

THE SLOVAK NUCLEAR REGULATORY AUTHORITY AND START-UP OF THE MOCHOVCE NPP

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Foreword

A major element of providing information is the demonstration that the area of nuclear energy uses has its binding rules in the Slovak Republic and the observance thereof is controlled by the state through an independent institution – Slovak Nuclear Regulatory Authority (UJD). As early as 1995 were laid on the UJD the foundations of the concept of broadly keeping the public informed on UJD activity and the safety of nuclear installations by opening the UJD Information Centre that provides by its activity communications with the public and mass media, which is instrumental in creating in the public a favourable picture of the independent state nuclear regulation.

Clear communication policy is the key to credibility and is based on perceptions which give rise to varying levels of confidence. It has been consistently found in opinion research that credibility is the single most powerful persuasive force. Public communication programmes are the principal currency for the Regulatory Authority to inform the public on issues like costs, benefit requirements and risks.

Last two years were important for the UJD in public information especially the situation at the NPP Mochovce and activities of the Austrian Government, dealing with personal, medial and visiting activities. These activities were focused on stopping the commissioning of the first unit at the NPP Mochovce. Nevertheless, deputy of the Slovak Government has presented facts about commissioning of the first unit and the preparation for commissioning of the second unit of the NPP Mochovce, during the 43rd General Conference in Vienna.

The NPP Mochovce is an example of international co-operation in achieving internationally acceptable safety standards. Companies from France, Germany, USA, Russian Federation, Czech Republic and Slovakia and last, but not least also the IAEA participated significantly on increasing the safety level of this NPP. We have been fully aware of the importance of good communication with press, television and radio broadcasting in this pre-

operation and operation period about nuclear safety, nuclear standard and the other nuclear aspects commissioning of the NPP Mochovce in the UJD. The information policy of the UJD was in this period focused on the preparation of actual press releases for general and specialised newspapers and national press agencies. Very important were the frequent presentations about the requirement safety stages of the NPP Mochovce on television and radio broadcasting by headquarters of the UJD.

The public relations are understood as attempts to establish, keep and improve the UJD's good relations to its neighbours through purposeful informing. Parallel such communication also means to follow particular ethical principles and independence which are precondition to attain a respect of the national supervision for nuclear safety in Slovakia.

The UJD already in its origins laid the foundation of a policy of keeping the public broadly informed on all activities and the safety of nuclear installations in the Slovak Republic by opening the UJD Information Centre. Catering to public & media relations, the Information Centre is instrumental in forming a favourable picture of independent state supervision on nuclear safety. The Information Centre in its offices at UJD was built and opened in October (1995) with the IAEA Director General Dr. Hans Blix as the first visitor.

Professionally, the public relations at the UJD are responsibility of the Public Information Manager who is at the same time the press officer of the UJD. Of course, his close co-operation with all staff members is absolutely necessary. The Manager co-ordinates all public relations activities and he also personally prepares press releases, writes articles, organises press conferences and communicates with television, radio broadcasting and journalists. He also monitors news in various media on subjects interesting for the UJD.

Operation and responsibility of the Nuclear Regulatory Authority

The primary mission of the Nuclear Regulatory Authority of the Slovak Republic is to guarantee both the Slovak Republic's citizens and the international community that atomic energy on Slovak territory is used exclusively for peaceful purposes and that Slovak nuclear power plants are designed, built or liquidated, as the case may be, in compliance with appropriate legislation.

The UJD in its activity makes use of the results of science and research as well as international co-operation with the aim of achieving internationally acceptable levels of

nuclear safety of nuclear installations in the Slovak Republic. The UJD's mission is defined by Act No. 130/1998 Coll. on the peaceful uses of nuclear power which took effect 1 July 1998. This Act is approximated to law of the European Commission. The compliance of activities described therein and the observance of the UJD requirements and decisions are checked up by nuclear safety inspectors.

Pursuant to this Act, control activity over nuclear safety is carried out by the main inspector and nuclear safety inspectors. The performance of this activity is regulated at the UJD by an internal directive significant part of which is an annual inspection plan. The inspection plan envisages routine inspections to be conducted first of all by the UJD site inspectors who control how the observance of nuclear safety requirements. Conditions are ensured, the state of nuclear power installations, the observance of approved limits and conditions and selected operating regulations, namely in particular during operation and maintenance nuclear power installations.

Special inspections are focused on closely professional areas (such as fire safety or qualifications and training of NPP personnel, etc.), particularly on control of the fulfilment UJD requirements and decisions. Team inspections organized by the UJD main inspector prior to a major step of the start-up programme or operating conditions are targeted toward complex control of the observance of the UJD conditions usually simultaneously in a number of problematic areas.

Control and evaluation activity of the UJD rests in the assessment of safety documentation for nuclear power structures, intended in particular to enhance nuclear safety of nuclear installations in service. Further documentation are focused on the preparation for their operation start-up as well as the evaluation of changes to installations influencing the nuclear safety.

Communication activities and Mochovce NPP

Extra activities of the UJD in the area of public relations resulted during entire year 1998 from the commissioning of Mochovce NPP. The UJD inspectors have carried out a number of inspections at individual technological complexes of Mochovce NPP, based on year plan of inspection activities. It was for the first time, when Press Officer of Regulatory Body was included into UJD inspection teams, who was preparing short as well as longer information reports about these inspections, providing there particular results of inspections and accepted measures. The UJD requirement has been to construct and operate Mochovce NPP on such

safety level, which would meet current international requirements and standards and would be acceptable by public.

All these steps in reviewing safety measures and realisation of preparation and commissioning of Mochovce NPP unit II. has been presented to mass-media and press agencies by national independent surveillance over nuclear safety. Many questions from national daily papers, television and radio broadcasting are very often responded by the Press Officer. Commissioning of Mochovce NPP unit was significantly flavoured also by negotiations with Austrian government. As a result of these contacts between Austria and Slovakia, related to Mochovce NPP, were many presentations of leading authorities of the UJD in television programs of Austrian, Hungarian and in all programs of Slovak television. Press Officer regularly responded to questions of redactors of domestic daily papers, but often also questions from Austrian, German, Hungarian and Slovak television stations, related to safety of Mochovce NPP unit I and II. During this period leading authorities of UJD were often taking part, together with Mochovce NPP operator, at discussions with mass media in Bratislava, Budapest and in Vienna. Press Officer of the UJD has taken part at a few round tables to particular issues, especially in Slovak radio broadcasting.

Unfortunately, issues of Mochovce NPP safety have been discussed at certain international levels (Austrian government, EU etc.) to political extortion. Issues of safety improvement have been politicised in mass media, what resulted into hot medial summer 1998 and autumn 1999. In spite of these unfavourable influences, process of the I. and II. unit commissioning has been managed on high professional level, what has remarkably positive response in mass-media and in expert sphere all over the world. Start-up unit I. and II. of Mochovce NPP into operation means also positive response to co-operation "East - West". Mochovce Nuclear Power Plant is an example of international co-operation in improving safety and achieving up-to-date safety standards.

NPP Mochovce start-up

The completion of the first NPP Mochovce units was decided by the Government of the Slovak Republic as early as 1995 with the requirement that safety be brought up to the current international practice level.

Enhancing safety of the NPP Mochovce is also the basic requirement of the UJD. The construction of the Mochovce nuclear power plant was implemented under the operation-proven design of nuclear power plants of VVER 440/V213 type. The NPP Mochovce detailed

project also reflected the experience in operation of this type of nuclear power plants above all in the former Czechoslovakia, but also in other countries, mainly the former USSR, Hungary, CR, and Finland. Of all-important safety improvements, which were part of the original NPP Mochovce project, in particular seismic resistance improvement of structures and facilities, I&C system technology innovation and increased reliability of facilities designed to enhance nuclear safety and radiation protection can be noted.

The year 1998 was a historic milestone to the NPP Mochovce, when Unit 1 was commissioned following the years of its suspended construction. In addition to Unit 1 trial operation and installation works on Unit 2 has been intensively completed, analytic, project and implementation works under the NPP Mochovce safety improvements programme has been conducted during 1999. As a follow-up, also preparations and subsequent tests of plant equipment were performed.

During 1999, intense completion of construction works on Unit 2 was taking place, part of which was also the implementation of safety measures. The scope of implemented safety measures on Unit 2 was the same before the start-up as on Unit 1 at the time following the refuelling outage. Significant milestones on the Unit 2 start-up in 1999 included the completion of Phases 1 and 2 of extended hydrotesting. Permission for the Phase 1 physical start-up, i.e. core loading, was given by the UJD on 4 October 1999, criticality was achieved on 1 December 1999 and the unit power start-up phase began on 14 December 1999 (the first turbo-generator of Unit 2 was brought to phase on 21 December 1999). Power start-up tests at a power level of 20 %, 35 % and a part of tests at a power level of 50 % were run on EMO Unit 2. Another milestones of the NPP Mochovce Unit 2 will be the achievement of the unit rated capacity and the putting into trial operation following a successful 144-hour demonstration running.

Special attention was also devoted by the inspectors to the implementation of safety measures targeted toward enhancing the unit nuclear safety level. It may be noted that the implementation of safety measures on this unit was (as compared to Unit 1) for the unit operation start-up more consistent, thus the level of their implementation on Unit 2 prior to physical start-up was the same as on Unit 1 after the refuelling outage (during which project and supplier prepared safety measures required by the UJD decision were implemented on Unit 1).

Continuously controlled was also the activity of the operator's personnel was controlled in both testing and routine operations as per operating regulations or instructions. No major shortcomings were found in this area. Personnel of the NPP Mochovce Unit 2 have sufficient

experiences gained during the Unit 1 start-up. Based on the knowledge obtained by the UJD through inspections in the Unit 2 start-up the shortcomings occurring particularly in the preparation of technical documentation, in which changes arising out of the implemented safety measures had not been sufficiently flexibly incorporated. Under the evaluation of operating events, the results of control activity, but also taking into account operating indicators, the UJD assessed the EMO Unit 1 operation as safe and reliable in 1999. The results of Unit 2 tests during the start-up up to the 35 % power level N_{NOM} show that Unit 2 is well-prepared in the light of the state of equipment and systems as well as personnel activity for another start-up phase to take place in 2000.

All activities and tests are performed in the start-up process according to pre-developed programmes subdivided into phases subject to approval by the UJD. A transition into another phase will only be possible under the UJD's permission, following the evaluation of the previous phase, with the permission being conditional primarily on the meeting of conditions related to nuclear safety.

UJD inspectors under all the phases of unit preparation for its start-up and phases of its start-up according approved programmes check the progress of accidentally selected tests. The UJD also consistently monitors compliance with requirements for unit start-up scientific supervision provided, by the Výskumný ústav jadrových elektrární, a.s., Trnava (VUJE).

The conditions for safe operation of the NPP Mochovce Unit 1 have been imposed by the UJD decision for trial operation. This fundamental document details the obligations the utility has to continuously satisfy for safe operation and charges it to complete all safety measures at established dates. The UJD has issued this decision in the form commonplace in advanced countries and thus guarantees the same standard of nuclear safety as it is adopted in such countries. UJD inspectors followed the same procedure also in starting up the NPP Mochovce Unit 2.

Despite improvements on the original project thorough reassessment of the project safety was conducted during the construction suspension by the NPP Mochovce in co-operation with its contractors. It was based on the comparison of the original project with internationally accepted nuclear safety standards as well as the evaluation of experiences of Western European operators of analogical power plants featuring PWR-type reactors. The evaluation results led to the adoption of an additional programme of safety improvements of the NPP Mochovce. By implementing the safety improvement programme the nuclear plant has achieved the position, which in terms of the meeting of current nuclear safety standards measures compares with nuclear PWR-type reactors in service in Western Europe.

In assessing operating events it should be noted that in 1998 and 1999 the UJD initiated a number of working meetings with the NPP Mochovce management to tune up the methodology of assessment of operating events, record-keeping and the system of reporting thereof.

Even despite that the nuclear power plant start-up period is designed to confirm project properties of an installation and find and clear defects and such an activity is undertaken continuously throughout the start-up period under professional supervision of specialists in the unit control room. The assessment of operating events during start-up is one of the components to assess the success of start-up works. The primary criterion for start-up success is the quality of unit tune-up and its mastering by the operating personnel. In general, it can be noted for NPP Mochovce Units 1 and 2 that the whole start-up process was permanently under control by supervisory start-up bodies and no nuclear dangerous operating events occurred during the start-up. In particular no radioactive leak into the working environment and the environment has been recorded throughout the start-up period.

Within the transparency and openness policy, the following five international missions focused on independent verification of specific nuclear safety issues were held at the Mochovce utility or in connection therewith:

- Mission of Austrian specialists in May 1998 was intended to verify the utility safety prior to its start-up. The mission stated that remarkable progress had been made in improvements of the original Soviet-era project. The Austrian side formulated its recommendations. Some of them concerned unit operation regimes, were accepted already during the mission, others were charged with the operator to improve the project (e.g. advanced protection against lightnings). Of contentious opinions of the Slovak and Austrian sides in particular the question of the NPP Mochovce Unit 1 reactor pressure vessel should be mentioned.
- IAEA expert group set up to assess the safety of the NPP Unit 1 reactor pressure vessel was held in September 1998 in Vienna. Its main conclusion was that the pressure vessel of the NPP Mochovce Unit 1 was safe and no new issues relating to its safety were confirmed.
- IAEA mission intended to assess the project of safety improvements at the NPP Mochovce took place in October 1998. The mission's preliminary conclusions stated that the safety improvement programme included and dealt with all the IAEA recommendations addressed to VVER 440/V213 units.

- Special IAEA mission focused on the assessment of seismic characteristics of the Mochovce site (the mission was held together for the NPP V-1 and V-2 Bohunice). The PHARE project of assistance to the Slovak regulatory authority in assessing safety of the NPP Mochovce. The project funded by the EC, managed by RISKAUDIT, bringing together Western organisations active in the area of nuclear safety GRS (Germany), IPSN (France), ANPA (Italy) and CIEMAT (Spain), and others reoriented in the course of solution-making toward an independent assessment of the NPP Mochovce safety.

Conclusion

The results of all the missions were presented and discussed at various levels in 1999. The mass media were kept regularly informed on the progress, principal results and adopted conclusions and they were also on the agenda of the UJD press conferences.

The problems of ensuring nuclear safety are increasingly becoming international in nature. Assessments include nuclear reactor ageing, modernisation of technological systems such as control systems and gaining of new scientific knowledge and necessary transparency in the problems of nuclear installations safety.

The conclusion at last years roundtable of Forum EUROSAFE in Paris, where the current state in ensuring nuclear safety on Unit 1 (refuelling outage) and Unit 2 (physical start-up phase) of the NPP Mochovce was presented, sounded favourable. The Forum EUROSAFE participants stated that the NPP Mochovce is the first nuclear power plant of the former Soviet design built in Eastern Europe to meet the level of safety comparable with Western standards. The safety level attained by the NPP Mochovce has become a guide to modernisation of the other Eastern European nuclear power plants of VVER 440/V 213 type. The prepared report was submitted in late 1999 to the European Union and thereafter made public.

It is obvious, however, that a lot of work is still to be done, especially with the aim to assure better direct presentation of the UJD to the public as a competent and independent regulatory organisation. All communication and information activities of the UJD in 1999 aimed to form the public confidence and the favourable UJD image at home as well as abroad.