instance.

In the 2000 IRRT report it was noted that several questions regarding PURAM still remain open. For example, the timing of, and the procedures for the transfer of ownership and related responsibilities with respect to the spent fuel from the NPP to the PURAM were not defined. The experts identified a general concern regarding the interpretation of the role/responsibility assigned to ministries, authorities and co-authorities in the authorization process.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The legislative framework regarding decommissioning, interim storage and final disposal of spent fuel and radioactive waste should be reviewed and amended to provide for continuity of responsibilities and for the recording of the transfer of responsibility when obligations are taken over from the present operators of the nuclear facilities to be carried out by the designated organization.

Suggestion: Strengthening of the legal support/advice for the regulatory authority should be considered as a priority assignment to provide for legal backing to the authority in making regulatory decisions within this complex legal framework.

Changes since the 2000 IRRT Mission

Due to the complexity of legal questions in connection with the nuclear safety regulatory regime and in response to the suggestion of the 2000 IRRT mission the HAEA recruited additional lawyers and established a new legal Section to provide independent legal expertise. As far as possible the HAEA-NSD is making efforts to fill gaps in the process of review/ drafting of modifications to nuclear safety regulations and to Governmental Decree 108/1997(VI.25.)

Findings

With regard to the process for the transfer of the licences due to changes in ownership and/or operating organizations of nuclear installations the HAEA has realized that the responsibilities/involvement of authorities and co-authorities in the licensing process needs to be clarified and formalized in more depth. In the past this issue was resolved as a practical matter on a case-by-case basis between the authorities involved. However, the lack of clarity and formality in these arrangements came into focus during the process of establishing PURAM's operating licence for the storage of spent fuel. It is felt both by the HAEA and the IRRT experts that the problem lies with the legal framework where there seems to be a lack of clarity with regard to the roles and responsibilities of authorities and co-authorities in the licensing process. Without clarity there is a possibility to introduce formal problems into the licensing process and the following recommendation is made to draw attention to this matter so that this can be addressed as a priority.

1.2.1. Recommendations and Suggestions

(1) **BASIS** –IAEA Safety Standards Series (SSS) GS-R-1 requires in Paragraph 4.2 that *"If the regulatory body consists of more than one authority, effective arrangements shall be*

made to ensure that regulatory responsibilities and functions are clearly defined and co-ordinated, in order to avoid any omissions or unnecessary duplication".

a) **Recommendation: The roles and responsibilities of all parties/authorities involved in the Hungarian nuclear regulatory process should be clarified and formalized in more depth. Additional administrative and/or legal actions seem to be necessary in order to consolidate the relationship of parties concerned.**

1.3. INDEPENDENCE OF THE REGULATORY BODY

In its final report, the 2000 IRRT noted that the HAEC appears in a prominent position regarding the execution of the governmental tasks as stipulated in the AAE. According to the AAE *"the Government shall exercise supervision over HAEA through the President of HAEC"(*currently the Minister of Economy and Transport). Although Decree 87/1997 stipulates that *"Government supervision of HAEA shall be exercised by an appointed member of the Government independent of his responsibility toward his ministry"*, it was difficult for the experts to conclude that the regulatory body of Hungary is *"effectively independent from organizations or bodies charged with the promotion of nuclear technologies or responsible for facilities or activities".* This was in particular because the reporting line of the HAEA to the Government is through a commission that exercises activities of promotional as well as of regulatory nature. The experts also raised concerns with respect to the dual role of the Director General of the HAEA representing the second instance for all appeals concerning the regulation of nuclear facilities and activities and exercising at the same time the duties of the Founder of the PURAM as well as the functions of the head of the HAEA managing the Central Nuclear Financial Fund.

It was concluded that the specific role of the Director General of the HAEA in the management of the Central Nuclear Financial Fund might conflict with his responsibility for regulating safety.

<u>Recommendations and Suggestions from the 2000 IRRT Report</u>

Recommendation: The reporting line of the HAEA should be channelled through persons, bodies or organizations that are not directly or indirectly charged with the promotion of nuclear energy. The same provisions should be applied regarding the Government supervision of its activities through the HAEC.

Recommendation: The HAEA should not be involved in the establishing of any organization or body financing and operating facilities or performing activities in the field of the use of atomic energy. At present, it applies to the establishing of PURAM and the managing function of the Central Nuclear Financial Fund.

<u>Changes since the 2000 IRRT Mission</u>

To further strengthen the independence of the regulatory body an amendment to the AAE was decided. According to the draft the HAEC is supposed to be dissolved and be replaced by the Atomic Energy Co-ordination Council. The present functions of the HAEC will be distributed between the HAEA and the new Council.

The Atomic Energy Co-ordination Council among others shall:

- Co-ordinate the activities related to safety in the application of atomic energy, nuclear safety and radiation protection issues being assigned under the AAE to several ministries, the HAEA and other central public administrative organizations;

- Monitor the enforcement of legal regulations related to the application of atomic energy and the implementation of regulatory authorizations.

Regarding the position of the HAEA it is clearly stipulated that:

- The HAEA is a central public administration organization having nationwide jurisdiction with autonomous tasks and regulatory authorities, operating under the management of the Government;

- Its supervision is exercised by the minister appointed by the Prime Minister;

- In its legally defined tasks the HAEA cannot be directed, its decisions cannot be altered or modified by its supervisory bodies.

The HAEA is a state budget organisation; its budget is identified separately within the overall budget of the ministry, the head of which is supervising the HAEA. Incoming fees of the HAEA are used – with exception of incomes stemming from fines – to cover its operation. These incomes cannot be diverted for other purposes.

The Director General and his deputies are appointed and dismissed by the Prime Minister.

Findings

The above-mentioned draft amendments to the AAE were submitted to the parliament for final scrutiny. The promulgation is expected by the middle of 2003. The situation as described in the 2000 IRRT will be improved in a way that regarding the position of the HAEC it meets the internationally required independence of regulatory authorities as laid down in the IAEA Safety Standards Series. However, it is understood that the conflict of interest stemming from the position of the HAEA as the Manager of the Central Nuclear Financial Fund and of the DG of the HAEA as Founder of PURAM and representing the authority of the second instance as nuclear regulator is unresolved. An impact on independent regulatory decision-making in this regard cannot be excluded.

1.3.1. Recommendations and Suggestions

(1) **BASIS** - SSS GS-R-1 stipulates:

> In paragraph 2.2. (2) "A *regulatory body shall be established and maintained which shall be effectively independent from organizations or bodies charged with the promotion of nuclear technologies or responsible for facilities or activities*".

In paragraph 2.2. (5) *"No other responsibility shall be assigned to the regulatory body which may jeopardize or conflict with its responsibility for regulating safety".*

In paragraph 4.1. it reads:
"The regulatory body's reporting line in the governmental infrastructure shall ensure effective independence from organizations or bodies charged with the promotion of nuclear or radiation technologies, or those responsible for facilities or activities".

a) **Recommendation: In order to achieve comprehensive independence of the HAEA a governmental action is necessary to transfer the responsibilities/rights of the DG of the HAEA as the Founder of PURAM as well as the HAEA as Manager of the Central Nuclear Financial Fund to another governmental body.**

1.4. BUDGET AND FINANCIAL RESOURCES OF THE REGULATORY BODY

In order to ensure normal operation of the HAEA the AAE provides two financial resources for its annual budget:

- A specific amount of HAEA's budget is covered from the general state budget; and
- Revenues from licensee fees are obliged to pay for regulatory activities as specified in the AAE.

The 2000 IRRT mission noted that the HAEA was proposing an increase of its 2001 budget corresponding to new activities in the field of waste treatment (mainly in connection with the PURAM), off-site emergency preparedness, preparation to EU (European Union) accession, revision of regulation and guidelines. At the same time according to national policies of reducing staff in state offices, the HAEA envisaged a decrease of existing staff. Having in mind the recently assigned activities, the experts questioned the effective fulfilment of regulatory obligations through the HAEA under the expected resource restrictions.

Recommendations and Suggestions from the 2000 IRRT Report

Suggestion: Policies of the Government that could conflict with the assigned responsibilities of the regulatory body should not be applied to the regulatory body; thus general decisions of reducing staff of public offices or level of taxes or fees recovered on activities or facilities should only be applied to the nuclear, radiation, radioactive waste or transport safety regulatory body if they do not jeopardize its efficiency and effectiveness.

Suggestion: The Act on Atomic Energy should be modified so that regular increase of the level of fees can be decided by other legal procedure, for example the yearly Act for Finance determining the state budget of Hungary**.**

Changes since the 2000 IRRT Mission

Fee incomes based on the nominal thermal capacity (MWth) of nuclear power plants and research reactors (146, 992 Ft /MWth/year) as described by the 2000 IRRT mission were meanwhile increased through amendments to the AAE by stipulating an increase of the

accounting basis up to 176,390 Ft/MWth/year and claiming also an annual fee in the case of the interim spent fuel storage at the PURAM (75,000 Ft times number of fuel bundles stored at the end of the preceding year).

Findings

The discussions with counterparts revealed that the increase in the fees recovered has helped offset HAEA's concerns over the budgetary situation. It is understood that the available budget is sufficient to carry out routine regulatory duties and to respond to emergent problems, or events as they occur. The issue of human resources will be dealt within Section 3 of this report.

1.4.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

2. AUTHORITY, RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY

Expert: G. Giersch

2.1. CO-ORDINATION BETWEEN AUTHORITIES

The HAEA as a central public administration organization acts as a nuclear regulatory body under the supervision of the Hungarian Government. Authorities, responsibilities and functions regarding nuclear safety are entrusted to the HAEA through the promulgation of the AAE along with the Governmental Decree 87/1997.

The scope of responsibilities of the HAEA in the fields of nuclear safety and technical radiation protection are limited to nuclear facilities and connected activities. During the 2000 IRRT mission the HAEA responsibilities comprised in particular:

- Nuclear safety licensing required for the siting, construction, enlargement, commissioning, operation, modification, putting out of operation, decommissioning of nuclear facilities (on facility level, system level and component level);
- Nuclear safety inspection of nuclear facilities;
- Licensing and control of structures connected to nuclear facilities (i.e. civil works and constructions);
- Licensing and inspection of technical radiation protection;
- Monitoring of the QA system (of the operating organization and its suppliers) or having such systems inspected by an institution designated by the HAEA;
- Regulatory supervision of on-site Emergency Preparedness and analysis and decisions support with respect to Emergency Response.

The regulatory control of non nuclear activities such as the use of radioactive sources or generating of ionising radiation, or waste disposal facilities (not classified as a nuclear facility, see Section 1.2.) and the supervision of the radiation protection service of the nuclear facilities, the protection of the workers and the general public from ionizing radiations fall under the scope of responsibility of the Minister of Health, Social and Family Affairs.

In addition, five other Ministers exercise responsibilities in the Hungarian nuclear regulatory regime. By law the Ministers have to enforce their responsibilities through designated authorities, which shall act as co-authorities for both, the HAEA and organizations subordinate to the Minister of Health, Social and Family Affairs.

The report of the 2000 IRRT mission noted that at the time of the mission a regulated designation of a co-authority through the minister responsible for environment was pending. The bilateral relationship between the Ministry of Health and the HAEA was considered as not being enough consolidated, mainly because of incomplete regulation on the side of the Minister of Health - both bodies have regulatory responsibilities in the field of nuclear, radiation, radioactive waste and transport safety.

It was further noted that the HAEC did not effectively co-ordinate activities related to the safe application of atomic energy which fall within the scope of the authority of the ministries, the HAEA and other central public administration organizations as prescribed in the AAE.

As a consequence of this situation, the operating organization in contrast to the HAEA considered some co-authorities not to be involved in certain licensing processes. In addition, the list of the *"pressure vessels and piping which contain or can be contaminated by radioactive materials"* (section 21 (4) of Decree 108/1997) was not complete. As a result this part, pending classification, was not controlled by any authority at all and remained only under the supervision of the utility.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The legal and governmental infrastructure of Hungary with distributed regulatory responsibilities, involving up to nine authorities, should be more thoroughly co-ordinated in order to avoid any omission or overlap and to provide for effective co-operation between those authorities.

Suggestion: In case of difficulties occurring in the co-operation with other authorities, the HAEA should appeal to the governmental level co-ordination; in the present situation the HAEC has that governmental level co-ordination responsibility**.**

Changes since the 2000 IRRT Mission

A decree of the Minister of Health regulating comprehensively among others the radiation protection of workers and general public, radiation protection services within the organization of nuclear facilities was issued and entered into force in summer 2000.

A decree of the Minister of Environment identifying his co-authority organization regarding nuclear safety procedures entered into force in summer 2001. Still some procedural questions remained open and have to be resolved.

Co-ordination between regulatory co-authorities and NSD is carried out in an informal forum of state authorities responsible for nuclear energy that is supposed to convene at the beginning of each year, however the 2002 meeting was postponed and the 2003 session is pending.

Urgent information exchange and co-ordination is mainly achieved through bilateral relationships/arrangements between NSD and co-authorities concerned. These inter-office activities resulted in the following achievements:

- A written co-operation agreement on radiation protection issues between the local health co-authority has been prepared and its approval is expected shortly;

- A working group on the regulation of safety zones around the nuclear facility has been initiated by NSD in 2002 with the participation of interested institutions;

- Written agreements were signed with the heads of civil construction authorities with respect to the distribution of responsibilities in this field for all nuclear facilities;

- Frequent discussions were held between representatives of the local environment authority and NSD regarding necessary co-authority contributions to each others licensing commitments. Since December 2002 NPP environmental impact study draft requirements are under negotiation among others with the involvement of NSD;

- The HAEA-NSD has taken actions to include an annex in the Governmental Decree 108/1997 (VI.25) clarifying the required contributions from the responsible co-authorities in the licensing processes.

As already discussed in Section 1.3. a draft amendment of the AAE, which is supposed to enter in force by middle of 2003 dissolves the HAEC and establishes The Atomic Energy Co-ordination Council. Its main task shall be the co-ordination of nuclear safety activities related to the application of atomic energy and nuclear safety and radiation protection issues being assigned under the AAE to ministries, the HAEA and other central public administrative organizations.

Findings

Progress has been made concerning co-operation and information exchange mainly on the basis bilateral arrangements between NSD, co-authorities and parties being committed in the regulatory process. It is understood that the establishment of the Atomic Energy Co-ordination Council by middle of 2003 provides for a comprehensive, effective co-ordination of all parties being involved or having responsibilities in the nuclear regulatory process in Hungary.

2.1.1. Recommendations and Suggestions

See recommendation 1.2.1. of this report.

3. ORGANIZATION OF THE REGULATORY BODY

Expert: G. Giersch

3.1. ORGANIZATIONAL STRUCTURE

In its final report the 2000 IRRT noted that the Nuclear Safety Directorate of the HAEA as the nuclear authority in the first instance in Hungary reflects the main regulatory obligations i.e. licensing, inspection and assessment. The HAEA-NSD met these obligations through three departments (Department for Licensing, Department for Inspection, Department of Technical Support). Each department was subdivided in divisions with specific duties (Licensing of Facilities, System Licensing, I&C (Instrumentation and Control), Operational Inspection, Construction & Maintenance Inspection, Analysis, Centre for Emergency Response Training and Analysis).

Changes resulting from a HAEA-NSD self-assessment were planned and due for implementation. The organizational structure of the HAEA, in force at the time of the 2000 IRRT mission is reflected in Fig. 1.

As part of a Medium Term Strategic Plan the HAEA decided to implement a QM system to be established based on the requirements of ISO 9001:2000 along with a certification through an accredited outside organization. Among others the HAEA expected from the implementation:

- To improve confidence of its stakeholders with respect to HAEA's activities;
- To meet best its strategic goals;
- To improve the transparency of its processes; and
- To strive for continuous improvement.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The HAEA should proceed to improve its internal QA system with high priority. Quality management in regulatory bodies is a prerequisite to increase its effectiveness and an essential contribution to an integral approach facing the new regulatory challenges.

Changes since the 2000 IRRT Mission

The HAEA was in the process of defining and developing its Quality Management (QM) system. The ISO 9001: 2000 standard was adapted to the activities of the HAEA, whose processes were defined and categorised as service (basic), management and support processes. The regulating documentation (Quality Policy, Quality Manual, procedures etc.) have been elaborated, introduced and maintained as necessary. The certificate was granted in January 2003.

Along with the implementation activities of the new QM system an internal review of functions and the scope of HAEA's activities were performed anticipating that the structure of

the HAEA should reflect the basic regulatory processes that overlaps in the scope of responsibilities of the organizational units should be avoided, the regulatory assessment function should be strengthened and emerging new regulatory challenges should receive adequate organizational resources. As a result the Division for Analysis was transferred from NSD to the Section of Informatics, which reports directly to the DG.

A position of a Senior Advisor to the DDG (Deputy Director General) of NSD was recently created. He reports directly to the DDG and performs among others co-ordination functions and contributes to the Department of Inspection in investigating events occurring under NSD responsibilities. He also performs co-ordination functions and contributes to the Department of Licensing and to the Department of Technical Support. Similarly a new Section of Strategic Affairs was introduced reporting directly to the DDG-NSD and performs among others preparation and co-ordination of regular reviews of the nuclear safety regulations and guides, liaison to and co-ordination with the other HAEA divisions, co-ordination of affairs in context with other co-authorities. The old Division for QA was dissolved in view of the appointment of a QA manager in the Secretariat of the DG.

The former divisions of the Department of Licensing were reorganized and converted into three sections (Power Reactors, Small Reactors and Storage Facilities and Equipment of Nuclear Installations). In the Department of Inspection the former Division of Operational Inspections as well as the Division for Construction & Maintenance Inspection were merged into a Site Inspection Office. In addition, a new Section of the Assessment of Operational Safety was recently introduced. Among others it takes part in the event investigation activities, records event investigation reports, collects data for and co-ordinates evaluation activities of safety performance indicators, co-ordinates the regular comprehensive inspection programs and assesses the annual safety performance of all Hungarian nuclear facilities.

Finally the Department of Technical Support was also reorganized. Organizational activities related to the formulation, performing, evaluation, and acceptance of the R&D (Research and Development) work is the responsibility of its Section of Research, Development and Education along with the organization of training courses and seminars. The CERTA has been integrated in the Section of Emergency Response and Training Section. The new organizational structure is depicted in Fig. 2.

Findings

It can be concluded that no further major changes in the organisational structure are required in order to meet international standards. A formal QM programme has been implemented and certified. It is noted that HAEA Quality Management System is an evolving process including self-evaluations and continuous audits by the certification organization. It is understood that the HAEA staff adopted and accepted the QM system as an effective tool to provide improved transparency in HAEA's working processes and that it is designed to continuously improve the work in the authority. The introduction of a computerized "Integrated Office System" is considered as an effective tool for executing the QM system.

3.1.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

3.1.2. Good Practices

(1) **BASIS** – GS-G-1.2 "Review and Assessment of Nuclear Facilities by the Regulatory Body" in paragraph 4.2. states that *"The regulatory body should have a system to audit, review and monitor all aspects of its review and assessment process so as to ensure that it is being carried out in a suitable and efficient manner and that any changes to the process necessitated by advances in knowledge or improvements in methods or for similar reasons are implemented."*

a) Good Practice: The implementation of a Quality Management system by NSD across all its regulatory activities is recognised as an important achievement in improving its regulatory effectiveness.

3.2. STAFFING AND TRAINING

At the time of the 2000 IRRT mission the HAEA-NSD employed thirty-eight professional staff. The qualification requirements for professional staff assigned to nuclear safety matters are specified in Governmental Decree 9/1995. (II.3). Further professional skills were specified in the Training Procedures of the HAEA-NSD for current staff as well as for newly hired people. The need for a comprehensive policy on staff training and re-qualification of personnel had been identified by the HAEA-NSD along with a new training programme. The major input to this training programme stemmed from a staff survey in which employees were asked to indicate their needs for further training. In view of the new tasks and responsibilities that had been assigned to the HAEA-NSD at the time of the 2000 IRRT the mission concluded that some increase of staff will be necessary for effective execution of the new tasks and challenges.

<u>Recommendations and Suggestions from the 2000 IRRT Report</u>

Recommendation: A review of the resources including staffing of the HAEA-NSD should be performed, taking into account the new tasks and responsibilities being assigned to the HAEA-NSD and future regulatory challenges.

Suggestion: The need for reviews of resource allocation should be performed periodically keeping in mind that regulating and supervising the use of nuclear energy effectively is an evolutionary process rather than a static one. The periodic review should also consider potential needs of salary adjustments. Incomes of regulatory staff should be comparable for the equivalent positions of counterparts within the nuclear industry.

<u>Changes since the 2000 IRRT Mission</u>

An internal performance evaluation system was introduced in 2002 with the objective to assess performance of all technical staff and to identify human resource deficiencies. At the beginning of each year the allocation of duties are determined. The performance is evaluated individually at the end of each year. An internal performance indicator system identifies performance, efficiency, and effectiveness of organizational units and/or functions. In combination with a computerized time accounting system, broken down to 20 staff activities and being applied on the level of individuals, units, sections and departments, it is possible to

identify needed effort for specific activities to optimize resource allocation, to track human resource development and elaborate justified needs for new staff recruitments.

Findings

A study of the functions of NSD has been performed to monitor regulatory activities and to reveal links within NSD and connections to supplementary functions of the HAEA as a whole. Completeness and distribution of regulatory tasks and responsibilities among departments have been reconsidered and necessary human resources have been reallocated. Currently the HAEA-NSD employs 44 professional staff, 36 of which are experts holding a higher education degree (university or college). It is the understanding that based on the survey and the reallocation of staff currently there is no urgent need for an increase in human resources in the HAEA-NSD to perform its regulatory responsibilities effectively.

An assessment of the corporate knowledge profile has been carried out and an internal knowledge matrix developed in order to determine gaps of competencies needed. Based on this gap analysis individual training and retraining programmes were developed to provide for a sustainable training approach.

3.2.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

3.3. ADVISORY BODIES TO THE HUNGARIAN ATOMIC ENERGY AUTHORITY

The format, content and time scales of information and documentation exchange between the operator and the regulator necessary for the licensing and supervision process is specified in safety codes and guides. Besides this exchange of information, annual meetings are convened between the HAEA-NSD management and the senior management of the operator. In the 2000 IRRT report it was mentioned that no representative of the licence holder (Corporate Level) attends these meetings. The NPP is mainly represented by the General Manager, Heads of Directorates (operation, technical affairs, maintenance, safety) and Department Heads of the Directorate for Safety. The HAEA-NSD is represented by the DDG and all managers of the NSD's departments. Besides a general exchange of experience, subject areas on the agenda include review of safety performance, reassessment of events with the emphasis on identifying any tendency, effectiveness and efficiency of co-operation.

Recommendations and Suggestions from the 2000 IRRT Report

Suggestion: Matters of improved safety should be considered as an ongoing commitment. The HAEA-NSD should therefore consider the involvement of a representative of the Corporate Level particularly if matters of safety culture are an agenda item at the annual meetings between NPP and Regulatory Body. The same principles should also be applied for other nuclear installation.

Changes since the 2000 IRRT Mission

The HAEA-NSD decided to hold regular meetings with the minor licensees also in addition to already established meetings with the NPP top management, and the NPP Safety Department. The top-level management of the research reactor licensees, the KFKI AEKI research institute and the Budapest University of Technology and Economics (TUB), are invited to these meetings. For the meetings that NSD had with the operating organizations since the IRRT mission in 2000, several topics have been discussed in detail, often with unplanned spontaneity, about the human factors and human behaviour. The Enforcement Policy and the related in-house procedure also state that while discussing the safety culture and enforcement aspects of human activities, the focus should always be the organization rather than the individual.

Based on discussions with licensee department heads during the mission, they considered the current level and extent of interactions with the HAEA appropriate. These include annual assessment meetings, pre-outage meetings, entrance and exit meetings for inspections with senior plant management attending the annual meeting. They further indicated that integrated team inspections described in section 6 provide useful feedback that they put in their corrective action program. They also indicated that the number of licensing actions that require more than the 30-day limit for approval is high, because of the unnecessarily low threshold for approval of all safety class 1 and 2 modifications. However, they did indicate that high priority modifications needed to support outages get approved on time. They also expressed concerns about the HAEA control of the number of NPP staff through the FSAR (Final Safety Analysis Report) revision process. Finally, they indicated that there is some disagreement about the current state of the site safety culture from the most recent HAEA assessment of needing improvement described in section 6. While they acknowledged that their corrective action backlog is high, safety culture surveys that they have conducted since the mid-1990s and the small number of safety concerns raised by their staff would argue against the need for significant improvements in safety culture.

Findings

The HAEA has made progress in involving senior utility management in meetings that discuss safety culture matters. The utility has not yet responded to the need for corrective actions in the area of safety commitment performance indicators because of recent management and organization changes. However, the HAEA-NSD expects comments on the new performance indicator process and an action plan to address the need for corrective actions in the area of safety commitment.

3.3.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

4. AUTHORIZATION PROCESS

Expert: P. Hughes

The authorization, or licensing process is usually initiated by the licensee when an application for a licence is made. The licensing process is governed by a Guide (1.13 Processing of Applications for Authorizations) and an NSD procedure (ME-3-1-1) and is generally led by the Department for Licensing (DL) of NSD. The head of department assigns the application to the appropriate section, sets the timescale for completion and identifies the units that will take part in the review and assessment. The head of section assigns an officer to the application to manage the execution of the authorization procedure, to co-ordinate the review and assessment and to prepare the draft decision (resolution) document. At the time of issuing the resolution NSD can set conditions or limitations on the operator's subsequent activities.

4.1. LEGAL BACKGROUND OF THE AUTHORIZATION PROCESS

The general rules for the issue of licenses are set out in Act IV of 1957 on the "General Rules of State Administration" (Ae). Specific rules associated with atomic energy arise in Act CXVI of 1996 on Atomic Energy (AAE) and 108/1997 (VI.25) Korm. Governmental Decree and its Appendices (i.e. Nuclear Safety Regulations).

In the case of nuclear facilities, other laws and other co-authorities are involved. It is the duty of the licensee to verify that all the applicable laws are satisfied and to obtain the separate authorizations that are needed from these co-authorities, before introducing an application for authorization to NSD. Similarly, NSD has a duty at the start of the licensing procedure to verify that the application meets all the legal requirements.

Under the General Rules (Ae) the regulatory decision (resolution) has to be delivered within 30 days from the submission of the application, with a possible extension of another 30 days. The AAE allows for a period of 6 months in case that the application concerns siting, construction, enlargement, commissioning, operation, modification, putting out of operation and decommissioning of nuclear facilities.

<u>Recommendations and Suggestions from the 2000 IRRT Report</u>

Recommendation: The time period in which the resolutions of the HAEA-NSD are to be delivered should not be constrained to avoid compromising the regulatory body's responsibility.

Suggestion: The HAEA-NSD should agree with applicants on timescales for the submission of documentation in advance of a formal licence application to provide flexibility in their licensing, review and assessment activities. The Act on Atomic Energy should be revised accordingly.

Changes since the 2000 IRRT Mission

Since the IRRT in 2000 the authorization process has not changed. NSD has considered the recommendation of the IRRT team but has indicated that the recommendation contradicts the general principles identified in the General Rules (Ae). In addition, NSD has reported to the IRRT team that the Hungarian Constitutional Court has ruled that having a time limit is an important and necessary constitutional guarantee.

NSD also reported that the Government is reviewing the situation with regard to the scope of the General Rules and to shorten the time taken for civil administrations to respond.

Findings

It is now understood that NSD will not be able to implement the recommendation as stated as it would mean NSD attempting to introduce a modification to the AAE that would go against the constitutional guarantees provided within the Hungarian legislative system.

Bearing this situation in mind the IRRT discussed the NSD licensing process in greater detail to better understand NSD's approach. The main concern the IRRT team had in 2000 was that the 30-day rule could potentially restrict the time available for NSD's assessment, particularly where the application related to a complex change.

NSD counterparts explained that for an application that involves complex changes NSD's approach is to hold a preliminary discussion with the licensee. The result of this meeting is a licensing plan in which NSD specifies the number, type and stages of licences that will be issued and the necessary packages of submissions that the licensee will need to provide. In this way NSD divides a complex licensing application into discrete steps that build up to a final licensing decision. To meet the legal requirement of the General Rules, a "decision in principle" can be issued, which is conditional on the licensee meeting at the detailed specified steps and conditions. This approach allows NSD to assign sufficient time to the review and assessment activities so that due attention can be given to complex applications.

On this basis the IRRT concluded that the recommendation and the suggestion could be closed. However, as the Government is reviewing the General Rules the IRRT thought it necessary to re-emphasize the international guidance in this area, which seeks to ensure that regulatory reviews are unfettered.

4.1.1. Recommendations and Suggestions

(1) **BASIS**: GS-G-1.2 "Review and Assessment of Nuclear Facilities by the Regulatory Body" in paragraph 2.6. states that *"...The regulatory body should expend its best efforts to complete its review and assessment process in accordance with the agreed schedule, but this objective should in no way compromise the regulatory body's responsibilities."*

a) Suggestion: NSD should continue in its discussions with Government to preserve the situation with regard to the current time limits associated with licence applications.

4.2. TYPES AND STAGES OF AUTHORIZATION

The AAE Section 7(2) requires that a parliamentary "approval in principle" is needed to "initiate activities" of preparing for the establishment of a new nuclear facility etc. The Act does not make it clear what "initiate activities" meant in practice. As other authorities, involved in the licensing may start their process at different times it was unclear to the IRRT at what point NSD should become involved in the authorization process in the absence of a parliamentary "approval in principle".

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The Act on Atomic Energy or related legislative documents should be revised to make clear what is meant by *"initiate activities"*.

Changes since the 2000 IRRT Mission

NSD have reported that rather than make a direct amendment to the AAE it is intended that an amendment will be made indirectly through provisions in a draft Act on Natural Gas Supply. Currently this draft Act is undergoing Cabinet approval and is expected to be laid before Parliament in early 2003.

Findings

The text of the proposed amendment makes clear which activities need Parliamentary approval in principle. The IRRT concluded that the recommendation had been fulfilled and could be closed.

4.2.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

5. REVIEW AND ASSESSMENT

Expert: P. Hughes

The HAEA-NSD conducts review and assessment of plant modifications, safety analysis and Periodic Safety Reviews (PSR). In addition, information is gathered from the plant to analyse the cause of events.

5.1. ORGANISATION OF THE REVIEW AND ASSESSMENT

In 2000 the IRRT identified that the review and assessment was performed by a well defined process, developed by the HAEA-NSD in accordance with the applicable administrative and nuclear laws, decrees, regulations and guidelines. The project management of the review and assessment activities also followed clearly defined procedures and NSD made use of an integrated electronic office system from the receipt of documents from the NPP, through notification of the appropriate inspectors to the final review and issue of resolutions. While many original documents were on paper, many of the internal transactions had started to be managed electronically using Lotus Notes.

The HAEA-NSD was found to apply appropriate engineering judgement in their review and assessment activities. In a number of technical areas an excellent or good level of competence had been achieved, while in a few areas the need for further development was identified.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The HAEA-NSD should further develop its competencies for specifying the scope and depth of the independent review of safety analysis to be carried out by the Technical Support Organizations (such as criteria for sensitivity studies, evaluation of safety margins).

Recommendation: The HAEA-NSD should develop further its in-house competencies for the assessment and understanding of thermohydraulic safety cases.

Suggestion: The HAEA-NSD should make better use of the event analysis in defining their basic inspection plan.

Changes since the 2000 IRRT Mission

NSD has built on the well-defined and organized approaches it had when the IRRT mission was held in 2000. It retains the high technical skill base and has initiated work to fill the few gaps it had in its competencies. The restructuring of NSD (completed in 2000) has led to further integration of the review and assessment work with inspection, such that review and assessment topics routinely lead inspection activities in the Integrated Team Inspections. Large review and assessment activities such as the PSR are assessed on a team basis, drawing

together the technical skills throughout NSD under the lead of an officer assigned by the licensing department.

The Lotus Notes Document Administration System has been further developed and its use extended to cover most aspects of NSD's activities. While a paper based file is retained for legal purposes to record regulatory decisions, all significant activities are carried out electronically. Documents received from the licensee are registered in the DDG's office and are then forwarded as a "case" to the relevant divisions. At any time it is possible to track where documents are and what actions are needed by the holders. All activities associated with licensing and review and assessment are controlled in this way. Event data that was collected and stored in MS (Microsoft) Access has now been migrated to Notes, and for each event a case history is available recording the investigations, evaluation and follow-up action taken. All guidance material both internal and external is readily available through the system. NSD is now benefiting from the use of this software tool through reducing administration and a greater integration in the way of working.

Findings

The IRRT in 2000 recommended that NSD develop its competencies in the specification of independent analysis work and in its competencies to review thermohydraulic analyses.

In addressing the first recommendation NSD has developed a record of in-house competencies in a qualifications and skills matrix for its entire staff. This matrix is used by the Department of Technical Support through internal procedure ME-0-0-48 to identify and assign experts to specify the scope of external work carried out for NSD. A separate procedure has been developed to guide the assigned expert in the specification of the scope and depth of the external work. In addition, to exercising greater control NSD has taken over the administration of its TSO (Technical Support Organization) contracts (previously administered by the General Safety Directorate).

With regard to the second recommendation NSD has substantially completed the development of its baseline competency in thermohydraulic analysis. NSD has acquired the APROS (Advance Process Simulator) plant analyser and staff have completed training associated with its use. NSD has ordered, from the TUB, an APROS model of the Paks NPP. Further training is associated with the model. Training has also been completed on general thermohydraulic safety analysis and background training material has been ordered.

In the view of the IRRT substantial progress has been made by NSD to address the recommendations and they can be closed. Sustaining the appropriate level of competency in the necessary technical areas is an essential and continual activity for a regulatory body. NSD has recognised that competence in thermohydraulic analysis will need to be sustained through ongoing work experience and refresher training.

With regard to the suggestion made in this area the IRRT found that NSD though their re-organization had made a substantial change in emphasis in the use of the information gathered from operational events.

This emphasis is marked out by the creation of a section to assess operational safety. This section investigates events at the utility and evaluates what were the direct and root causes. Also while NSD retains its national INES (International Nuclear Event Scale) reporting

role, NSD has made the NPP responsible for rating an event. NSD then report to IAEA if appropriate and produce an evaluation of the NPP's rating.

In addition, the work that had been on-going in 2000 on NPP performance indicators has been further developed throughout 2001 and 2002 using IAEA-TECDOC-1141 as a guide. The specific indicators e.g. effect of an event on Technical Specifications, is evaluated using a weighting dependant on the significance of the event's direct or potential effect on safety. The numerical values are then used to grade the information so that in addition to straight quantities of events there is a qualitative value associated with the plant's performance and whether there may be underlying problems that relate to management commitment to safety (safety culture), operational availability (smooth operation) or safety performance issues. The results of event evaluations and the performance indicators, gathered from the utility and from NSD inspections are assessed and are factored into the inspection plan.

HAEA has established a project to define a set of internal performance indicators to cover all the work of NSD and GND (General Nuclear Directorate). These indicators are based on all regulatory activities and staff are assigned to collect the relevant information. A reporting system is being developed that will be used as a means of indicating regulatory effectiveness.

5.1.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

5.2.2. Good Practices

(1) **BASIS** – GS-G-1.4 "Documentation for Use in Regulating Nuclear Facilities" in paragraph 5.23 states that *" The document control system should be such as to ensure that regulatory staff are provided with up to date regulatory requirements and policies and are issued with the appropriate revisions of documents for use in their work. External documents that are products of the regulatory staff's work, such as regulations and guides or reports, should also be controlled and should be kept available."*

   a) **Good Practice: The use of software based integrated electronic office system is seen as offering significant benefits to NSD in improving its efficiency and in integrating its working arrangements.**

6. INSPECTIONS AND ENFORCEMENT

Expert: J. Linville

Observer: R. Ciucelis

6.1. ORGANIZATION OF THE HAEA INSPECTORATE

The objective of the inspection programme is to control and monitor the enforcement of legal regulations related to the application of atomic energy. The methods used to discharge the responsibilities are inspections, review and assessment.

The HAEA-NSD is responsible for nuclear safety inspections of nuclear facilities, including inspection of activities related to design, manufacture, installation, commissioning, operation, modification, repair, and decommissioning. HAEA-NSD is further responsible for monitoring the QA system, inspection of managing of radioactive materials and conduct of inspections at any user of atomic energy.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The HAEA-NSD should assess inspection resources in a manner that takes into the account the integrated nature of their inspection responsibilities. Specific attention to resource needs should address the development of personnel competencies and the use of other options such as the use of technically competent staff from other parts of the organization or contractors teamed with inspectors to meet short term needs.

Changes since the 2000 IRRT Mission

Based on a self-assessment, the HAEA-NSD moved the Operational Safety Assessment Division to the Department of Inspection. This was intended to more clearly define inspection activities and enhance teamwork.

A new inspection philosophy has been implemented. Inspection is a process of regulatory control, overview and assessment of activities performed according to the operating license and its conditions. In 2000 a new inspection method, called the integrated team inspection has been introduced. Over a four year period twelve functional areas such as management processes, procedures, QA, maintenance, radiation protection, safety analysis and radwaste are inspected with three team inspections per year. Teams typically cover four sub-areas with two inspectors per sub-area. Every department and every expert in the HAEA-NSD staff take part in the inspection activities consistent with their duties and proficiency in collecting information about licensed activities, assessment of operational safety performance and reporting the results of the assessment to the licensee and to the public.

The overall inspection function is managed by the head of the inspection department who is located in the HAEA-NSD headquarters in Budapest. His department consists of six site inspectors at Paks Nuclear Power Plant and a site supervisor. In addition, the assessment

section includes a supervisor and four inspectors in the headquarters offices. The inspection group has limited expertise in instrumentation and control, and electrical equipment. To compensate for this deficiency the inspection staff uses the electrical expertise in the licensing organization when necessary. To provide highly specialized expertise the inspection department has TSO arrangements with organizations such as the Atomic Energy Research Institute (KFKI-AEKI).

Findings

The HAEA-NSD has made exceptional progress in enhancing inspection resources and competencies.

6.1.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

6.2. TRAINING AND QUALIFICATION OF INSPECTION STAFF

The HAEA-NSD site inspectors are qualified in several of the engineering and scientific disciplines that are needed to provide an effective review and assessment function to support the manufacturing products, QA, outage maintenance, tests, fuel and the core safety issues involving NPPs and other nuclear and radioactive waste facilities. These individuals are well motivated and were observed to carry out their responsibilities professionally. However, there is limited operational experience among the HAEA-NSD inspectors. The HAEA-NSD has recently developed a comprehensive training programme to provide and maintain technical competence to support inspection needs.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The HAEA-NSD should implement the new training and development programme to improve the capabilities of the inspection staff and ensure that the personnel who perform inspections are appropriately trained and qualified in effective methods of inspection and integrated plant operations and maintain technical competence.

Suggestion: The HAEA-NSD should develop training profiles for each individual performing inspections, which records training experience and prescribes refresher and further training needs.

Changes since the 2000 IRRT Mission

The inspection staff has received additional training from the utility training programme. The new training programme also added training in QA, radiation protection, industrial safety, nuclear technology, and systems training on the nuclear facilities to name a few. In addition, there is more focused specialized training in areas such as PSA (Probabilistic Safety Assessment). Training methods include formal classroom training, training conducted by external experts, self-study, and on the job training depending on the topic. While this will not be required of the existing technical staff, they have been surveyed to identify areas currently

needing attention. Additional course work in operations including simulator training is planned for the future at Paks NPP.

A detailed survey of the individual training profiles of the inspectors was conducted, which also served as the basis for identifying refresher and further training programme for 2002 by supervisors. The profiles will be updated on a yearly basis and the training programme will be adjusted accordingly.

Findings

The HAEA-NSD has made considerable progress in providing its inspectors the necessary training, particularly in the area of reactor technology and operations to perform their inspections and interact with the NPP staff as professional and credible regulators. Plans are in place to provide additional training such as simulator training including emergency operating procedures to further enhance the knowledge and credibility of the inspectors.

6.2.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

6.3. METHODS OF INSPECTION

The HAEA-NSD conducts inspections at licensee and supplier facilities with advance notice, or without notice in justified cases. Based on the HAEA-NSD procedures there are the following types of inspections:

- Frequencies are daily, quarterly, occasional, and exceptional;
- Subject areas include manufacturing, maintenance, normal operation, inspection of surveillance tests, commissioning, initial criticality and research reactors.

Surveillance inspections cover observation and results of operator‘s activity during safety system surveillance. According to the HAEA-NSD, there are opportunities for both announced and unannounced inspections but the HAEA-NSD inspectors usually perform announced inspections, and they are accompanied by NPP nuclear safety division personnel. In addition, the HAEA-NSD inspectors performed indirect inspections, which cover review of NPP databases.

Recommendations and Suggestions from the 2000 IRRT Report

Suggestion: The HAEA-NSD should provide specific and detailed guidance for the approach, conduct, methods, and expectations necessary to be carried out for inspections. Additionally, this guidance should ensure that a proper level of supervisory attention is focused on the selection of the HAEA-NSD personnel that employ the proper inspection and technical competencies.

Suggestion: The HAEA-NSD should consider including more unannounced inspections.

Changes since the 2000 IRRT Mission

A new written procedure has been developed that governs the integrated team inspection. This procedure covers twelve areas. The integrated inspection procedure has been provided to the licensee. Two weeks before the inspection HAEA-NSD sends a letter to the licensee informing them of the inspection. The inspection duration is one week with an entrance meeting to discuss the scope and counterpart assignments, and an exit meeting to provide the preliminary results. Each of the four subgroups inputs to the report, which is about twenty pages long. The report is forwarded to the licensee by letter and the findings are subject to appeal.

Unannounced inspections are determined based on the operations meetings held by the NSD leading personnel every morning. The decisions by the inspection supervisor are based on the daily reports of the utility, on inspection results and other information. The number of unannounced inspections constitutes about 20% of the inspections. Two IRRT team members witnessed a portion of an unannounced reactive inspection of a problem involving low jacket water temperature on a diesel generator.

Findings

The new integrated inspection procedure represents substantially improved guidance on the approach and conduct of inspections, as does the supervisory guidance provided in the selection and conduct of unannounced reactive inspections. The assigned inspector initiated a thorough inspection of a potentially safety significant problem with the diesel generator jacket cooling water system.

6.3.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

6.4. INSPECTION PROGRAMME AND PLANNING.

Regulatory inspection programmes should be comprehensive and should be developed within an overall regulatory strategy. These programmes should be thorough enough to provide a high level of confidence that operators are in compliance with the regulatory requirements and are identifying and solving all actual and potential problems in ensuring nuclear safety. The HAEA-NSD has only developed a partial inspection programme based on inspection procedures for certain types of inspections.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The HAEA-NSD should develop an integrated inspection plan that provides for a consistent and effective verification of the level of operational safety performance of nuclear installations.

Suggestion: The HAEA-NSD should consider the use of Section 4 Regulatory Inspection Programme and Planning of IAEA Draft Safety Guide No. GS-G.1.4. Regulatory

Inspections of Nuclear Facilities and Enforcement of Regulatory Body for preparation of the inspection plan to cover all areas.

Changes since the 2000 IRRT Mission

Missing inspection areas have been included in the inspection programme. A new written procedure for the integrated team inspections was developed covering twelve areas such as management processes, QA, environmental qualification, radioactive waste and radiation protection. These are generally areas that were not previously covered by HAEA-NSD's routine program. The HAEA-NSD has chosen to use these initial efforts in these areas as pilots to evaluate whether and how to include the areas in the routine inspection programme.

Another procedure defines the yearly inspection plans including the integrated team inspection areas and focused reactive inspections on equipment issues based on previous inspection results, regulatory reviews of safety analyses, operating experience, event investigations and the results of an annual assessment of recently developed performance indicators.

The HAEA-NSD has developed and used for one annual assessment period, twenty-one performance indicators divided into three areas of operational safety performance each of which is further subdivided into three areas. The three main areas are plant operates smoothly, plant operates with low risk, and commitment to safety. The results are colour coded with green being acceptable performance, yellow cause for concern and red indicating that corrective action by the licensee is needed. The results of the first year indicated that corrective action is needed in the area of commitment to safety. The results were provided to the licensee, who has not yet responded except to informally challenge the thresholds for each colour established by the HAEA-NSD. The HAEA-NSD indicated that the licensee intends to provide comments on the process and an action plan to address the need for improvement in the safety commitment. In addition, the HAEA-NSD has included an inspection in the area of management process for the 2003 integrated team inspection to assess the need for corrective action in the area of safety commitment identified by the 2002 performance indicator results. The HAEA-NSD has also shared the programme and results at an international conference on safety culture sponsored by the IAEA.

Findings

Through the integrated team inspections and safety performance indicators, the HAEA-NSD has developed a focused and deliberate approach toward expanding its inspection programme comprehensively to provide for consistent and effective verification of the level of operational safety performance at licensed facilities.

6.4.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

6.4.2. Good Practices

(1) **BASIS** – IAEA Safety requirements document GS-G-1.2 "Review and Assessment of Nuclear Facilities by the Regulatory Body", paragraph 3.63 states that "…*the regulatory body should verify claims made in the documentation*, *as a necessary part of the process, by means of and inspections of the facility."*

a) Good Practice: The use of the integrated team inspections to pilot inspection in previously uncovered areas and the development and use of safety performance indicators to focus HAEA-NSD inspections on areas in need of corrective action have been efficient and effective means to expand the inspection programme comprehensively and take an aggressive posture in assuring safety.

6.5. INSPECTION PROCEDURES AND REPORTS

The scope of the HAEA-NSD inspection procedures includes activities related to design, manufacture, installation, commissioning, operation, modification, imports and decommissioning of nuclear facilities. Applicable facilities include Paks NPP, the spent fuel facility, the Budapest Research Reactor of the KFKI-AEKI and the Training Reactor of the TUB.

The HAEA-NSD has provided limited guidance on the contents of the inspection reports. In addition, inspectors are required to prepare a monthly report to management summarizing their activities, focusing management attention on matters of importance such as repeat findings and attaching their protocols. The HAEA-NSD managers discuss these reports with Paks NPP managers and are considering making them available to NPP. The inspection department is also in the process of creating a database of inspection protocols accessible from either the site inspector's office or headquarters in Budapest.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The HAEA-NSD should improve the content and effectiveness of inspection reports according to the IAEA guidelines.

Changes since the 2000 IRRT Mission

The HAEA-NSD has added several detailed inspection procedures, most notably the integrated team inspection procedure with its twelve broad areas to be assessed, and the event investigation procedure. Other written procedures have been modified, putting more emphasis on the information content of inspection reports. Detailed inspection forms have been created, and reports and comments on inspection results are issued more frequently.

While routine inspection protocols remain rather terse characterizations of findings agreed upon by the licensee representative and the HAEA-NSD inspector, the integrated inspection reports produced three times per year provide detailed 10 to 20 page assessments of the broad areas inspected along with an average of about 10 findings generated per report. The event investigations and focused reports are also more extensive than routine protocols.

In addition, the annual assessment report includes a comprehensive analysis of inspection results and performance indicators. All of these reports are provided to the licensee and are available internally and at the site to the staff in an electronic database along with inspectors monthly summary of activity and assessment reports. The timeliness and quality of these reports will be monitored through recently developed internal performance indicators associated with HAEA's quality management program.

Findings

The HAEA-NSD has made progress in improving the quality of inspection reports through improved inspection procedures, and has established additional self assessment tools in the form of internal performance indicators associated with its quality management programme to further improve.

6.5.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

6.6. REGULATORY ACTION AND ENFORCEMENT

The HAEA has a defined enforcement authority. Consistent with international practices, the regulatory body has a number of graduated measures available to ensure that licensees take corrective action in a timely fashion. The available sanctions include the power to withdraw a license and the ability to require the licensee to pay a fine for violating a legal safety regulation, for failing to comply with a required standard or with the provisions set forth in an individual regulatory license. The limits on the amounts of the fines are specified.

The HAEA-NSD relies upon management meetings and warning letters for offences which would not rise to the level of enforcement described above such as multiple or recurrent minor violations. The principle vehicles for articulating minor compliance concerns to NPP licensees are to articulate findings of inspectors on the spot in inspection protocols, which are acknowledged by NPP representatives and for which the response is articulated in an NPP protocol, which is attached to the HAEA-NSD protocol.

Recommendations and Suggestions from the 2000 IRRT Report

Suggestion: The HAEA-NSD should develop the necessary policy to eliminate any barrier to imposing fines in appropriate circumstances and thereby establish the credibility of this sanction with its own staff and the licensee.

Changes since the 2000 IRRT Mission

The enforcement policy is included in a document entitled HAEA-NSD "Enforcement Policy of HAEA" that was adopted in December 2001, while the implementing procedure was completed after long discussions and legal assessment in 2002. The Policy and the Procedure fit into the framework of the quality management system that governs roles, activities and responsibilities. In order to make the procedure available to the public, the HAEA-NSD published the Policy in a small booklet, and informed the licensees about the

Policy and Procedure in the bilateral meetings in the first half of 2002. According to the quality management system in late 2002 the Policy underwent a regular review, resulting in slight amendments for accuracy.

In most cases HAEA-NSD resolutions with obligations and conditions were considered an effective tool to prevent the licensees from continuing undesired activities. The tool set has provisions for escalating through new soft elements to the set of hard tools including license modifications and civil penalties through administrative letters, negotiations and regulatory resolutions with new obligations and conditions. The system permits an enforcement initiative to come from anybody in the NSD or a specific individual or outside organization. The HAEA only intends to use the process if it is necessary to impose the hard sanctions to achieve the desired result. The inspectors have been trained on the policy, which is available by Internet.

While the policy has not yet been used, the HAEA-NSD demonstrated its ability to use the inspection and assessment processes during the mission by its handling of a safety significant issue involving unidentified deposits on the fuel and control rod drive mechanisms of Paks unit 3 which resulted in an outage. During the outage the fuel was replaced and the control rod drive mechanisms were cleaned by the licensee as a result of an analysis performed by the reactor vendor, which showed that core flow would be outside its design basis limit during a LOCA (Loss of Coolant Accident), and control rod drive speeds were outside technical specification limits. In addition, the regulator insisted by resolution that the licensee characterizes by chemical analysis the nature of the deposits to better assess the extent of condition of the problem, the effectiveness of the licensee's corrective action, and the likelihood of recurrence before the resumption of power operation.

Findings

While not yet used, the HAEA has developed the policy and procedures necessary to use the enforcement sanctions permitted by law should they become necessary to assure safe operation of licensed facilities.

6.6.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

7. DEVELOPMENT OF REGULATIONS AND GUIDES

Expert: P. Hughes

7.1. REGULATORY APPROACH

The IRRT in 2000 found that the most important regulations existed in five volumes as an annex to Decree N° 108/1997. As the Decree 108/1997 required the completion of a review and update every 5 years (i.e. by 2002) it meant that in 2000 NSD was involved in a significant task to review the Codes and establish all the guidelines it had identified as necessary. In May 2000 NSD informed the IRRT team that 35 of the 68 planned guidelines had been issued and a further 21 were in preparation. Remarks from the licensees and from the NSD staff were collated based on experience with the Codes and guides over a period of about a year. Then a series of Codes and guides were reviewed over the next year. NSD had also indicated that while the storage of spent fuel was the responsibility of Paks NPP it had been covered by the existing Codes. However, as the responsibility for this nuclear facility had been transferred to PURAM, a sixth Code addressing spent fuel storage was being prepared.

Part of this Code and guideline review process necessitated the involvement of topics that were in the scope of other authorities and the approach outlined above was applied. However, in 2000 the implementation of this process was incomplete and at various stages of depending on which co-authority was involved. The IRRT considered that the difficulties NSD were having at the time related to the lack of clarity in the roles and responsibilities governing the interfaces between NSD and the other authorities where co-regulation of different aspects of safety for the same utility exists.

Recommendations and Suggestions from the 2000 IRRT Report

Suggestion: The present set of Codes and Guides does not cover the subject “Siting” and it is suggested to introduce this subject at an appropriate time.

Suggestion: The HAEA-NSD will benefit from the establishment of the procedures and instructions that support the establishment, review and approval of nuclear safety codes series (NSCS) and guides.

Changes since the 2000 IRRT Mission

The process for the review of the Codes with the co-authorities, established in 1999, is on-going. Annual meetings of all the co-authorities have been held however the meeting for 2002 has been deferred until early 2003 pending the completion of the review by NSD of some of the Codes.

NSD having recognized the complexity of the interrelationship between the authorities had conducted a review of the situation by setting out, in a matrix, all the possible interfaces between the co-authorities and the Codes. This allowed NSD to determine where each co-authority should be involved in NSD’s licensing process according to the Decree 108/1997,

Codes and where there should be an equivalent requirement in other co-authority Codes to enable NSD's involvement in their licensing process. The results of the review have been shared and discussions held with the co-authorities that NSD considers are a priority, to agree on working arrangements and so ensure that the licensing process is correctly followed. This process has led to closer co-operation, a better exchange of information and some joint inspection activities with the co-authorities.

Findings

The review of the Codes was due to be complete in 2002 (so that the process could start again in 2003). Currently all 5 main volumes have completed their review but there are a few residual topics that NSD and Paks NPP have yet to agree on. Volume 6 on "Safety Regulations for the Spent Nuclear Fuel Interim Storage Facility" is still being developed; it follows the same basic structure as Volume 5. The IRRT noted that one of the topics that Paks NPP disagreed with was NSD's introduction regarding new requirements in Volume 1 regarding the assessment of the impact on safety of organizational changes. The IRRT considered that NSD's inclusion of this regulatory requirement was appropriate and consistent with the requirement in IAEA Safety Standards Series NS-R-2 "Safety of Nuclear Power Plants: Operation" in paragraph 2.5. *"A document describing the plant's organizational structure and the management arrangements for discharging all these responsibilities shall be made available to the regulatory body for review. In addition, proposed changes to the structure and associated arrangements which might be significant to safety shall be systematically reviewed by the operating organization and shall be submitted to the regulatory body for review."*

With regard to the IRRT suggestions NSD reported that they have not established a separate Code on Siting but have developed guidance material in support of the procedural rules for Siting in Volume 1 of the regulations. This improvement in the situation is considered to be reasonable given that there was no urgency associated with meeting the IRRT suggestion. Also as the existing IAEA Code on Siting is expected to be updated and published as a new Requirements document in the IAEA's Safety Standards Series in 2003 NSD will be better able to take account of the IAEA document in the next cycle of review of their Codes.

With regard to the second suggestion, NSD's report of the steps they have taken reflects their pragmatic approach and willingness to find solutions to a complex co-authority arrangement. The IRRT supports their approach to analysing the situation and to identifying and prioritising the areas where NSD's interfaces need to be clearly defined. It seems that NSD has established good co-authority working arrangements, to ensure that the licensing/review/inspection processes are sound. It also seems that these working arrangements are vulnerable as they can be overridden by the issue of a Decree, the impact of which may not been thoroughly consulted on with all the authorities affected. The recommendation made in section 1, regarding the need to establish the formality of the co-authority responsibilities, is related to this issue.

7.1.1. Recommendations and suggestions

See the recommendation in Section 1.2.1. regarding Co-authorities.

7.2. FUTURE DEVELOPMENT

The plan for development of future guidelines was established. A new Code for regulating spent fuel storage facilities was in preparation. The level of coverage of the nuclear safety and radiation safety aspects was estimated to be relatively large and needed it further developments. It was recognized that the development of codes and guides is a lengthy and resource consuming process.

Recommendations and Suggestions from the 2000 IRRT mission

Suggestion: In view of the new regulatory responsibilities that were attributed to the HAEA, the prioritization for the establishment for future guidelines should be re-evaluated, for instance for emergency planning.

Suggestion: In view of further completion of the regulatory guidelines the HAEA-NSD should compare the present set of topics covered with the list attached to the Draft Safety Guide Documentation Produced and Required in Regulating Nuclear Facilities. The topic "human factors" is one of the subjects that should be addressed in the future.

Changes since the 2000 IRRT mission

NSD reported that their production of guidelines, 60 in total, is essentially complete. Some of these guides are now on their second review. New guides have covered the topics identified by the IRRT for emergency preparedness and for human factors.

Findings

The IRRT concluded that NSD has a well-established and effective process for the identification, review and updating of their Codes and guides. NSD has already identified the need to develop its policies and criteria towards risk informed regulatory approaches. This will ultimately lead to the regulatory requirements in this area and new guidance.

In addition, NSD has identified that in their guidance material there are second level requirements. The next phase of Code and guideline review will establish a clearer separation of requirements and guidance between the documents. The IRRT observed that this development was entirely consistent with the practice established in the new IAEA Safety Standards Series documents where the Requirements level statements are in terms of "shalls" and at the Safety Guide level statements are in terms of "shoulds". This development of NSD regulatory framework will help to ensure greater clarity in determining what are regulatory requirements and what is regulatory advice.

7.2.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

8. EMERGENCY PREPAREDNESS

Expert: J. Linville

Observer: R. Ciucelis

8.1. RESPONSIBILITIES OF THE HAEA EMERGENCY PREPAREDNESS ORGANIZATION

Emergency preparedness in Hungary has a firm basis in law. The HAEA has a small, dedicated professional team who are committed to maintaining good emergency preparedness within the HAEA. They also provide training to the HAEA.

A single leading Governmental Coordination Committee is headed by the Minister of Internal Affairs for all types of catastrophes. In the case of nuclear emergencies the Director General (DG) of the HAEA is the Deputy to the Minister of Internal Affairs. They head a National Emergency Directorate that operates a Nuclear Emergency Information Centre as well as a dedicated Centre for Emergency Response, Training and Analysis (CERTA).

The HAEA-NSD operates its CERTA, with its Emergency Preparedness Organization (EPO). The role of the EPO is to give expert advice to the decision makers of the Governmental Coordination Committee concerning the status of the facility involved, the possible consequences of the accident and recommended protective actions.

The HAEA-NSD is the contact point for receiving notifications of any nuclear or radiological emergencies within Hungary or internationally. For outgoing notifications, the HAEA-EPO is the single contact point in Hungary responsible for the notification of the international community on any nuclear or radiological event having a potential effect on the population.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The HAEA-NSD should define its role as an independent and credible spokesperson during nuclear emergencies with respect to public information in both the National and Nuclear Emergency Plans currently being revised to take into account the provisions of the new Act.

Changes since the 2000 IRRT Mission

The role of the HAEA-NSD Public Relations (PR) officer has been clearly defined. While this role is not enumerated in an Emergency Procedure it is described in the PR procedures. Persons in this position are regular participants of the HAEA-EPO exercises and drills. He/she is meant to be a credible spokesperson reflecting the views and describing the activity of HAEA during a nuclear emergency. The PR person performs this role by providing status information in the form of press releases relative to the responsibilities of the HAEA-NSD from the CERTA to the national Nuclear Emergency Information Centre and Nuclear

Emergency Centre where the DG is located as well as directly to the media with the permission of the CERTA Crisis Manager.

While the HAEA-NSD does not anticipate responding directly to public inquiries or participating in press conferences, they do expect to dispatch a technical briefer to the National Emergency Information Centre to support Ministry of the Interior staff performing this role. In addition, the DG would be available at the National Emergency Information Centre and the DDG at the HAEA-NSD to make public statements regarding the role of the HAEA-NSD in emergency response activities. The HAEA-NSD believes this approach is appropriate to assure consistent public communications. However, there are no provisions for these activities in HAEA-NSD procedures and Ministry of the Interior procedures for the National Emergency Information Centre are under development.

The HAEA-NSD has now also established a Radiological Analysis Group that analyses the radiological and meteorological situation, predicts radioactivity propagation, and provides recommendations to the decision-makers on the countermeasures to be applied.

Findings

The HAEA-NSD has made progress in defining its public information role during nuclear emergencies, but has not yet provided for a credible nuclear authority to speak publicly on the nature of the hazard that confronts the public in a nuclear accident.

8.1.1. Recommendations and Suggestions

(1) **BASIS** – The IAEA Safety Requirements document "Preparedness and Response for a Nuclear or Radiological Emergency", paragraph 4.83, states that *"Arrangements shall be made for: providing useful, timely, truthful, consistent and appropriate information to the public in the event of a nuclear or radiological emergency; responding to incorrect information and rumours; and responding to requests for information from the public and from the news and information media."* In addition paragraph 4.84, states that *"The operator, the response organization, other States and the IAEA shall make arrangements for co-ordinating the provision of information to the public and to the news and information media in the event of a nuclear or radiological emergency."*

   a) **Suggestion: The HAEA should define its support role as an independent and credible spokesperson with respect to public information in its own Emergency Plan and procedures including staff support, and should continue its efforts to clearly define its role in the National Emergency Plans and procedures under development.**

8.2. RESPONSE AND TRAINING OF HAEA EMERGENCY PREPAREDNESS STAFF

HAEA staff responsibilities in the event of a nuclear emergency are defined in procedures. Emergency response training has been undertaken by the staff. Their response is also periodically rehearsed in exercises and drills.

In the event of an emergency, HAEA staff are alerted by the HAEA Duty Inspector. There are procedures to define the roles of each of the individuals and groups as well as the operation of CERTA. An additional set of operational procedures provides support for early and rapid analysis of a nuclear accident when there is only limited information available. As a result of recent changes in the Hungarian act on crisis management, the EPO is being changed to incorporate the added responsibilities for radiological analysis and propagation forecasts. The CERTA includes all equipment and software needed to respond to an emergency.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The HAEA-NSD should assure that all Emergency Preparedness Organization staff receive emergency response training and have pre-staged guidance available in emergency centre needed to carry out their responsibilities, including radiological impact assessment.

Changes since the 2000 IRRT Mission

The HAEA-NSD Emergency Preparedness Organisation has recently undergone essential changes. The HAEA-EPO is alerted according to a well-defined alert-plan in case of a nuclear or radiological emergency. The necessity to alert the staff is decided by the Crisis Manager of the EPO. Alerting is done in a tree-like manner by telephone calls with the persons responsible for alerting other members provided mobile phones.

The HAEA-EPO consists of activity groups that have well defined responsibilities and tasks. They include:

- Crisis Management Group: heads and organizes the activity of the EPO, approves the proposals on countermeasures, takes the responsibility for decisions on actions and statements; organizes the PR activity of the HAEA-EPO; operates the telecommunication and related tools (faxes, copier) and provides assistance, catering and troubleshooting;

- Nuclear Analysis Group: analyses the actual nuclear status, predicts the possible future events, and calculates the source term;

- Radiological Analysis Group: analyses the radiological and meteorological situation, predicts radioactivity propagation, and provides recommendations to the decision-makers on the countermeasures to be applied.

The groups include fixed positions. At least four persons are assigned to each position. In the five most important positions a 24-hour duty system is applied. The persons on duty carry mobile phones and are required to reach their post in CERTA within 1 hour after being alerted. In the remaining positions the first available person is called in an alert.

Another aspect of the changes is related to moving the HAEA headquarters. As a result of this move the HAEA crisis centre (CERTA) has been redesigned and recently established. As a result of the changes all procedures and guides related to emergency preparedness have been revised. The training and exercise plan of 2002 has taken into account the needs following the major changes.

At the HAEA-EPO workplaces, including the site inspectors place in the Paks Emergency Response Centre, pre-staged packets including procedures, guidelines, forms and auxiliary materials assist the work of the personnel. A specific technical guideline, also called an Operational Procedure has been established for the fast determination of the nuclear and radiological consequences of a nuclear reactor accident as well as the suggested first countermeasures. The first tests of the Operational Procedures have been carried out during recent exercises.

A Lotus Notes based electronic information and office system called STIP has been established to facilitate and make automatic the administrative work during emergencies and exercises. The system knows the hierarchy, tasks and duties of the various players in the HAEA-EPO and assists in preparing, checking and approving the necessary documents, including among others the EMERCON (International system for notification in case of radiological emergencies) formats. The system is available from the CERTA server via the Local Area Network (LAN) and can also be reached with the proper password protection from every workplace in the HAEA.

An on-the-job training system has been established to exercise the use of the STIP electronic emergency office system. Simple and short typical tasks are sent to the trainees' workplaces through the HAEA-LAN and the trainees are expected to perform the task in 5-10 minutes without interruption of their activity.

Yearly training and exercise plans are developed and executed in which the majority of the HAEA-EPO, as well as the experts from the Meteorological Service are involved.

Findings

The HAEA-NSD has made remarkable improvements to ensure that its Emergency Preparedness Organization is appropriately trained and equipped with state of the art equipment, facilities and guidance to carry out their responsibilities, including radiological impact assessment.

8.2.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

8.2.2. Good Practices

(1) **BASIS** – IAEA Safety Requirement document "Preparedness and Response for a Nuclear and Radiological Emergency", paragraph 5.25 states that " *Adequate tools, instruments, supplies, equipment, communication systems, facilities and documentation…shall be provided for performing the functions specified in…".*

a) Good Practice: The STIP system is a noteworthy tool for assuring the orderly efficient generation, review, approval and distribution of internal and external reports during the course of a nuclear emergency, as well as for routine reports to assure that the staff maintain proficiency on the system.

8.3. EMERGENCY EXERCISE PROGRAMME

Drills and exercises on different levels are important to show the effectiveness of the HAEA-EPO and to demonstrate the ability to co-operate with different organizations and particularly with Paks NPP. Regular drills and exercises of the HAEA started in 1998. Three main types of exercises are conducted: alert, mini- or thematic exercises, and full-scale exercises. In the year 2000 two alert exercises, three mini exercises and two full-scale exercises are planned.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The HAEA should address the need for a national comprehensive full scope exercise consistent with the five-year cycle in revising the national and nuclear emergency plans.

Changes since the 2000 IRRT Mission

The HAEA has initiated with the Governmental Co-ordination Committee the organization of a full scope comprehensive national exercise. The GCC (Governmental Co-ordination Committee) has established an organizing committee. The committee has defined the general and specific objectives of the exercise and suggested that the exercise be held in October 2004. Further organizing steps as well as the financial planning of the exercise are underway. The exercise is planned to last two days and shall involve all major stakeholders of the national nuclear emergency management.

Findings

The HAEA has made substantial progress in planning and scheduling a full scope comprehensive national exercise. However, no full scope national exercise has been conducted yet. The HAEA plans to revise the emergency plans to include provisions for periodic full scope exercises in the future.

8.3.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

9. RADIOACTIVE WASTE MANAGEMENT IN NUCLEAR FACILITIES AND DECOMMISSIONING OF NUCLEAR FACILITIES

Expert: Z. Prouza

9.1. SOURCES AND HANDLING OF LOW AND INTERMEDIATE LEVEL RADWASTE

In Hungary the main producer of low and intermediate level radwastes (L/ILW) is the Paks NPP, which produces annually about 210 m^3 of solid L/ILW and about 250 m^3 of liquid L/ILW. The total amount of L/ILW arising during the lifetime of the Paks NPP will depend on the technology of the waste treatment.

Compactable solid LLW (Low Level Waste) at NPP is collected in 50 liter polyethylene bags. The solid waste in bags having a dose rate less than 100 μSv/h is put into a segregation box, and the waste below 1 μSv/h is handled like a clearance type one. The rest of the solid waste is placed in 200-liter steel drums and compacted.

High salinity water is treated by evaporation. Low salinity water leaving the process is cleaned in the purification systems of the plant by ion exchanger. The annual accumulation of dry solid wastes after treatment is about 100 m^3 from all four NPP units.

A radioactive waste repository for L/ILW is operated at Püspökszilágy for wastes originating from small producers and research reactors. Solid L/ILW from Paks NPP was also deposited there earlier, but it has been prohibited since 1996. The wastes produced by the training and research reactors (accounted for as institutional producers) are stored on their sites under special circumstances waiting for the collection and removal to the disposal site. The repository is working under a license issued by the Office of Chief Medical Officer and the inspections are carried-out by the relevant County Institute of the State Public Health and Medical Officers' Service.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The HAEA-NSD should evaluate the optimisation of waste management procedures at the nuclear facilities and request as necessary implementation of improved waste handling techniques.

Changes since the 2000 IRRT Mission

Based on construction and operation experience of the Spent Fuel Interim Storage Facility (SFISF), a decision was made that in the course of the review of Governmental Decree No. 108/1997 and the attached regulations (currently in force) should be supplemented by more specific rules and requirements on the SFISF.

In accordance with this decision, the HAEA prepared a draft of the Volume 6 of the Nuclear Safety Regulations titled "Regulatory Requirements for the Spent Fuel Interim Storage Facility". This draft has been prepared in co-operation with external experts and in consultation of its content with professionally competent forums. The Nuclear Safety

Regulations will be applicable for all nuclear facilities in Hungary and will be harmonised with each other.

The HAEA-NSD has published two new regulatory guidelines (No. 4.4 and 1.22) determining the HAEA-NSD duties related to the inspection of radioactive waste handling. These guidelines regulate the activity of the participants taking part in the inspection.

In parallel with these legislative activities, the extension of the SFISF modular storage system started in 2001. The seven present storage modules are to be expanded by four other modules by the PURAM. Construction work started in 2001. Relevant licensing began for the technological systems together with the production of storage components. The new modules are expected to be in operation in 2003. The long-term plan for innovation of the conditioning technology in the SFISF is under preparation. The method of waste treatment will be improved by using modern technology (based on Mobile Waste Cementation System - MOWA). Guideline No. 4.4 recommends the upgrading of technology – "considering international practice and technical progress, as well as ALARA (As Low As Reasonably Achievable) principle, licensee is required to continuously develop technologies applied and equipment used at these technologies".

The KFKI-AEKI developed a new type of storage for the spent fuel of the Budapest Research Reactor. The fuel bundles are being placed (since 2002) into a container filled with inert gas and hermetically sealed. Then the container, ensuring dry storage of the fuel, is placed into the storage pool full of water. With this solution, the cladding material of the fuel bundles does not come into contact with water removing the residual heat. The licensing process was carried out and the equipment required was manufactured in 2001.

Findings

The 2000 IRRT mission recommended that the HAEA should evaluate the optimisation of waste management procedures at the nuclear facilities and require implementation of improved waste handling techniques.

The HAEA devotes significant effort to improve existing legislative documents. Experts of the HAEA participate in drafting decrees within the responsibility of the Ministry of Health, Social and Family Affairs to facilitate finalisation of all necessary regulations required to implement Act CXVI of 1996 on Atomic Energy. There are, however, remaining problems with time delay in the development of some decrees, which are under responsibility of the Ministry of Health, Social and Family Affairs.

Amendments of Guidelines (No. 4.4 and 1.22), which determine the HAEA-NSD duties related to the inspection of radioactive waste handling, represented substantial progress for inspection practice. In the Guidelines the recommendations are given for implementation of ALARA principle, collection, managing radioactive waste, and for monitoring the system.

The HAEA-NSD activities related to radioactive waste management are limited to the systems and components on the nuclear facility site. Therefore co-operation is needed with other involved authorities. The informal forum of different authorities with responsibilities in the area of nuclear energy has been established in 1999, holding annual meetings regularly. The last meeting was hosted by the HAEA-NSD.

With regard to the above-mentioned recommendation, the HAEA-NSD has made substantial progress. This includes issuing of new guidelines with recommendations on optimisation of management of the radioactive waste using improved methods and technology.

9.1.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

9.2. INSPECTION OF WASTE MANAGEMENT ACTIVITIES

The inspection activities of the HAEA-NSD related to radioactive waste management were limited to the systems and components on the site of the nuclear facilities. There were no special requirements concerning waste treatment systems compared to the other nuclear safety related systems and components, and the licensing process was the same. Waste treatment systems were classified as Safety Class No. 3. After commissioning, the implementation and operation of the systems were subject to the daily, quarterly and maintenance inspections. These ordinary inspections were focused specially on waste treatment systems, in particular if problems were discovered in their operation.

On the basis of reporting requirements set up by the Nuclear Safety Regulations and the Guideline 1.24, revised in May 2000, the licensee has to report on waste management as the part of its annual report. This is reviewed by NSD and the evaluation is included its own annual report. A separate report on wastes (with harmonized content with the relevant part of the NPP's overall annual report) shall be prepared and delivered to responsible radiation and environmental protection authorities/organisations.

Inspections of radioactive waste management activities were described in the new Guideline 1.22, approved in May 2000, but this guide did not include a requirement on the observation of the implementation of ALARA principle, which, on other hand, was mentioned as one of the basic principles for the operator.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: The HAEA-NSD should reflect ALARA principle in the inspection guidelines for radioactive waste management and perform inspections accordingly.

Changes since the 2000 IRRT Mission

The IRRT reviewed guidelines No. 4.4 (Technical Radiation Protection during the Operation of NPP), No. 1.20 (Technical Radiation Protection Inspection) and No. 1.22 (Inspection of Radioactive Waste Management) issued by the HAEA to give guidance for the waste handling procedure from the viewpoint of ALARA principle.

During the period since the last IRRT mission in 2000, the HAEA has introduced a new integrated approach to inspections. Radioactive waste management is one of the subjects of the comprehensive inspection plan. In accordance with this plan each individual subject will be completely inspected once every 3 or 4 years. Inspections of radwaste handling include: application of optimisation principle (optimisation of radioactivity and amounts of collected,

treated and stored radioactive waste based on technology and equipment used); radiation protection control systems; internal documents and administrative measures of licensees regulating radioactive waste; technology and equipment used for radioactive waste handling; and conditions and limits for temporarily stored radioactive waste.

With regard to the above-mentioned recommendation, progress has been made by the HAEA. This includes issuing of new guidelines, which reflected ALARA principle by means of optimisation of the radioactive waste management using improved methods and technology. A new inspection system was implemented in the HAEA. The recommendation is therefore fulfilled.

9.2.1.Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

9.3. DECOMMISSIONING OF NUCLEAR FACILITIES

The licensee - operator of a nuclear facility (NPP, research, university reactor) is responsible for safe operation of its facility. The performance of tasks related to the decommissioning of a nuclear facility shall be the responsibility of an organisation designated by the Government. According to the Decree 108/1997, Sec. 13, decommissioning can only be done by a qualified and certified organisation. The PURAM was designated as such organisation. However, the PURAM has not yet authorised to perform any decommissioning activity. Funding of the decommissioning will be covered from the Central Nuclear Financial Fund. No nuclear facility has performed decommissioning in Hungary with exception of a small critical assembly. In 2000 the IRRT experts identified that according to the present legislation, in the future there will be a transfer of the responsibility for the given facility from one operator to another. The borderlines between the operators and the procedure for transfer of responsibility should be specified.

In 2000 only general requirements for decommissioning were available. Decree 108/1997 among others required that the Preliminary Decommissioning Plan (PDP) should be prepared. However, neither detailed regulatory guidance on the format and contents of the Preliminary Decommissioning Plan, nor internal review guidelines had been developed. For research reactors, the same requirements regarding the decommissioning will be applied as for the NPP.

There was no organisational unit specifically devoted to the decommissioning activities within the HAEA. The work had been organised on a project basis. It was planned to involve not only all qualified HAEA specialists, but also to invite external experts, if needed.

<u>Recommendations and Suggestions from the 2000 IRRT Report</u>

Recommendation: A formal relationship between the HAEA-NSD and the Ministry of Health and their responsible organisations and organisational units should be established to provide an adequate link between their separate responsibilities in decommissioning nuclear facilities.

Suggestion: The HAEA should issue regulatory guidance for the key documents covering decommissioning and radioactive waste management and internal regulatory review guidelines.

Changes since the 2000 IRRT Mission

The informal forum of different authorities having responsibilities for nuclear energy was established in 1999. The agenda of the meetings, which are annually held, typically address actual problems on legislation and questions of licensing and inspection.

Act No. CXVI on Atomic Energy regulates the way of performing and financing the tasks related to the radioactive waste management and decommissioning of nuclear facilities. Its basic principles conform to the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, which have been signed and ratified by Hungary.

Establishment of clear interfaces (both procedural and technical) are needed with the relevant health authorities in the area of radioactive waste repositories. The HAEA is waiting for new regulations, which should be contained in the decree of the Ministry of Health, Social and Family Affairs.

The first document concerning decommissioning of the Hungarian NPP was prepared by DECOM, a Slovak company, in 1993 and was updated in 1997. The updated version covers the decommissioning of all 4 NPP units. In the future improved specific regulations and guidelines for decommissioning should be prepared.

The Nuclear Safety Regulations prescribe the documentation for decommissioning as part of the Safety Analysis Report. During the operation phase, the documentation has to be updated every 2 years. Five and one year prior to the final NPP shutdown this documentation should be rewritten with proper consideration of the NPP life cycle.

Two upgraded Safety Guidelines are in force: “Inspection of the radioactive waste handling”, and “Quality assurance of the decommissioning”. The first one was approved by the DG of the HAEA in May 2000 and issued in summer of the same year. At present, the revised version of this guideline is at an advanced stage of preparation. Internal review of the draft version by the NSD is close to completion. The QA guideline has been enter in force since May 1998; it is practically a translation of the relevant IAEA Safety Guide.

The first attempt to make written internal regulatory review guidelines is in progress, and is dedicated to the review of the FSAR. Nevertheless, it also contains parts related to radioactive waste management and decommissioning.

According to the established priorities, the elaboration of two guidelines related to decommissioning (“Licensing documentation of ceasing NPP units” and “Licensing documentation of dismantling NPP components and structures”) was deferred. Issuing of other guidelines on these topics is not yet planned by the HAEA.

The Ministry of Health, Social and Family Affairs, through an organisation appointed by a separate regulation, shall carry out licensing and monitoring of siting, construction, commissioning, operating, modifying and closing down radioactive waste disposal facilities.

The decommissioning of nuclear facilities in Hungary, and thus detailed regulation regarding responsibilities of licensing and supervising authorities in this area is not an urgent problem, but certainly more precise regulation should be established in the future.

Findings

The IRRT in 2000 recommended establishing a formal relationship between the HAEA and the Ministry of Health to provide an adequate link between their competencies in the area of decommissioning nuclear facilities.

The last annual meeting of both authorities was hosted by the HAEA-NSD. The agenda of the meeting addressed legislative problems and questions of licensing and inspection. Personnel of the HAEA and of the State Public Health and Medical Officers' Service drafted an agreement on co-operation between the authorities in licensing and inspection of the all four Hungarian nuclear facilities. This agreement is ready for signing by the highest-level representatives of both organisations for quite long time, probably as a consequence of organisational and personal changes within the governmental administration.

In the 2000 IRRT report, the problem of future transfer of the regulatory responsibilities for a given facility from one operator to another was addressed. It was suggested that the borderlines between the operators and clear procedure for transfer of responsibilities should be specified. The present IRRT mission did not find any progress in this matter.

Similarly, no progress was identified with reference to the recommendation of the Atomic Question Group Working Party on Nuclear Safety articulates that "Hungary should regarding further strengthening of the independence of regulatory authority in particular address the arrangement that the Head of the PURAM reports to the Director General of the HAEA".

Progress has been achieved with regard to the suggestion of issuing the key regulatory documents covering decommissioning and radioactive waste management and relevant internal regulatory review guidelines. The HAEA staff participates in drafting decrees within the responsibility of the Ministry of Health, Social and Family Affairs, with the aim of facilitating finalisation of all laws required for implementation of Act CXVI of 1996 on Atomic Energy.

The lifetime extension of the Paks NPP units appears to be the task of the highest priority, while decommissioning is not expected in the near future. Establishment, regulatory approval and updating of the FSAR of the NPP units have been a major task recently for both the operator and the HAEA. The FSAR also deals with the issues of radioactive waste management and decommissioning. Two relevant Guidelines are in force, on "Inspection of the radioactive waste handling" (see above), and on "Quality assurance of the decommissioning". According to the HAEA established and justified priorities, the development of other guidelines related to decommissioning was postponed.

9.3.1. Recommendations and Suggestions

(1) **BASIS** –IAEA Safety Standards Series (SSS) GS-R-1 requires in Paragraph 4.2 that *"If the regulatory body consists of more than one authority, effective arrangements shall be*

made to ensure that regulatory responsibilities and functions are clearly defined and co-ordinated, in order to avoid any omissions or unnecessary duplication".

a) **Suggestion: The HAEA is encouraged to complete the agreement on co-operation between the HAEA and the State Public Health and Medical Officers' Service.**

10. TECHNICAL RADIATION PROTECTION IN NUCLEAR FACILITIES

Expert: Z. Prouza

10.1. LEGISLATIVE FRAMEWORK AND HISTORICAL DEVELOPMENT

The system of radiation protection regulations in 2000 was based on principles of the ICRP (International Commission in Radiological Protection) Report 26; a new regulatory framework was in the final phase of issue.

In 1996 the AAE underlined the independence of the regulatory body, centralised to some extent the scope of a distributed regulatory system, recognised the importance of nuclear safety, and established the HAEA as the new regulatory body for nuclear safety. In 1997 the HAEA became responsible for technical radiation protection (hereinafter TRP). This involves the supervision of all technical efforts to reduce doses/dose rates to workers and to the population. Its responsibility was limited to nuclear facilities (NPP, two research reactors, and dry spent fuel storage) and did not cover such facilities as radioactive waste storages and depositories outside the nuclear installations.

A major part of the radiation protection still remained under the authority of the Ministry of Health, which discharges its responsibility through the State Public Health and Medical Officers' Service. This Service has its offices distributed throughout the country and performs a regulatory function in the area of health effects of radiation from any ionising sources.

Since the responsibilities in the radiation protection and radioactive waste areas has been shared by two main co-authorities, the need for close co-operation has been recommended. Problems in co-operation arose from two main facts:

- In the existing legislation, the HAEA-NSD was not identified as the co-authority for authorisation processes with the Ministry of Health as the main authority;
- There was a considerable delay in developing a legislative basis, which was the responsibility of the Ministry of Health; e.g. a decree containing new dose limits and also clarifying the role of the HAEA as co-authority had not been issued.

It was therefore difficult to clarify fully the interfaces between the two authorities. This was one of the reasons why implementation of HAEA responsibilities in the field of TRP was in its initial phase. Another reason was, that the development of the regulatory guidelines for the new responsibilities had a very low priority compared with many other HAEA duties.

<u>Recommendations and Suggestions from the 2000 IRRT Report</u>

Recommendation: The legal and governmental infrastructure of Hungary with distributed regulatory responsibilities, involving up to nine authorities, should be more thoroughly co-ordinated in order to avoid any omission or overlap and to provide for effective co-operation between those authorities.

Suggestion: In case of difficulties occurring in the co-operation with other authorities, the HAEA should appeal to the governmental level co-ordination; in the present situation the HAEC has that governmental level co-ordination responsibility.

These recommendations were included in section 2.1 of the 2000 IRRT report.

Changes since the 2000 IRRT Mission

The HAEA and the Ministry of Health have made remarkable improvements to develop and issue a new legislation based on internationally adopted principles (ICRP, IAEA). During the last two years several important decrees were issued:

- Decree No. 16/2000 of the Ministry of Health on the execution of the certain provisions of Act on Atomic Energy (Act CXVI of 1996);
- Decree No. 15/2001 of the Ministry of Environmental Protection on the releases of radioactive material and environmental monitoring;
- Decree No. 30/2001 of the Ministry of Health on radiation protection of outside workers at the workplace.

- Decree No.16/2000 includes following:

  - Fundamental requirements and principles of the RP, based on the ICRP 60 and the International Basic Safety Standards, IAEA Safety Series (SS) No.115/1995;
  - The internal RP Code of nuclear facilities shall be approved by the Office of the Chief Medical Officer of the State Public Health and Medical Officers' Service;
  - Fundamental regulations of the facility RP;
  - Controlling activity of regulatory authorities;
  - Tasks of the RP service in facilities;
  - Requirements of the RA authorizations related to RP;
  - Classification of workplace from RP point of view;
  - RP requirements of transport equipment; and
  - RP training.

Findings

Substantial progress has been made by the HAEA in developing and issuing the above-mentioned decrees and new guides (all together 22 new guidelines were issued; for example "Technical Radiation Protection during the Operation of NPP", "Inspection of Radwaste Management"). Harmonisation of the Hungarian legislation with the EU in the field

of TRP continues by reviewing relevant documents. There are, however, remaining problems with time delay in development of some documents, which are under the responsibility of the Ministry of Health, Social and Family Affairs, such as the Decree on radioactive waste management.

10.1.1. Recommendations and Suggestions

See recommendations in Section 1.2.1. of this report.

10.2. RADIATION PROTECTION AT PAKS NUCLEAR POWER PLANT

The IRRT Mission observed already in 2000 that the radiation protection of workers was adequately implemented in the design and operation of the NPP. The measures implemented included prescribed low radionuclides in the environmental, low contamination and dose rate level in the working place, extensive monitoring and good dosimetry follow-up.

Changes since the 2000 IRRT Mission

The situation has been remarkably improved by developing and issuing in the Paks NPP new internal Regulations, Radiation Protection Procedures and RP Guidelines ("Dose Planning", "Shielding of Hot-Spot", "Monitoring of Internal Radiation Exposure", "Radiation Protection Monitoring of Spent Fuel Transport, "Requirements for Radiation Protection Planning"). These new NPP documents reflect the relevant requirements, which were imposed by the new decrees, such as:

- Main objectives of the RP practices based on implementation of the ALARA principle;
- Scope of responsibilities related to the RP;
- Organisation chart and responsibilities of the RP staff;
- Pre-conditions for qualification and regulation of operations with potentially higher radiation risk;
- Relevant limits and reference levels of dose and releases;
- RP control procedures and methods of monitoring; and
- The technical and organisational RP measures.

Findings

The follow-up mission reconfirmed observations made by the 2000 IRRT mission. In addition, the situation has been improved further by developing and issuing of the new internal Regulations, Radiation Protection Procedures and RP Guidelines (RPG) in the Paks NPP consistent with the recently issued Decrees. ALARA goals were set up and implemented in the management and daily operation of the plant in accordance with new legislative requirements.

The level of radiation protection using ALARA principle is controlled based on a specific system of indicators (based on WANO's (World Association of Nuclear Operators) indicators

system). Different indicators (collective, individual doses, concentration of radionuclides, releases into air and water, etc.) are evaluated for normal operation, for outages and for maintenance.

10.2.1. Recommendations and Suggestions

No further recommendations and suggestions were identified in this section.

10.3. TECHNICAL RADIATION PROTECTION ACTIVITIES OF HAEA-NSD

The scope of technical radiation protection licensing and inspection activity of the HAEA-NSD in 2000 covered:

- The equipment related to the operation of a nuclear facility, the radiation field generated by or radioactive material released from, i.e. a source term, which may present a potential or effective radiation hazard for a living person, with the exception of sealed radioactive sources;
- The equipment limiting or reducing harmful effects of the source term; and
- The equipment providing information on the radiation conditions of the source term or of the space including the source term.

Technical radiation protection related inspections of the HAEA-NSD were performed with the same frequency as other types of inspections. The scope of the inspections was specified in Nuclear Safety Guidelines 4.4 (Technical Radiation Protection during the Operation of Nuclear Power Plants), 1.20 (Technical Radiation Protection Inspection) and 1.22 (Inspection of Radioactive Waste Management) the issuance of which was in progress. Pre-planning of the inspections was done. The inspection protocols were prepared and given to responsible counterparts at NPP and sent ahead to NSD headquarters. However, interfaces between different organisational units of the NPP (e.g. operation, maintenance, technical support, contractors), and fulfilment of requirements were not adequately implemented into the HAEA-NSD inspections.

Recommendations and Suggestions from the 2000 IRRT Report

Recommendation: In order to fully implement the recently issued guidelines on technical radiation protection, training of inspection personnel is needed on the use of the applicable guidelines.

Recommendation: The inspection of the implementation of the NPP's radiation protection programme should not be an isolated activity, but be integrated in the overall inspection plan. As the NPP's radiation protection activities are part of a global process, the HAEA-NSD's inspection activities should be organised accordingly.

Changes since the 2000 IRRT Mission

The HAEA-NSD has employed a highly qualified specialist in radiation protection and has developed a sophisticated training programme for on-site inspectors involved in the TRP and radioactive waste management. The situation has also been improved from a staffing point of view. There are four inspectors at Paks NPP site and three at the HAEA Headquarters involved in TRP and the radioactive waste area. Two of these inspectors are responsible for licensing and inspections at other nuclear facilities.

Within the General Nuclear Directorate of the HAEA, the Department of the EU Co-ordination and Theoretical Radiation Protection has been established. Activities of the Department are not only focused on co-ordination of HAEA activities during the accession process of Hungary to EU, but also generally play a consulting, co-ordination and expertise role in radiation protection area. It is also involved as a consultant in the legislation process for documents issued by the Ministry of Health, Social and Family Affaires. The establishment of an ad hoc expert group composed of the Department staff (4 highly specialized experts in the field of radiation protection), inspectors of TRP and several external experts is being discussed now. Enhancement of co-operation and exchange of information between the Department's radiation protection experts and HAEA-NSD TRP staff is desirable.

High school graduation is the basic qualification requirement for the inspectors. A new inspector is obliged to pass through the 5-week basic course organised by the NPP. During the first two years on the job each of them has to participate in a specialised 5-month course also organised by the NPP Training Department entrusted by the Ministry of Education to develop these courses and to issue certificates. Self-study, postgraduate study, and participation in the international training courses are another steps to obtaining qualification needed. For example, one inspector completed a two-year postgraduate study of environmental engineering. Inspectors' knowledge and skills are examined every two years.

As already mentioned, since the IRRT mission in 2000, the HAEA introduced a new integrated approach to inspections. The scope of the inspections is specified in the Nuclear Safety Guidelines 4.4 ("Technical Radiation Protection during the operation of nuclear power plants"). A new version of these guidelines has been issued. In the Guidelines the requirements of the new Decrees (mentioned above) as well as the recommendations of 2000 IRRT report were implemented.

In addition, to the special reports from comprehensive inspections, all TRP inspectors prepare monthly reports on their activities performed during the last period. The monthly reports are forwarded to the head of the HAEA-NSD. The monthly reports represent an effective tool through which any proposal that may indirectly or directly affect the activity of the HAEA-NSD can be made. Furthermore, additional information for judging the licensee performance from the point of view of TRP can also be provided in this way.

The objectives of the HAEA inspections for the TRP were described in detail in the IRRT Mission Report of 2000. In accordance with the recommendations of this report, the TRP should be part of the comprehensive inspections, which usually cover several subjects only once every 3 or 4 years. The first such inspection at the Paks NPP is planned for 2003. During the planned inspection, the following TRP specific issues (besides other general issues such as structure of the organization, skills and qualification of personnel, etc.) will be covered:

- Application of optimisation principle in the TRP practice (implementation of ALARA principle – planning of doses before special operations – outages, maintenance);
- Integrity of fuel assemblies, activated corrosion products, operation and maintenance of activated and contaminated components;
- Dose rates near the main components, existence of temporary shields, decontamination technology;
- Radiation protection and control systems;
- Control of the levels of releases of effluents;
- Technologies for handling radioactivity in the secondary circuit and outside the controlled zone;
- Documents and administrative measures regulating radioactive releases;
- TRP performance indicators (collective and individual doses of radiation workers, doses obtained during specific operations – outages, maintenance, etc.); and
- Inspection of collecting and managing radioactive wastes, (e.g. documentation, qualification, temporary storage, conditioning).

Findings

The nuclear facilities under the HAEA responsibility (NPP Paks, Budapest Research Reactor, Training Reactor of the TUB, the Spent Fuel Interim Storage Facility) operate in accordance with relevant requirements. No radiation protection dose limits, limits of the radionuclides releases were exceeded.

Since the previous IRRT mission, the situation has significantly improved in the area of staffing for TRP as well as in training of TRP inspectors; therefore, the recommendation from 2000 IRRT report has been fulfilled.

In the course of the Periodic Safety Review, the HAEA had concluded that the radiation monitoring system (RMS) established for releases into environment-needed renovation. The reconstruction will involve not only upgrading measuring devices, but also implementation of a new type of measurement, system of data collection and their interpretation. The reconstruction should be completed in 2003. The HAEA is prepared to grant a regulatory approval to ensure that TRP requirements are met during the reconstruction and to minimize possible risk resulting from it. A higher frequency of the TRP inspection with special attention to the process of reconstruction of the RMS seems to be justified.

10.3.1. Recommendations and Suggestions

(1) **BASIS** – The paragraph A.27 of GS-G–1.3 states "*The inspection program should include verification that any releases of effluents are within the authorised discharge limits. This should include the review of systems for the monitoring of effluents".* In addition GS-G-1.2 states in paragraphs 3.48 and 3.49 "*The assessment of routine operation is directed towards the determination of... radioactive discharges. These consequences will be compared with those safety objectives, requirements and limits approved by the regulatory body, including ALARA principle....the regulatory body should satisfy itself that ...radioactive releases to the environment are acceptable....*".

a) **Suggestion: In the inspection plan on TRP a focused inspection should be included on the radiation monitoring system (equipment, methods, procedures) for releases into environment. This inspection should preferably be a joint inspection to be carried out together with co-authorities.**

10.3.2. Good Practices

(1) **BASIS** – The paragraphs A.33 and A.34. of GS-G–1.3 state "*...The planning and scheduling of maintenance should be assessed to ensure that maintenance activities are performed by competent staff and are properly co-ordinated, and that repairs of equipment are handled in accordance with appropriate priorities. All types of maintenance activities should be observed."*

a) **Good Practice: The possibility of direct observation of the maintenance work at Paks NPP by means of the NPP computer network interconnected with the on-site inspectors' computers provides a useful tool for planning the inspections and for monitoring to assure adequate performance of testing and maintenance of safety systems.**

LIST OF ACRONYMS

AAE	Act on Atomic Energy
ALARA	As Low As Reasonably Achievable
APROS	Advance Process Simulator
CERTA	Centre for Emergency Response, Training and Analysis
DG	Director General
DDG	Deputy Director General
DL	Department for Licensing
EMERCON	International system for notification in case of radiological emergencies (IAEA)
EPO	Emergency Preparedness Organization
EU	European Union
FSAR	Final Safety Analysis Report
GCC	Governmental Co-ordination Committee
GND	General Nuclear Directorate
HAEA	Hungarian Atomic Energy Authority
HAEC	Hungarian Atomic Energy Commission
IAEA	International Atomic Energy Agency
ICRP	International Commission in Radiological Protection
INES	International Nuclear Event Scale
IRRT	International Regulatory Review Team
ISO	International Organization for Standardization
I&C	Instrumentation and Control
KFKI-AEKI	Atomic Energy Research Institute
LAN	Local Area Network
L/ILW	Low and Intermediate Level Waste
LLW	Low Level Waste
LOCA	Loss of Coolant Accident
MOWA	Mobile Waste Cementation System
MS	Microsoft
NPP	Nuclear Power Plant
NSD	Nuclear Safety Directorate
NSCS	Nuclear Safety Code Series
PDP	Preliminary Decommissioning Plan
PR	Public Relations
PSA	Probabilistic Safety Assessment
PSR	Periodic Safety Review
PURAM	Public Agency for Radioactive Waste Management
QA	Quality Assurance
QM	Quality Management
RA	Regulatory Authorities
R&D	Research and Development
RMS	Radiation Monitoring System
RP	Radiation Protection

RPG	Radiation Protection Guidelines
SS	Safety Series
SSS	Safety Standard Series
SFISF	Spent Fuel Interim Storage Facility
TRP	Technical Radiation Protection
TSO	Technical Support Organization
TUB	Budapest University of Technology and Economics
WANO	World Association of Nuclear Operators

ANNEX I - HAEA DOCUMENTS REVIEWED DURING THE IRRT MISSION

1. Advance Reference Material prepared for the IRRT Mission to Hungary and Updated for the IRRT Follow-up Mission, HAEA-NSD, November 2002.

2. Hungarian Regulatory Aspects of NPP Safety, opening presentation for IRRT Follow-up mission made by L. Voross, Deputy Director General, Head of the NSD.

3. List of regulatory guidelines in Hungary.

4. Safety Performance Assessment of the Hungarian Nuclear Facilities in 2001, HAEA-NSD, Department of Inspection.

5. Assessment of Safety Culture: Changing Regulatory Body Approach in Hungary, Jozsef Ronaky, Andras Toth, Presented at the IAEA Safety Culture Conference in Rio de Janeiro, Brazil, December 2002.

6. The Role of HAEA in Hungarian Nuclear Emergency Preparedness - A Brief Overview.

ANNEX II - SYNOPSIS OF RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

Recommendations

R.1. The roles and responsibilities of all parties/authorities involved in the Hungarian nuclear regulatory process should be clarified and formalized in more depth. Additional administrative and/or legal actions seem to be necessary in order to consolidate the relationship of parties concerned.

R.2. In order to achieve comprehensive independence of the HAEA a governmental action is necessary to transfer the responsibilities/rights of the DG of the HAEA as the Founder of PURAM as well as the HAEA as Manager of the Central Nuclear Financial Fund to another governmental body.

Suggestions

S.1. NSD should continue in its discussions with Government to preserve the situation with regard to the current time limits associated with license applications.

S.2. The HAEA should define its support role as an independent and credible spokesperson with respect to public information in its own Emergency Plan and procedures including staff support, and should continue its efforts to clearly define its role in the National Emergency Plans and procedures under development.

S.3. The HAEA is encouraged to complete the agreement on co-operation between the HAEA and the State Public Health and Medical Officers' Service.

S.4. In the inspection plan on TRP a focused inspection should be included on the radiation monitoring system (equipment, methods, procedures) for releases into environment. This inspection should preferably be a joint inspection to be carried out together with co-authorities.

Good Practices

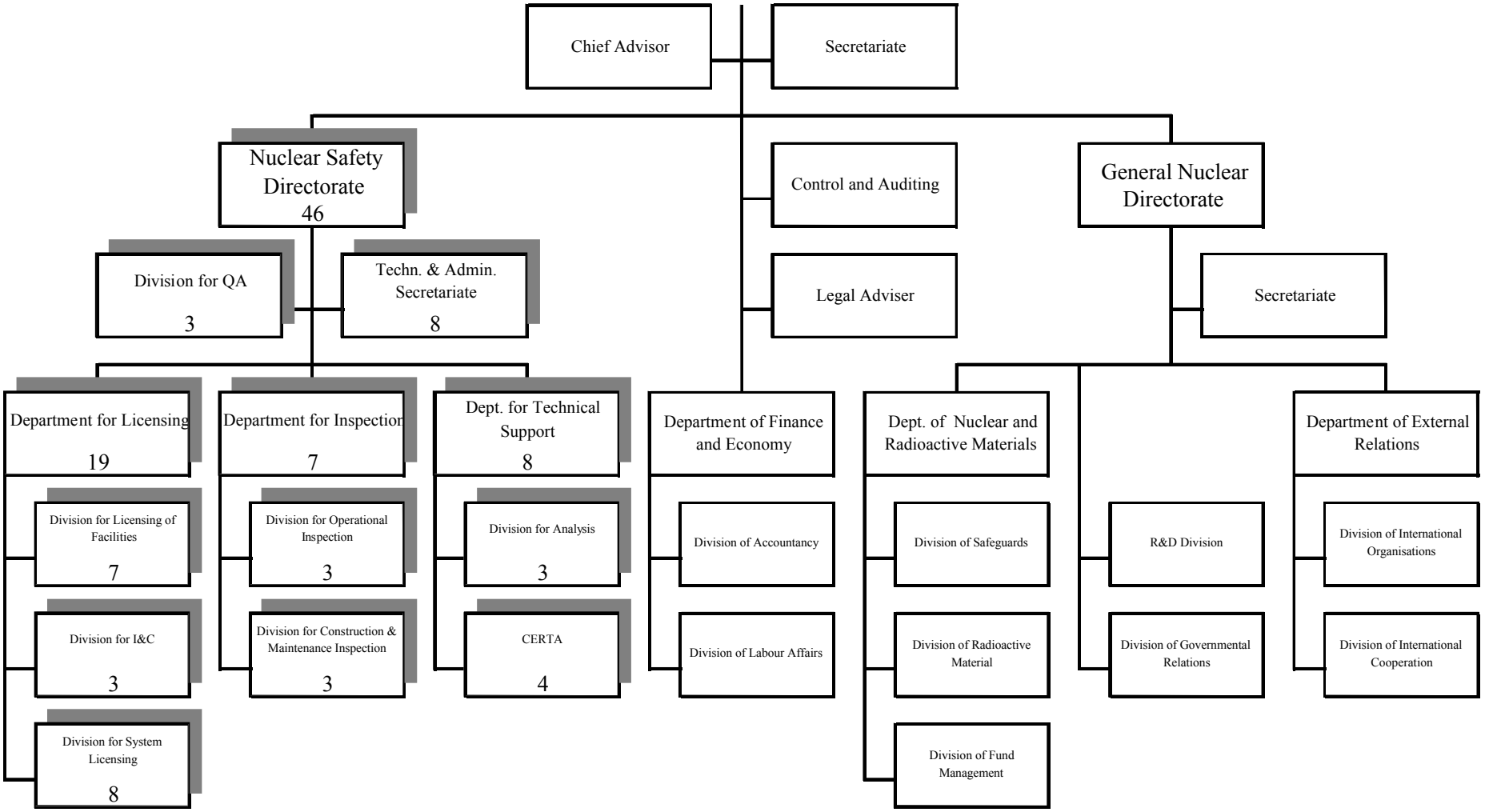
G.1. The implementation of a Quality Management system by NSD across all its regulatory activities is recognized as an important achievement in improving its regulatory effectiveness.

G.2. The use of software based integrated electronic office system is seen as offering significant benefits to NSD in improving its efficiency and in integrating its working arrangements.

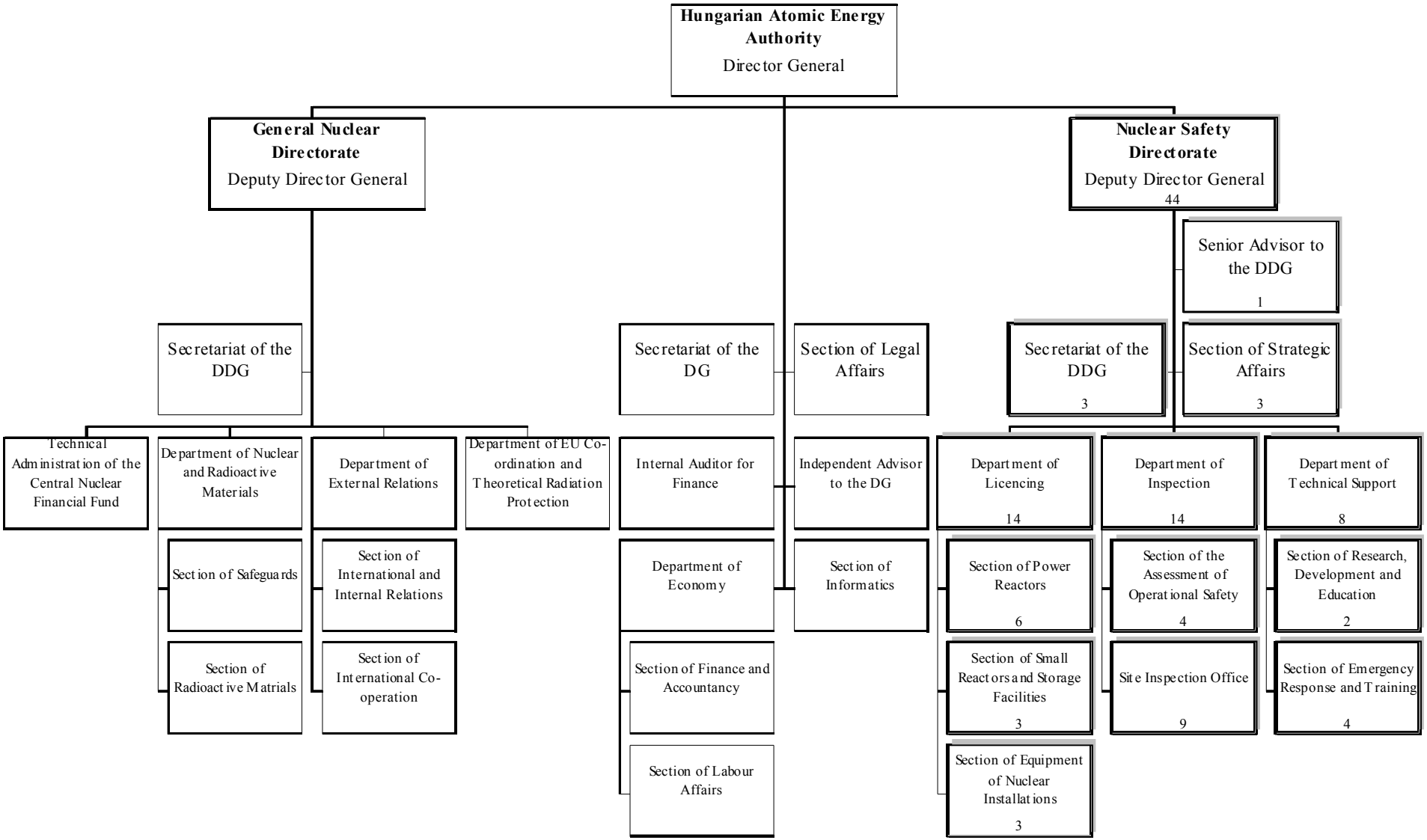
G.3. The use of the integrated team inspections to pilot inspection in previously uncovered areas and the development and use of safety performance indicators to focus HAEA-NSD inspections on areas in need of corrective action have been efficient and effective means to expand the inspection programme comprehensively and take an aggressive posture in assuring safety.

G.4. The STIP system is a noteworthy tool for assuring the orderly efficient generation, review, approval and distribution of internal and external reports during the course of a nuclear emergency, as well as for routine reports to assure that the staff maintain proficiency on the system.

G.5. The possibility of direct observation of the maintenance work at Paks NPP by means of the NPP computer network interconnected with the on-site inspectors' computers provides a useful tool for planning the inspections and for monitoring to assure adequate performance of testing and maintenance of safety systems.



ANNEX III
Organization of the Hungarian Atomic Energy Authority in 2000
FIGURE 1



ANNEX IV
Organization of the Hungarian Atomic Energy Authority in 2003
FIGURE 2

ANNEX V - TEAM COMPOSITION

Ms. Maria Olga de Gonçalves	IAEA, Safety Assessment Section Division of Nuclear Installation Safety Department of Nuclear Safety
Mr. Gunter Giersch	IAEA, Safety Assessment Section Division of Nuclear Installation Safety Department of Nuclear Safety
Mr. Peter Hughes	Health & Safety Executive Nuclear Installations Inspectorate United Kingdom
Mr. James Linville	Nuclear Regulatory Commission Region 1. Electrical Branch U.S.A
Mr. Jozef Mišak, Team Leader	IAEA, Safety Assessment Section Division of Nuclear Installation Safety Department of Nuclear Safety
Mr. Rolandas Ciucelis, Observer	Lithuanian State Nuclear Power Safety Inspectorate Resident Inspections Division, Ignalina NPP Lithuania
Mr. Zdenek Prouza	State Office for Nuclear Safety Radiation Protection Section Czech Republic