

APPROACH OF THE STATE OFFICE FOR NUCLEAR SAFETY TO THE REGULATORY INCUMBENCY

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Státní úřad pro jadernou bezpečnost (State Office for Nuclear Safety)

1. State Office for Nuclear Safety

This contribution gives account of activities in 1996 of the State Office for Nuclear Safety ("Státní úřad pro jadernou bezpečnost", "SÚJB") as the Czech regulatory authority responsible for supervision of nuclear safety of nuclear facilities and supervision of radiation protection in the Czech Republic.

The State Office for Nuclear Safety is a governmental body with its own budget. In SÚJB's head is the SÚJB Chairman, appointed by the Government of the Czech Republic. The SÚJB Chairman is also the Nuclear Safety Inspector General. The authority and responsibility of the SÚJB is stipulated by Act No. 85/1995, amending the State Office for Nuclear Safety Responsibilities Act No. 287/1993, and associated legislation. SÚJB's activities with respect to the state supervision of nuclear safety are based on applicable legislation, in particular the State Supervision of Nuclear Safety of Nuclear Facilities Act No. 28/1984 and the State Office for Nuclear Safety Responsibilities Act No. 287/1993, as amended by Act No. 85/1995. SÚJB's attention has been primarily aimed at safety review of nuclear facilities and the level of radiation protection in the Czech Republic. This was based on analyses of the documentation and information on the operation of nuclear facilities and workplaces handling ionizing radiation sources, results of SÚJB's own inspection visits and missions and evaluation of the level of compliance with the terms, conditions and requirements laid down by the supervision body. Where analysis had shown that the compliance was inadequate, the SÚJB specified requirements and conditions for continued operation of the facility concerned. Adequate attention was also paid to the level of physical security (safeguarding) of nuclear facilities and nuclear materials. Within its role in the inspection regimes in support of the Treaty on Non-Proliferation of Nuclear Weapons (NPT), the SÚJB performed periodical inspection of nuclear materials and satisfied additional requirements following for the Czech Republic's commitment to the international safeguards agreement based on the NPT.

Responsibilities of the State Office for Nuclear safety include:

- State supervision of nuclear safety of nuclear facilities, radioactive waste management, and spent nuclear fuel.
- State supervision of nuclear materials, including accountancy and control.
- State supervision of selected materials, facilities and technologies used in the nuclear field, as well as double-purpose materials and facilities.
- State supervision of ionizing radiation protection.
- Co-ordination of the Radiation Monitoring Network of the Czech Republic and international exchange of radiological data.

· Professional co-operation with the International Atomic Energy Agency.

In 1995, the authority of the SÚJB was extended to cover state supervision of protection against ionizing radiations. To this end, the structure of the Office was modified adequately. No additional changes in the SÚJB structure were effected in 1996. In accordance with the responsibilities, the Office is divided into three Sections, which are all headed by the SÚJB Deputy Chairmen, and an independent Department:

- Section of Nuclear Safety, which includes the Nuclear Safety Assessment Department, Components and Systems Department, and Nuclear Materials Department,
- Section of Radiation Protection, which includes the Radiation Source Applications Department, Natural Radiation Sources Department, Department of Radiation Protection at Nuclear Facilities and in the Environment, and an independent Department of the Health Aspects of Radiation Protection,
- Section of Management and Technical Support, which includes the International Co-operation Department, Financial Department, and Office Bureau.

Independent Department of Emergency Preparedness (reporting directly to the SÚJB Chairman), which fulfils the function of the Crisis Co-ordination Center and co-ordinates the Radiation Monitoring Network.

The SÚJB also incorporates its Regional Centers in Prague, Plzeň, České Budějovice, Ústí nad Labem, Hradec Králové, Brno, and Ostrava, as well as two local offices at the Dukovany and Temelín nuclear power plants.

The SÚJB is also the managing authority of the National Radiation Protection Institute (SÚRO) in Prague.

Major nuclear facilities currently operated in the Czech Republic and falling under nuclear safety and radiation protection supervision included the 4 operated units of the Dukovany nuclear power plant equipped with WER 440/213 reactors, two research reactors (the LVR 15 reactor with a maximum power of 10 MW and the zero-power LR-0 reactor) at the Nuclear Research Institute in Řež, and the VR-1 P school reactor at the Faculty of Nuclear Science and Physical Engineering, Czech Technical University in Prague.

Under the authority of nuclear safety and radiation protection supervision by the SÚJB is also the construction of the Temelín nuclear power plant. Inspection activities at the Temelín site were mainly concerned with the quality of the construction and installation work, personnel training, safety documentation reviewing, and overall preparedness of the nuclear power plant for commissioning and start-up.

In addition, the SÚJB is responsible for supervision of the radioactive waste repositories at the Dukovany site and in the "Richard" mine near the town Litoměřice, the interim spent fuel storage facility at the Dukovany site, and the high level radioactive waste storage facility operated by the Nuclear Research Institute at Řež.

With respect to radiation protection, the SÚJB executes supervision of over 5000 workplaces where ionizing radiation sources are handled.

No serious accident causing radioactivity leak into the environment, above-the-limit radiation endangerment of the professional staff or the public, or increase in contamination of the environment and the food chain by artificial radionuclides occurred in 1996. At none of the facilities or workplaces inspected by it, the SÚJB identified any basic shortcoming or deficiency calling for suspension or withdrawal of the licence granted by the SÚJB.

Of particular importance in 1996 was the safety review of the Dukovany-2 nuclear power plant unit in 10 years of operation, based on which the SÚJB granted licence for a continued operation of this unit. Additional SÚJB's important decisions concerned licences for a permanent operation of the interim spent nuclear fuel storage facility at the Dukovany site and permanent operation of the high level radioactive waste storage facility of the Nuclear Research Institute at Řež.

2. State System of Nuclear Materials Accountancy and Control

In 1996 the SÚJB accomplished 47 inspections of nuclear materials; out of these, 39 were performed in co-operation with inspectors of the IAEA. The goals were attained during all inspections. A new field of material balance was prepared for the Temelín nuclear power plant.

The SÚJB granted 31 new permissions for possessing nuclear materials in 1996. Old permissions were withdrawn from 29 organizations based on their application on the grounds of no nuclear material being in their possession any more and no such possession being planned for the future. For 16 organizations the permission to possess nuclear materials expired.

Within its authority in the inspection regimes in support of the Non-Proliferation Treaty, the SÚJB granted permission for 43 imports and 12 exports of controlled items; the SÚJB also issued 17 permissions for user change within the Czech Republic. Permission for exports and temporary use of nuclear materials abroad was issued by the SÚJB in 4 cases. The SÚJB contributed actively to the preparation of the Protocol supplementary to safeguards agreements, which is under way under the auspices of the IAEA as a response to the illicit nuclear activities disclosed in Iraq. This Protocol should strengthen the authority of the IAEA in the field of inspections to ensure peaceful use of nuclear energy and an overall improvement in the efficiency of the international safeguards system.

3. Personnel Qualification and Training

In 1996, the SÚJB licensed a revised scheme of theoretical training of selected Dukovany and Temelín NPP personnel. After checking that all requirements had been met and based on an inspection visit, the SÚJB licensed the Human Resources Department of the Dukovany NPP management to organize practical training of selected personnel operating nuclear power facilities of the plant. Furthermore, the SÚJB paid attention to the continuing preparation and re-qualification of selected personnel for the Temelín reactor Unit 1 and to the development of a VVER 1000 simulator.

The State Examining Commission to examine special professional qualification and competence of selected nuclear facilities personnel sat 14 times in 1996. Based on successful results of examination by the State Examining Commission, 72 new nuclear facility operator licences were issued and 11 licences were renewed.

Within the IAEA Project CZR/005-07, an IAEA mission concerned with the human factor aspects within the Temelin project took place at the SÚJB. The following documents served as underlying information for this mission: Preliminary Safety Report of the Temelin Nuclear Power Plant, Chapter 18 (Engineering Aspects of the Human Factor), and an expert opinion on that Report prepared on a contractual basis by the organization ORGREZ, Brno. The conclusions of the mission and the expert opinion were employed by the SÚJB when reviewing the Report and preparing requirements to be imposed on the utility, ČEZ, a. s. Meeting those requirements is a prerequisite for continuation of the review of the Temelin safety documentation by the SÚJB.

In the field of professional education and training of nuclear facility personnel in the Czech Republic, the SÚJB is a member of an international working group of the IAEA. Conclusions made by this group during its meetings, in which the SÚJB has been participating regularly, are mainly concerned with the implementation of a systematic approach to the training of selected personnel of nuclear facilities, improvements in the training scheme for maintenance personnel, including contractors, the role of the management in the process of training scheme preparation and implementation, and improvements in the safety culture. All recommendations made by the working group are respected by the Czech Republic, and the SÚJB is making efforts for the recommendations to be gradually introduced into the system of preparation and training.

4. Emergency Preparedness

The SÚJB emergency preparedness, which is particularly concerned with the management of situations arising from radiation accidents, concentrated mainly on reviewing emergency plans of nuclear facilities and setting up the Crisis Co-ordination Center, which is SÚJB's technical and professional basis serving the needs of the Czech Governmental Commission on Radiation Accidents. Preparatory work was done in 1995 and in the 1st half of 1996, and the Crisis Co-ordination Center was opened officially in July 1996 in the presence of representatives of the engaged Ministries and other Czech organizations as well as representatives of the Embassy of the United Kingdom and the UK Nuclear Installations Inspectorate, which participated in the equipment of the Center with some technical facilities.

Subsequently, the performance of the Center was tested by engaging it in two international nuclear emergency exercises: "EXERCISE 96", organized by Austria and "INEX 2", organized by the NEA/OECD. The exercises provided opportunity to test and examine the co-ordination function, communication and information and data transmission between the Center and bodies and organizations involved in the emergency planning system, both at the national and international levels, as well as to test the preparedness of selected components of the Radiation Monitoring Network. In command of the exercise within the SÚJB authority was the Crisis Staff, who had at their disposal technical means of the Crisis Coordination Center and of the National Radiation Protection Institute.

The exercise gave evidence that the SÚJB has the capability for co-ordinating, within the Czech Republic, activities associated with the assessment of the radiation situation arising from a radiation accident abroad having impacts on this country. The performance of the SÚJB

Contact Point was tested in co-operation with the Czech Civil Defence Headquarters in the fulfilment of tasks following from international agreements, both within the country and in relation to other countries. The emergency preparedness exercises proved that the SÚJB has the capability for co-ordinating effectively activities of the components of the Radiation Monitoring Network, the Early Warning Network, for analyzing information and data obtained, and for preparing proposals of measures to be taken by the Government and State Administration bodies to protect the population and environment. The co-ordination and communication during joint exercises with the Czech Civil Defence Headquarters, Czech Hydrometeorological Institute, and the Operational Center of the Rescue Fire Department proved to be good as well.

At the Dukovany site, SÚJB's efforts concentrated on improving the public warning system within the emergency planning zone. The SÚJB reviewed proposals for a new design of the public warning system that would eliminate false signals and make possible selection of territories where the sirens should be activated. In fact, however, unplanned siren activation took place after the new system was implemented; the SÚJB paid major attention to this event and to remedial actions taken to prevent such events in the future. A number of proposals submitted by the Dukovany plant management in relation to the preparation of review of the internal emergency plan were also assessed.

At the Temelin site, attention was systematically paid to the on-site emergency plan of the NPP as well as to the off-site emergency plans of the administrative districts affected.

At the Nuclear Research Institute at Řež, the SÚJB concentrated on the upgrading of the emergency monitoring and data evaluation system.

5. Other Activities of the State Office for Nuclear Safety

5.1. Legislative activities

In 1996, the SÚJB activities in the legislative field were associated with the preparation of the Peaceful Uses of Nuclear Energy and Ionizing Radiations Act ("Atomic Act"). Preparation of the Atomic Act in the form of a Bill was the joint responsibility of the Czech Ministry of Industry and Trade and the SÚJB. In January 1996, the Government submitted the Bill to the Czech Parliament (House of Representatives), and representatives of the SÚJB were present when the bill was discussed by the relevant Parliamentary Committees and prepared statements on many amendments proposed by some Members of Parliament. The third reading of the Bill was postponed due to complications associated with the preparation of general elections. The newly elected House of Representatives passed the bill only on 20 December 1996, and subsequently the bill was passed on to the Senate.

In relation to the Atomic Act, pains were taken to prepare 16 associated regulations, which the SÚJB is authorized to issue under the Atomic Act. However, since the final version of the operating regulations can only be adopted after the Atomic Act has been passed, the delay in the parliamentary procedures will cause delay in the schedule of the regulations as well.

Based on consultation with the IAEA, the SÚJB prepared for the Czech Government a proposal for signing a new Agreement between the Czech Republic and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the

Non-Proliferation of Nuclear Weapons. The Government adopted the Agreement, and the latter was signed in Vienna on 18 September 1996 and submitted to the Czech Parliament for approval.

Within the process of Czech Republic's preparation for joining the European Union, the SÚJB was engaged in the harmonization of the Czech and EU legislation in the field of nuclear safety and radiation protection, as well as in filling out the relevant parts of the EU Questionnaire.

5.2. International cooperation

The SÚJB activities in the field of international co-operation concentrated mainly on the development of bilateral contacts with the counterpart bodies and co-ordination of projects of technical co-operation and assistance, which in the field of nuclear safety and radiation protection are organized by the IAEA, EU (PHARE), US AID, and OECD. Cooperation within the Forum (formerly Association) of Regulatory Bodies of Countries Operating WER Reactors continued in 1996 as well.

Significant events in 1996 included participation in the 40th (anniversary) IAEA general conference and creation of conditions for representation of the Czech Republic in the Board of Governors. The 40th IAEA general conference, which was held in September 1996, elected the Czech Republic to the Board of Governors for the next two-year term of office. The fact that the Czech Republic is represented in the Board of Governors, the IAEA's supreme body between the general conferences, strengthens the position of this country within the IAEA and tightens mutual co-operation.

Among important activities in the bilateral relations with Germany were two meetings of the Czech-German Technical Expert Team, concerned with the preparation of a technical document on nuclear and radiation safety assurance and on environmental impacts of the Isar II and Temelin nuclear power plants, which both lie near the state borders. Public information documents on the safety of the two plants should be ready for exchange between the Czech Republic and the Federal Republic of Germany in May 1997. Among bilateral contacts, cooperation between the SÚJB and the US Nuclear Regulatory Commission, particularly in the training of experts in regulatory inspection of nuclear facilities, has been playing a major role. In addition to some minor activities, training of the SÚJB and Nuclear Research Institute Řež personnel took place in 1996 within the preparation for licensing of the Temelin nuclear power plant; moreover, two staff members underwent long-term training in inspection activities. In collaboration with USE DOE experts, a new program of technical cooperation aimed at support of nuclear power plant operators and their technical background was launched. In June 1996, the SÚJB organized a workshop attended by US DOE experts and the beneficiaries, i.e. ČEZ a.s. and the Nuclear Research Institute at Řež, where the finalized projects were discussed and a plan of new activities was prepared.

Extensive informal bilateral contacts in 1996 included co-operation with the Nuclear Regulatory Authority of the Slovak Republic. Nuclear safety of plants with VVER 440/213 reactors in ten years of operation and important proposals for improvement of the original design and further safety enhancement of the Dukovany plant were discussed at a meeting of representatives of the regulatory bodies and NPP operators organized by the Slovak Regulatory Authority in co-operation with the SÚJB and their Hungarian counterpart in

January 1996. The SÚJB and the Nuclear Regulatory Authority of the Slovak Republic prepared a draft co-operation programme for the period till the year 2000.

Within co-operation between the SÚJB and the UK Nuclear Installations Inspectorate, a British delegation led by HM Chief Inspector of Nuclear Installations Mr S. A. Harbison visited the Czech Republic in July 1996 on the occasion of opening the SÚJB Crisis Co-ordination Center. Furthermore, co-operation with the British Department of Trade and Industry is being effected through the research organization of AEA Technology.

The SÚJB has maintained professional contacts with the OECD Nuclear Energy Agency (NEA). SÚJB representatives participated in the regular meeting of the NEA/OECD Committee on Nuclear Regulatory Activities (CNRA), joining representatives of regulatory bodies, where the Czech Republic presented itself for the first time as a NEA/OECD Full Member, and in the meeting of the Committee on Radiation Protection and Public Health (CRPPH). The participation of the Czech Republic in the INEX 2 exercise is another example of international co-operation.

The SÚJB is a Founding Member of the Forum of Regulatory Bodies of Countries Operating VVER Type Reactors, established in 1993 in support of nuclear safety and radiation protection improvements by making use of common experience, information exchange, and coordination of nuclear safety assurance efforts. The SÚJB organized the 3rd Forum Meeting in Prague, June 1996. The Meeting was attended, as well as by ordinary members, by representatives of the IAEA, OECD/NEA, and countries supporting activities of the latter (USA and Germany). The Czech Republic's annual presidency of the Forum thereby culminated. The 3rd Meeting reviewed activities of the Working Groups, discussed suggestions, and founded three new Working Groups for the next term of office, with the following scopes of activity:

- Licensing process of dry spent fuel storage facilities, with the task to finalize Table of Content for the SAR and prepare a set of criteria for an assessment of the safety of operational states of DSFSF (this Working Group will be headed by the Czech Republic).
- In-service inspections at nuclear power plants, with the task to modify the EU document "Proposal for common position of European regulators on qualification of non-destructive testing systems for pre- and in-service inspection of lightwater reactor components" (this Working Group will be headed by Finland).
- Reactor pressure vessel embrittlement, with the task to prepare a report on common understanding of Russian norms and standards (this Working Group will be headed by Finland).

Co-ordinated by the SÚJB, the second international training course in "Physical Security of Nuclear Installations and Nuclear Materials" was held in 1996. This training course was funded to a large part by the US DOE, and lectured by SANDIA National Laboratories staff members. An IAEA Workshop on "The Role of NPP Management in Public Information" was held at the Dukovany plant in August 1996. The two international exercises organized in the Czech Republic for 60 experts (from roughly 16 countries) were favourably rated by both the IAEA and the US DOE.

The project preparation stage within the programme of technical assistance between the Czech Republic and the IAEA culminated in mid-1996. Based on discussions with the organizations involved and following its own review, the SÚJB submitted to the IAEA five draft project schemes:

- Assessment of Corrosion of Zircaloy Cladding in Nuclear Fuel (continuation of the 1995 - 1996 project).
- Radioactive Waste Characterization Programme (continuation of the 1995 - 1996 project).
- Remediation for Uranium Mill Tailings Impoundments (by using waste material and products of other mining activities).
- Quality Assurance Programme in Radiology and Radiotherapy.
- A Model Project

Unlike the previous years, the SÚJB made use of the opportunity and submitted, in addition to the proposed projects of technical co-operation with the IAEA in the conventional format, a so-called Model Project. Such projects are by definition aimed at problems of special importance, whose addressing will result in a major improvement in the social status and/or economy of the beneficiary country. Both the volume of funding and expert support from the IAEA and the beneficiary country's involvement are appreciable. Following preliminary consultations with the IAEA, the joint nuclear medicine project of the Nuclear Research Institute at Řež and the Bulovka hospital, which is also supported by the Czech Ministry of Health, was selected as the Model Project. Within this project, manufacturing capabilities and a distribution network for cardiological and oncological radiodiagnostic pharmaceuticals should be built up within four years with IAEA's assistance. So far, technical discussions with IAEA experts have been finished and the project has been launched.

During the preparation of the scope of the IAEA technical assistance programme for the 1997 -1998 period, the SÚJB was also engaged in planning activities concerned with the whole European region. Additional cooperation with the IAEA was through many expert discussions and negotiations, devoted to topics such as:

- strengthening the non-proliferation regime and safeguards system;
- nuclear energy for non-power uses and the International Nuclear Information System.

In relation to the review of the internal activities of the Office, the SÚJB requested from the IAEA an expert mission. This mission reviewed, in cooperation with the SÚJB experts, SÚJB's internal quality assurance system. Experts from the US, Finland, and UK found the organization of the Office, including documentation, very good, and put forth recommendations for a future optimization of the system.

Technical co-operation with the IAEA in 1996 also had the form of foreign expert missions with the following scopes:

- Reviewing proposed modifications in the Temelin NPP design with respect to the shortcomings identified by the IAEA for VVER 1000 reactors.
- Providing support to SÚJB experts in assessing the role of the human factor within the Temelin NPP design.
- Reviewing the design approach to fire protection at the Temelin NPP with respect to nuclear safety.
- Reviewing the level of preparedness of the SÚJB Crisis Co-ordination Center for managing situations arising from radiation accidents.

The regional PHARE-Nuclear Safety programme, co-ordinated by the SÚJB, constitutes a significant fraction of foreign technical assistance to the Czech Republic, with respect to both the scope and volume of the assistance provided. This is aimed at three crucial aspects of the nuclear programme:

- support provided to regulatory bodies - RAMG projects;
- support provided to scientific institutions - TSO projects;
- support provided to nuclear power plant operators.

Within this scope, the SÚJB was engaged in many activities in 1996, such as discussion of the technical terms of reference of the projects proposed and definition of new projects for the period to come. Important was the participation of experts of the SÚJB, the Dukovany nuclear power plant, and the Machine Design Research Institute (SVÚSS Běchovice) in specification of the so far largest PHARE project, consisting in testing the safety system of the bubbling facility at the VVER 440/213 unit in various accident conditions. Among additional programmes of technical assistance to the Czech Republic and other Central and East European countries was the "Invitation Programme" by the government of Japan, within which training courses on nuclear power plant maintenance and on seismic aspects of nuclear power plant designs have been organized.

5.3. Public information

In March 1996, the SÚJB submitted to the Government of the Czech Republic the SÚJB Annual Report 1995. Based on this Report, the SÚJB prepared Czech and English versions of a public report, which was distributed to the institutions involved. The English version was sent to SÚJB's regulatory counterparts abroad and to the contact points of bilateral agreements concerned with the nuclear safety issue. The public report was also the issue of a dedicated press conference attended by mass media reporters, where the SÚJB Chairman was present.