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INTERNATIONAL ATOMIC ENERGY AGENCY

REPORT OF THE

**INTERNATIONAL
REGULATORY
REVIEW TEAM (IRRT)**

TO

Switzerland

(Follow-up Mission)

27 January - 1 February 2003

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 staff 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 Swiss Government authorities, in December 1998 an IAEA team of eleven experts visited the Swiss Federal Nuclear Safety Inspectorate (HSK) to conduct an International Regulatory Review Team (IRRT) mission. The purpose of the mission was to undertake a peer review of the regulatory body of Switzerland against the IAEA Safety Standards and to exchange information and experience in the regulation of nuclear, radiation, radioactive waste and transport safety. Except for Radioactive Waste Management and Decommissioning the mission covered all areas related to the nuclear safety of nuclear installations.

In May 2002 HSK requested a follow-up mission to review the measures undertaken following the recommendations and suggestions presented in the report of the IRRT mission to Switzerland in 1998. Except the areas of Radiation Protection and Transport of Radioactive Material the follow-up mission was asked to review all areas subject to the mission in 1998. In the opinion of the three experts of the team, the 2003 follow-up review noted that significant progress has been identified in resolving the 1998 IRRT recommendations and suggestions.

It was noted in the 1998 IRRT that strengthening of the licensing power of the Swiss regulatory body and the planned improvements to the legal basis for clarification of the independence the regulatory body were recommendations of high priority. The 2003 IRRT follow-up noted that although safety is being maintained by HSK evaluations, currently only informal agreements provide for de facto independence.

The legal mechanisms are based on the same legislative framework that was in force at the time of the previous IRRT mission in 1998. This framework does not provide an effective de jure independence of the Swiss regulatory body as internationally required through the IAEA Safety Standards nor has licensing authority been delegated to HSK.

The team understands that this deficiency is supposed to be resolved through the introduction of a new Swiss Nuclear Energy Act (KEG) and/or the establishment of a Swiss Agency for Technical Safety (SATS). Deliberations on the draft KEG have started in the Federal Parliament in 2001. However it is understood that the legislative process still will take time so that a promulgation of the new KEG is expected in 2005 at the earliest.

The reviewers identified a number of good practices, which have been recorded for the benefit of other nuclear regulatory bodies. The recommendations and suggestions made in this report indicate where improvements are necessary or desirable to further strengthen the regulatory body in Switzerland.

The staff of the Swiss Federal Nuclear Safety Inspectorate (HSK) put a considerable effort into the preparation of the mission. During the review the administrative and logistic support was excellent and the team was extended full cooperation during technical discussions with HSK personnel. HSK counterparts were enthusiastic and interested in obtaining international advice on how to conduct their work and on their plans for further development.

INTRODUCTION

At the request of the Swiss Government authorities, an IAEA team visited the Swiss Federal Nuclear Safety Inspectorate (HSK) to conduct a Follow-up International Regulatory Review Team mission. The purpose of the mission was to continue the work of improving regulatory effectiveness by reviewing progress in the response to the 1998 IRRT mission recommendations or suggestions and to exchange information and experience in the regulation of nuclear safety in the following specific predetermined areas: 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.

The review was conducted from 27 January to 1 February 2003 by an IAEA team of three experts. Before taking part in the mission the experts reviewed the Advance Reference Material provided by HSK. It included both descriptive material and a table summarizing the response of HSK to the set of recommendations and suggestions made in the report to the previous IRRT mission. During the follow-up, a systematic review of the predetermined areas was completed using interviews with staff and direct observation of working practices. HSK made available to the team a large number of legal, regulatory and internal documents; they are listed in ANNEX I.

Most of the IRRT activities took place at the HSK offices in Würenlingen. During the mission one member of the team visited the nuclear power plant at Leibstadt, to observe inspection practices and to interview utility management. The same expert visited the national emergency centre (NAZ) in Zurich and the HSK emergency centre (Genora) in Würenlingen.

In carrying out the review the team recognized that there are a number of projects being finalized or still in progress in HSK, which are aimed at improving regulatory effectiveness. The team was aware that there are three particular developments, which when developed will have a positive impact both on the independence and the effectiveness of the Swiss regulatory body. These are the implementation of the new Public Management Elements (FLAGS) on a short-term basis, the introduction of a new Nuclear Energy Act (KEG), and the intention to incorporate HSK into a new Swiss Agency for Technical Safety (SATS).

1. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES

Expert: Samuel J. Collins

1.1. PRINCIPAL LAWS OR OTHER LEGAL PROVISIONS

The regulatory regime in Switzerland, that currently governs the peaceful use of nuclear energy, the safety of nuclear installations and radiological protection in Switzerland, remains based on the same legislative framework as it was in force in 1998 at the time of previous IRRRT mission.

1.1.1. Development of a new Nuclear Energy Act (KEG)

Because it was recognized that the Atomic Energy Act (AtG) from 1959 falls short in meeting all requirements of modern legislation in the field of the peaceful use of nuclear energy, efforts are underway in Switzerland to improve the legal basis by introducing a new Nuclear Energy Act (KEG).

The Federal Parliament started to deliberate on a draft of the new Nuclear Energy Act (KEG) in 2001. The experts understand that the legislative process still will take about two years so that it is expected that the draft KEG could be promulgated in 2005 at the earliest. Compared to the Atomic Energy Act the draft KEG addresses in more depth the following areas, among others:

- the protection of individuals, society and environment;
- protective measures conforming to internationally recognized principles in respect to the design, construction and operation of nuclear installations and security measures to prevent impairment of nuclear safety in nuclear installations as well as the misappropriation of nuclear materials;
- the responsibility of licensees;
- regulation of the reprocessing of spent fuel, and the decommissioning of nuclear installations and final disposal of nuclear waste;
- the independence of regulatory authorities from other bodies in respect to directions of a specialist nature and their strict separation from the licensing authorities; and
- the power of regulatory authorities to decree measures in the case of imminent danger which might diverge from the granted licence.

Regarding the authorization process, the new draft KEG is different from the AtG in that the granting of the general licence through the Federal Council (Government), requires an

optional referendum of the Swiss public on the resolution of the Federal Assembly. Additionally the authority for granting the construction and operating licence of nuclear installations will be transferred from the Federal Council to the Federal Department for Environment, Transport, Energy, and Communication (UVEK/DETEC).

1.1.2. Project Federal Technical Safety Act (BGTS)

In order to enable the government to concentrate on its essential duties the Department of Environment, Transport, Energy and Communication intends to reorganize the technical safety oversight in the sphere of its responsibilities. It is intended that all safety authorities of the Department including HSK shall be integrated in a newly established Swiss Agency for Technical Safety (SATS). This effort is consistent with the implementation of European Union (EU) directives in the areas of technical safety, separating promotional and safety tasks, providing for equal treatment of comparable risks and centralizing all tasks in the technical safety area. As a corporate body under public law its organization, duties, rights and responsibilities shall be settled through a new Federal Technical Safety Act (BGTS).

1.2. LEGAL DEFINITION AND POSITION OF THE SWISS REGULATORY BODY

1.2.1. Independence of the regulatory body

In its final report, the 1998 IRRT noted that the position of HSK as a division of the Federal Office of Energy give an image to the public that does not attest to the capability for independence. More important is the fact that nuclear safety licences are drafted by the Legal Section of the Division for Energy Economy of the Federal Office of Energy (FOE) on the base of the expert opinion of HSK on one side and on the base of the statement of KSA (Federal Nuclear Safety Commission) on the other side.

Recommendations and Suggestions from the 1998 IRRT report

Recommendation - HSK should have the responsibility of drafting the final nuclear safety licence of any decision concerning nuclear installations.

Suggestion - The Statement of the advisory committee KSA should be sent by the Federal Department of the Environment, Transport, Energy and Communication to HSK for consideration in the drafting of the licences.

Recommendation - The independence of the Regulatory Body should be ensured in a reorganization of governmental supervisory bodies. The Atomic Energy legislation should be revised accordingly.

Recommendation - A more independent position should be given to HSK with added legal staff.

Changes since the 1998 IRRT mission

Since completion of the IRRT HSK has proposed and/or supported the following initiatives:

- A proposed amendment to the Draft on the new Nuclear Energy Act (KEG) which would have given the supervisory authority (HSK) the lead in the licensing procedure. This proposal was rejected.
- The development of new legislation, Nuclear Energy Act (KEG) which is proposed to revise the duties and responsibilities of the supervisory body including not being subject to directions, and becoming formally separate from the licensing authorities (Art. 69 para. 2). This proposal is pending on the introduction of the KEG.
- A reorganization of the administration consistent with the Project Technical Safety Act (BGTS) would create a Swiss Agency for Technical Safety (SATS) uniting the supervisory organizations of the most important regulated industries in Switzerland, including HSK. This effort is consistent with the implementation of European Union directives in the areas of technical safety, separating promotional and safety tasks, providing for equal treatment of comparable risks and centralizing all tasks in the technical safety area. Specifically, this reorganization would strengthen the position of HSK in the licensing procedure, giving it the same formal position as the Office of Energy (FOE). During the public review process strong opposition was expressed by the Swiss industries and currently a scaled-down version of SATS is under consideration.
- Lastly, a formal application to the Federal Council by HSK to strengthen the administrative independence of HSK by implementing the New Public Management Elements (FLAG) is in the final stages of completion with implementation scheduled for January 2004.

Findings

At this time pending resolution and implementation of the above mentioned efforts, the roles of the supervisory authority (HSK), the Federal Office of Energy (FOE) and the Legal Section of the Division of Energy Economy have not changed relative to licensing matters.

In its final report the 1998 IRRT Mission noted that the Swiss situation, where the Federal Council grants the general licence and also some other main licences (construction, operation and modification authorization), does not contradict internationally approved principles, and that "*HSK seems to possess the characteristics for acting in a competent and independent way*". HSK indicates that presently there exists "de facto separation" and independence of the supervisory authority in safety decision matters.

A realignment or reorganization inconsistent with the Swiss social and political framework is not practical. The development of new legislation KEG is a pending solution, as is the creation of SATS.

Concerning the suggestion that KSA forward their statements to HSK for consideration in drafting of licences; since the proposed amendment to give HSK the lead in licensing, was rejected. this suggestion is not material. Presently KSA statements are provided to HSK for information and consideration of a response at the option of HSK. See chapter 4.4 for a more complete discussion of this topic.

1.2.1.1. Recommendations and Suggestions

(1) **BASIS** – IAEA Safety Standards Requirements Document No. GS-R-1 "Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety" (hereafter called IAEA Safety Standards Requirements Document No. GS-R-1) paragraph 2.2., item (2) states: *"A regulatory body shall be established and maintained which shall be effectively independent of organizations or bodies charged with the promotion of nuclear technologies or responsible for facilities or activities. This is so that regulatory judgments can be made, and enforcement actions taken, without pressure from interests that may conflict with safety"*. Moreover, IAEA Safety Standards Requirements Document No. GS-R-1 states in paragraph 2.5 *"If other authorities, which may fail to meet the requirement of independence set out in item (2) of paragraph. 2.2, are involved in the granting of authorizations, it shall be ensured that the safety requirements of the regulatory body remain in force and are not modified in the regulatory process."*

a) **Recommendation:** In order to achieve independence of the Regulatory Body government action to promulgate the new Act (KEG) is necessary as soon as possible. It is recommended that the Ordinances implementing the KEG specify the requirement of IAEA Safety Standards Requirements Document No. GS-R-1, paragraph 2.5, ensuring that the safety requirements of the regulatory body remain in force and are not modified in the regulatory process. In the short term the FLAG project by HSK is viewed as a positive step towards more administrative independence. Additionally, pending implementation of KEG or SATS, it is recommended that a means be established and implemented by which any concerns by HSK, based on the FOE dispositioning of the Safety Evaluation in support of the licensing process, would be elevated to the Department Level for resolution and transparency of the process. This would address the current position of HSK as a division of the FOE and the perception of a lack of independence of the supervisory authority in licensing matters.

(2) **BASIS** – IAEA Safety Standards Requirements Document No. GS-R-1 paragraph 4.6 states: *"..... The regulatory body shall acquire and maintain the competence to judge, on an overall basis, the safety of facilities and activities and to make the necessary regulatory decisions"*.

b) **Recommendation:** In consideration of the existing and pending challenges represented by the pending development and implementation of changes in Energy Act legislation, the BGTS/SATS organizational initiative, the continued development of a more structured inspection and enforcement policy, and the management challenges represented by FLAG, it is recommended that independent legal expertise be provided within HSK.

1.3. BUDGET AND FINANCIAL RESOURCES OF THE REGULATORY BODY

The 1998 IRRT mission noted that fees for the activities of HSK and KSA are assessed according to expenditure of resources of those two bodies. The revenue from those fees goes to the general budget of the Government. Then HSK has to discuss its budget as a constituent part of the budget of the Federal Office of Energy (FOE). The report noted "...there is no clear link between fees and the budget of HSK. In addition, the budget of HSK has been effected by public policies like reducing the burden of taxes on the economy of Switzerland, policies which may conflict with the responsibility for safety of the regulatory body".

Recommendations and Suggestions from the 1998 IRRT report

Recommendation - HSK should be enabled to discuss directly its budget with the department in charge of finance. Then, according to this accepted budget the level of fees should be established.

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 recovered by State Departments should only be applied to the nuclear safety regulatory body if they do not jeopardize its efficiency and capability.

Suggestion - Fees should be imposed to all operating organization, private, public, international or scientific. In case of difficulties some special budget could be provided to organizations that have difficulties for paying their fees.

Changes since the 1998 IRRT mission

At this time the situation, as described by the 1998 IRRT mission, fundamentally remains in accordance with the ordinance on the fees in the Field of Nuclear Energy. In the short-term, as a practical matter, HSK has been invited to the Department of Finances discussions related to the HSK/FOE budget. Fee based activities now account for greater than 90% of HSK/KSA activities. The annual budget remains allocated by Parliament, specific to areas of expense based on an FOE/HSK proposal.

The pending FLAG project, would allow HSK to propose a global budget with increased discretion in spending and in how to accommodate budget reductions. FLAG will allow documentation of the basis for budget requests as well as the impacts of budget reductions. FLAG requires HSK planning at a Strategic Plan level and results in a published Business Plan. It is noted that under FLAG the HSK budget would remain as a constituent part of the FOE budget. It is foreseen, however, under FLAG and the HSK Business Plan, that the responsibility of independently formulating a budget, with the Department of Finance, will be delegated to HSK from FOE. The FLAG regime should become effective in January 2004.

An additional pending initiative is a reorganization of the administration consistent with the Project Technical Safety Act (BGTS) which would create a Swiss Agency for Technical Safety (SATS) as discussed in Section 1.2. of this report. Under SATS the HSK becomes

responsible for formulation of the budget and presentation to the SATS Board. The budget would not be debated at the Swiss parliament.

In addition the fee policy has been revised to allow HSK the recovery of fees from additional operating organizations such as scientific and research activities. This increases the percentage of the HSK budget which is fee based thereby decreasing the potential impact of mandated budget reductions.

Since completion of the 1998 IRRT the HSK has requested increases in resources which were supported by FOE and granted by Parliament.

Findings

The situation as described in the 1998 IRRT has improved due to the informal agreement between HSK/FOE which results in HSK presence during budget discussions with the Department of Finance. As an outcome measure since the 1998 IRRT, HSK has requested and received resource increases. The longer term more formal initiatives of FLAG and SATS remain pending.

1.3.1. Recommendations and Suggestions

(1) **BASIS** - IAEA Safety Standards Requirements Document No. GS-R-1 paragraph 2.2. item (4) states: *"The regulatory body shall be provided with adequate authority and power, and it shall be ensured that it has adequate staffing and financial resources to discharge its assigned responsibilities."*

a) **Suggestion - In the interim period pending governmental decisions and implementation of SATS and in preparation of the January 2004 HSK implementation of FLAG, it is suggested that formal delegation by FOE of the responsibility of independently formulating a budget with the Department of Finance be granted to HSK.**

2. AUTHORITY, RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY

Expert: Samuel J. Collins

2.1. REGULATORY AUTHORITY

In its formal report, the 1998 IRRT noted that HSK has legally the power to perform enforcement actions consistent with IAEA Safety Standards Requirements document. The mission concluded that Chiefs of division of HSK had a clear knowledge of the enforcement powers of HSK, however personnel performing the inspections were less certain of their legal enforcement powers. Additional information on this subject area can be found in Section 6.5.

In a related matter it was noted that the Federal Office of Energy (FOE) was charged with all multilateral and bilateral relationships through the Division of International Affairs and Nuclear Questions. This arrangement precluded the safety authority (HSK) from formal direct contact with international organizations and counterparts in the field of nuclear safety.

Recommendations and Suggestions from the 1998 IRRT Report

Recommendation - All staff of HSK should be well aware of the legal enforcement powers of HSK. HSK should establish additional procedures of enforcement and designate the level at which enforcement decisions can be made.

Suggestion - HSK should consider having some legal staff or allocate a staff member the responsibilities for enforcement matters in order to be able to deal with enforcement matters and train HSK personnel in them.

Recommendation - HSK shall have the formal authority to represent Switzerland in foreign organizations (like the Department of Nuclear Safety – NS – of the IAEA) or in exchanges with other foreign regulatory bodies in matter concerning safety.

Changes since the 1998 IRRT mission

Since the completion of the IRRT the HSK has formalized the roles and responsibilities of HSK staff by publishing expectations of the Inspection Process and the Enforcement Process into the Management Handbook (MHB). Training in the form of a seminar, with external experts, workshops and informational meetings have been conducted.

In support of a Swiss government project, the HSK staff has been involved in the development of the Nuclear Energy Act (KEG). The KEG clarifies and expands the duties and responsibilities of the supervisory authority (HSK) in the areas of establishing safety criteria and authority to preserve nuclear safety.

A reorganization of HSK has taken place to strengthen the focus and oversight of the inspection and enforcement processes. A related request to obtain a position for legal staff was denied (Additional information on this subject area can be found in Section 1.2).

In the area of international corporation and exchange of regulatory information; formally all international relations belong to the ministries (Federal Departments) and may be delegated to the Federal Office (Office of Energy – FOE). At this time an informal delegation from FOE to HSK exists for communication with regulatory bodies and representation at the working group level for exchange of regulatory information. Proposals for an independent more formal HSK role in representation activities were rejected.

Findings

The formalized roles and responsibilities now incorporated into the Management Handbook provide a means to communicate inspection and enforcement expectations to HSK staff.

Subsequent training and involvement of HSK staff in formulation of the KEG provided an additional opportunity to increase staff awareness of existing authorities.

The suggestion to consider legal staff within HSK was rejected. The subject area is also addressed in Section 1.2 as a new recommendation.

Clarification of HSK authority in the international cooperation and regulatory information exchange area was partially addressed by an informal delegation from FOE to HSK.

2.1.1. Recommendations and Suggestions

(1) **BASIS** - IAEA Safety Standards Requirements Document No. GS-R-1 paragraph 2.6 states: *"The regulatory body shall have the authority...(14) to liaise with regulatory bodies of other countries and with international organizations to promote co-operation and the exchange of regulatory information"*.

a) Recommendation - The Federal Office should consider the consultation and involvement of HSK in international matters promoting co-operation and exchange of information, particularly involving nuclear safety experiences and international programme policy relevant to HSK's supervisory body responsibilities. For clarity of roles and responsibilities a formal delegation should be established between the Federal Office and HSK in respect to these matters.

3. ORGANIZATION OF THE REGULATORY BODY

Experts: Samuel J. Collins

3.1. ORGANIZATIONAL STRUCTURE

In its final report the 1998 IRRT noted that the Swiss Federal Nuclear Safety Committee (KSA), is an advisory body to the Federal Department of Environment, Transport, Energy and Communication, and to the Federal Council. The Federal Council has the exclusive competence to grant licences. The HSK, as supervisory authority, is a part of the Federal Department of Environment, Transport, Energy and Communication and is attached to the Federal Office of Energy (FOE). The mission noted that under BGTS it would provide for the formulation of the Swiss Agency for Technical Safety (SATS). The role of KSA in the formulation of SATS was not specified at the time of the 1998 mission.

Recommendation and Suggestions from the 1998 IRRT report

Recommendation - In any reorganization of the regulatory body KSA should be retained as the advisory committee to the Federal Council and in addition in the future be also the advisory committee to the regulatory body.

Changes since the 1998 IRRT mission

Since completion of the IRRT the SATS proposal has been developed and the resolution of public comments is presently pending. The HSK has noted that consistent with IAEA Safety Standards Requirements Document No. GS-R-1, Paragraph 4.9 Advisory Bodies to the Regulatory Body – *"The government or the regulatory body may choose to give formal structure to the processes by which expert opinion and advice are provided to the regulatory body"* . The March 1983 Ordinance for the Swiss Federal Safety Commission is still valid. The role and functions of KSA are defined by Ordinance and are not expected to change as a result of the BGTS effort, which would create SATS, nor as a result of the proposed new Nuclear Energy Act (KEG).

Findings

The legislation has defined a role for KSA consistent with IAEA Safety Standard Requirements document No. GS-R-1 paragraph 4.9. Since the transfer of licensing authority to HSK was rejected the duties of KSA, as defined by the Ordinance on the Swiss Federal Nuclear Safety Commission (March 1983), are appropriate. The role and functions of KSA are not expected to change as a result of the BGTS effort, nor as a result of the proposed KEG.

3.1.1. Recommendations and Suggestions

No need for further recommendations or suggestions was identified in this area.

3.2. STAFFING AND TRAINING

In its final report the 1998 IRRT noted that the number of personnel of the HSK has been increasing due to increased responsibilities and tasks. Threats to adequate recruiting and retention of expertise were identified both within the utilities and at HSK.

The mission reviewed a KSA assessment of the safety research programme and noted the report's conclusion that limitations of the proposed research programmes could have a negative influence on nuclear safety .

Recommendations and Suggestions from the 1998 IRRT report

Recommendation - A review of the resources of the HSK Sections should be performed taking into account the duties and responsibilities of those sections.

Recommendation - Full-time Section Heads should be nominated to all HSK Sections to strengthen the line management of the Divisions in question.

Recommendation - The research funding available to the HSK has been decreasing in recent years. To maintain the nuclear expertise, which is important also from HSK's point of view, adequate research funding should be provided by the Government for nuclear and radiation safety research.

Changes since the 1998 IRRT mission

Since completion of the IRRT the following actions have been formed and implemented:

- An analysis of HSK's organization and resources was completed. The HSK has been reorganized and additional staff have been authorized and recruited.
- An evaluation of HSK resources is performed twice a year as provided for by the HSK Management Handbook (MHB). This ongoing review has resulted in further organizational changes in response to HSK programme responsibilities and in preparation for implementation of FLAG.
- Full-time Division Heads and Section Heads have been authorized and appointed.
- Research funding provided to HSK has increased by about 25 % since the 1998 IRRT. This follows a period of significant decline of the research budget.
- Under the proposed New Nuclear Energy Act (KEG) financing of confirmatory research for nuclear safety becomes the responsibility of the operators.
- Under FLAG and the global budget approach by HSK a four year business plan will be developed and HSK's flexibility for budget decisions will be improved.

Findings

HSK actions have resulted in establishing a more appropriate organizational structure, more stable management positions and increased staffing. The HSK Management Handbook provides for periodic review (twice a year) to ensure these areas are evaluated for needed changes. The increase in research funding amounts and the proposed change to the source of funding, pending approval of the KEG, will help stabilize research resources. The implementation of FLAG in 2004 will bring business planning, budget formulation, budget execution, flexibility and accountability to these processes.

3.2.1. Recommendations and Suggestions

No need for further recommendations and suggestions was identified in this area.

3.3. QUALITY ASSURANCE

In its final report, the 1998 IRRT noted that, at that time, no formal Quality Assurance (QA) system was in place in the HSK. The HSK had started a project to introduce a quality management system including programmes being implemented in the trial phase and the training of staff in project management. Work process improvement initiatives were also being pursued and an attitude of continuous improvement by HSK was noted by the mission.

Recommendation and Suggestions from the 1998 IRRT report

Suggestion - The first steps to introduce formal QA within the activities of the HSK, in addition to the on-going project, should be to start preparing a QA Manual and internal audits to establish whether existing internal guidelines are followed.

Suggestion - HSK should consider self-assessment seminars for the whole staff. The purpose of these seminars would be to assess and develop activities based on, e.g. some international or national Quality Award Criteria and/or organizational assessment methods.

Changes since the 1998 IRRT mission

The HSK was in the process of defining and developing a quality management (QM) programme during the 1998 IRRT. This effort began in 1996 in preparation for the potential of HSK future independence. Since the 1998 mission the QM programme development was completed and its implementation began in 2000/2001. Significant efforts for development of the Management Handbook and the HSK Management System, including ISO-9001:2000 Certificate granting in December 2001 were accomplished. Internal audits and self-assessment programmes were conducted with results discussed in workshops involving all levels of HSK staff. It is noted that the HSK Management System is an evolving process including self evaluations and routine checks by the certification agency.

Findings

A formal QM programme has been established and implemented. Documentation of roles, responsibilities and expectations is evident. The Management Handbook development and the effort expended to obtain the ISO-9001:2000 Certificate in December 2001 are noteworthy accomplishments. Internal audits and evaluation of results, including Feedback forms, provide the means for continuous assessment and opportunities for improvement. The ongoing development of Performance Indicators and a Management Report is noted and encouraged.

3.3.1. Recommendations and Suggestions

No need for further recommendations or suggestions was identified in this area.

3.3.2. Good Practices

(1) **BASIS** – Achievement of International Quality Certificate

a) Good practice – HSK obtained the ISO-9001:2000 Certificate in December 2001.

(2) **BASIS** - Development of process-oriented, integral management system.

b) Good practice – The HSK Quality Management System-Management Handbook (MHB) development and implementation. An electronic version of the MHB is under preparation to improve access to and use of the MHB.

3.4. INTERNATIONAL COOPERATION AND LIAISON

In its final report, the 1998 IRRT noted that the HSK has established bilateral arrangements with regulatory bodies of numerous countries and that HSK is actively participating in, and establishing programmes and networks with the regulatory authorities of other countries.

In particular the Government of Switzerland supports and HSK coordinates bilateral agreements with countries in an outreach to improve the safety of their nuclear power plants. It was noted that HSK technical staffs role in these efforts was limited.

Recommendations and Suggestions from the 1998 IRRT report

Suggestion - The HSK should consider ways to increase the participation of staff and corresponding resources in the nuclear safety assistance programmes, because they provide possibilities for learning.

Changes since the 1998 IRRT mission

Since completion of the IRRT, HSK has increased its involvement and participation in nuclear safety assistance programmes. This effort has been conducted at many levels including

participation in IAEA services, IRRT and OSART missions, staff exchanges with foreign regulators, inspection workshops with other countries and the benefit of the preparation for and the follow-up actions resulting from the 1998 IRRT.

Findings

Improved focus and structure is apparently resulting in the efficient use of limited HSK resources to leverage international operating experience and insights into regulatory programmes of other countries. Examples include efforts to support East European through bilateral agreements (SWISSRUSS, SWISSLOVAC), and the sponsorship of the Centre for Nuclear Safety in Central and Eastern European Countries (CENS).

3.4.1. Recommendation and Suggestions

No need for further recommendations or suggestions was identified in this area.

3.4.2. Good Practices

(1) **BASIS** – Arranging for the participation in programmes to fulfill safety obligations and to promote cooperation.

a) **Good Practice** – **The leadership of the Swiss government and HSK in establishing and dedicating resources to international safety support programmes is a good practice.**

4. AUTHORIZATION PROCESS

Expert: José I. Villadóniga

4.1. GENERAL OVERVIEW

The legislative framework provides for two types of licences:

General Licence:

It is applicable to any new nuclear installation since 1978.

The four nuclear power plants (five units) currently in operation have no general licence since they were granted site and construction licences prior to that date.

Licences for construction, commissioning, operation, modification or decommissioning:

These licences are by nature primarily technical since the main requirements relate to nuclear safety. Under the Atomic Energy Act, the conditions to be met and the procedures are identical in all cases.

The central interim storage facility for nuclear waste in Würenlingen, (ZWILAG), has received both a general licence and a construction plus operating licence.

The licences are granted by the Federal Council, on the basis of a draft written by the Legal Section of the Federal Office of Energy (FOE).

The decision is based on the application, a procedure of review and assessment leading to a Safety Evaluation Report (SER) of HSK and a report on security by the Section Nuclear Energy of the FOE (KE), a statement of the Federal Nuclear Safety Commission (KSA) and a public as well as administrative consultation.

Licence conditions included in the licence are legally binding. In the frame of a valid licence, HSK has introduced the permit procedure which is used to authorize specific sets of the licensee's activities (e.g. selected parts of construction work, manufacture of important components, commissioning tests, start up after refueling or after modifications or repairs,...). This permit procedure is handled directly between HSK and the licensee and is based on Article 8 of the Atomic Energy Act which states: "*The Federal Council and the authorities designated by it shall have the right in executing their supervisory function to order instructions...*". In some cases the permits are the result of requests included in the Guidelines issued by HSK.

Changes since the 1998 IRRM mission.

There has been significant work in the preparation of a new Nuclear Energy Act (KEG) and corresponding ordinances that are now available in draft form and include significant improvements over the present Act. According to the draft the KEG will:

- be granting the general licence through the Federal Council which requires the approval of the Federal Assembly and supplementary an optional referendum of the Swiss public. Additionally the authority for granting the construction and operating licence of nuclear installations will be transferred from the Federal Council to the Federal Department for Environment, Transport, Energy and Communication (Art.15).
- establish clearly that the licence-holder is responsible for the safety of the installation (Art. 22).
- define duties and responsibilities of regulatory authorities (Art. 71) and their separation from the licensing authorities (Art. 69).

But it may take several years before these significant improvements are enacted.

4.1.1. Recommendations and Suggestions

Recommendation 1.2.1.1.(a) of this report deals with this issue.

4.2. LICENCE TIME LIMITATION

For historical reasons, the licences of the NPP are unlimited in time or have been issued for a limited period. This discrepancy exists in particular for the Beznau units. This might lead to difficulties at the time of expiration of the licence and decommissioning, like sharing personnel or waste facilities between a plant in operation and one under decommissioning.

Changes since the 1998 IRRM mission.

In May of 2003 there would be two popular votes on nuclear power phase-out and nuclear power moratorium. If any of these votes is favorable to the proposed action then HSK will face the situation of having NPPs with a predefined life limit. These types of limits could have a negative impact on the motivation of the plant personnel and in the commitment of the utility regarding investments in safety improvements. Therefore in such a case, HSK would have to work on a systematic understanding of the potential safety problems and the ways to deal with them. HSK has been proactive in raising this issue with the Nuclear Energy Agency Committee on Nuclear Regulatory Activities (CNRA) and may need to devote significant resources and increase international cooperation in this matter.

4.2.1. Good Practice

(1) **BASIS** – HSK is already considering actions and supporting international collaboration, without waiting for the results of the public vote. The actions look for ways to address the potential safety drawbacks derived from the establishment of a non-safety-related limit in the life of Nuclear Power Plants.

a) Good practice: HSK is proactive in identifying the potential safety problems that can arise from the May 2003 public votes and is supporting international collaboration to speed up learning.

4.3. LICENSING PROCESS

After HSK has completed its review and assessment of a project submitted by the applicant, it writes down its Safety Evaluation Report (SER) with conclusions (including any conditions) as well as findings and recommendations.

The licence and the SER of HSK are public documents. Any one would be able to compare the licence conditions with the conditions proposed by the HSK, therefore there is a small risk that conditions proposed by HSK would not be introduced in the licence. However, nothing prevents the licensing authorities from introducing what may look like additional safety requirements but could have the opposite effect, since they lack the expertise that is available at the HSK.

Recommendations and Suggestions from the 1998 IRRT Report.

Recommendation: While the present situation for licensing continues, the licence should, in one of its paragraphs, make explicit reference to the Safety Evaluation Report (SER) of HSK and to the KSA statements, so that all recommendations or requirements can be pursued through the permit process.

Changes since the 1998 IRRT mission.

The draft KEG previously mentioned.

Findings.

The current licence for ZWILAG includes the conditions recommended by the HSK in its Safety Evaluation Report and makes explicit reference to it. Therefore in the case analyzed the recommendations have been implemented. Although the current practice is to implement the SER, it is not legally binding for the licensing authorities to do so. They have the freedom to modify HSK's recommendations in any direction. To have the recommendations completely implemented, changes should be made to the KEG or to the corresponding ordinance to make the SERs legally binding for the organization issuing the licence.

4.3.1. Recommendations and Suggestions

Recommendation 1.2.1.1(a) of this report covers this issue.

4.4. GUIDANCE TO THE LICENCEES ON THE DOCUMENTS TO BE SUBMITTED

Although the applicants/licensees have the obligation to propose acceptable technical solutions, experience has shown that it is useful to inform them how HSK will review and assess the application of a licence. This is done by means of guidelines prepared and issued by HSK, which indicate ways of implementing some of the safety requirements. Up to now, HSK has established 34 valid guidelines covering a number of different topics with another 9 guidelines under preparation.

Recommendations and Suggestions from the 1998 IRRT Report.

Recommendation: HSK should establish formal general safety requirements for all topics related to licensing stages. HSK should therefore issue additional guidelines on a priority basis on topics, such as: Quality Assurance, Fire Safety, Seismic Design, Decommissioning and Periodic Safety Reviews.

Changes since the 1998 IRRT mission.

During last years HSK has made a significant effort in issuing new guidelines and revising the ones already published (the yearly plan for 2002 included 8 new guidelines).

Findings.

During the past years, guidelines on topics like Periodic Safety Review (PSR) and security were issued and others on topics like fire safety have been prepared. But still there is a need to establish general safety requirements. The KEG and the ordinances, presently in draft form, include such general safety requirements.

HSK includes in the yearly goals the development of new guidelines and the review of existing ones. These goals are updated at least quarterly. The list of guidelines have a priority assigned to use resources according to the priority. The PSR guide has been issued, the other guides mentioned in the recommendation are being developed. Assuming proper resources are allocated to this activity in the future, the recommendation can be considered fulfilled.

4.4.1. Guidance on Probabilistic Safety Assessment (PSA) applications.

Utilities are carrying out pilot programmes to test the potential benefits of PSA applications. Not having guidance available may deter the efforts of the utilities to use PSA in ways that can be beneficial for the safety of the plants. HSK is already working in the preparation of some guidelines but a specific programme in this area could reduce the uncertainties faced by the licensees today.

4.4.1.1. Recommendations and Suggestions.

- (1) **BASIS** – Paragraph 2.7 of the IAEA Safety Standards Guides Document GS-G-1.4 – “Documentation for Use in Regulating Nuclear Facilities” (hereafter called IAEA Safety Standards Guides Document GS-G-1.4) indicates that the regulatory body is required to perform the following functions: developing or adopting regulations and guides upon which its regulatory actions are based.
 - a) **Suggestion: HSK should prepare a programme of development of guidelines for PSA applications proposed by the licensees that is coherent with their plans for submission of requests for approval of PSA applications such as those related with In-service Inspection, In-service Testing, changes to Technical Specifications, etc.**

4.5. SWISS FEDERAL NUCLEAR SAFETY COMMISSION (KSA)

KSA is an advisory body of the Federal Council and the Federal Department of Environment, Transport, Energy and Communication; it is administratively affiliated with the HSK.

This Commission gives statements on applications for licences (all types). It makes statements on the corresponding SER of HSK and expert opinions on other federal agencies. It can also make statements related to the issuance of regulations and to legislative amendments in the field of nuclear safety, and can examine research issues.

There is the potential for KSA to issue recommendations in disagreement with the ones produced by HSK.

Recommendations and Suggestions from the 1998 IRRT Report

Suggestion: HSK and KSA should establish a formal procedure to resolve discrepancies between their technical recommendations prior to the drafting of the final licence.

Changes since the 1998 IRRT mission.

HSK is attending the meetings of KSA to try to ascertain whether there could be potential disagreements and to provide further information in order to help KSA in understanding HSK's conclusions.

Findings

This suggestion has not been fulfilled. Since HSK and KSA are independent organizations with different technical capabilities it may not be feasible to expect an agreement in every case. Given the significant difference in technical capabilities it does not seem reasonable to place their technical opinions on an equal level. Moreover the Federal Office for Energy does not have the competences required to deal with potential technical conflicts between HSK and KSA. In the IAEA documents advisory bodies are meant to advise Regulatory Bodies

and not the Licensing Authority given the difficulties that the last may have in addressing conflicting comments. It may be more appropriate to establish, in the forthcoming ordinances for the new KEG, that the Federal Office of Energy provides to the HSK the KSA comments on the HSK SER together with KSA recommendations. The objective should be that HSK is enabled to express its formal opinion on proposals made by KSA before the preparation of the licence by the Federal Office for Energy. Until the ordinances come into force the Federal Office for Energy can establish this mechanism formally.

4.5.1. Recommendations and Suggestions

(1) **BASIS** - According to paragraph 2.5 of IAEA Safety Standards Requirements Document No. GS-R-1 "... if other authorities which may fail to meet the requirement of independence ...are involved in granting of authorizations, it shall be ensured that the safety requirements of the regulatory body remain in force and are not modified in the regulatory process". Paragraph 2.29 of IAEA Safety Standards Guides Document GS-G-1.2 – "Review and Assessment of Nuclear Facilities by the Regulatory Body" (hereafter called IAEA Safety Standards Guides Document GS-G-1.2): stipulates "...careful consideration should be given to the establishment of one or more such bodies to provide assistance in the review and assessment process of the regulatory body".

a) **Suggestion: HSK and FOE should include in the KEG ordinances a process whereby HSK has to express its formal opinion regarding the proposals made by KSA. In the interim the FOE should establish this approach for all cases where reports from HSK and KSA are issued regarding nuclear safety and radiological protection matters of nuclear installations.**

4.6. PERIODIC SAFETY REVIEWS

HSK requested, at the beginning of the nineties, that the licensees perform a Periodic Safety Review (PSR). The subjects to be covered are those for new installations complemented by a review of operational experience, back-fitting, modifications and aging.

For all Swiss plants except Gösgen, PSR have been combined with major backfitting programmes or power upgrades. The PSR underway for Gösgen was comprehensive and the topics covered provided the basis for writing a guideline for PSRs.

Recommendations and Suggestions from the 1998 IRRT Report.

Recommendation: HSK should send the guideline defining PSR requirements to all licensees and should indicate the exact dates at which the next PSRs are to take place.

Suggestion: For future PSRs effective arrangements should be made in order to ensure consistency. HSK should write the guideline defining PSR requirements for the next PSRs based on the experience gained in Gösgen NPP.

Changes since the 1998 IRRM mission.

HSK has issued Guideline R-48 “Periodic Safety Reviews of Nuclear Power Plants” in November of 2001.

Findings

The guideline has been sent to all utilities. Annex 1 to the guideline includes the dates when the licensees have to present the PSR report. In the development of the guideline the previous experience has been taken into account.

4.6.1. Recommendation and Suggestions

No need for further recommendations or suggestions was identified in this area.

5. REVIEW AND ASSESSMENT

Expert: José I. Villadóniga

Deterministic and Probabilistic methods are tools used by HSK. The safety of the NPPs is proven using both deterministic and probabilistic ways. The basis for, and objective of the review and assessment is to verify compliance with the safety objectives, principles and criteria. The establishment of the safety criteria is in the competence of the regulatory authority.

The Advisory Committee (KSA) is involved in the licensing process as it can review and comment on the licence applications and the corresponding safety evaluation reports prepared by HSK.

The review and assessment process is applied to the following activities:

- Licensing basis and process
- Periodic safety reviews
- Modifications to NPPs
- Event analysis

Operation of a NPP has to be in accordance with an appropriate set of Technical Specifications approved by HSK derived from safety analysis and test results.

HSK gives special attention on event reporting and investigation. Lessons learned and feedback from events are essential contributions to the NPPs safety. The main inputs for HSK analysts to assess the events are the licensee information according to R-15 Guideline, attachment 3. Depending on the events, some require a detailed root cause analysis that includes a human factor root cause analysis in the plant.

Technical sections that are responsible for adequate event assessments:

- Section for Reactor, Fuel and Systems Engineering (RBS) regarding safety significance;
- Section for Personnel, Organization and Safety Culture (MOS) regarding human factor and organizational aspects;
- Sections of Division: Radiation Protection and Emergency Preparedness (SANO) regarding radiological consequences;
- Related sections, if necessary Section Electrical and Control Engineering (ELT), Section Mechanical and Civil Engineering (MBT), Section Probabilistic Safety Analysis and Accident Management (PSA) and Section for Inspection Management (KAI).

Changes since the 1998 IRRT mission.

The implementation of the Management Handbook has contributed to improve the efficiency of the review and assessment processes focusing on more important aspects and reducing unneeded paperwork.

5.1. SAFETY ASSESSMENT RESOURCES

HSK from the regulatory point of view is responsible for the evaluation of all reactor safety and radiological protection matters of the Swiss Nuclear Installations. The organization has to be very efficient to fulfill its responsibilities with the limited human resources available.

Recommendations and Suggestions from the 1998 IRRT Report

Recommendation: Taking into account the number and type of Swiss NPPs, HSK should increase the human resources available to the Reactor Design and Safety Analysis Division, RST Section in particular, considering the extent, diversity and highly specialized activities.

Changes since the 1998 IRRT mission.

The requests made by HSK for additional human resources in the technical field have been approved and implemented.

Findings

Presently the Section for Reactor, Fuel and System Engineering RBS (previously RST) has 7 technical persons, what is a significant improvement and responds to the request made by HSK management, which was based on an internal resource analysis.

5.1.1. Recommendations and Suggestions

No need for further recommendations or suggestions was identified in this area.

5.2. OPERATIONAL EXPERIENCE PROGRAMME

The operating experience analysis is carried out by a Multidisciplinary Group for Event Assessment (BVA) that provides a systematic and comprehensive analysis of both the Swiss operating experience and the international operating experience. This group is composed of 6 experts and a group leader is in charge of the work coordination and organization. The group covers the main technical aspects:

- Instrumentation & Control(I&C) and Electrical engineering;
- Mechanical engineering;

- Systems engineering;
- Radiation protection; and
- Human factors

Other technical experts may be included according to the needs identified by the group leader.

Recommendations and Suggestions from the 1998 IRRRT Report.

Recommendation: HSK should ensure that the licensee should provide them with reports of the national and international operating experience analysis. Actions applicable to Swiss plants should be assessed and agreed by HSK.

Suggestion: The minimum achievable scope and objectives of the operating experience programme should be specified by HSK.

Changes since the 1998 IRRRT mission.

No significant change in the process indicated above.

Findings

HSK-Guideline R-15 has been issued requesting the utilities to review international experience, listing the reviews performed in four of the monthly reports. The guideline also establishes the scope and objectives of the operating experience programme.

The actions are identified by the licensee and their implementation is checked by the Plant Coordinator. Reviews and independent assessments are carried out by the individual technical sections, as appropriate.

5.2.1. Recommendations and Suggestions

No need for further recommendations or suggestions was identified in this area.

5.2.2. Good Practice

(1) **BASIS** – HSK has recognized the importance of increasing resources to deal with organizational and management aspects as recommended in various paragraphs of the IAEA Safety Standards Guides Document GS-G-1.2.

a) **Good practice: HSK has recognized the importance of Human and Organizational factors to nuclear safety and has recruited personnel from the behavioral sciences field to address this area.**

5.3. PRIORITISATION OF SAFETY ISSUES

The findings of the safety evaluations and the resultant backfitting and safety improvements are stated as NPP safety issues. The control and maintenance of a survey of the safety aspects of the NPPs and their management is a significant task carried out by HSK, in particular, the control of the execution of requirements and all the requested and pending issues by means of a corresponding control list.

Recommendations and Suggestions from the 1998 IRRT Report.

Suggestion: To provide a clear understanding to the licensees, HSK should prioritize the pending safety issues in accordance with their safety significance.

Changes since the 1998 IRRT mission.

The Management Handbook establishes the meetings that have to take place between HSK and the licensee at different hierarchical levels. In these meetings HSK personnel provides information to the licensee about the priorities and target dates assigned to the main licensing and control activities in relation with the licensee. These meetings are considered as inspections, and a report is written accordingly.

Internally, priorities and target dates are controlled by means of a bimonthly “business coordination meeting” (GEKO), during which the control list is reviewed and updated.

Findings

The meetings between HSK and licensees (among others at the management level and at technical section level) allow for a continuous information of the licensee about the plans and priorities of HSK work; however it is not clear how the safety significance of the issue is taken into consideration in setting up the priorities.

5.3.1. Recommendations and Suggestions.

(1) **BASIS** - According to paragraph 3.4 of the IAEA Safety Standards Guides Document GS-G-1.2 “...for regulatory efficiency, the findings of the preliminary review should be prioritized on the basis of their potential implications for the overall safety assessment.” In paragraph 3.7 it states: “...that in practice, the scope and depth of the review and assessment will depend on several factors such as novelty, complexity, previous history, the experience of the operator and the associated risk.”

a) **Suggestion: HSK should emphasize the process of assignment of priorities of pending issues based on their safety significance and other factors considered in IAEA Safety Standards Guides Document GS-G-1.2.**

5.4. PLANT MODIFICATIONS

HSK requires a comprehensive safety analysis for each plant modification or backfitting (HSK guideline R-35) which defines what has to be met by the licensees. The guideline establishes how to evaluate the safety impact of a proposed modification. The Section for Coordination of NPP Supervision (KAI) coordinates the safety evaluation reports and the execution of permits of back fitting projects and plant modifications for all Swiss NPPs.

Findings

HSK has not established a system where the utility could decide, based on an internal review, which modifications to carry out without previous approval of HSK. Although there are some established exceptions in specific HSK guidelines, most modifications are sent to HSK for approval.

HSK has a very efficient system to process the request for approval of non safety significant modifications, but this system consumes significant HSK resources and can lead to the perception that HSK reviews all licensee's actions.

Although the present system may prove to be a good approach, it might be appropriate to consider a system that allocates more responsibility to the licensee and frees the regulatory body from activities with a very low safety impact , thereby giving HSK additional time to concentrate on other work more important to safety. .

5.4.1. Recommendations and Suggestions.

(1) **BASIS** - According to paragraph 2.4 of IAEA Safety Standards Guides Document NS-G-2.3: - "Modifications to Nuclear Power Plants": "*Management of the modifications should be the responsibility of the operating organization. The extent of the regulatory body's involvement in this process should depend on the safety significance of the modification. All safety relevant modifications should be submitted for review and approval by the regulatory body in accordance with national regulations. Non-safety-relevant modifications should be documented and accessible to the regulatory body. It should be demonstrated by the operating organization that these modifications do not influence safety...*"

a) **Suggestion: HSK should consider the benefits and drawbacks of modifying the present approach for the approval of modifications versus focusing on the more relevant ones for the safety of the plants and requiring the licensee to have a sound process for deciding when a modification needs previous approval by the HSK.**

5.5. TESTING SURVEILLANCE PROGRAMME

Before commissioning of the NPP a testing programme of safety systems is established to check the status and ensure the reliability of safety systems during operation. After some years of operation of the NPPs many modifications to safety systems, test procedures and acceptance criteria have been carried out. Therefore it was advisable to check the consistency of Technical Specifications requirements against surveillance procedures.

Recommendations and Suggestions from the 1998 IRRT Report.

Suggestion: HSK should establish a programme to review the surveillance programme of the safety systems of NPPs. In particular, it should review the acceptance criteria and verify the exhaustiveness of the testing programme and the consistency between the testing procedures and the technical specifications.

Changes since the 1998 IRRT mission.

The process of Inspection of the Management Handbook includes a generic request for the verification of the surveillance programme.

Findings.

The Basic Inspection Programme includes activities to verify that required surveillance tests are done and the results are according to established procedures. Also during 2001 there has been a specific mandate to check the consistency between the testing procedures and the technical specifications. It is understood that, if as a result of the inspections a discrepancy is found this will trigger a request for a review by the utility of the said consistency.

5.5.1. Recommendations and Suggestions

No need for further recommendations or suggestions was identified in this area.

5.6. SAFETY CRITERIA

Safety criteria are part of the regulatory process and the results of the PSA can be evaluated against a safety goal that express the desired level of safety. Safety criteria can be expressed in terms of the probability of occurrence of a health effect to members of the public or operators or accident releases.

Two safety criteria have been developed by HSK. One criterion is based on the individual dose limitation system versus probabilities, according to Swiss Legislation on Radiological Protection, chapter 7- Incidents, article 94 and HSK Guideline R-11. Another criterion is related to beyond design basis accidents, based on the probability of release of a certain amount of Cesium equivalent to the environment, independent of the individual dose to the public or operators.

Recommendations and Suggestions from the 1998 IRRRT Report.

Suggestion - HSK should develop a formal and unique criterion that considers both design-basis accidents and beyond-design basis accidents or demonstrate that the current practice of using separate criteria achieves consistency.

Changes since the 1998 IRRRT mission.

A revision of HSK Guideline R-11 “Objectives for the protection of people in the area of influence of nuclear power plants” is in the last stages of approval. Also HSK Guideline R-100 “Nuclear Power Plant Conditions” is being elaborated. These two guides should clarify the use of criteria for design basis events and beyond design basis events.

Findings

It is considered that by issuing revisions to HSK Guidelines R-11 and R-100 the issue is clarified and the suggestion is fulfilled.

5.6.1. Recommendations and Suggestions

No need for further recommendations or suggestions was identified in this area.

5.7. EXTERNAL RELATIONSHIPS WITH REGULATORY BODIES OR OTHER STATES AND INTERNATIONAL BODIES.

HSK is already participating in activities of key international organizations like Nuclear Energy Agency(NEA) and IAEA, however given its lean budget it is difficult to allocate a significant budget to international travel thereby reducing the potential for learning from other organizations work.

5.7.1. Recommendations and Suggestions.

(1) **BASIS** - According to paragraph 2.39 of IAEA Safety Standards Guides Document GS-G-1.2: “...*information may be exchanged by means of meetings, transfer of documents and visits by experts...*” Paragraphs 2.36, 37 and 38 deal with the aim and content of the exchanges of safety related information.

a) **Suggestion: HSK should increase the participation of its experts in working groups and regulatory exchanges to ensure that it fully benefits from the experience of other regulators facing similar problems. Enough resources should be allocated to these activities.**

6. INSPECTION AND ENFORCEMENT

Expert: C.M. Patchett

6.1. ORGANISATION OF INSPECTION ACTIVITIES

In the 1998 IRRT report several recommendations were made on the development and implementation of an inspection planning process into the HSK inspection regime. The processes used to co-ordinate the results of inspection activities were also identified as an area for further enhancement.

Recommendations and Suggestions from 1998 IRRT Report

Recommendation - HSK should develop and implement an inspection programme that is both systematic and comprehensive in nature

Suggestion - HSK should consider the use of section 355 of IAEA safety Guides 50-SG-G4 in the development of a systematic and comprehensive inspection programme .

Recommendation - HSK should ensure that their inspection programme has an appropriate focus on operational safety issues so that its implementation will provide an effective verification of the level of operational safety performance established at an NPP.

Suggestion - The focus on operational safety issues could be accomplished by specifying that this element of the inspection programme is the responsibility of all HSK individuals that conduct inspections at NPPs and ensuring that specific guidance (including management expectations) is included within inspection programme documents.

Recommendation: HSK should assess inspection resource in a manner that takes into the account the integrated nature of their supervisory responsibilities. Specific attention to resource needs should address the elements of programme development, monitoring the effectiveness of inspection oversight, the development of personnel competencies, and reactive inspections for event follow-up at the sites.

Suggestion - HSK should consider the allocation of responsibility for the management and performance of the inspection programme 's operational safety verification activities to the KOA Site Coordinator.

Suggestions - HSK should confer with Member States that share similarities in their nuclear power programmes (philosophy, resource allocations) to identify effective policies and objectives that can be emulated at HSK for the development of a comprehensive inspection programme .

Changes since the 1998 IRRT Mission

HSK recognized a need to review the organization of their inspection activities to ensure management systems were in place for their staff to follow when carrying out their duties. This

also involved the review and development of an inspection plan which was to be systematic and comprehensive. The review carried out by HSK has resulted in a Management Handbook (MHB) which provides guidance on how HSK manages its work and reviews its effectiveness.

Part of the organizational review process involved initiating a project to develop an inspection plan and supporting arrangements for managing the inspection and enforcement process. This has resulted in a Basic Inspection Plan (BIP) for each Nuclear Power Plant (NPP) being developed by HSK for use by its inspectors. The Basic Inspection Plan (BIP) was implemented by HSK in May 2001 and is planned for review during 2004.

In developing the BIP for each NPP HSK took account of the following areas; plant technical specifications; Swiss Ordinances and HSK guidelines; inspection results and assessments carried out by HSK, NPP Safety Reports; NPP Procedures; IAEA Requirements and guidance; and relevant national and international guides and standards. The BIP includes provision for the following types of inspection: announced and unannounced, team process; result orientated; and reactive. The planned periodicity of inspection ranges from 1 month to 10 years.

Findings

In developing the MHB HSK has produced an inspection programme for use by their inspectors, this is referred to as the BIP. The BIP has been developed by a project review team which identified those key areas HSK consider appropriate for inspection over a ten year period. This aligns with the periodicity of the Periodic Safety Review (PSR) for NPP in Switzerland. HSK has confirmed that the BIP has taken account of relevant parameters such as NPP safety reports and HSK inspections. The guidance provided by IAEA in Safety Guides GS-G-1.3 on the inspection areas to be considered in the development of the BIP has also been included. HSK has recognized the need to ensure a balance of inspection activities allowing flexibility in the programme to initiate reactive inspections arising from occurrences or plant modifications.

Good progress has been made in the development of an inspection programme, however it is important for HSK to establish the effectiveness of the process. HSK has recognized the need to develop processes to establish the effectiveness of their inspections, including the use of performance indicators. Guidance has been provided by HSK on the monitoring and review process for the management and revision of inspection plans. However, to optimize inspection plans it is therefore important for HSK to develop an overall inspection planning strategy to develop those indicators and measures such as the NPP operators quality management systems, needed to evaluate the effectiveness of their inspection activities.

The need to consider operational safety during inspections has been addressed by HSK in the development of their MHB. This resulted in the inclusion of plant operating procedures, safety system operations and operator performance in the BIP. HSK has also developed further inspection guidance for staff in their Management Handbook (MHB) where operational safety is considered especially in the MOSAIK inspection methodology for operational inspections. This has been produced in the form of check sheets where inspectors are expected to report on a number of generic safety issues they should review when visiting the plant.

HSK has taken action to integrate operation safety issues into their inspections. However, it is important for HSK to develop this process to ensure that an appropriate overview of operational issues is continued to confirm regulatory effectiveness. Examples were given of a recent HSK inspection where a number of improvements in the interaction between HSK staff on operational issues have been identified. However, it was noted that generic operational safety considerations identified in the MOSAIK are not mandatory for all HSK inspections. It is considered that this approach may lead to inconsistent regulation during HSK inspections.

In the review of HSK arrangements for managing inspection activities consideration was given to the management and review of the inspection programme to ensure effectiveness. The MHB has clarified the inspection planning process and put processes in place to ensure that inspection planning is co-coordinated and managed more effectively. The process has put in place responsibilities to ensure this takes place. Information was provided to confirm that reviews have been carried out and routine internal reports have been produced by HSK on their results.

The planning process has clearly developed and has been integrated into the HSK management system. However the system in place will need to be kept under review to establish the effectiveness of inspections. This will enable HSK resources to be optimized and appropriately targeted.

HSK was able to confirm that discussions with other regulators have taken place and further meetings are being identified. Since the previous IRRT HSK confirmed that exchanges have also taken place with a number of regulatory bodies both in Europe and the USA. In addition HSK staff have attended international workshops and seminars on inspection practices, to identify effective policies and objectives they should consider.

From the discussions with HSK it was evident they had made changes to their management system, in the area of inspection planning. The HSK Section for Co-ordination of NPP Supervision (KAI) now has responsibility for co-ordination, planning and supervision of operational safety inspections carried out by HSK. This also includes liaison with the operators on the findings and results of these inspections. However it was noted HSK did not routinely provide a general appraisal of their inspection results to NPP operators, this should be considered.

6.1.1. Recommendations and Suggestions

(1) **BASIS** – Paragraph 4.5 of IAEA Safety Standards Guides Document GS-G-1.3 Regulatory Inspection of Nuclear Facilities and enforcement by the Regulatory Body indicates: "... *different methods may be used in establishing or modifying an inspection programme ...*".

a) **Suggestion: HSK should further develop their inspection planning strategy to optimize the process by the use of internal indicators, those from the operator and the performance of NPP operators quality management systems.**

(2) **BASIS** – Appendix, paragraph A17 of IAEA Safety Standards Guides Document SG-G-1.3 indicates: "...*that the regulatory body shall implement an inspection programme to*

systematically verify the operators compliance with regulatory requirements and achievements of general safety objectives and to detect potential safety problems...".

b) Suggestion: HSK should keep under review the outcome of operational inspections to enhance HSK regulatory effectiveness during inspections.

6.2. TRAINING AND QUALIFICATION OF INSPECTION STAFF

The training and qualification for inspection competencies was principally through learning by doing approach with HSK relying on specialist skills to support inspection activities. Work was also being carried out to consider international practices and procedures to identify additional training needs.

Recommendations and Suggestions from 1998 IRRT Report

During the development of the comprehensive and systematic inspection programme (as recommended elsewhere), HSK should determine the training and development programme necessary to meet programme goals and objectives; ensure that the personnel who perform inspections are appropriately trained and qualified in effective methods of inspection, and maintain technical competence.

Recommendation - HSK should develop training profiles for each individual performing inspections, which records training experience and prescribes refresher and further training needs; conduct team-building training for HSK personnel to enhance inspection performance; and consider broadening the practice of temporary assignment of its inspection personnel to foreign NPPs to gain relevant operational experience and insights into the various phases of plant operations (refueling, start-up and shut-downs, etc.).

Recommendation- HSK should develop a plan to address the loss of personnel due to retirements. This plan should also take into account the issue of loss of nuclear competence within the country given the current stagnation in the NPP industry.

Changes since the 1998 IRRT Mission

Since completion of the IRRT the training of HSK staff to carry out inspection duties has principally been by individual training through management discussion, reviews and "on the job" training with experienced inspection staff. Training profiles for HSK staff have not been developed at the present time. The Management Handbook identifies the current training arrangements for staff. This has been supported by seminars and workshops organized by HSK or other external organizations.

In the area of Human Capital Planning HSK has developed a focused approach to the risk of knowledge loss, and knowledge preservation activities. An assessment was performed by the Center for Enterprise, Science, Technology and Innovative Management of the Swiss Federal Institute of Technology for the HSK. Results noted that "HSK knowledge preservation activities were good, with room for improvement in the area of knowledge capturing when employees

leave". Knowledge risks were identified and assessed and a preservation strategy developed. It was noted that the Management Handbook (MHB) is a valuable source of working procedure knowledge and that the ISO-9001:2000 Certified Management System includes Knowledge Management. The HSK initiative has been broadened to include key competency identification, job descriptions, staff selection, skills analysis and training plans. Documentation of HSK activities with access through a computerized information system is also a consideration. In the area of knowledge preservation a strategy has been developed to consider redundancy of knowledge, early planning of retirements, overlapping assignments and learning on the job programmes for new employees. Lastly, the option to rehire retired experts if needed, has been kept open.

Findings

HSK is a small regulator and it is therefore not generally cost effective to run special courses for small members of staff. The provision of specific training courses for the small number of staff routinely recruited has therefore been addressed by generally providing individual training and appraisal of staff. This approach is also undertaken for permanent staff who require additional training to meet the needs of HSK. Examples of the current training and review process used by HSK was presented and discussed to establish the extent of training carried out.

Although there is not currently a detailed training programme for all staff there are individual training programmes for staff. The effectiveness of the process is monitored and evaluated through management reviews. In addition HSK has also confirmed that internal workshops and seminars have been held for staff on a number of general areas on inspection activities, where specific issues have arisen. These were considered by HSK to have been successful in enabling staff to discuss a wide range of regulatory issues.

Evidence was also provided to demonstrate HSK staff have attended international seminars, workshops and have worked with other regulators to broaden their knowledge and experience.

However, it is important for HSK to develop an overall training programme which will enable management to confirm that staff have the necessary skills and competencies to continue to implement their inspection process effectively.

6.2.1. Recommendations and Suggestions

(1) **BASIS** – Paragraph 4.7, IAEA Safety Standards Requirements Document No. GS-R-1, states: "... *the regulatory body shall ensure that its staff members participate in well defined training programmes*".

- a) **Suggestion: HSK should consider developing an overall training programme for staff to ensure they achieve and continue to meet necessary competencies. In addition the programme could also be used for staff development and succession planning.**

(2) **BASIS** – Paragraph 4.7, IAEA Safety Standards Requirements Document No. GS-R-1, states: "*...that the proper skills are required and adequate levels of competence are achieved ...*".

b) Suggestion: The output from the Knowledge Management project will establish the necessary competencies for HSK to meet its regulatory responsibilities. This should be incorporated into the HSK management system for management to keep under review competency requirements for staff.

Findings

From the information provided and the discussions held with HSK it was apparent that the training needs to enable inspectors to carry out their work have been reviewed. The MHB has provided additional guidance to inspectors on the extent of their inspection activities. This has been supported by HSK workshops, team building training and attendance at international workshops and seminars. HSK has initiated the Knowledge Management Project to address the competency requirements for staff. This is a longer term project, the results of which will be considered by HSK for the further development of their training strategy.

From the information provided and the discussion held with HSK it is acknowledged they have implemented an interim arrangement to address the loss of personnel due to retirement. There is a need however to develop a more formal arrangement process which can be used to manage the competence requirements for HSK to maintain its effectiveness and meet new challenges. The Knowledge Management project will provide HSK with information to develop this process.

The HSK approach to knowledge preservation and succession planning has been developed and its implementation is ongoing. The annual attrition rate for HSK has been historically low. The future status of the nuclear power plant industry could be an additional consideration in HSK's human resource planning. It is important for HSK to implement a more formal process than the one currently adopted.

6.2.2. Good practice

(1) **BASIS** – knowledge preservation programme (s)

a) The HSK sponsored programme to identify knowledge related risks and develop a comprehensive presentation strategy is a good practice.

6.3. METHODS OF INSPECTION

Inspections have been routinely carried out by HSK staff using the technical expertise of the organization. Additional guidance on HSK inspection activities had been developed, however the scope of inspections was considered rather narrow.

Recommendation of the 1998 IRRT Report

Recommendation - HSK should provide specific and detailed guidance for 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 HSK personnel that employ the proper inspection and technical competencies.

Changes since the 1998 IRRT Mission

As part of their review of inspection activities HSK have considered the need for guidance on how inspections should be carried out by their staff and how the process should be managed. This has resulted in a Management Handbook (MHB), being produced by HSK. It provides a management framework for HSK and confirms management expectations. The MHB also provides guidance for inspectors on how to plan, prepare, implement and report the results of their inspection findings and identifies where appropriate the processes and procedures they should follow. In addition HSK have also considered the selection and competency needs of staff involved in inspections by providing training and establishing the competencies of inspectors.

Findings

In the development of their MHB, HSK has provided guidance for inspection staff in the approach they should adopt. This is an important development which will ensure that HSK inspectors are aware of management expectations and the process and procedures they should follow when preparing, implementing and reporting the results of their inspections. The management framework should provide consistency of inspection activities and greater transparency of the inspection process.

Information was provided by HSK on several recent inspections they have carried out and the results of those inspections were discussed. In addition an HSK inspection was observed by the IRRT to confirm implementation of the inspection process on a plant modification. During the inspection operational issues were also considered. Examples were also given by HSK staff of recent inspections, where generic operational issues have been identified, which operators have been asked to address. The issues arising from the inspection witnessed by the IRRT, and the results of recent inspections confirm the need for HSK inspectors to be aware of safety issues beyond their technical specialism, when carrying out inspections.

6.3.1. Recommendations and Suggestions

No need for further recommendations or suggestions was identified in this area.

6.4. INSPECTIONS REPORTS

Although additional guidance had been provided on the inspection process it was considered the form of the inspection reports was rather narrow. The practice of providing draft HSK inspection reports to the operator was questioned by the IRRT.

Recommendations and Suggestions from the 1998 IRRT Report

Recommendation - HSK should review its current guidance on the production of inspection reports.

Recommendation - should improve the technical accuracy of inspection reports and stress the necessity for improved performance by inspection personnel in this area.

Suggestion - HSK should consider discontinuing the practice of submitting draft inspection reports to the utility for comment.

Changes since the 1998 IRRT Mission

The use, content and process for producing inspection reports has been reviewed by HSK to develop guidance for inspectors when producing the inspection reports and for HSK staff to approve them. The MHB and supporting documentation has provided guidance for producing the reports and a process for their approval has been established. Specific areas addressed in the contents of inspection reports cover future regulatory actions, periodic review of inspection findings and root causes and trends.

The technical accuracy of the inspection reports has also been addressed by further guidance given in the MHB. In addition other measures put in place such as the introduction of the MOSAIK process are also considered by HSK to enhance their reporting processes.

Findings

In the overall review of HSK's arrangements consideration was given to the inspection reporting process. The Process Inspection section of the MHB has provided guidance to inspectors on the scope, content and quality management requirements for reports on inspections carried out at NPP's.

The Process Inspection Section of the MHB has clarified the expectations of HSK management for the preparation and issue of inspection reports. Introduction of the revised reporting process was reported by HSK to have improved the quality of reports. This has been measured by comparing the challenges made by operators prior to the process being introduced. It is considered that an important contribution to the improvements made has been the introduction of a quality management process within HSK.

HSK has confirmed that since the 1998 IRRT Mission draft inspection reports are no longer submitted to the operator for comment.

6.4.1. Recommendations and Suggestions

No need for further recommendations or suggestions was identified in this area.

6.5. REGULATORY ACTION AND ENFORCEMENT

At the time of the IRRT mission in 1998 HSK had no defined Enforcement Policy. It was recommended by the IRRT HSK should produce an Enforcement Policy and guidance for inspection personnel on its implementation.

Recommendations and Suggestions from the 1998 IRRT Report

Recommendation - HSK should generate an Enforcement Policy that clearly lays out the practices and procedures to be followed by HSK personnel for the implementation of enforcement actions that are used to ensure compliance by licensees with regulatory requirements.

Recommendation - HSK should develop adequate guidelines for inspection personnel performance when potential safety issues or potential non-compliance with licensed conditions are identified during the conduct of inspections. These guidelines should reinforce the principle that the licensee is responsible for safety.

Changes since the 1998 IRRT Mission

As part of the overall review of its activities HSK has reviewed regulatory action and enforcement. The review has resulted in guidance being provided in the HSK Management Handbook. A separate section has been produced within the document which sets out the HSK policy and confirms the legal responsibilities of the operator, HSK, and its inspectors and in addition confirms the actions inspectors could take. To support implementation of their enforcement policy HSK has provided supporting guidance clarifying the process inspectors should use to determine the action to take when considering potential safety issues. To support implementation of the MHB, clarify and discuss the legal enforcement powers of HSK and confirm the processes to be followed a seminar was held for HSK staff members in 2001.

Findings

Since the IRRT mission HSK has reviewed the enforcement policy, to improve the guidance for staff on the practices and procedures they should follow when considering enforcement actions. It is considered the guidance produced in the MHB identifies HSK policy, clarifies the legal powers of HSK and the actions HSK and its inspectors can take and the factors which should be taken into account when making enforcement decisions.

The enforcement policy and guidance HSK has produced does provide practices and procedures which inspectors should use. During the inspection, discussions took place with HSK staff to clarify their understanding of the enforcement policy. From the discussions it was apparent that staff were aware of the policy and procedures to be adopted by HSK inspectors.

HSK has produced guidance for inspectors on how enforcement action can be taken when potential safety issues or non compliance is identified, either during or as a result of inspections. The various methods of enforcement are described in the MHB and a Process Inspection flow

chart has been produced to confirm how and what HSK inspectors should do for differing situations.

An HSK inspection was observed by the IRRT team to establish implementation of HSK inspection procedures. From the inspection and the subsequent close out meeting with the operator the IRRT was able to confirm that enforcement practices were being implemented. This was further qualified by reviewing a number of inspections previously undertaken by HSK and reviewing the actions taken.

It is apparent the enforcement process is being adopted by HSK staff, however there is a need to ensure that the process of reporting findings to the operator is implemented consistently, by ensuring regulatory issues for consideration by the operator, are communicated in correspondence using an appropriate procedure by the consistent use.

6.5.1. Recommendations and Suggestions

No need for further recommendations or suggestions was identified in this area.

7. DEVELOPMENT OF REGULATIONS AND GUIDES

Expert: José I. Villadóniga

7.1. REGULATORY APPROACH

The legislative and regulatory framework for governing the peaceful use of nuclear energy, the safety of nuclear installations and radiation protection in Switzerland is established on a four-level system:

- Federal Constitution
- Federal Laws
- Federal Ordinances
- Guidelines

The Federal Constitution stipulates that the legislation on the use of nuclear energy and on radiation protection is enacted exclusively at the Federal level.

The main legal provisions for authorizations and regulation, supervision and inspection are established by the Atomic Energy Act, the Federal Decree to the Atomic Energy Act and the Radiological Protection Act. These are the basis for further legislation and for guidelines issued by the HSK and the KSA.

The civil liability for nuclear damage caused by nuclear installations or by the carriage of nuclear materials is regulated in the Nuclear Liability Act (KHG).

The Swiss policy for regulation and supervision of nuclear installations, as expressed in the legislation, is essentially to indicate that nuclear safety and radiological protection have to be ensured, without entering into technical details. The applicant for a licence has to seek and present technical solutions reflecting the internationally recognized state of science and technology.

According to legislation two main licence types have to be distinguished:

- General Licence
- Construction, operating and decommissioning licences

The general licence is applicable to any new nuclear installation. It is granted by the government and has to be approved by the Parliament. The construction, operating and decommissioning licences are also granted by the government.

The Atomic Energy Act has been under revision for long time. Some of the objectives of a new Nuclear Energy Act (KEG) are to maintain the competence to grant nuclear licences exclusively at the federal level, to contribute to the further safe operation of the existing nuclear power plants and to establish requirements about decommissioning and radioactive waste management. Granting a general licence may require a referendum.

The legislation related to nuclear safety of nuclear installations is prepared by the legal section of the Federal Office of Energy with the assistance of the technical expertise of HSK staff.

HSK publishes guidelines, which present the criteria it uses in evaluating an application or in assessing activities and projects of the nuclear power plant operators. These guidelines are not binding; the applicant is entitled to propose other solutions. However, compliance with the guidelines makes it easier to verify that safety is adequately ensured. Any departures from the guidelines have to be evaluated and justified. The use of guidelines, which is not mandatory, gives more flexibility to take into account the state of the art of the nuclear technology.

Some procedural guidelines are an exception to the above, they are mandatory. Thirty four guidelines are presently in force.

In the guidelines the HSK has introduced the permit procedure which can be used within the frame of a valid licence.

There is no goal to cover all safety related areas or functions with these guidelines. The decision to prepare a new guide is made on a case-by-case basis. HSK Guidelines are used to complement the regulations of the country of origin of the Swiss nuclear power plants suppliers.

KSA and all utilities are asked to comment on every guideline in the preparation phase. KSA may choose whether to give a statement or not.

In preparing the guidelines the IAEA NUSS Codes and other international standards are used as reference material.

There seems to be a need for some new guidelines of fundamental nature concerning for example: QA, operational experience feedback, deterministic and probabilistic analyses, periodic safety reviews and decommissioning.

For structures and equipment it is the responsibility of the utility to select appropriate standards and to present them to the HSK for approval in the application of a request.

HSK issues a permit for the next cycle after each refueling/maintenance outage and this process (contained in the HSK Management Handbook) is certainly very good for maintaining the design safety case.

Recommendations and Suggestions from the 1999 IRRT Report

Recommendation: In the future Nuclear Energy Act under preparation, or in some other relevant law or ordinance, a clear authorization to HSK to issue guidelines should be presented to clarify and strengthen the role and status of the HSK Guidelines.

Recommendation – The process for preparation of the HSK Guidelines should be documented in the internal guides of HSK. HSK should review existing guidelines and should make plans to update them, if necessary, and to assess the need to expand the scope of guidelines. Greater management attention should be paid to the issue.

Changes since the 1998 IRRT mission.

Since 2002 Guidelines are only issued by HSK. There has been significant work in the preparation of a new Nuclear Energy Act (KEG) that it is now in draft form and includes significant improvements over the present Act. According to the draft the KEG will:

- The granting of the general licence through the Federal Council requires the approval of the Federal Assembly and supplementary and optional referendum of the Swiss public. Additionally the authority for granting the construction and operating licence of nuclear installations will be transferred from the Federal Council to the Federal Department for Environment, Transport, Energy and Communication (Art.15).
- Establish clearly that the licence holder is responsible for the safety of the installation (Art. 22).
- Define duties and responsibilities of regulatory authorities (Art. 71) and their separation from the licensing authorities (Art. 69).

But it may take several years before these significant improvements are enacted. See recommendation 1.2.1.1 a) for further discussion.

Findings.

Today a clear authorization to HSK to issue guidelines is still missing. Moreover guidelines should normally be issued after general safety requirements are established at a level of “regulations”. The draft of the new Nuclear Energy Act (KEG) in preparation and the draft of the corresponding ordinance include the general safety requirements appropriate for the level of regulations and provide a clear mandate or authorization to HSK for the issuance of guidelines. However the issuance of the KEG and the ordinance may still take several years and there is significant uncertainty about the date of issuance. Therefore it is considered that some interim action needs to be taken until the KEG is enacted.

HSK requested to the Federal Office for Energy one position for legal support and the request was denied. Although paragraph 3.24 of the IAEA Safety Standards Guides Document GS-G-1.4 accepts that: “...legal support can be provided by the staff of the regulatory body or by another governmental body, or it can be obtained by means of a contract”, it is understood that if provided by another governmental body it should be in a nearby location. In the case of

Switzerland FOE and HSK are not located in a short distance and the kind of collaboration expected in IAEA Safety Standards Guides Document GS-G-1.4 is not practical. The use of consultants could be acceptable for a limited scope activity, but what the IRRT found and it is still existent is a wider issue that requires full-time long term work. If a legal expert is added to HSK personnel this professional could help in dealing with other issues like mergers of utilities, changes in ownership, potential safety problems derived from legal issues, like the popular votes, changes in market competition rules, etc”.

HSK has prepared a Section of the Management Handbook devoted to the description of the process that has to be followed for the preparation of Guidelines. It requires a management decision at the beginning regarding the need to prepare the Guideline. In the yearly plan the new guidelines to develop and the existent guidelines to review are established. Quarterly there is a confirmation or modification of the planning to keep track of the development and revision. In the last years a significant number of new issuances and revisions have taken place. Therefore the recommendation has been fulfilled.

7.1.1. Recommendations and Suggestions.

(1) **BASIS** - According to paragraph 2.2 (3) of the IAEA Safety Standards Requirements Document No. GS-R-1: *"...responsibility shall be assigned to the regulatory body for authorization, regulatory review and assessment, inspection and enforcement, and for establishing safety principles, criteria, regulations and guides"*. Also according to paragraph 2.6 (1&2): *"...the regulatory body shall have the authority to develop safety principles and criteria, to establish regulations and issue guidance..."* According to paragraph 3.2: *"...in fulfilling its statutory obligations, the regulatory body shall establish, promote or adopt regulations and guides upon which its regulatory actions are based"*. According to paragraph 3.24 of IAEA Safety Standards Guides Document GS-G-1.4: *"...the development of regulations and guides will, by its very nature, require professional legal support"*.

a) **Recommendation: HSK and Federal Office of Energy (BFE/UVEK) should take rapid coordinated action to introduce at the level of “ordinances” the general safety requirements and the clear assignment to HSK of Guidelines issuing responsibility, that are similar to what is presently contained in the draft of the KEG and its ordinances. To make sure that these new ordinances resolve all present limitations HSK should provide a detailed proposal based on a comparison with IAEA Safety Standards Requirements Document No. GS-R-1, GS-G-1.2, GS-G-1.4, GS-G-2.3 and others that may be in the lasts stages of development. To perform this activity HSK should have within staff the legal support needed.**

8. EMERGENCY PREPAREDNESS

Expert: C. M. Patchett

8.1. ALERTING THE PUBLIC

Emergency planning in Switzerland was based on the assumption that in the event of an accident with potential off site consequences, several hours were available before a radioactive release occurred. However the arrangements for alerting and informing the public to a fast breaking accident, where an immediate response was needed, were not in place.

Recommendations and Suggestions from the 1998 IRRT Report

Recommendation - HSK should pursue the timely implementation of the new Federal Concept for Emergency Planning in the Vicinity of NPPs.

Suggestion - Diverse means of ensuring an alert may also be considered. Both the police and the NPP could activate the sirens and authorize the broadcast of the pre-recorded public information message in the event of an immediate release of radioactivity.

Suggestion - Arrangements to ensure the timely provision of public information after the sounding of the sirens in Zone 1 for all accident scenarios including those resulting in an immediate release of radioactivity should be made and tested.

Suggestion - The triggering of all sirens in Zone 1 surrounding the Beznau and Leibstadt plants from one central point should be considered.

Suggestion - The Ordinance on Emergency Protection (Notfallschutzverordnung) and the HSK Guidelines on design, installation, maintenance and testing of sirens should be discussed with the NPPs, cantons and communities and the Guidelines amended to reflect the agreed position.

Changes since the 1998 IRRT mission.

Planning for a nuclear emergency in Switzerland has been further developed since the IRRT to improve the arrangements for alerting the public in the event of a fast breaking accident (very early release of radioactivity). New procedures were put in place on 1 July 2001, to ensure that, in the event of a very early release of radioactivity, arrangements for alerting the public in zone 1 around each NPP are the responsibility of the operator.

Consideration of the arrangements for timely provision of public information following an alert arising from a very early release of radioactivity have been made. Procedures are in place

for the cantonal police force to provide pre-planned information through the broadcasting media. Diversity of the alerting system has also been considered and provision was made at the end of 2002 for all sirens in the combined zone 1 around Beznau and Leibstadt NPPs to be triggered centrally by either NPP. Arrangements are also being put in place to enable the cantons to trigger the system. The systems should be operational on 1 January 2004.

Findings

From the information presented it was clear that the issue of a very early release of radioactivity had been considered. The Federal Concept for Emergency Planning in the vicinity of NPPs was prepared and the regulation came into force on 1 July 2001. Discussion with HSK staff confirmed the alerting system was tested and shown to be acceptable prior to the regulation coming into force.

Information was provided to confirm arrangements had been made to ensure that in the event of a very early release of radioactivity the canton would provide relevant public information. Confirmation was also provided by HSK to demonstrate the system for providing public information under such circumstances had been tested. In addition HSK was also able to confirm the relevant authorities in the Federal Republic of Germany had been contacted.

HSK was able to confirm diversity of the alerting system had been considered and procedures for triggering the sirens in zone 1 had been revised and implemented. This however only applies to the NPP triggering the siren in the event of a nuclear emergency. The cantonal police will be able to activate the sirens in 2004 when the new Civil Protection Law is proposed to come into force.

Discussion with HSK confirmed the ordinances on Emergency Protection contained a requirement for the NPP operator to be responsible for triggering the sirens in zone 1 for a very early release of radioactivity. HSK confirmed that the siren system for alerting the public in zone 1 around the Beznau and Leibstadt plants have been integrated and new sirens and remote triggering systems are in place. The system was reported to be in operation since the end of December 2002. Within zone 2 it was confirmed the canton and communities have the responsibility for alerting the public.

HSK advised that the Ordinance on Emergency Protection and HSK Guidelines on sirens would become obsolete when the proposed new civil protection law comes into force on 1 January 2004. This will pass responsibility to the canton and communities for the maintenance and testing of the alerting system. If implementation of the law is delayed further, consideration should be given to adequacy of the current arrangements.

8.2. HANDLING THE MEDIA

At the time of the IRRRT mission in 1998 there was no overall co-ordination of media briefing in Switzerland in the event of a nuclear emergency. The quality and timing of information is important to ensure speculation is avoided.

Recommendations and Suggestions from 1998 IRRT Report

Suggestion - HSK may wish to suggest to all other emergency response organizations (e.g. NPPs, cantons, communities, NAZ, the Information Center of the Federal Chancellery, etc.) that an overall media coordination plan is agreed and rehearsed during national exercises.

Suggestion - HSK, the Information Center of the Federal Chancellery, the NAZ, cantons and communities should together identify possible locations for Media Briefing Centers. These should be in locations convenient to both the affected NPP and its appropriate cantonal authority responsible for the implementation of off-site countermeasures. In addition, testing the implementation of such facilities during national exercises should be considered.

Changes since the 1998 IRRT mission.

Managing the media and responding to their concerns is an important issue during an emergency situation. The basic principle applied is that each organization is responsible for its own briefing. However, a new regulation "Koordination der Information bei Unfällen in einer schweizerischen Kernanlage" dated 1 July 2000 was introduced and has been tested in recent exercises. The purpose of this regulation is to improve information on co-ordination in the early phase when the National Emergency Operations Center will have responsibility for information and co-ordination.

Recent tests on media handling have identified a number of areas for improvement, some of which have commenced. Issues to be taken forward included further staff training and updating supporting arrangements.

Findings

Discussions were held with HSK staff and National Emergency Organization Center (NEOC) staff. It was evident from discussions that progress had been made and a regulation produced to address the issue of overall media co-ordination in the early phase. Exercises held have identified a number of issues which are being taken forward. It was also confirmed an exercise to be held in March 2003 would also test the media co-ordination.

Media co-ordination is an important issue to ensure accurate, timely and clear advice and information is provided. Since the media may adopt differing responses for emergency situations it is important to ensure strategies for media handling and management are developed and coordinated by the information center. These issues should therefore be considered during the exercise planning process.

From discussions held with HSK and NEOC staff it was clear that overall information co-ordination in the early phase had been addressed. There was however evidence that co-ordination at the canton level could be improved to ensure consistency of the local and response and its interface with the national information strategy. This could be best developed by identifying possible local media briefing centers which could be used to co-ordinate media briefing of the local and national response organizations.

8.2.1. Recommendations and Suggestions

(1) **BASIS** – Paragraph 4.8.2 – IAEA Safety Standards Requirements Document No. GS-R-2 “Preparedness and response for a Nuclear or Radiological Emergency” (hereafter called IAEA Safety Standards Requirements Document No. GS-R-2) states that: *"All practicable steps shall be taken to provide the public with useful timely truthful, consistent and appropriate information throughout a nuclear or radiological emergency"*.

a) Suggestion: HSK, the Information Center of the Federal Chancellery, the NEOC, cantons and communities should consider further the provision of Joint Media Briefing Centers in the NPP vicinity to ensure local and national briefing and information management is coordinated effectively.

8.3. EMERGENCY EXERCISE PROGRAMME

At the time of the 1998 mission there was no requirement for NPP's to carry out an annual safety emergency exercise.

Recommendations and Suggestions from 1998 IRRT Report

Recommendation - HSK should require that an exercise of all on-site nuclear emergency response functions at the NPP is undertaken annually.

Suggestion - HSK should either require that an on-site technical exercise is undertaken annually or they may consider a modular exercise approach which takes benefit from those functions demonstrated during a security exercise and additional on-site exercises which specifically test those functions not exercised during a security exercise.

Changes since the 1998 IRRT mission.

Emergency exercises at NPP plants are routinely carried out to test their arrangements. These cover safety exercises and security exercises at the NPP. All NPP operators now carry out an annual safety exercise at each plant. Security exercises may also be carried out during the same year by the plant operator. The Regulatory Guides concerning emergency exercises and their frequency is currently under revision.

Findings

HSK confirmed NPP operators had been formally advised they would need to carry out an annual safety exercise which would be witnessed by the regulator. Information on the performance of NPP emergency teams not involved in the exercise has also been requested by HSK to show they have undertaken the appropriate training. However, it is noted revision to the Regulatory Guides on Emergency exercises should be completed to formalize the situation.

The need for an annual exercise for the NPP to demonstrate its emergency arrangements has been addressed. HSK should also consider how the NPP can demonstrate all parts of the

emergency plan have been tested over a period of time. This could be carried out by producing a matrix of emergency arrangement activities which should be tested over a period of time to ensure all appropriate parts are covered. This principle would also be applicable to the national emergency exercise programme.

8.3.1. Recommendations and Suggestions

- (1) **BASIS** – Paragraph 5.33, IAEA Safety Standards Requirements Document No. GS-R-2, states that: *"... exercise programmes shall be conducted to ensure all specified functions required to be performed for emergency response and all organizational interfaces ...are tested at suitable intervals"*.
 - a) **Suggestion - HSK should ask the NPP operators to develop a testing matrix to show they have demonstrated all appropriate parts of the plan have been tested over an agreed timescale.**
 - b) **Suggestion - HSK should propose to NEOC they develop a testing matrix to show the national exercises have tested all appropriate parts of the plan over an agreed timescale.**

9. INTERFACE AUTHORITY UTILITY

Expert: C.M. Patchett

9.1. REGULATORY APPROACH

From discussions held between the IRRT and utilities it was felt HSK had an inconsistent approach to their inspection. The 1998 IRRT recommended HSK should review their inspection approach.

Recommendations and Suggestions from 1998 IRRT Report

Recommendation - HSK should make sure that all NPPs receive an appropriate and similar level of attention directed at actual operational safety performance unless special concerns need to be addressed at a given NPP.

Recommendation - HSK should initiate an internal performance improvement programme in a timely manner to demonstrate the added value brought forward by their regulatory inspections in operational safety.

Recommendation - The performance improvement programme recommended above should also establish provisions for an integrated and comprehensive safety performance of each individual NPP.

Changes since the 1998 IRRT mission.

As described in section 6 of the report, HSK has reviewed their organizational inspection processes including the arrangements for planning inspections. This has resulted in guidance and the HSK Management Handbook being produced. The document contains guidance on inspection activities including planning and the production of a Basic Inspection Plan (BIP) and reporting.

The BIP has been produced by HSK to manage its regulatory inspection activities. This process has been in operation since 2001. During the development of annual plans HSK take into account plant performance to establish whether further planning adjustments are necessary.

To establish the effectiveness of operational safety inspections HSK has developed guidance on the organization of NPPs, participated in international workshops and employed several specialist contractors to assist their Management of Safety Section.

Finding

From the information presented by HSK on their inspection planning programme process it was evident they have processes in place to consider operational safety. The arrangements described in the MHB are considered to provide HSK programme coordinators with relevant guidance on issues to be considered when developing operational inspection programmes.

HSK has through the introduction of the Management Handbook and inspection concept arrangements addressed the issue of reviewing the regulatory impact on operational safety. This has provided HSK with the necessary arrangements for the appropriate staff to monitor and review the inspection planning process for each NPP. However, it is considered further development and refinement of the process will be necessary as experience in managing the system is gained. It will be particularly important to establish parameters, such as safety indicators, which can be considered during evaluation of the process. See findings and suggestions at Subsection 6.1.2.

9.1.1. Recommendations and Suggestions

No need for further recommendations or suggestions was identified in this area.

9.2. SAFETY CULTURE.

The utilities have analyzed the KSA report on Safety Culture and in one case an action plan was developed and implemented. HSK initiated a contract with the Bern University to produce a report on guidance for safety culture assessment and enhancement, however the work was finally considered to be of low practical value.

Recommendations and Suggestions from the 1999 IRRT Report.

Recommendation - HSK should request all NPPs to perform their own safety culture assessment and report to HSK on the evaluation.

Suggestion - HSK should develop an approach to an independent evaluation of plants safety culture.

Changes since the 1998 IRRT mission.

Three psychologists are now part of the HSK MOS (Section: Personnel, Organization and Safety Culture) human resources team providing a strong competence in the field of safety management.

HSK has issued a new revision of HSK Guideline R-17 “Organization of NPPs” considering safety management as the key issue, integrating concepts from INSAG-13 “Management of Operational Safety of NPPs”, and taking into account country and plant specific issues and existing quality management systems.

Moreover HSK has developed also an Inspection Handbook to HSK Guideline R-17 that has been tested in two pilot inspections. The utilities have considered that the pilots provide them with helpful information.

All plants have implemented safety culture improvement programmes and they assess its status periodically through their “Licensee Self Assessment” programme .

Findings.

In 25 January 2000 HSK sent a letter to all the utilities requesting them, in the framework of their quality management system, to perform a “self-assessment” regarding operating safety. Chapter 2 of HSK Guideline R-17 requires that “*every nuclear power plant shall have a safety culture policy that describes how its own safety culture shall be promoted and evaluated*”. Reporting to HSK will be part of the information provided by the utilities regarding the results of their self-assessment. However, it is important for HSK to ensure the utilities have the appropriate resources and competence to assess their organizational and human performance.

HSK-Guideline R-17 and the associated Inspection Handbook constitute an approach towards an independent evaluation of safety management. Since the Handbook addresses an evolving issue, HSK is aware that it is going to be a living document to include the state of the art developments. Since HSK is actively contributing in activities of the NEA and IAEA in this field, the Guideline and Handbook will benefit from the knowledge generated in international activities.

Given the evolving nature of this issue it can not be considered fully complete but the recommendation and suggestion are fulfilled. However, in May of 2003 there would be a popular vote on nuclear power phase-out and nuclear power moratorium. If vote is favourable to the proposed initiative then HSK and, specially, the utilities will need to significantly reinforce their activities in this area.

9.2.1. Recommendations and Suggestions

(1) **BASIS** – Paragraph 3.46 IAEA Safety Standards Guides Document GS-G-1.2 states: “*...should cover all aspects of the operators managerial and organizational procedures and systems ...*” also Appendix A7(b) states: “*It has an adequate safety management system to be able to manage and control the facility...*”

a) Suggestion: HSK should ensure utilities have the appropriate resource and competence to assess their performance of organization and human behavior.

ANNEX I – LIST OF DOCUMENTS PROVIDED TO THE IRRT-TEAM

1. Measures of HSK to fulfill the IRRT recommendations:
 - R.1 to 29 according to chapters 1 to 8 of the IRRT report
 - R.42 to 45 according to chapter 12 of the IRRT report
2. Measures of HSK to fulfill the IRRT suggestions:
 - S.1 to 26 according to chapters 1 to 8 of the IRRT report
 - S.36 according to chapter 12 of the IRRT report
3. HSK Self-Assessment by Answering the IRRT Questionnaires A to E and F to H and Modules 1 and 2
4. Management Handbook MHB: Parts of the Key Processes Inspection
5. Management Handbook MHB: Management and Information
6. Management Handbook MHB: Enforcement
7. Introduction into the Basic Inspection programme (BIP)
8. Main parts of the Nuclear Energy Act (KEG)
9. Nuclear Energy Liability Act (KHG)
10. HSK-Guideline R-15: Reporting of the Operation of NPPs
11. HSK-Guideline R-17: Organization of the NPPs
12. HSK-Guideline R-30: Supervisory Procedures for the Construction and Operation of Nuclear Installations
13. HSK-Guideline R-48: Periodic Safety Reviews of Nuclear Power Plants
14. HSK-Guideline R-103: Plant Internal Measurements against the Consequences of Severe Accidents
15. HSK Business Plan (FLAG)
16. Nuclear Safety Convention
17. http://www.hsk.psi.ch/publikationen/uebrige_publicationen/nsc/nsc_ch_01.pdf
18. Answers to the IAEA IRRT questionnaire
19. HSK Annual Report 2001
20. http://www.hsk.psi.ch/pub_eng/publications/annual_reports/2001/jabe01_auswahl.htm
21. Handout of the presentation of the "HSK Management Handbook" by Willem van Doesburg

22. Handout of the presentation of the "Integrated Oversight Concept" by Ulrich Schmocker
23. Handout of the presentation about the "Independence of HSK" by Georg Schwarz
24. Handout of the presentation of the "Swiss Emergency Preparedness" by Martin Baggenstos
25. Introduction brochure to HSK
26. Second national report of Switzerland in accordance with the Convention on Nuclear Safety
27. Detail documentation on the FLAG project
28. Detail information on the BGTS project
29. Programme of the enforcement seminar hold out in 2001
30. Management handbook of HSK
31. Atomic Energy Act (English translation)
32. Draft of HSK guidelines R11 and R100

ANNEX II - SYNOPSIS OF IRRT RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

Recommendations

- R.1. In order to achieve independence of the Regulatory Body government action to promulgate the new Act (KEG) is necessary as soon as possible. It is recommended that the Ordinances implementing the KEG specify the requirement of IAEA Safety Standards Requirements Document No. GS-R-1, paragraph 2.5, ensuring that the safety requirements of the regulatory body remain in force and are not modified in the regulatory process. In the short term the FLAG project by HSK is viewed as a positive step towards more administrative independence. Additionally, pending implementation of KEG or SATS, it is recommended that a means be established and implemented by which any concerns by HSK, based on the FOE dispositioning of the Safety Evaluation in support of the licensing process, would be elevated to the Department Level for resolution and transparency of the process. This would address the current position of HSK as a division of the FOE and the perception of a lack of independence of the supervisory authority in licensing matters.
- R.2. In consideration of the existing and pending challenges represented by the pending development and implementation of changes in Energy Act legislation, the BGTS/SATS organizational initiative, the continued development of a more structured inspection and enforcement policy, and the management challenges represented by FLAG, it is recommended that independent legal expertise be provided within HSK.
- R.3. The Federal Office should consider the consultation and involvement of HSK in international matters promoting co-operation and exchange of information, particularly involving nuclear safety experiences and international programme policy relevant to HSK's supervisory body responsibilities. For clarity of roles and responsibilities a formal delegation should be established between the Federal Office and HSK in respect to these matters.
- R.4. HSK and Federal Office of Energy (BFE/UVEK) should take rapid coordinated action to introduce at the level of "ordinances" the general safety requirements and the clear assignment to HSK of Guidelines issuing responsibility, that are similar to what is presently contained in the draft of the KEG and its ordinances. To make sure that these new ordinances resolve all present limitations HSK should provide a detailed proposal based on a comparison with IAEA Safety Standards Requirements Document No. GS-R-1, GS-G-1.2, GS-G-1.4, GS-G-2.3 and others that may be in the last stages of development. To perform this activity HSK should have within staff the legal support needed.

Suggestions

- S.1. In the interim period pending governmental decisions and implementation of SATS and in preparation of the January 2004 HSK implementation of FLAG, it is suggested that formal delegation by FOE of the responsibility of independently formulating a budget with the Department of Finance be granted to HSK.
- S.2. HSK should prepare a programme of development of guidelines for PSA applications proposed by the licensees that is coherent with their plans for submission of requests for approval of PSA applications such as those related with In-service Inspection, In-service Testing, changes to Technical Specifications, etc.
- S.3. HSK and FOE should include in the KEG ordinances a process whereby HSK has to express its formal opinion regarding the proposals made by KSA. In the interim the FOE should establish this approach for all cases where reports from HSK and KSA are issued regarding nuclear safety and radiological protection matters of nuclear installations.
- S.4. HSK should emphasize the process of assignment of priorities of pending issues based on their safety significance and other factors considered in IAEA Safety Standards Guides Document GS-G-1.2.
- S.5. HSK should consider the benefits and drawbacks of modifying the present approach for the approval of modifications versus focusing on the more relevant ones for the safety of the plants and requiring the licensee to have a sound process for deciding when a modification needs previous approval by the HSK.
- S.6. HSK should increase the participation of its experts in working groups and regulatory exchanges to ensure that it fully benefits from the experience of other regulators facing similar problems. Enough resources should be allocated to these activities.
- S.7. HSK should further develop their inspection planning strategy to optimize the process by the use of internal indicators, those from the operator and the performance of NPP operators quality management systems.
- S.8. HSK should keep under review the outcome of operational inspections to enhance HSK regulatory effectiveness during inspections.
- S.9. HSK should consider developing an overall training programme for staff to ensure they achieve and continue to meet necessary competencies. In addition the programme could also be used for staff development and succession planning.
- S.10. The output from the Knowledge Management project will establish the necessary competencies for HSK to meet its regulatory responsibilities. This should be incorporated into the HSK management system for management to keep under review competency requirements for staff.
- S.11. HSK, the Information Center of the Federal Chancellery, the NEOC, cantons and communities should consider further the provision of Joint Media Briefing Centers in the

NPP vicinity to ensure local and national briefing and information management is coordinated effectively.

- S.12. HSK should ask the NPP operators to develop a testing matrix to show they have demonstrated all appropriate parts of the plan have been tested over an agreed timescale.
- S.13. HSK should propose to NEOC they develop a testing matrix to show the national exercises have tested all appropriate parts of the plan over an agreed timescale.
- S.14. HSK should ensure utilities have the appropriate resource and competence to assess their performance of organization and human behavior.

Good Practices

- G.1. HSK obtained the ISO-9001:2000 Certificate in December 2001.
- G.2. The HSK Quality Management System-Management Handbook (MHB) development and implementation. An electronic version of the MHB is under preparation to improve access to and use of the MHB.
- G.3. The leadership of the Swiss government and HSK in establishing and dedicating resources to international safety support programmes is a good practice.
- G.4. HSK is proactive in identifying the potential safety problems that can arise from the May 2003 public votes and is supporting international collaboration to speed up learning.
- G.5. HSK has recognized the importance of Human and Organizational factors to nuclear safety and has recruited personnel from the behavioral sciences field to address this area.
- G.6. The HSK sponsored programme to identify knowledge related risks and develop a comprehensive presentation strategy is a good practice.

ANNEX - IV – ABRIVIATIONS

AtG	Atomic Energy Act
BFE/UVEK	Federal Office of Energy (FOE)
BGTS	Federal Technical Safety Act
BIP	Basic Inspection Plan
BVA	Multidisciplinary Group for Event Assessment
CENS	Centre for Nuclear Safety in Central and Eastern European Countries.
CNRA	Nuclear Energy Agency Committee on Nuclear Regulatory Activities
ELT	Section:Electrical and Control Engineering
EU	European Union
FLAG	Public Management Elements
FOE	Federal Office of Energy (BFE/UVEK)
GEKO	Business Coordination Meeting
Genora	HSK Emergency Centre
HSK	Swiss Federal Nuclear Safety Inspectorate
I&C	Intrumentation & Control
INSAG	International Nuclear Safety Advisory Group
IRRT	International Regulatory Review Team
KAI	Section for Inspection Management
KE	Section: Nuclear Energy of the FOE
KEG	Swiss Nuclear Energy Act
KHG	Nuclear Liability Act
KOA	Former Section for Inspection Co-ordination
KSA	Federal Nuclear Safety Commission
MBT	Section:Mechanical and Civil Engineering
MHB	Management Handbook
MOS	Section: Personnel, Organization and Safety Culture
MOSAİK	Inspection Checklist
NAZ	National Emergency Centre
NEA	Nuclear Energy Agency
NEOC	National Emergency Organization Centre
NS	Department of Nuclear Safety of the IAEA
PSA	Probabilistic Safety Assessment
PSR	Periodic Safety Review
QA	Quality Assurance
QM	Quality Management

RBS	Section for Reactor, Fuel and System Engineering
SANO	Division: Radiation Protection And Emergency Preparedness
SATS	Swiss Agency for Technical Safety
SER	Safety Evaluation Report
SWISSLOVAC	Bilateral Agreements between Switzerland and Slovakia
SWISSRUSS	Bilateral Agreements between Switzerland and Russia
UVEK/DETEC	Federal Department for Environment, Transport, Energy, and Communication
ZWILAG	Central Interim Storage Facility for nuclear waste in Würenlingen

ANNEX V - TEAM COMPOSITION

Mr. Samuel J. Collins	United States Nuclear Regulatory Commission USA
Mr. Gunter Giersch, Team Leader	International Atomic Energy Agency
Mr. Collin M. Patchett	Health and Safety Executive Nuclear Safety Directorate United Kingdom
Mr. José I. Villadóniga	Consejo de Seguridad Nuclear Spain

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Throughout the entire mission HSK personnel were extremely co-operative, open minded and helpful in locating sources of information and responding to queries. Their co-operation was instrumental in maintaining a professional and highly productive working atmosphere throughout the course of the mission.

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