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**REDUCED SCOPE
INTERNATIONAL REGULATORY
REVIEW TEAM (IRRT) MISSION**

TO

CZECH REPUBLIC

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DIVISION OF NUCLEAR INSTALLATION SAFETY

INTERNATIONAL REGULATORY REVIEW TEAM
UNDER TECHNICAL COOPERATION PROGRAMME RER/9/052

FOREWORD

by the

Director General

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

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

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

The number of recommendations, suggestions and good practices contained in this report 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 Czech Government authorities, an IAEA team of five experts visited the State Office for Nuclear Safety (SÚJB) to conduct a reduced scope International Regulatory Review Team (IRRT) mission. The purpose of the mission was to review the effectiveness of the regulatory body of the Czech Republic by reviewing regulatory practices and activities related to the Temelín nuclear power plant and to exchange information and experience in the regulation of nuclear safety.

The review team concluded that:

- there is a sound legal basis for the licensing of Temelín nuclear power plant and SÚJB issues permits at each of the defined key stages during the construction and commissioning phases;
- SÚJB has put in place regulatory requirements for the safety justification of the Temelín nuclear power plant and has adopted a flexible approach to ensure that criteria for its review and assessment are established;
- SÚJB has a planned inspection programme in which the resident inspectors and inspectors from the Prague office confirm that the licensee is constructing and commissioning Temelín nuclear power plant in accordance with the conditions set out in the authorisations; and
- advice and assistance from regulatory bodies in Western Europe and North America has been used to develop an appropriate regulatory system for authorisation, review and assessment and inspection of the Temelín nuclear power plant.

The reviewers identified a number of good practices which have been recorded for the benefit of other nuclear regulatory bodies. They also made recommendations and suggestions which indicate where improvements are necessary or desirable to further strengthen the regulatory body in the Czech Republic. In the majority of cases the recommendations and suggestions are concerned with the longer term development of the organisation and build on current practices and achievements.

SÚJB staff put a considerable effort into the preparation of the mission. During the review the team was extended full co-operation during technical discussions with SÚJB personnel and the organisation and administrative support was excellent. SÚJB counterparts were enthusiastic and interested in obtaining international advice and team members appreciated the opportunity to identify lessons for their own organisations from SÚJB practices.

INTRODUCTION

At the request of the Czech Government authorities, an IAEA team of five experts visited the State Office for Nuclear Safety (SÚJB) to conduct a reduced scope International Regulatory Review Team (IRRT) mission. It was agreed that the mission would concentrate on the regulatory activities associated with the nuclear power plant Temelín. This agreement resulted in the review of the following predetermined areas: the authorisation (licensing) process; regulatory review and assessment; and inspection and enforcement during commissioning. A full scope IRRT mission to review the regulatory infrastructure for nuclear, radiation, waste and transport safety in the Czech Republic and the way in which SÚJB fulfils its full range of regulatory responsibilities is planned for 2001.

The review was conducted from 7 to 11 February 2000. Before taking part in the mission the experts reviewed the Advance Reference Material provided by SÚJB. During the mission, a systematic review of the predetermined areas was completed using interviews with staff and direct observation of working practices. The team was based at the SÚJB offices in Prague and during the mission two team members reviewing the topic inspection and enforcement spent one and a half days at Temelín nuclear power plant.

SÚJB made available to the team a number of legal, regulatory and internal documents in English and these are listed in Appendix I. Case studies were presented to the reviewers to describe the work of SÚJB and assist understanding of working practices.

In carrying out the review the team recognised that SÚJB was established in 1993 and has taken many steps to develop its regulatory system within a short time-scale to ensure effective regulatory supervision of nuclear facilities in the Czech Republic.

1. THE AUTHORISATION PROCESS

Experts: Oskar Grözinger, Marja-Leena Järvinen

1.1. THE LICENSING CONCEPT

1.1.1. History

The legislative process regulating industrial utilisation of nuclear energy was launched by the amendment to the Law No. 50/1976 Coll. on Physical Planning and Construction Code (the Construction Act). The implementation of this Act has been set in Regulations No. 83/1976 Coll. on Documentation of the Constructions and No. 85/1996 on More Detailed Regulation of Area Management and Construction Regulations. The Construction Act of 1976 established for the first time that realisation of constructions with nuclear installations would require the special approval of the Czechoslovak Atomic Energy Commission (ČSKAE).

Regulation No. 85/1976 Coll. defined the types and content of Safety Analyses required by the ČSKAE as basic information necessary for the issuance of its consents:

for site approval - site license - Siting Safety Analysis Report
for construction approval - construction license - Preliminary Safety Analysis Report
for operation approval - operational license - Pre-operational Safety Analysis Report

These three main stages of the licensing process are still valid.

1.1.2. Present legal situation

On the 1st of January 1993 the Czech Republic was formed. Since this time a new legislative system was build up and the State Office for Nuclear Safety, Státní Úrad pro Jadernau Bezpecnost (SÚJB) was entrusted with the execution of the state administration and state supervision in the peaceful utilisation of nuclear energy and ionizing radiation. SÚJB is on the level of a Ministry with its own budget.

In January 1997 the Parliament of the Czech Republic passed Act No. 18/1997 on the Peaceful Utilisation of Nuclear Energy and Ionising Radiation (Atomic Act). This act represents a modern atomic law. According to this law the licensing of a nuclear facility consist of three main licensing phases and several approvals or permits. Despite of this new legal base the old licenses remained still valid.

The Atomic Act 18/1997 authorises the SÚJB to issue regulations in the area of the Atomic Act. The current set of regulations is listed in Appendix II.

1.1.3. Present licensing practice

The main stages of the licensing process are the site, construction and the permanent operation license, which are granted based on the Construction Act 50/1976. Besides the Atomic Act and the Construction Act the Environmental Impact Assessment Act and the Environmental Act are relevant in the context of licensing

process of a nuclear installation. In different stages of licensing process different regulatory bodies are involved. Some of the systems such as pressure vessel and fire protection system are regulated in addition to SÚJB by other regulatory bodies. The following picture shows all the parties involved in the licensing process.

A description of the licensing process and the parties involved is given in Appendix III.

1.1.4. Main licensing steps

The body issuing the licenses for the main stages of the licensing process (site license, construction license, and operation license) is the Construction Office of the District Authority having jurisdiction on the specific site. There are 80 districts in the Czech Republic. The applicant is required to collect the separate approvals of SÚJB and of the other involved bodies and to submit the relevant documents to the District Authority. The District Authority takes the final decision (see figure "Licensing process" in Appendix III). SÚJB represents the only state regulatory body in all the aspects of nuclear safety and radiation protection.

The authorisations given by SÚJB for the main licensing steps are:

- **Site license:**

For the site approval, the licensee has to submit to SÚJB the "Siting Safety Analysis Report" for review. This report includes e.g. the description and evidence of suitability of the selected site with regard to siting criteria for nuclear installations, the preliminary assessment of operational impact of the proposed installation on personnel, the public and environment. This report also includes a general quality assurance (QA) program. The SÚJB Regulation No. 215/1997 Coll., - on criteria for siting of nuclear installations and installations with significant ionising radiation sources - gives the requirements for the site approval. The Environmental Impact Assessment process has to be finalised prior to the issuing of the SÚJB decision.

- **Construction license:**

For the construction approval, the applicant has to submit to SÚJB for review the "Preliminary Safety Analysis Report (PSAR)", which includes evidence that the proposed design meets all the requirements for nuclear safety, radiation protection and emergency preparedness as laid down in the applicable regulations. More specific QA programs are also submitted to SÚJB for approval. The SÚJB Regulation No. 195/1999 Coll., - on requirements on nuclear installations for assurance of nuclear safety, radiation protection and emergency preparedness - gives the main safety requirements. Based on positive review results of PSAR and related documents SÚJB issues the construction permit.

- **Operation license:**

For the operation approval, the applicant has to submitted to SÚJB for review the "Final Safety Analysis Report (FSAR)" and additional documents in respect to the previous commissioning stages, evidence that installation and personnel are prepared for operation and up-dated limits and conditions of safe operation. The

SÚJB Regulation No. 106/1998 Coll., - on ensuring nuclear safety in nuclear installations during their commissioning and operation - and Regulation No. 195/1999 - on requirements on nuclear installations for assurance of nuclear safety, radiation protection and emergency preparedness - gives the requirements for this step.

1.1.5. Additional permits¹

According to Article 9 of the Atomic Act 18/1997 further permits by the SÚJB are required for: particular stages of commissioning, restart of a nuclear reactor to criticality following a nuclear reload, discharge of radionuclides into environment, modification of the plant in respect to nuclear safety and radiation protection, physical protection or emergency preparedness of the nuclear installation and so on. Especially in the case of modification of the plant further approvals of the other regulatory bodies for example in respect to fire protection or conventional safety could be needed. There is no administrative body, which co-ordinates all the safety relevant aspects. Only the licensee is required to collect the separate approvals.

1.1.5.1. Recommendations and suggestions

- (1) **BASIS** - At the main licensing steps the District Authority issues the license after receiving all the approvals. This Authority therefore has a co-ordination and final control function. However, there is no formal co-ordination at the additional permit stages and for reactor pressure vessel inspections at the relevant main licensing stages. According to paragraph 4.2 of the IAEA Safety Standards Series, GS-R-1 "Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety" ... effective arrangements shall be made to ensure that regulatory responsibilities and functions are co-ordinated to avoid any omissions or unnecessary duplication and to prevent conflicting requirements being placed on the operator. ...
 - a) **Suggestion: SÚJB should consider what could be done to ensure that there is proper co-ordination between different governmental bodies at the additional permit stages and for reactor pressure vessel inspections at the relevant main licensing stages.**

¹ The word in the Czech language translated as license in previous sub-sections of the report is translated as permit in the current sub-section. This use of English allows distinction between the internationally recognized major licensing activities and stages during the construction, commissioning or operation of a facility at which permission is required from the regulatory body before further actions may be taken.

1.1.6. License duration and periodic safety review process

The Atomic Act states in Art 15, (1)d that SÚJB shall specify the period for which a license is issued. That means, that the law allows a limited or an unlimited license. SÚJB can also attach conditions to a license. Either a limited license or a license condition could therefore be used to require completion of a Periodic Safety Review. For a new NPP like Temelín a time limitation of 10 years should be adequate and the Periodic Safety Review should include a Probabilistic Safety Analysis.

1.1.6.1. Recommendations and suggestions

- (1) **BASIS** - PSR shall be carried out as indicated in principle 25 of the IAEA Safety Fundamentals “The Safety of Nuclear Installations“ Safety Series No. 110: “Systematic safety reassessments of the installation in accordance with the regulatory requirements shall be performed throughout its operational lifetime, with account taken of operating experience and significant new safety information from all relevant sources.
- (2) **BASIS** - According to paragraph 2.6 (6) of the IAEA Safety Standards Series, GS-R-1 “Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety”... to require an operator to perform a systematic safety reassessment or a periodic safety review over the lifetime of facilities
- (3) **BASIS** - According to paragraph 732 of the IAEA Safety Standards Series, Draft NS 248 “Review and assessment by regulatory body for Nuclear Facilities” ...”As a complement to the deterministic approach described in para. 730, the regulatory body should require an evaluation of the risks arising from the facility. A common method to provide such an evaluation is for the operator to perform a quantified risk analysis or probabilistic safety analysis (PSA). PSA provides a comprehensive, structured approach to identifying failure scenarios and the corresponding damages to the facility and as a last step deriving numerical estimates of risk to workers, the public and the environment. PSA provides a systematic approach for determining whether the safety systems are adequate, the defence in depth requirements have been met and the risks are as low as reasonably achievable. It is usual in such analyses to use less conservative assumptions and to consider best estimate values.”
 - a) **Recommendation: The operational license for Temelín, when granted, should include a requirement for a periodic safety review (PSR) to be carried out every 10 years. The PSR should include evaluations based on a balance of deterministic and probabilistic analysis.**

1.3. GUIDANCE TO THE LICENSEE

Act 18/97 § 13 and Annexes give outline guidance to an applicant in respect to the documents, which have to be submitted. To avoid inefficient discussions SÚJB should define in advance volume and content of documents to be submitted.

SÚJB intends to continue development of guidance on safety levels to be achieved and the safety relevant aspects which the documents to be submitted should cover.

1.3.1. Recommendations and suggestions

- (1) **BASIS** - According to paragraph 5.4 IAEA Safety Standards Series, GS-R-1 "Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety" ... "Regulatory body shall issue guidance on the format and content of documents to be submitted by the operator in support of applications for authorization. ..."

- a) **Suggestion: SÚJB could take benefit from relevant documents on format and content of documents to be submitted in applications for an authorisation which have been published by various regulatory bodies.**

1.4 MODIFICATION CONTROL

SÚJB has established a graded (with several levels in respect of safety impact and adequate consequences of SÚJB's review and assessment) system of reactions on modifications of the NPPs in Dukovany. This concept serves the principle of a good and adequate regulatory supervision and helps to prevent a nuclear hazard. This system is not yet applied to the NPP Temelín, due to the fact that the plant is in the construction phase.

1.4.1. Recommendations and suggestions

- (1) **BASIS** - According to paragraph 5.11 of IAEA Safety Standards Series, GS-R-1 "Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety"... "Any modification to safety related aspect of a facility or activity (or having an indirect but significant influence on safety related aspects) shall be subject to review and assessment, with the potential magnitude and nature of the associated hazard being taken into account."

- a) **Good Practice: The procedure for defining regulatory actions based on categorisation of modifications applied at Dukovany nuclear power plant is a good tool for effective targeting of regulatory resources.**

- b) **Suggestion: The procedure for defining regulatory actions based on categorisation of modifications applied at Dukovany nuclear power plant should also be implemented in the regulatory process during the operational phase for Temelín nuclear power plant.**

1.5. AUTHORISATION OF SELECTED PLANT PERSONNEL

Requirements on NPP personnel qualification and training differ according to the activities they perform. According to the Atomic Act the applicant/licensee has to submit to SÚJB for approval a list of important working activities impacting on nuclear safety, competence requirements, professional training and method of its verification. The training is performed in a Training Centrum. The Training is subject to approval and inspection activities of SÚJB.

The NPP personnel can be divided into three groups in respect to requirements for qualifications and training. Selected personnel including shift supervisor, reactor unit supervisor, reactor operator, turbine operator, inspecting physicist and fuel supervisor need to be licensed by SÚJB. Technical personnel related to nuclear safety and other technical personnel related to housekeeping, Information Center Staff etc. need no license but requirements are set to their qualification and training.

Qualification and training requirements on technical personnel (with working activities in some aspects related to nuclear safety) depends on the position, they have to go through the specialised training in the Training Centrum. All personnel has to go through at least a basic training on conventional and nuclear safety.

There was no need for a recommendation or suggestion in this area.

1.6. ADVISORY GROUP

In accordance to the international customs two advisory committees, a Commission for Nuclear Safety and a Commission for Radiation protection - have been established by the Chairman of the SÚJB. The aim of the advisory committees is to discuss topical and strategic tasks of Nuclear Safety and Radiation protection in the Czech Republic. The Chairman of the SÚJB assigns the tasks of the committees. The committees prepare recommendations for the Chairman of the SÚJB.

The members of the advisory committees are appointed and withdrawn by the Chairman of SÚJB. They are selected from leading Czech or foreign professionals to assure high level of qualification and independence. The list of advisory committee members is in Appendix IV.

The advisory committees assemble at minimum twice a year. There may be additional meetings if necessary.

The advisory committees can conclude if two thirds of their members appointed in the date of the meeting are present. Conclusions are voted by majority of the present members. In complex or controversial questions the opinion of the minority can be attached to the conclusion. The Chairmen of each of the committees present the conclusions in the written form to the Chairman of SÚJB. These conclusions have a status of recommendations only.

1.6.1. Recommendations and suggestions

(1) **BASIS** - According to paragraph 2.4 (9) of the IAEA Safety Standards Series, GS-R-1 "Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety" ... "Legislation shall be promulgated to provide for the effective control of nuclear, radiation, waste and transport safety. This legislation: shall allow for the creation of independent advisory bodies to provide expert opinion to, and for consultation by, the government and regulatory body;" ... and according to paragraph 4.9 of the IAEA Safety Standards Series, GS-R-1 "Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety" ... "The government of 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 Czech Republic has established Advisory Committees. It is up to SÚJB to involve Advisory Committee. The Advisory Committee can, but must not, be involved in the licensing process of a project. In case of involvement the Advisory Committee may come to a different conclusions as the SÚJB.

a) Good Practice: SÚJB can obtain technical and scientific advice from the advisory committees for nuclear safety and radiation protection which comprise Czech and foreign professionals.

1.7. SÚJB BUDGET AND THE COSTS OF THE LICENSING ACTIVITIES

SÚJB is financed from the state budget. The budget is for one year (fiscal year = calendar year) and have a form of an Act i.e. cannot be easily changed. The amount allocated for the SÚJB as the whole budget undergoes political negotiations and may differ from year to year.

The general breakdown of the SÚJB budget is as follows:

40%	is allocated for financing two SÚJB institutes, salaries of SÚJB employees and investment of the SÚJB;
30-45%	SÚJB operational costs;
15-30%	is used for technical support e.g. independent calculation needed for evaluation of safety analyses.

The part used for technical support differs in different years. During the Temelín PSAR evaluation in 1996 – 1997, 30 % of the budget was used for external expertise. During last the two years the share of the technical support has been about 15 % of the SÚJB budget.

Contracts in the framework of technical support are subject to the rules for spending from public budgets. This limits flexibility of assignment and prevents larger projects, which may last for several years. Most of contracts have to be assigned according to Act No. 199/1994 on Public Procurement.

The Act No. 1999/1994 Coll. on the other side ensures the quality and independence of evaluation. This means that the same institution or individual cannot

evaluate its (his/her) work performed for another subject e.g. a NPP, a potential contractor has to prove qualification, competence etc.

The applicant/licensee pays only the license fee which is fixed and it does not reflect the amount of work needed for the assessment and review process. Therefore there are going on licensing processes of systems which are intended to foreign countries.

1.7.1. Recommendations and suggestions

(1) **BASIS** - According to paragraph 2.2 (4) of the IAEA Safety Standards Series, GS-R-1 "Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety" 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. "... It has become the generally accepted practice internationally that the majority of the substantial additional costs of operating a nuclear regulatory regime are recovered from those who give rise to the costs.

a) Recommendation: SÚJB should be able to acquire external expertise when and as far as it is necessary. To facilitate the availability of long term competence, in order to manage the balance between key competence available either within SÚJB or in supporting organisations, SÚJB should be able to:

- **contract external expertise without any time limits in the contracts**
- **select the consulted experts by the principle of best available expertise in respect to the objects to be evaluated**
- **build up long term co-operation with capable experts of technical or scientific organisations in order to retain access to enough independent expertise.**

2. REVIEW AND ASSESSMENT

Experts: Oskar Grözinger, Marja-Leena Järvinen

2.1. SAFETY ASSESSMENT CRITERIA

On the upper level the criteria for review and assessment are relatively indefinite but all subjects of nuclear safety are covered. In detail here exist Act No.18/1998 Coll. and the 14 specialised Decrees of SÚJB for different areas of licensing related to Act 18/1998. All basic criteria requirements are implemented in these basic documents, whose fulfilling is legally binding and from the part of the licensee holder unconditionally required for all phases during the whole lifetime of the nuclear facility – e.g. for design, construction, all stages of operation and for decommissioning. During the preparation of this legal base (in 1994-1999 period) advice was obtained and implemented from countries where the use of nuclear energy and radiation protection are found on a very high level.

On the practical level there exists no comprehensive system of detailed criteria. Detailed criteria (requirements), applied primarily to the individual components and systems are defined and follow a set of guides and/or national industrial standards. When, in some special cases, criteria base does not exist, the international recommendations, standards and guides, are adopted. These additional criteria are always subject of negotiations with the licensee (applicant). Individual specialist meetings between SÚJB and licensee (applicant) serve for the purpose of these negotiations. The conclusions of these meetings are presented in the minutes of the meetings and depending on the subject send to an applicant/licensee by a letter.

Regarding this topic see also chapter "Guidance to the licensee".

2.2. DETERMINISTIC AND PROBABILISTIC ASSESSMENT

The basis and the objective of deterministic and probabilistic assessment are to verify compliance with the safety criteria. The establishment of the safety criteria is on the operation level in the competence of SÚJB.

Review and assessment of SÚJB in the Temelín licensing process is mostly with deterministic tools. Up to now probabilistic methods have practically not been used by SÚJB for assessing the design of plant. But it has been used for approving the emergency zones of NPP Temelín.

In Czech review and assessment of nuclear safety the concept of design basis accidents play an important role. To some extent there also has been further prevention done to reduce the effects of beyond design basis accidents.

PSA is used as a tool for evaluating aspects of the safety at Dukovany nuclear power plant. It is the SÚJB intention to adopt PSA in a similar way for the Temelín nuclear power plant.

A recommendation on the use of PSA has been included in a chapter "License duration and periodic safety review process".

2.2.1. Recommendations and suggestions

- (1) **BASIS** - According to paragraph 732 of the IAEA Safety Standards Series, Draft NS 248 "Review and assessment by regulatory body for Nuclear Facilities" ... "As a complement to the deterministic approach described in para. 730, the regulatory body should require an evaluation of the risks arising from the facility. A common method to provide such an evaluation is for the operator to perform a quantified risk analysis or probabilistic safety analysis (PSA). PSA provides a comprehensive, structured approach to identifying failure scenarios and the corresponding damages to the facility and as a last step deriving numerical estimates of risk to workers, the public and the environment. PSA provides a systematic approach for determining whether the safety systems are adequate, the defence in depth requirements have been met and the risks are as low as reasonably achievable. It is usual in such analyses to use less conservative assumptions and to consider best estimate values."

a) Good Practice: As a result of discussions between SÚJB and licensee some severe accident management features have been incorporated to the design, even though this is not a legal requirement.

2.3. ORGANISATION OF SÚJB ASSESSMENT AND ITS DOCUMENTATION

SÚJB's QA system consists of two levels of guidance. The higher level guide describes the organisational rules of SÚJB and defines the organisational structure, Safety Policy and the QA System Strategy. The second level of QA system consists of a set of procedures. Below these two levels there are four methodological instructions. Three of them are related to assessment activities of Temelín and one defines the procedure to check the readiness of the utility before the start-up. The list of SÚJB guides is in Appendix V.

In addition to this guidance there are orders given by the Chairman or the vice - chairmen.

The following directives have guided the assessment of the documentation of the Temelín NPP, for instance:

- VDS 17/1994 "Directive on the responsibility of the SÚJB inspections in the process of NPP Temelín licensing"
- VDS 30/1996 "Directive on evaluation of computer codes for nuclear safety assessment"

VDS 17/1994 defines the tasks of the SÚJB personnel in respect of the assessment of different chapters of PSAR/FSAR and the way of documentation. Each chapter of the Safety Evaluation Report (SER) shall contain all predefined topics. In chapter 2.3 the assessment criteria are presented.

2.3.1. Recommendations and suggestions

- (1) **BASIS** - According to paragraph 4.5 of the IAEA Safety Standards Series, GS-R-1 "Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety"... "The regulatory body shall establish and implement appropriate arrangements for a systematic approach to quality management that extends throughout the range of its responsibilities and functions."
- a) **Good Practice: The documentation of the assessment results in a structured and systematic way in the SER can be seen as a good practice. Especially when the assessment criteria are a combination of the national, international practices and related standards.**
- b) **Recommendation: SÚJB should review the internal processes associated with review and assessment, authorisation, inspection and enforcement, and ensure these are documented in the QA system.**

3. INSPECTION AND ENFORCEMENT

Experts: Alan Rae and Michael Tschiltz

3.1 PROVISION OF GUIDANCE TO INSPECTORS

SÚJB has not developed a complete set of instructions, referred to hereafter as an inspection manual, for conducting all types of inspections within its areas of responsibility. The inspection manual is necessary in order to provide specific guidance for inspectors on items to be considered for review during the inspection. A limited number of procedures have been developed for inspection of commissioning activities and routine resident inspector inspection activities at Temelín. Inspectors assigned to perform inspections are expected to develop and submit for approval inspection plans that detail the areas to be covered during the inspection activities. Until a complete set of procedures can be developed, management review of inspection plans provides a method to help assure consistency of inspections. SÚJB management can also ensure that the inspection plans are written with the appropriate level of detail to ensure that the appropriate level of effort is applied. It should be noted that current inspection activities at Temelín are primarily focused on commissioning activities for which some inspection procedures have already been written and approved.

Discussions with SÚJB inspection managers also indicated that although the topic of standards for conduct of inspectors is mentioned in the Atomic Act, certain aspects of standards for code of conduct for inspectors included in the applicable IAEA Safety Guide are not covered. Further discussions on the topic revealed that SÚJB procedures governing the inspection program did not provide any guidance on the topic of the standard of conduct of inspectors.

3.1.1. Recommendations and Suggestions

- (1) **BASIS** - According to paragraph 501 of the IAEA Safety Guide, “Inspection and Enforcement by the Regulatory Body for Nuclear Power Plants (50-SG-G4, Rev 1),” the regulatory body should provide written guidance to its inspectors. The guidance should be sufficiently detailed to ensure that the inspection programme is operated with consistency and equity. This is to ensure that all nuclear power sites in a country are inspected to a common standard and that the level of safety is consistent. The guidelines should allow sufficient flexibility for inspectors to take the initiative in identifying and addressing new concerns as they arise.
 - a) **Recommendation - SÚJB complete development of an inspection manual which contains instructions for the implementation of the inspection program including: (1) areas to be the subject of inspection, (2) method of inspection to be used, (3) selection of inspection samples, (4) relevant technical information and questionnaires.**

(2) **BASIS** - According to paragraphs 503 and 504 of the IAEA Safety Guide, “Inspection and Enforcement by the Regulatory Body for Nuclear Power Plants (50-SG-G4, Rev 1),” the regulatory body should develop standards of conduct for inspectors that emphasise that the authority vested in inspectors obliges them to conduct themselves on-site in a manner which inspires confidence and respect concerning their competence and integrity. They should, for example, make adequate preparation by gathering and reviewing all relevant information and data before proceeding on an assignment and should be knowledgeable about the area which they are required to inspect. The importance of objectivity and fairness on the part of inspectors should also be stressed by the regulatory body in its guidance along with the necessity to respect, as far as possible, facility rules established by the operator.

a) **Suggestion - SÚJB should develop instructions for the standards of conduct for inspectors as described in the paragraphs 503 and 504 of IAEA Safety Guide (50-SG-G4, Rev 1).**

3.2 RESIDENT AND NON-RESIDENT INSPECTORS

Interviews with SÚJB management and inspectors revealed that the regulator has not established specific requirements for maintaining inspector objectivity. When specific actions for maintaining objectivity are established, the impartiality of an inspector is less likely to be compromised in dealing with the licensee and the inspector is less likely to become isolated from the activities and decision making of the regulatory body. Creating opportunities for maintaining objectivity also serves to help assure that inspectors are not isolated from evolving standards including best practices within the nuclear industry.

In this same area, it was noted that SÚJB did not have any limitations on the number of years that a resident inspector could be assigned to a specific site. The IRRT recognised that the size of the regulator and the limited number of sites may make it impractical to set specific time limits for the assignment of resident inspectors. Other actions, such as assigning temporary duties at the headquarters office, can be established in order to help assure inspector objectivity.

3.2.1. Recommendations and suggestions

(1) **BASIS** - According to paragraph 409 of the IAEA Safety Guide, “Inspection and Enforcement by the Regulatory Body for Nuclear Power Plants (50-SG-G4, Rev 1),” in order to maintain objectivity, it may be necessary to change locations of resident inspectors periodically or to give them more general duties at headquarters from time to time.

a) **Suggestion - SÚJB should consider development and implementation of guidance which describes the ways in which inspector objectivity can be assured.**

3.3. SURVEILLANCE AND DIRECT OBSERVATIONS

The conduct of routine inspections was discussed during the interviews with the Temelín site senior resident inspector. As a part of the discussions, the examples of the types of activities specified to be reviewed in the procedure were examined. It was noted that the current instruction does not contain all of the activities of areas noted for observation by IAEA Safety Guides. For example, no provisions were included for the observation of management presence, interfaces between departments or boundaries of controlled areas.

Interviews with resident inspectors at the Temelín site and observation of resident inspector inspection activities revealed that inspectors were accomplishing performance based inspections. Inspection activities involved direct observation of activities and discussions with licensee and contractor personnel. Inspectors had performed appropriate reviews of procedures and standards in advance of inspection activities

3.3.1. Recommendations and suggestions

- (1) **BASIS** - According to paragraph 512 of the IAEA Safety Guide, “Inspection and Enforcement by the Regulatory Body for Nuclear Power Plants (50-SG-G4, Rev 1),” the regulatory inspection programme should provide time for general observation of the site by regulatory inspectors. These observations are for the purpose of gaining an overall impression of the licensee’s capabilities and performance and as such are not tied to specifically designated components, systems or designated activities or tests. SÚJB accomplishes the type of observations specified in paragraph 512 as a part of resident inspector activities. The guidelines for resident inspector routine inspections developed by SÚJB to cover these types of observations do not contain all of the areas included in paragraph 512. In addition, these instructions are different for the two nuclear power sites regulated by SÚJB.
 - a) **Suggestion - SÚJB should revise the resident inspector guidance for routine inspections to cover all areas included for observation recommended in paragraph 512 of IAEA Safety Guide (50-SG-G4, Rev 1). The revised guidance should be used consistently at both nuclear power plant sites.**

- (2) **BASIS** - According to paragraph 512 of the IAEA Safety Guide, “Inspection and Enforcement by the Regulatory Body for Nuclear Power Plants (50-SG-G4, Rev 1),” planned inspection activities provide an opportunity for examination of operator activities in order to confirm operator performance and identify potential problems at an early stage.
 - a) **Good practice - Inspectors were adequately prepared and knowledgeable of licensee activities as they related to planned inspection activities. This enabled the inspectors to accomplish meaningful inspections of ongoing licensee activities in a manner that allowed them to identify potential problems at an early stage.**

Inspections are to a large degree performance based. Inspectors were observed monitoring ongoing testing activities and discussing the progress of the testing with licensee personnel. Inspection activities appeared to be a combination of in the field observation of ongoing activities, discussions with licensee personnel, review of regulatory and technical requirements and test results.

3.4. DEVELOPMENT OF A PLANNED AND SYSTEMATIC INSPECTION PROGRAMME.

SÚJB uses a six month schedule for planning inspection activities. In addition to normally scheduled inspections, SÚJB performs reactive inspections in response to events, incidents or when performance in specific areas is of concern. Monthly reviews of the schedule are conducted by an Inspection Evaluation Board in order to determine the need for revision of the schedule based upon licensee performance, inspection results and changes to the licensee's scheduled activities. In addition, SÚJB periodically issues a formal evaluation of inspection activities in the form of an inspection evaluation report. Inspections are, to a large extent, scheduled based upon the licensees planned activities, as opposed to being scheduled in a manner that ensures systematic and periodic reviews of all important activities.

For inspections at Temelín, a limited number of inspection procedures have been developed for inspections covering certain commissioning activities and routine resident inspector activities. For other types of inspections where no specific inspection guidance has been developed, inspectors are expected to write inspection plans without the benefit of specific guidelines for the inspection. In addition, programme guidance has yet to be developed for the level of effort expected for conducting different types of periodic inspections. As a result, the present program for inspection scheduling and planning does not ensure that all important areas are sufficiently inspected with a minimum expected level of effort on a periodic basis.

Discussion of planned SÚJB activities identified that as a part of commissioning activities there was no plan to assess the ability of the operator's management system to progress from supervising construction to supervising operation, and its arrangements for the transition.

3.4.1. Recommendations and Suggestions

- (1) **BASIS** - According to paragraph 301 of the IAEA Safety Guide, "Inspection and Enforcement by the Regulatory Body for Nuclear Power Plants (50-SG-G4, Rev 1)," the establishment and implementation of inspection programmes should be comprehensive and thorough enough to provide a high level of confidence that applicants/licensees are in compliance with the regulatory requirements and are identifying and solving all actual and potential problems in ensuring nuclear safety. This provides the means that the regulatory body shall establish a planned and systematic inspection programme. More specifically, paragraph 303 specifies that verification of overall applicant/licensee performance also requires inspections that focus on a

relatively broad range of subject areas and that do so with adequate depth and frequency.

- a) **Recommendation - SÚJB should further develop and implement a systematic programme for inspection that ensures all appropriate areas are inspected on a periodic basis. The programme should also define the expected level of effort associated with each of the inspection activities.**
- (2) **BASIS** - Paragraph A.15 of the IAEA Safety Guide, “Inspection and Enforcement by the Regulatory Body for Nuclear Power Plants (50-SG-G4, Rev 1),” entitled “Other commissioning activities,” specifies that there are a number of areas requiring inspection by the Regulatory body during the commissioning stage. The purpose of this inspection is to determine the ability of the operator’s (licensee) management to progress from supervising construction to supervising operation, and its arrangements for this.
- a) **Recommendation - SÚJB should perform an assessment of the management system effectiveness at the Temelín nuclear power plant. This assessment should review the ability of plant management to progress for supervising construction to supervising plant operation and its arrangements for doing so.**
- (3) **BASIS** - According to paragraph 402 of the IAEA Safety Guide, “Inspection and Enforcement by the Regulatory Body for Nuclear Power Plants (50-SG-G4, Rev 1),” in order to establish or modify an inspection programme fulfilling the objectives of the safety guide, different methods may be used when selecting the inspection areas and priorities for the inspection programme.
- a) **Good Practice - SÚJB utilizes a number of different sources for Operating Experience Feedback. This information is considered by the organization on a routine basis when determining upcoming inspection activities. Discussions with SÚJB managers indicated that there were a number of periodic and ongoing activities where operational experience and lessons learned were reviewed to ensure items of potential concern were incorporated into the inspection programme. This included periodic interactions with others involved with the operation and regulation of VVER design reactors.**

3.5 REVIEW OF INSPECTION AND ENFORCEMENT ACTIVITIES AND ASSOCIATED DOCUMENTATION SYSTEM

During discussions with SÚJB managers regarding review of inspection programme activities, it was noted that SÚJB performs a review of inspection activities on a monthly basis and publishes an Inspection Evaluation Report. Although this in part accomplished the requirements for a system to audit, review and monitor inspection functions it did not cover all of the areas recommended for such a system.

Discussions with the Temelín Senior Resident Inspector indicated that a database had been developed to track the review of disposition of certain items identified during inspection activities. However, the system did not include reports of non-compliance submitted by the licensee that require regulatory review to determine if any further action on the part of the regulator is warranted. Further discussions with SÚJB managers revealed that a formal tracking system had not been established to track these particular reports. In order for SÚJB to ensure that these documents receive the proper review and any follow-up action that may be appropriate is taken, it is necessary to formally track them for accountability.

3.5.1. Recommendations and Suggestions

(1) **BASIS** - According to paragraph 705 of the Draft IAEA Safety Standards Series, “Regulatory Inspection of Nuclear Facilities and Enforcement by the Regulatory Body,” the regulatory body should have a system to audit, review and monitor all aspects of inspection and enforcement activities to ensure that they are being carried out in a suitable and effective manner. The system should ensure that any changes due to improvements in techniques or otherwise, are implemented. Areas that should be audited include:

- (a) Inspection guidance
- (b) Inspection methods
- (c) Inspection resource allocation
- (d) Procedures within the regulatory body in relation to inspection activities (e.g., planning of inspections, unresolved findings)
- (e) Procedures for coordination of inspection activities with the review and assessment process
- (f) Procedures for involving consultants in inspection activities
- (g) Recording of documentation
- (h) Procedures related to enforcement actions
- (i) Effectiveness of enforcement actions.

a) **Recommendation - SÚJB should implement a system to audit, review and monitor all inspection and enforcement activities as described in paragraph 705 Draft IAEA Safety Standards Series, “Regulatory Inspection of Nuclear Facilities and Enforcement by the Regulatory Body.”**

(2) **BASIS** - According to paragraph 604 of the Draft IAEA Safety Guide (GS-G-1.2) a programme for production of documents for each facility should be established by the regulatory body, taking into account the facilities to be authorised and the available human and financial resources. This should include the development of a system to control the status of identified deficiencies in order to ensure timely implementation of corrective actions.

- a) **Suggestion - SÚJB should consider development and implementation of a system that tracks the status of identified deficiencies, in particular, written reports submitted by the licensee to SÚJB as required by Technical Specifications.**

3.6. DISTRIBUTION AND USE OF INSPECTION REPORTS

Discussions with SÚJB managers and inspectors revealed inspection reports are appropriately distributed within the organisation. Additionally, meetings are held on a monthly basis with inspectors to discuss inspection findings for the two sites as well as other potentially generic issues of potential significance. The routine sharing of information is important to developing and maintaining an effective inspection organisation as well as the development of resident inspector skills.

3.6.1. Recommendations and Suggestions

- (1) **BASIS** - According to paragraph 524 of the IAEA Safety Standards Series, “Inspection and Enforcement by the Regulatory Body for Nuclear Power Plants (50-SG-G4, Rev 1),” it is a good practice for inspection findings to be discussed at regular meetings attended by groups of site inspectors.
 - a) **Good Practice - SÚJB conducts inspector counterpart meetings on a monthly basis. During these meetings inspection reports are reviewed and inspection findings are discussed by inspectors.**

3.7. IMPLEMENTATION OF THE INSPECTION PROGRAMME

3.7.1. Evaluation of inspection findings

The team noted that SÚJB has arrangements for reviewing the results of inspections carried out by their inspectors. This is carried out by the “Inspection Evaluation Board” which meets monthly at SÚJB headquarters and which consists of the Heads of principal departments and is chaired by the SÚJB Vice Chairman. In accordance with SÚJB procedure 008, this group reviews the reports of each of the inspections made over the previous month at the two NPP sites and at issues arising. If necessary this group can arrange for follow up inspections either by the Site Inspectors or by other Specialist Inspectors, or can ensure that issues are progressed directly with the Utility. The group can also reshape the forward inspection programme at either site to take account of findings. This arrangement, which reflects good practice elsewhere and the requirements of IAEA Safety Standards Series 50-SG-G4 (rev.1) sections on “Inspection Planning” in relating inspection to Utility performance, is considered to be a strength.

3.7.2. Readiness for Major Licensing Stages

The team interviewed SÚJB managers and inspectors to determine their intentions for ensuring that a sufficiently wide range of inspections are conducted over a period to inform major regulatory decisions such as fuel load or start of operations. In particular, the team discussed SÚJB’s plans to include inspections to

confirm operator training, team training, procedural and plant readiness, plant turn over to operators and base-lining of plant maintenance. Although SÚJB recognised the need to further develop this Readiness Assessment programme, this work is still in progress.

3.7.2.1 Recommendations and suggestions

- (1) **BASIS** - IAEA Safety Standards Series Safety Guide No. 50-SG-G4 (Rev. 1) includes guidance on the “Relationship between inspection activities and licensing stages”. Included in the section on “other commissioning activities” are requirements for ensuring readiness for progression from stage to stage.

a) Suggestion - SÚJB should further develop and formalise its readiness assessment programme to support key licensing approval stages.

3.7.3. Temelín Inspection programme activities

It was evident to the team that the current focus of inspection work at Temelín was dominated by the key current activities, i.e. commissioning of Unit 1 and construction of Unit 2. Although it was noted above that SÚJB should develop and implement an overall inspection programme and a Readiness Assessment programme for the Temelín nuclear power plants in order to ensure that all important areas are covered on a periodic basis, the team was satisfied that the current inspection activities are appropriately focused at this time on areas which are important to the assurance of plant safety and conformance to the safety report.

3.8. RELATIONSHIP BETWEEN REGULATOR AND LICENSEE

3.8.1. Housekeeping and Cleanliness Standards for Unit 2 construction

The team accompanied a Resident Inspector on a brief tour of inspection of housekeeping and system maintenance of selected areas of Temelín Unit 2. Although the resident inspector noted that during the last year the licensee had improved performance in the housekeeping, maintenance and preservation of systems under construction, it was apparent that continued emphasis was needed in this area. In particular, the removal of scrap construction materials, unused scaffolding and general cleanliness were areas where improved performance was needed. Improvement was also needed in the implementation of appropriate foreign material exclusion controls. The team believes that it will require licensee management attention with continued emphasis by SÚJB to achieve the needed improvements. Although the team did not observe any specific instances where these practices had a negative impact on the quality of the construction, without improvements in these areas the potential for such negative impacts exist. No specific recommendations are being made in this area in view of SÚJB’s understanding of the need for continued improvement.

3.8.2. Co-operation of the Licensee with SÚJB

Co-operation of the operator is essential to ensure that regulatory inspection can be carried out in an effective, informed and unhindered manner. The operator

should at all times provide regulatory inspection personnel with the necessary assistance and support required for carrying out their responsibilities. In discussions with SÚJB regarding the co-operation of the licensee, several examples were noted where it had been difficult for SÚJB to obtain the needed information from the licensee. In addition, there had been instances where the Utility had repeatedly challenged the findings of the Regulator, or had sought to challenge the legal basis of regulatory actions. In the end the Regulator's position prevailed. The team believes that this may be indicative of weaknesses in the safety culture of the Utility, however, SÚJB has engaged in a constructive dialogue with the Utility to secure improvements in this area.

3.9. GENERAL

3.9.1. Availability of English versions of regulatory process documents

While conducting this Reduced Scope IRRT the team which examined inspection and regulatory process were hampered by the lack of English versions of some of the key process documents. While this was countered in part by explanations of the contents of such documents by SÚJB staff, the team felt that this delayed progress and reduced the amount of scrutiny that could be given. While the team is satisfied that it had sufficient visibility of key processes to support the above findings it believes that translations of such documents will be essential to the work of the Full Scope IRRT team due next year.

3.9.2. Remuneration for Inspectors

In discussions with SÚJB Inspectors the team noted that pay levels in the regulator are lower than those in the regulated industry. While there is no evidence at this time that this has led to any immediate recruitment or retention issues, the team were aware that previous IAEA missions in equivalent countries have recommended that salary disparities between the industry and regulatory bodies are kept under review to ensure that such problems do not develop. The team believe that this recommendation will also be valid for the Czech Republic.

3.9.2.1. Recommendations and suggestions

(1) **BASIS** - Best practice in equivalent countries and as recommended by previous IAEA missions.

a) **Suggestion: SÚJB to keep the government apprised of the relationship between salaries in the regulated industry and its ability.**

APPENDIX I - LIST OF LEGAL, REGULATORY AND INTERNAL DOCUMENTS MADE AVAILABLE IN ENGLISH

Advance Reference Material

Regulatory documents:

- Law No.18/1997 Coll., on Peaceful Utilisation of Nuclear Energy and Ionising Radiation (the Atomic Act);
- Regulation of the SÚJB No. 106/1998 Coll., on Nuclear Safety and Radiation Protection Assurance during Commissioning and Operation of Nuclear

Facilities;

- Regulation of the SÚJB No. 195/1999 Coll., on Basic Design Criteria for Nuclear Installations with Respect to Nuclear Safety Radiation Protection and Emergency Preparedness.

Information on SÚJB and its practices:

- Extracts from the Annual Report of the SÚJB;
- Extracts from National Report of the Czech Republic under the Convention on Nuclear Safety;
- A brief description of SÚJB inspection activities;
- A brief description of NPP Temelín licensing procedure.

Documents provided during mission

Internal procedure:

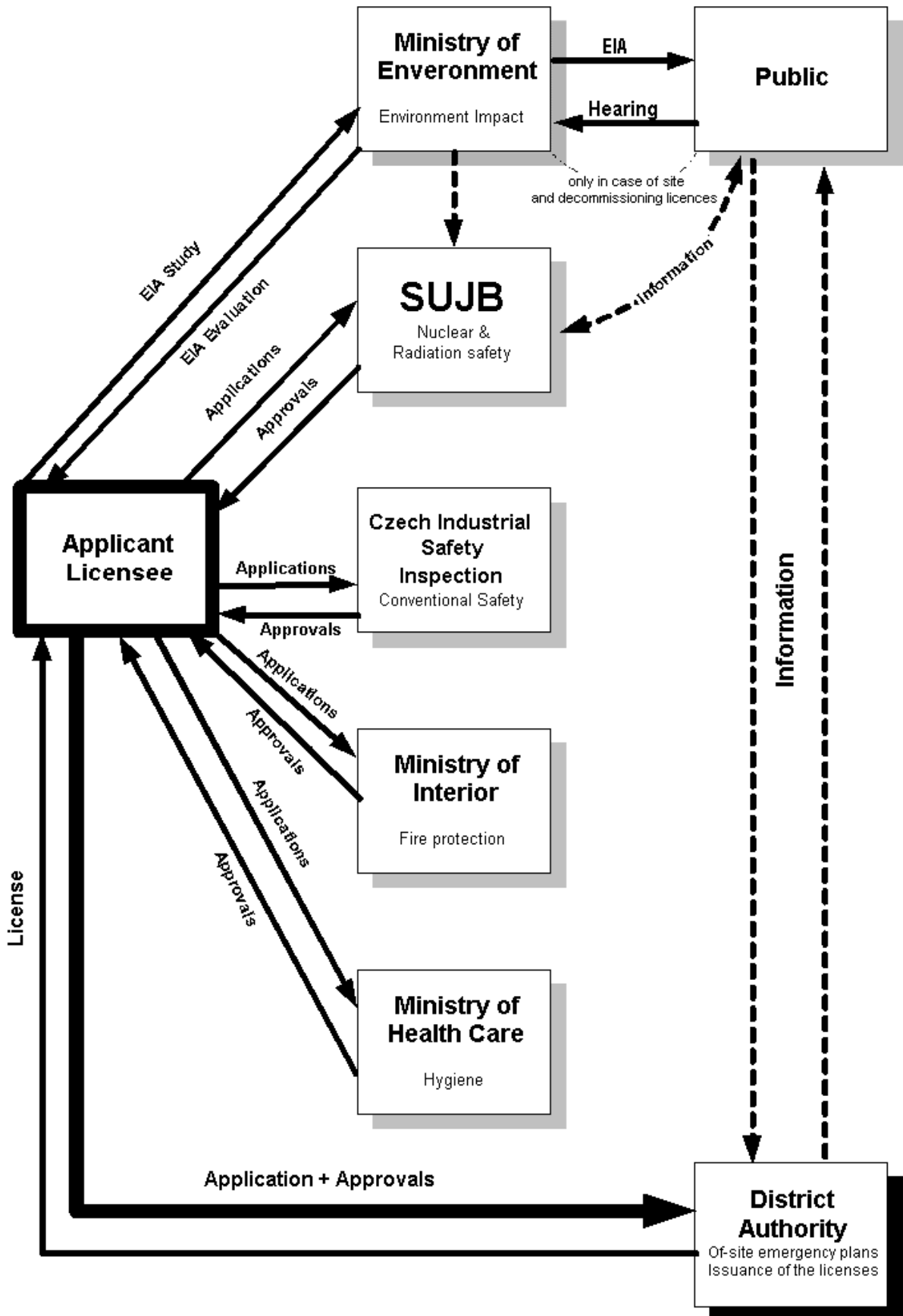
”Planning, Preparation, Implementation and Evaluation of the Inspection Activities. Labelling and Archiving of Records and Inspection Reports.” Directive VDS 008.

APPENDIX II - REGULATIONS ISSUED BY SÚJB

1. Regulation of the SÚJB No. 142/1997 Coll., on Type-Approval of Packaging Assemblies for Transport, Storage, and Disposal of Radionuclide Sources and Nuclear Materials, on Type-Approval of Ionising Radiation Sources, and on Type-Approval of Protective Devices for Work Involving Ionising Radiation Sources and other Devices for Ionising Radiation Source Handling (on Type-Approval).
2. Regulation of the SÚJB No. 143/1997 Coll., on Transportation and Shipment of Specified Nuclear Materials and Specified Radionuclide Sources.
3. Regulation of the SÚJB No. 144/1997 Coll., on Physical Protection of Nuclear Materials and Nuclear Facilities and their Classification.
4. Regulation of the SÚJB No. 145/1997 Coll., on Accounting for and Control of Nuclear Materials and their Detailed Specification.
5. Regulation of the SÚJB No. 146/1997 Coll., Specifying Activities Directly Affecting Nuclear Safety and Activities Especially Important from Radiation Protection Viewpoint, Requirements on Qualification and Professional Training, on Method to be Used for Verification of Special Professional Competency and for Issue Authorisations to Selected Personnel, and the Form of Documentation to be Approved for Licensing of Expert Training of Selected Personnel.
6. Regulation of the SÚJB No. 147/1997 Coll., Laying Down a List of Selected Items and Dual Use Items in Nuclear Sector.
7. Regulation of the SÚJB No. 184/1997 Coll., on Radiation Protection Requirements.
8. Regulation of the SÚJB No. 214/1997 Coll., on Quality Assurance in Activities Related to the Utilisation of Nuclear Energy and in Radiation Activities, and Laying Down Criteria for the Assignment and Categorisation of Classified Equipment into Safety Classes.
9. Regulation of the SÚJB No. 215/1997 Coll., on Criteria for Siting Nuclear Facilities and Very Significant Ionising Radiation Sources.
10. Regulation of the SÚJB No. 219/1997 Coll., on Details of Emergency Preparedness of Nuclear Facilities and Workplaces with Ionising Radiation Sources, and on Requirements on the Content of On-Site Emergency Plans and Emergency Rules.
11. Regulation of the SÚJB No. 106/1998 Coll., on Nuclear Safety and Radiation Protection Assurance during Commissioning and Operation of Nuclear Facilities.
12. Regulation of the SÚJB No. 195/1999 Coll., on Basic Design Criteria for Nuclear Installations with Respect to Nuclear Safety Radiation Protection and Emergency Preparedness.

13. Regulation of the SÚJB No. 196/1999 Coll., on Decommissioning of Nuclear Installations and Working Places with Important and Very Important Sources of Ionizing Radiation.
14. Regulation of the SÚJB No. 324/1999 Coll., on Limits of Concentration and Amount of Nuclear Material for which Nuclear Liability

APPENDIX III - LICENSING PROCESS



APPENDIX IV - ADVISORY COMMITTEE MEMBERS

Nuclear Safety:

D. Matějů	private expert, former CEZ Utility senior manager
J. Stejskal,	operations manager, NPP Muhleberg, <u>Switzerland</u>
A.T. Gutsalov	deputy chairman, Gossatomnadzor, <u>Russia</u> ,
Bedřich Heřmanský	retired, former professor of the Technical University in
Prague,	
Jaroslav Koucký	professor, Technical University of Pilsen
Zdeněk Kříž	expert, former SÚJB chief inspector
Stanislav Vejvoda	associated professor, Institute for Applied Mechanics
František Klik (chair)	scientific secretary of the Nuclear Research Institute in Rez
Pavel Hejzlar,	professor, Technical University Prague

Radiation Protection

Jan Daneš	associated professor, Charles University, Prague
Václav Hušák	professor, Purkyně University of Olomouc,
Vladislav Klener	professor, retired, former head of the National Institute for Radiation Protection
Stanislav Kozoubek, Sciences	senior researcher, Institute for Bio physics, Academy of
Julian Liniecki, (chair)	professor, University of Lodz, <u>Poland</u>
Denisa Nikodémová,	PhD, Institute of Clinical Medicine, Bratislava, <u>Slovakia</u>
Daniela Pelclová,	associated professor, Charles University, Prague
František Spurný	associated professor, Academy of Sciences

APPENDIX V - SEZNAM PLATNÝCH SMĚRNIC SÚJB: LIST OF SÚJB DIRECTIVES IN FORCE

<p>VDS 01/1993 (rev. 5/2000) Organizační řád SÚJB Příloha 1 - Schéma organizační struktury Příloha 2 - Politika Státního úřadu pro jadernou bezpečnost Příloha 3 - Strategie zavedení systému jakosti SÚJB</p>	<p>SÚJB Organisation Schedule Annex 1 – The chart of organisation structure Annex 2 - The SÚJB policy Annex 3 – SÚJB QA System Implementation Strategy</p>
<p>VDS 02/1993 Zkušební řád Státní zkušební komise pro ověřování zvláštní odborné způsobilosti vybraných pracovníků jaderných zařízení</p>	<p>Statute of the State Examination Commission for verification of special professional competence of selected personnel of nuclear installations</p>
<p>VDS 03/1993 (rev. 2/1998) Směrnice o organizaci autoprovozu</p>	<p>Business cars park service organisation</p>
<p>VDS 04/1993 (rev. 1/1995) Pracovní řád</p>	<p>The working regulations</p>
<p>VDS 05/1993 (rev. 2/1999) Spisový a skartační řád Doplněk Spisového a skartačního řádu (příkaz 7/94) Skartační rejstřík Jmenný seznam pracovníků a jejich označení pro potřeby systému ISOAD</p>	<p>Internal documentation management. Amendment of internal documentation schedule; List of workers for ISOAD system needs</p>
<p>VDS 06/1993 (rev. 1/1994) Směrnice pro výkon sluz by styčného místa ČR v případě jaderné nebo radiační havárie Součinnostní dohoda</p>	<p>Directive for performance of “Co-ordination Place” activity in the Czech Republic in the case of nuclear or radiological accident. Co-ordination agreement.</p>
<p>VDS 07/1993 Směrnice o kvalifikaci a odborné přípravě pracovníků SÚJB</p>	<p>Directive on qualification and professional training of SÚJB staff members.</p>
<p>VDS 08/1993 (rev. 4/1999) Plánování, příprava, provádění a hodnocení kontrolní činnosti. Značení a archivace protokolů a zpráv o kontrole Příloha I - Vzor formuláře Protokolu z inspekce Příloha II - Vzor formuláře Zprávy o kontrole Příloha III - Inspekční oblasti a hodnotící kategorie</p>	<p>Planning, preparation, realisation and evaluation of inspection activities, Inspection Reports and Protocols handling. Annex 1: Inspection Protocol Form. Annex 2: Inspection Report Form. Annex 3: Inspection areas and categories of evaluation.</p>
<p>VDS 09/1993 Směrnice pro postup při vyřazování přebytečného a neupotřebitelného majetku ve správě Státního úřadu pro jadernou bezpečnost</p>	<p>Directive on displace (discard) process of useless SÚJB possession.</p>
<p>VDS 10/1994 (rev. 3/1998) Směrnice pro hospodaření s rozpočtovými prostředky</p>	<p>Directive on economy; SÚJB budget and</p>

a majetkem SÚJB, nařizování a přezkušování hospodářských operací a oběh účetních dokladů	possession handling, account inspection.
VDS 11/1994 Směrnice ke způsobu zabezpečení Obchodní veřejné soutěže na státní zakázky	Directive on the model ensuring of commercial public tenders on the State procurement.
VDS 12/1994 Statut pracovní skupiny “Metrologické zabezpečení JZ ČR”	Statute of the Working Group on Czech nuclear installation metrology.
VDS 13/1994 Směrnice o pracovní činnosti lokálních inspektorů SÚJB na jaderné elektrárně Dukovany	Directive on the working activity of the SÚJB resident inspectors.
VDS 14/1994 Směrnice o provozu počítačové sítě SÚJB	Directive on SÚJB computer network operation.
VDS 16/1994 Statut Koordinačního krizového centra pro radiační havárie	Statute of Emergency Response Centre for radiology accidents.
VDS 17/1994 (rev. 2/2000) Směrnice stanovující odpovědnosti pracovníků SÚJB v procesu schvalování jaderné elektrárny Temelín	Directive on the responsibility of the SÚJB workers in the process of NPP Temelín commissioning.
VDS 18/1994 Směrnice stanovující odpovědnosti pracovníků SÚJB v procesu schvalování Provozní bezpečnostní zprávy jaderné elektrárny Dukovany po 10 letech provozu	Directive on the responsibility of the SÚJB workers in the process of approval (assessment) of NPP Dukovany Operational Safety Report after 10 years of operation.
VDS 19/1995 Směrnice “Kritéria pro výběr pracovníků plnicích služby v rámci KKC a Styčného místa ČR”	Directive on selection of employees responsible for duties in Emergency Response Centre and in Co-ordination Place in the Czech Republic.
VDS 20/1995 Směrnice pro postup při uzavírání smluv o dílo v souladu se zákonem č. 199/1994 Sb.	Directive on procedure for conclusion of contracts in order with the Act No.199/1994 Coll.
VDS 21/1995 (rev. 1/1996) Směrnice – Pracovní pokyny pro činnost pracovníků SÚJB plnicích úkoly styčného místa ČR v mimopracovní době	Directive on working activities of the SÚJB workers responsible for duties in Co-ordination Place after daily working hours.
VDS 22/1995 Statut odborných komisí pro hodnocení výpočtových programů zřízených Státním úřadem pro jadernou bezpečnost	Statute of the special Commissions for evaluation of computer codes established by SÚJB.
VDS 23/1995 Směrnice pro použití finančních prostředků SÚJB na pohoštění a dary	Directive on using of financial sources for hosting (routs) and gifts.
VDS 24/1995 Směrnice o způsobu zabezpečování vnitřní kontroly SÚJB	Directive on SÚJB internal audit.

VDS 25/1996 Směrnice o poskytování osobních ochranných pracovních prostředků pro pracovníky SÚJB a pracovníky SÚRO z dislokovaných pracovišť SÚJB	Directive on providing of personal protective equipment for SÚJB workers and for workers of National Radiation Protection Institute from SÚJB Regional Centres.
VDS 26/1996 Směrnice nebyla vydána	Directive has been not yet issued
VDS 27/1996 Směrnice pro vydávání ediční řady SÚJB “Bezpečnost jaderných zařízení”	Directive on Publishing of SÚJB Series “Safety of Nuclear Installations”.
VDS 28/1996 Směrnice ke tvorbě organizačních norem SÚJB	Directive on creation of SÚJB Organisational Regulations.
Příloha 1	Annex 1
Příloha 2	Annex 2
Příloha 3	Annex 3
Příloha 4	Annex 4
Příloha 5	Annex 5
VDS 29/1996 (rev. 1/1999) Směrnice o správním řízení ve věci ukládání pokut podle zákona č. 28/1984 Sb., o státním dozoru nad jadernou bezpečností jaderných zařízení	Directive on Administration Procedure in the matter of impose of penalties according to the Act No. 28/1984 Coll., on State Supervision on Nuclear Safety of Nuclear Installation.
VDS 30/1996 Směrnice k hodnocení výpočtových programů pro posuzování jaderné bezpečnosti	Directive on evaluation of computers codes for nuclear safety assessment.
VDS 31/1998 (Ing. Krotil) dosud nevydána	(Mr. Krotil) still not issued.
VDS 032/1998 Směrnice o správních poplatcích	Directive on administration fees.
VDS 033/1998 Směrnice kterou se ustavuje Státní zkušební komise pro ověřování zvláštní odborné způsobilosti vybraných pracovníků jaderných zařízení	Directive on establishing of the State Examination Commission for verification of special professional competency of selected personnel of nuclear facilities.
Příloha 1	Annex 1
Příloha 2	Annex 2
Příloha 3	Annex 3
Příloha 4	Annex 4
VDS 034/1998 Směrnice o postupu k realizaci zahraničních pracovních cest a poskytování finančních náhrad při zahraničních pracovních cestách	Directive on the process of realisation of working trips to abroad and providing of financial compensation of expenses.

VDS 035/1999

Směrnice o poskytování informací veřejnosti a sdělovacím
prostředkům

Directive on providing information to the
public and to the mass media.

APPENDIX VI - SYNOPSIS OF RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

Recommendations

- R.1. The operational license for Temelín, when granted, should include a requirement for a periodic safety review (PSR) to be carried out every 10 years. The PSR should include evaluations based on a balance of deterministic and probabilistic analysis.
- R.2. SÚJB should be able to acquire external expertise when and as far as it is necessary. To facilitate the availability of long term competence, in order to manage the balance between key competences available either within SÚJB or in supporting organizations, SÚJB should be able to
- contract external expertise without any time limits in the contracts
 - select the consulted experts by the principle of best available expertise in respect to the objects to be evaluated
 - build up long term co-operation with capable experts of technical or scientific organisations in order to retain access to enough independent expertise.
- R.3. SÚJB should review the internal processes associated with review and assessment, authorization, inspection and enforcement, and ensure these are documented in the QA system.
- R.4. SÚJB complete development of an inspection manual which contains instructions for the implementation of the inspection program including: (1) areas to be the subject of inspection, (2) method of inspection to be used, (3) selection of inspection samples, (4) relevant technical information and questionnaires.
- R.5. SÚJB should further develop and implement a systematic programme for inspection that ensures all appropriate areas are inspected on a periodic basis. The programme should also define the expected level of effort associated with each of the inspection activities.
- R.6. SÚJB should perform an assessment of the management system effectiveness at the Temelín nuclear power plant. This assessment should review the ability of plant management to progress for supervising construction to supervising plant operation and its arrangements for doing so.
- R.7. SÚJB should implement a system to audit, review and monitor all inspection and enforcement activities as described in paragraph 705 Draft IAEA Safety Standards Series, “Regulatory Inspection of Nuclear Facilities and Enforcement by the Regulatory Body.”

Suggestions

- S.1. SÚJB should consider what could be done to ensure that there is proper co-ordination between different governmental bodies at the additional permit stages and for reactor pressure vessel inspections at the relevant main licensing stages.
- S.2. Suggestion: SÚJB could take benefit from relevant documents on format and content of documents to be submitted in applications for an authorisation which have been published by various regulatory bodies.
- S.3. The procedure for defining regulatory actions based on categorisation of modifications applied at Dukovany nuclear power plant should also be implemented in the regulatory process during the operational phase for Temelín nuclear power plant.
- S.4. SÚJB should develop instructions for the standards of conduct for inspectors as described in the paragraphs 503 and 504 of IAEA Safety Guide (50-SG-G4, Rev 1).
- S.5. SÚJB should consider development and implementation of guidance which describes the ways in which inspector objectivity can be assured.
- S.6. SÚJB should revise the resident inspector guidance for routine inspections to cover all areas included for observation recommended in paragraph 512 of IAEA Safety Guide (50-SG-G4, Rev 1). The revised guidance should be used consistently at both Nuclear power plant sites.
- S.7. SÚJB should consider development and implementation of a system that tracks the status of identified deficiencies, in particular, written reports submitted by the licensee to SÚJB as required by Technical Specifications.
- S.8. SÚJB should further develop and formalise its readiness assessment programme to support key licensing approval stages.
- S.9. SÚJB to keep the government apprised of the relationship between salaries in the regulated industry and its ability.

Good Practices

- G.1. The procedure for defining regulatory actions based on categorisation of modifications applied at Dukovany nuclear power plant is a good tool for effective targetting of regulatory resources.
- G.2. SÚJB can obtain technical and scientific advice from the advisory committees for nuclear safety and radiation protection which comprise Czech and foreign professionals.

- G.3. As a result of discussions between SÚJB and licensee some severe accident management features have been incorporated to the design, even though this is not a legal requirement.
- G.4. The documentation of the assessment results in a structured and systematic way in the SER can be seen as a good practice. Especially when the assessment criteria are a combination of the national, international practices and related standards.
- G.5. Inspectors were adequately prepared and knowledgeable of licensee activities as they related to planned inspection activities. This enabled the inspectors to accomplish meaningful inspections of ongoing licensee activities in a manner that allowed them to identify potential problems at an early stage. Inspections are to a large degree performance based. Inspectors were observed monitoring ongoing testing activities and discussing the progress of the testing with licensee personnel. Inspection activities appeared to be a combination of in the field observation of ongoing activities, discussions with licensee personnel, review of regulatory and technical requirements and test results.
- G.6. SÚJB utilizes a number of different sources for Operating Experience Feedback. This information is considered by the organization on a routine basis when determining upcoming inspection activities. Discussions with SÚJB managers indicated that there were a number of periodic and ongoing activities where operational experience and lessons learned were reviewed to ensure items of potential concern were incorporated into the inspection programme. This included periodic interactions with others involved with the operation and regulation of VVER design reactors.
- G.7. SÚJB conducts inspector counterpart meetings on a monthly basis. During these meetings inspection reports are reviewed and inspection findings are discussed by inspectors.

APPENDIX VII - TEAM COMPOSITION

Mr. O. Groezinger	Ministerium für Wirtschaft, Umwelt und Verkehr, Germany
Ms. M-L Järvinen	Radiation and Nuclear Safety Authority of Finland
Mr. D. Lacey, Team Leader	IAEA, Safety Assessment Section Department of Nuclear Safety
Mr. A. Rae	HSE, Nuclear Installations Inspectorate, UK
Mr. M. Tschiltz	U.S. Nuclear Regulatory Commission