



ETE Road Map

According to Chapter IV and V of the
“Conclusions of the Melk Process and Follow-Up”

Chapter V Environmental Impact Assessment Final Monitoring Report

Report to the Federal Ministry of Agriculture,
Forestry, Environment and Water Management
of Austria

Vienna, June 2005



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EXECUTIVE SUMMARY

The Republic of Austria and the Czech Republic, using the good offices of Commissioner Verheugen, reached an accord on the “Conclusions of the Melk Process and Follow-up” on 29 November 2001 (“Brussels Agreement”). In order to enable an effective use of the “Melk Process” achievements in the area of nuclear safety, ANNEX I of this “Brussels Agreement” contains details on specific actions to be taken as a follow-up to the “dialogue” of the “Melk Process” in the framework of the pertinent Czech-Austrian Bilateral Agreement.

Furthermore, the four-member Commission on the Assessment of Environmental Impact of the Temelín NPP – set up on the basis of a resolution of the Government of the Czech Republic – presented a report and recommended in its Position the implementation of twenty-one concrete measures (ANNEX II of the “Brussels Agreement”).

It has to be recalled, that with the ‘Melk Protocol’ a comprehensive and full-scope environmental impact assessment of the Temelín NPP guided by the Council Directive on the assessment of the effects of certain public and private projects on the environment (Council Directive 85/337/EEC as amended by Council Directive 97/11/EC), in particular with regard to the participation of neighbouring countries has been agreed.

The signatories of the “Conclusions of the Melk Process and Follow-up” agreed that the implementation of the said measures would also be regularly monitored jointly by Czech and Austrian experts within the pertinent Czech-Austrian Bilateral Agreement.

A “Roadmap” for the monitoring on a technical level in the framework of the pertinent Czech-Austrian Bilateral Agreement as foreseen in the “Brussels Agreement” was elaborated and agreed by the Deputy Prime Minister and Minister of Foreign Affairs of the Czech Republic and the Minister of Agriculture and Forestry, Environment and Water Management of the Republic of Austria on 10 December 2001.

The Federal Ministry of Agriculture, Forestry, Environment and Water Management entrusted the Umweltbundesamt (Federal Environment Agency Ltd.) with the general management of the implementation of the “Roadmap”. Each entry in the “Roadmap” corresponds to a specific Austrian technical project.

Furthermore, the Federal Ministry of Agriculture, Forestry, Environment and Water Management commissioned the Umweltbundesamt to give technical support for monitoring the implementation of the measures referred to in Chapter V of the Conclusions. This specific project is referred to as project PN5. Therein, special attention was paid to the implementation of the measures which are of particular interest to Austria.

Following the information exchange at the annual meetings organised under the pertinent Czech-Austrian Bilateral Agreement in 2002, 2003 and 2004, and at an additional meeting of the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management and the Umweltbundesamt with representatives of SÚJB and the EIA commission in February 2005, the current status can be summarized as follows:

- An overview has been given by the EIA commission and SÚJB on the status of implementation of the said measures, their scope and the organisations in charge.
- Most of the activities for the implementation of the said measures are still under way, some for the whole service life time of the NPP Temelín.
- The pertinent Czech-Austrian Bilateral Agreement is considered to be the appropriate framework for further joint monitoring of the ongoing process of the implementation of the measures.
- It is of particular interest how the implementation of the measures for which corresponding research projects come to an end in the near future will be continued and how they will be integrated into standard programmes of the corresponding authorities.

- Furthermore, if there are any changes in the functionality of the EIA commission web-page as an information platform, continued provision of information to the general public needs further attention in the further bilateral information exchange.

ZUSAMMENFASSUNG

Die Republik Österreich und die Tschechische Republik haben mit Unterstützung des Mitglieds der Kommission Verheugen am 29. November 2001 eine Übereinstimmung über die "Schlussfolgerungen des Melker Prozesses und das Follow-up" erzielt („Vereinbarung von Brüssel“). Um eine wirksame Umsetzung der Ergebnisse des „Melker Prozesses“ im Bereich der nuklearen Sicherheit zu ermöglichen, enthält der Anhang I dieser „Vereinbarung von Brüssel“ Details zu spezifischen Maßnahmen, die als Follow-up zum „Trialog“ des „Melker Prozesses“ im Rahmen des einschlägigen bilateralen tschechisch-österreichischen Abkommens durchzuführen sind.

Weiters legte die vier Mitglieder umfassende Kommission zur Prüfung der Umweltverträglichkeit des KKW Temelín (UVP-Kommission) – die auf Grund einer Resolution der Regierung der Tschechischen Republik eingesetzt wurde – einen Bericht vor und schlug in ihrer Stellungnahme die Umsetzung einundzwanzig konkreter Maßnahmen vor (ANHANG II der „Vereinbarung von Brüssel“).

Es wird daran erinnert, dass innerhalb des „Melk Protokolls“ eine umfassende Umweltverträglichkeitsprüfung des KKW Temelín entsprechend der Richtlinie des Rates über die Umweltverträglichkeitsprüfung bei bestimmten öffentlichen und privaten Projekten (Richtlinie des Rates Nr. 85/337/EWG, geändert durch die Richtlinie des Rates Nr. 97/11/EG) vereinbart wurde, insbesondere im Hinblick auf die Teilnahme von Nachbarländern.

Die Unterzeichner der "Schlussfolgerungen des Melker Prozesses und das Follow-up" kamen überein, dass die Umsetzung der beschriebenen Maßnahmen in regelmäßigen Abständen von österreichischen und tschechischen Experten im Rahmen des einschlägigen bilateralen tschechisch-österreichischen Abkommens untersucht werden würde.

Zur Überwachung auf technischer Ebene im Rahmen des einschlägigen bilateralen tschechisch-österreichischen Abkommens wurde, wie in der „Vereinbarung von Brüssel“ vorgesehen, eine „Roadmap“ („Fahrplan“) ausgearbeitet und am 10. Dezember 2001 vom stellvertretenden Premierminister und Außenminister der Tschechischen Republik, sowie vom Bundesminister für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft der Republik Österreich vereinbart.

Das österreichische Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft beauftragte das Umweltbundesamt mit der Gesamtkoordination der Umsetzung der „Roadmap“. Jeder Eintrag in der „Roadmap“ entspricht einem spezifischen österreichischen technischen Projekt.

Darüberhinaus beauftragte das österreichische Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft das Umweltbundesamt mit der technischen Unterstützung bei der Überwachung der Umsetzung der Maßnahmen aus Kapitel V der „Vereinbarung von Brüssel“. Dieses spezifische Projekt wird als Projekt PN5 bezeichnet. Darin wurde besondere Aufmerksamkeit auf die Umsetzung jener Maßnahmen gerichtet, die von besonderem Interesse für Österreich sind.

In der Folge des Informationsaustausches bei den jährlichen Bilateralen Treffen 2002, 2003 und 2004, die im Rahmen des einschlägigen bilateralen tschechisch-österreichischen Abkommens organisiert worden waren, sowie bei einem zusätzlichen Treffen des Österreichischen Bundesministeriums für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft und des Umweltbundesamtes mit Vertretern von SÚJB und der UVP-Kommission im Februar 2005 kann der gegenwärtige Stand wie folgt zusammengefasst werden:

-
- Die UVP-Kommission und SÚJB haben einen Überblick über den Stand der Umsetzung der genannten Maßnahmen, ihren Umfang und die verantwortlichen Organisationen gegeben.
 - Die meisten Aktivitäten zur Umsetzung der genannten Maßnahmen sind noch im Gange, teilweise für die gesamte Betriebsdauer des KKW Temelín.
 - Das einschlägige Tschechisch-Österreichische Bilaterale Abkommen wird als der angemessene Rahmen für eine weitere gemeinsame Überprüfung des laufenden Prozesses der Umsetzung der Maßnahmen angesehen.
 - Es ist von besonderem Interesse, wie die Umsetzung jener Maßnahmen, für die die entsprechenden Forschungsprojekte in naher Zukunft zum Ende kommen, weitergeführt wird und wie sie in reguläre Programme der zuständigen Behörden integriert werden.
 - Weiterhin wird für den Fall, dass es Änderungen bei der Funktionsfähigkeit der Web-Seite der UVP-Kommission als Informationsplattform geben sollte, die Gewährleistung der Information der breiten Öffentlichkeit zusätzliche Aufmerksamkeit beim künftigen bilateralen Informationsaustausch erfordern.

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1 INTRODUCTION

1.1 Background of the project – Environmental Impact Assessment

A national law which would foresee an obligatory environmental impact assessment for the construction of nuclear facilities was not in place in Czechoslovakia at the time the procedures to obtain a construction permission for the NPP Temelín was started. NPP Temelín was granted its construction permit on 23 November 1986. In 1992 the Czech Republic enacted a law on environmental impact assessment.

The ESPOO Convention (UN-ECE Convention on Environmental Impact Assessment in a transboundary Context) was signed by Czechoslovakia on 30 August 1991 and ratified by the Czech Republic on 26 February 2001.

On 12 December 2000 the “Melk Protocol” was signed by the Czech Prime Minister

Zeman and the Austrian Federal Chancellor Schüssel, using the good offices of Commissioner Verheugen. It states according to Chapter V – Environmental Impact Assessment

“The European Commission will assist and monitor the environmental impact assessment of the NPP Temelín. The Czech authorities will voluntarily extend the ongoing environmental impact assessment of 78 design changes into a comprehensive and full-scope environmental impact assessment of the whole plant taking fully into account the expertise that was done up to now. In procedural terms this extension shall be guided by the Council Directive on the assessment of the effects of certain public and private projects on the environment (Council Directive 85/337/EEC as amended by Council Directive 97/11/EC), in particular with regard to the participation of neighbouring countries. The extended environmental impact documentation to be released to the public will comprise the project documentation and other reference documents to the extent necessary to understand and assess the conclusions of the environmental impact documentation respecting European standards including criteria of business secrecy. “

It should be noted, that a full-scope EIA, in particular with regard to the participation of neighbouring countries, would not have been required for the NPP Temelín by Czech Law. Consequently, the Melk-based EIA was perceived and conducted as a process sui generis by the Czech Republic.

A four-member Commission on the Assessment of Environmental Impact of the Temelín NPP was set up on the basis of a resolution of the Government of the Czech Republic. The members of the commission were nominated by the Ministry of the Industry and Trade and the Ministry of Environment. The commission presented a report and recommended in its position the implementation of twenty-one concrete measures.

Austria and Germany participated in the process with the status of an accepted concerned party. The process was finished at the end of 2001.

1.2 Framework – Roadmap Temelín

The Republic of Austria and the Czech Republic, using the good offices of Commissioner Verheugen, reached an accord on the “Conclusions of the Melk Process and Follow-up” on 29 November 2001 (see ANNEX A of this report). In order to enable an effective use of the “Melk Process” achievements in the area of nuclear safety, ANNEX I of this “Brussels Agreement” contains details on specific action to be taken as a follow-up to the “dialogue” of the “Melk Process” in the framework of the pertinent Czech-Austrian Bilateral Agreement.

Furthermore, the signatories agreed that the implementation of the twenty-one concrete measures, elaborated and recommended by the Commission on the Assessment of Environmental Impact of the Temelín NPP (ANNEX II of the “Brussels Agreement, ANNEX A of this report) would also be regularly monitored jointly by Czech and Austrian experts within the Czech-Austrian Bilateral Agreement.

A “Roadmap” for the monitoring on a technical level under the pertinent Czech-Austrian Bilateral Agreement as foreseen in the “Brussels Agreement” was elaborated and agreed by the Deputy Prime Minister and Minister of Foreign Affairs of the Czech Republic and the Minister of Agriculture and Forestry, Environment and Water Management of the Republic of Austria on 10 December 2001.

The „Roadmap“ is based on the following principles:

- *The implementation of activities enumerated in ANNEX I and II of the “Brussels Agreement” will be continued to ensure that comprehensive material is available for the monitoring activities set out below.*
- *Having in mind the peer review procedure foreseen by the EU to monitor the implementation of the recommendations of the AQG/WPNS Report on Nuclear Safety in the Context of Enlargement, the Czech and Austrian sides agree that this peer review should serve as another important tool to handle remaining nuclear safety issues.*
- *As a general rule the regular annual meetings according to Art. 7(1) of the bilateral Agreement between the Government of Austria and the Government of the Czech Republic on Issues of Common Interest in the Field of Nuclear Safety and Radiation Protection will serve to monitor the implementation of those measures referred to in Chapter V of the Conclusions and to address questions regarding nuclear safety in general, in particular those issues which – according to Chapter IV of the Conclusions □ have been found, due to the nature of the respective topics, suitable to be followed □ up in the framework of this Bilateral Agreement.*
- *In addition, specialists’ workshops and topical meetings will take place, organised as additional meetings according to Art. 7(4) of the bilateral Agreement between the Government of Austria and the Government of the Czech Republic on Issues of Common Interest in the Field of Nuclear Safety and Radiation Protection, as set out in the “Roadmap”.*

Chapter V of the “Conclusions of the Melk Process and Follow-up” states:

With the ‘Melk Protocol’ the signatories agreed on a comprehensive and full-scope environmental impact assessment of the Temelín NPP guided by the Council Directive on the assessment of the effects of certain public and private projects on the environment (Council Directive 85/337/EEC as amended by Council Directive 97/11/EC), in particular with regard to the participation of neighbouring countries.

To this end, a four-member Commission on the Assessment of Environmental Impact of the Temelín NPP was set up on the basis of a resolution of the Government of the Czech Republic.

The Commission on the Assessment of Environmental Impact of the Temelín NPP presented a report and recommended in its Position the implementation of twenty-one concrete measures (ANNEX II).

The signatories agree that the implementation of the said measures will be regularly monitored jointly by Czech and Austrian experts within the bilateral Agreement on the Exchange of Information.

Furthermore, the Czech Republic and Austria agree to intensify bilateral co-operation on emergency preparedness.

The Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management commissioned the Umweltbundesamt (Federal Environment Agency) with the general management of the implementation of the “Roadmap”. Each entry in the “Roadmap” corresponds to a specific Austrian technical project (see ANNEX B).

Furthermore, the Federal Ministry of Agriculture, Forestry, Environment and Water Management commissioned the Umweltbundesamt to provide technical support for monitoring of the implementation of measures referred to in Chapter V of the Conclusions. This specific project is referred to as project PN5.

1.3 Aim of the project

The aim of Project PN5 was to provide technical support for the monitoring of the implementation of measures referred to in Chapter V of the Conclusions.

Therein, special attention was paid to the implementation of the measures which are of particular interest to Austria. Consequently, it has been focused on the measures where the possibility for directly affecting Austrian territory cannot be ruled out. Likewise, attention was paid to the measures for providing the information to a wide public.

1.4 Austrian – Czech Information Exchange

As agreed in the “Conclusions of the Melk Process and Follow-up”, the implementation of the twenty-one measures has regularly been monitored jointly by Czech and Austrian experts within the Czech-Austrian Bilateral Agreement with bilateral meetings on 11 December 2002 in Prague, 17-18 December 2003 in Vienna and 29-30 November 2004 in Dolní Dunajovice.

An additional meeting of the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management and the Umweltbundesamt with representatives of SÚJB and the EIA commission was held on 14 February 2005 in Prague (SÚJB) to enable further discussion.

The information obtained at these meetings serves as the basis for the evaluation summarised in this report.

2 FINDINGS

At the annual meetings organised under the pertinent Czech-Austrian Bilateral Agreement in 2002, 2003 and 2004 the status of implementation of the twenty-one measures was presented by the EIA commission by giving an overview of some of the results of several research projects.

For further details the Austrian Delegation was referred to the web-pages of the EIA commission (<http://kostelec.czu.cz/comtem>), the Institute of Physics of the Earth, Masaryk University, Brno (http://www.ipe.muni.cz/seismologie_temelin), SÚJB (<http://www.sujb.cz/>) and the Radiactive Waste Repository Authority, SÚRAO (<http://www.surao.cz/>).

An additional meeting of the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management and the Umweltbundesamt with representatives of SÚJB and the EIA commission on 14 February 2005 in Prague (SÚJB) enabled further discussion.

Additional reports concerning radiation monitoring results and the National Report under the Convention on Nuclear Safety 2004 (http://www.sujb.cz/?c_id=314) have been provided after the February meeting.

The information obtained at these meetings serves as the basis for the evaluation summarised in this report.

Therein, special attention was paid to the implementation of the measures which are of particular interest to Austria. This concerns especially measures 1, 2, 3, 4, 6, 8, 9, 15, 17, 19, 20 and 21 (see ANNEX A) which are listed in detail in section 2.2.

2.1 General remarks

For each of the twenty-one measures it is defined which organisation is responsible for its implementation. Some are the responsibility of SÚJB, the Ministry of Environment, the Ministry of Health, the Ministry of Education, Youth and Sports or the Ministry of Culture, Ministry of the Industry and Trade. A table which is published on the web-page of the EIA commission (available only in Czech, http://kostelec.czu.cz/temelin/op04/op_2004.html) gives an overview (see ANNEX C). Additionally, this document provides direct links to a short description of the status of the implementation of each measure, again only in Czech.

At the moment, preparatory work for the implementation of most of the measures has been carried out or is still being carried out under scientific projects with a defined financing scheme and a defined project duration. The projects are funded by the ministries that are in charge of the corresponding measure. Activities for measures, that are the responsibility of ČEZ, are excluded, as ČEZ cannot participate in state-subsidised R&D programmes.

The implementation of the measures themselves go beyond the schedule of the projects. It is planned that the measures will be integrated into standard programmes of the responsible authorities. Some measures are already part of standard programmes, such as the emergency preparedness programme of SÚJB.

The EIA commission can be seen as an independent body which acts as a supervisor and collects all results.

Up to now, the schedule of the scientific projects with limited duration and the time table for the implementation of the measures have remained unclear.

2.2 Evaluation of specific measures of interest

2.2.1 Measure 1

To establish a system for continuous informing of wide public both on current values of the factors affecting the environment as a consequence of the Temelín NPP operation (on-line outlets) and on development of time sequence of selected parameters of the environmental impacts monitoring (continuously updated diagrams, photos of the Earth remote examination, bio-monitoring results, and so on) as well as on other important facts (for instance earthquake in Alps indicated on seismological stations in South Bohemia, ...). All of these data would be shown on the Internet pages of the Temelín NPP, on publicly available monitors in Týn nad Vltavou and in České Budějovice, and in the Temelín NPP information centre.

Concerning the information strategy, the Austrian side has been informed that the EIA commission provides four specific information links on its web-page related to the topics nuclear safety, radiation monitoring and seismic. These are:

- Nuclear Safety – SUJB:
(http://www.sujb.cz/?r_id=26)
The position and responsibility of the SÚJB within the state administration are explained.
- Radiation Status in and around NPP Temelín – ČEZ:
(<http://www.cez.cz/cze/public/elektrarny/article.asp?id=40536&cat=5297&ts=7ec30>)
Various graphs, such as the percentage of using 40-microSv effective dose limit from gaseous outlets over the period of 2004, are presented on the Czech web-page (not on the English web-page), no information on on-line outlets can be found.
- Radiation Monitoring Network – National Radiation Protection Institute – SÚRO:
(<http://www.suro.cz/en/index.html>)
A general overview of the monitoring network and selected measurement results is presented.
- Seismological Information Display IPE NPP Temelín – Institute of Physics of the Earth, Masaryk University, Brno:
(http://www.ipe.muni.cz/seismologie_temelin/index_en.htm)
Measurement results of the last significant earthquake registered in the broad vicinity of the NPP Temelín are presented.

Moreover, a scientific conference with the title “Environmental Impact Assessment of Temelín Nuclear Power Plant”, which was held in České Budějovice on 14 – 15 November 2004 and organised by the University of South Bohemia, discussing the results of the scientific projects related to the implementation of the measures, was intended to serve as an additional platform for information. The proceedings of this conference were made available on the EIA webpage in Czech with English abstracts. In the meantime the papers have been provided also in English. (<http://kostelec.czu.cz/comtem>)

It is planned to organise such a conference with an international focus every second year. It is planned to publish the results of the scientific projects in scientific journals or to present them at scientific conferences.

Up to now, the information has been provided on several web-pages maintained and hosted by different organisations. It remains unclear which kind of information, e.g. which indicators for possible effects on the environment, will be provided via which information channel of the information system for the broad public. It also remained unclear whether it is planned to provide information for the broad public via monitors in Týn nad Vltavou and in České Budějovice and in the information centre of ČEZ as stated in measure 1.

If there are any changes in the functionality of the EIA commission web-page as an information platform fulfilment of the requirements for measure 1 should be guaranteed.

With regard to upcoming scientific events, the Austrian side asked for being informed in time.

2.2.2 Measure 2

To ensure continuous measurement of gaseous radioactive outlets within the framework of the operating network of the investor of the Temelín NPP.

The Austrian side has been informed that measurements of gaseous radioactive outlets are performed continuously. The results of these measurements are not provided for the general public via an online service. Only in specific cases, e.g. if a release of radioactive gas is recorded by the early warning system, the measurement results will be made public.

The exchange of information in case of an incident is set out in the pertinent Czech-Austrian Bilateral Agreement on Information Exchange and in the “Melk Protocol”.

2.2.3 Measure 3

To continuously improve and modernise the existing radiation monitoring network operated by the state authorities of the Czech Republic.

The status of modernisation of the radiation monitoring network, both in the Czech Republic and in Austria, was continuously discussed within the pertinent Czech-Austrian Bilateral Agreement at the last meetings. It will be part of the bilateral information exchange also in the future.

2.2.4 Measure 4

To regularly inform the public in the Czech Republic, Austria and the Federative Republic of Germany on all measurements.

The Austrian side has been informed that the “Information on NPP Temelín” officially provided to Austria is regarded as public information. The data are also sent to the Joint Research centre (JRC) in ISPRA.

The exchange of information as set out in the pertinent Czech-Austrian Bilateral Agreement and in the “Melk Protocol” constitutes a useful measure, and its functionality should be assessed regularly within the bilateral Agreement on Information Exchange and, if needed, measures should be taken to increase its effectiveness as agreed in the “Conclusions of the Melk Process and Follow-up”.

2.2.5 Measure 6

To ensure independent and continuous monitoring of the Temelín NPP operation impacts in the following fields:

- a. Assurance of supply and quality of drinking water from the point of view of the nuclear power plant as well as nuclear power plant impacts on the water resources in the Temelín NPP surroundings;*
- b. Assurance of supply and quality of technological water from the point of view of the nuclear power plant;*

- c. Impacts of emissions on water system and risk of radioactive pollution of the recipient as a consequence of tritium water and other water effluents, including assessment of temperature impacts, accumulation and synergic impacts of harmful substances (including eutrofisation) in Orlík water reservoir;*
- d. Impacts of emissions on atmosphere, verification of thermal pollution and evaporation of water on cooling towers;*
- e. Impacts on agricultural activities and forest economy.*

The Austrian side has been informed for clarification, that the measure 6 b) focus is on the preservation of the quality of the water from an ecosystem point of view, and not on the assurance of water supply for the water supply system of the NPP.

2.2.6 Measure 8

To ensure conditions for seismic monitoring (including establishment of the monitoring centre located within the Temelín NPP area, eventually in the Information Centre). The basic objective of this centre will be to inform the public, state organisational units and local municipal governments on earthquake impacts on the locality and on the surroundings of the Temelín NPP.

For quick information about earthquakes in the vicinity of the NPP and in the Alps region a Seismological Information Display is operated by the Institute of Physics of the Earth, Masaryk University, Brno, on demand of the State Office for Nuclear Safety (SÚJB). It has been in operation since September 30, 2002. The following main sources are used:

- broadband stations of the Czech regional seismological network operated by IPE Brno – identification of occurrence of an earthquake greater than the threshold magnitude in the area of interest and localisation of the earthquake
- alert information issued by seismological organisations – RedPuma of SED, EMSC, ZAMG, NEIC of the USGS
- microearthquake monitoring network – IPE Brno, impact on the locality, readings of amplitudes in the NPP Temelín vicinity

Additional sources are used for a greater accuracy of the localisation. These sources are comprised of:

- other stations of the Czech national seismological network – operated by Geophysical Institute of the Academy of Sciences of the CR, Prague
- other European stations – operated by ZAMG Austria, BGR Germany, SED Switzerland, INGV Italy etc

The issue of seismic monitoring has also been discussed in the Final Monitoring Report of the Austrian Project PN6 related to Roadmap item 6 “Site Seismicity”.

The Austrian side has been informed that a grant has been given to IPE, Masaryk University, by SÚJB to renew the seismic monitoring network.

2.2.7 Measure 9

To guarantee continuous maintenance and restoration of all technical equipment and devices of the nuclear power plant in such a way to correspond with the up-to-date status of the technique development as well as with the knowledge in the field of seismic engineering.

For questions concerning this issue, the Austrian side was referred to the National Report under the Convention on Nuclear Safety 2004 (http://www.sujb.cz/?c_id=314), and particular to the chapter on continual monitoring and periodic assessment of nuclear safety at nuclear installations.

2.2.8 Measure 15

To ensure monitoring of radionuclide accumulation in biological materials – bryophyte, forest soil and pine bark and to maintain monitoring of radionuclides in fish.

The Austrian side was given an overview of the activities of the National Radiation Protection Institute – SÚRO as the central monitoring laboratory for monitoring the environment and foodstuff. Within the Radiation Monitoring Network SÚRO provides information on its web-page about the

- Actual radiation situation presenting daily data from the Early Warning Network
- Mean mass and volume activities in foodstuffs and agricultural products
- Monitoring of Radionuclides in the air (presenting weekly values and monthly mean values of activity concentration)
- Network of thermoluminescent dosimeters – TLD network (presenting measurement results of photon dose equivalent H_x [μ Sv] in the environment)

Apart from the internet, the data are also published in the annual report.

The system will be evaluated on EU level during 2005. The results will be published.

2.2.9 Measure 17

To establish long-term monitoring (even retrospective) of changes in landscape character by means of multispectral satellite data analysis, especially suitable for monitoring of humidity and temperature changes of landscape related to changes in vegetation structure and functions. We recommend annual assessment of satellite data and related creation of ground key for satellite data including definition of key biotopes comprising forests on satellite photos and to ensure regular generalisation in this context in five-year intervals. With respect to the range of individual photos it is possible to ensure objective assessment of changes, which could exceed the borders with Austria and the Federative Republic of Germany.

The Austrian side has been told that the activities undertaken since 2002 have concentrated on establishing long-term monitoring of changes in landscape character with remote sensing methods, e.g. for monitoring humidity and temperature parameters covering a region with overlaps on German and Austrian territory.

The first results were presented at the conference in České Budějovice, November 2004 (<http://kostelec.czu.cz/comtem>). Comparison with data of the landscape before the operation of NPP Temelín and 3 years of experience indicates no impact on humidity and temperature values.

In a second phase, it is planned to establish ground key data. First evaluation results are expected in five years' time.

2.2.10 Measure 19

To decide on further use of spent fuel or to ensure definite storage in permanent underground storage within 65 years in accordance with the concept on spent fuel disposal approved by the Czech Republic Government.

The Radiactive Waste Repository Authority (SÚRAO) provides further details related to the concept on spent fuel disposal on its web-page (<http://www.surao.cz/>). According to this, the Concept of Radioactive Waste and Spent Fuel Management in the Czech Republic was approved by the government of the Czech Republic on 15 May 2002. It was prepared in the

year 2000 by the Ministry of Industry and Trade in co-operation with many other organisations, including state administration, regulatory bodies, waste generators etc. and covers the management of all categories of radioactive waste and aims on optimisation of the currently existing system for low and medium level short-lived waste.

The building of a deep geological repository is recommended in the concept as being the best option for the disposal of spent nuclear fuel and high-level radioactive waste. 2065 is stated as the target completion date for the commissioning of the deep geological repository.

Beside considerations for a deep repository the concept includes support for the research focused on transmutation and a new evaluation of management options, scheduled in 20 years time. At the moment two projects are being carried out at the Academy of Science. Czech involvement in the Generation IV and IAEA (INPRO) activities was discussed at the Czech – Austrian meeting in Februar 2005 in Prague.

2.2.11 Measure 20

Measure 20: To eliminate high conservativeness of design accident calculations and to transfer to assessment of best estimate type; to compare inland calculation diagrams with the foreign ones.

The Austrian side has been informed by SÚJB as the authority in charge of nuclear safety that the development of SAMG is based on “best estimate” whereas for DBA (design basis accident) the strategy of SÚJB remains “risk informed” and conservative.

2.2.12 Measure 21

Measure 21: To improve eventual accident occurrence indication system including its assessment; to train emergency preparedness for this purpose and eventually to update emergency plans (conditions for fast information, ability to perform actions and coordination of emergency measures).

According to the information provided on the web-page of the EIA-commission (Czech version only), requirements on emergency preparedness of the NPP operator are given in Decree No. 318/2002 Coll. (“On details for emergency preparedness assurance at nuclear installations and workplaces with ionizing radiation sources and on requirements for the content of on-site emergency plans and of emergency rules”) as amended by decree No 2/2004 Coll. §15 (2) of Decree 318/2002 Coll. states that an on-site emergency plan shall be revised at least every three years:

An on-site emergency plan shall be revised at least every three years. The changes in the on-site emergency plan and its parts shall be submitted without delay to the Office for approval provided there is a change in conditions that may influence emergency preparedness. The licensee shall carry out without delay any potential changes in the intervention instructions.

Both decrees are provided on the web-page of SÚJB (decree 318/2002 both in Czech and in English).

Methods of the indication of eventual accident occurrence are described in basic NPP documents for emergency preparedness and in NPP on-site emergency plan. The NPP shift-engineer, responsible for emergency incident classification, are regularly trained once a year. In parallel, during each emergency exercise (carried out several times per year at the NPP) the capability of the shift-engineers to properly perform their duties concerning incident classification and fulfilment of measures set out by related approved documents are verified.

Besides it, to check the interaction between on site and off-site emergency plans, every two years a common exercise of governmental, regional and local responsible bodies are performed. In June 2004 one exercise was performed within the region Vysocina (oriented to NPP Dukovany) and in September the second one within the region South Bohemia (oriented to the NPP Temelín).

Furthermore, the issue of emergency management has been addressed within the information exchange of the Czech-Austrian Working Group on Comparison of Calculations Regarding the Radiological Consequences of Beyond Design Basis Accidents of Roadmap Item 7a, resulting in a joint presentation of the “Joint Summary Report” at the International Symposium on Off-site Nuclear Emergency Management, Salzburg 2003, and resulting in an intensified co-operation strategy between the Crisis Centres of Czech Republic and Austria.

3 CONCLUSIONS

Following the information exchange at the annual meetings organised under the pertinent Czech-Austrian Bilateral Agreement in 2002, 2003 and 2004, and at an additional meeting of the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management and the Umweltbundesamt with representatives of SÚJB and the EIA commission in February 2005, the current status can be summarized as follows:

- An overview has been given by the EIA commission and SÚJB on the status of implementation of the said measures, their scope and the organisations in charge.
- Most of the activities for the implementation of the said measures are still under way, some for the whole service life time of the NPP Temelín.
- The pertinent Czech-Austrian Bilateral Agreement is considered to be the appropriate framework for further joint monitoring of the ongoing process of the implementation of the measures.
- It is of particular interest how the implementation of the measures for which corresponding research projects come to an end in the near future will be continued and how they will be integrated into standard programmes of the corresponding authorities.
- Furthermore, if there are any changes in the functionality of the EIA commission web-page as an information platform, continued provision of information to the general public needs further attention in the further bilateral information exchange.

4 LIST OF ABBREVIATIONS

DBA	Design Basis Accident
EIA	Environmental Impact Assessment
IPE	Institute of Physics of the Earth, Masaryk University, Brno, CZ
R&D	Research & Development
SAMG	Severe Accident Management Guidelines
SUJB	Státní Úřad Pro Jadernou Bezpečnost – State Office for Nuclear Safety
SURO	Státní Ústav Radiační Ochrany – National Radiation Protection Institute
SÚRAO	Správa úložišť radioaktivních odpadů- Radioactive Waste Repository Authority
TLD	Thermoluminescent Dosemeters
UVP	Umweltverträglichkeitsprüfung

ANNEX A

“CONCLUSION OF THE MELK PROCESS AND FOLLOW-UP”

CONCLUDING STATEMENT

**ON THE NEGOTIATIONS HELD ON 29 NOVEMBER 2001
BETWEEN THE CZECH AND AUSTRIAN GOVERNMENTS
LED BY PRIME MINISTER ZEMAN AND FEDERAL CHANCELLOR SCHÜSSEL
WITH THE PARTICIPATION OF COMMISSIONER VERHEUGEN
ON THE**

“CONCLUSION OF THE MELK PROCESS AND FOLLOW-UP”

The Republic of Austria and the Czech Republic have, using the good offices of Commissioner Verheugen, reached an accord on the annexed “Conclusions of the Melk Process and Follow-up”. They have agreed to communicate this agreement, in an appropriate form, to the Accession Conference.

Prime Minister Milos ZEMAN

Federal Chancellor Wolfgang SCHÜSSEL

Commissioner Günter VERHEUGEN

Conclusions of the Melk Process and Follow-up

Preamble

With the aim of further developing good-neighbourly relations between the Czech Republic and the Republic of Austria, a “Protocol on the Negotiations between the Czech and the Austrian Governments, led by Prime Minister Zeman and Federal Chancellor Schüssel with the Participation of Commissioner Verheugen” was signed in Melk on 12 December 2000, further referred to as the ‘Melk Protocol’.

The signatories of the ‘Melk Protocol’ found it appropriate to meet in Brussels on 29 November 2001 to define a follow-up to the process set forth in the Protocol mentioned above.

The signatories agree that the process started in Melk has led to an improvement in the exchange of information on the Temelín Nuclear Power Plant thus creating prerequisites for more confidence between the Czech Republic and Austria within an intensive dialogue on nuclear energy.

The signatories agree on the usefulness to open expert talks on amending the existing bilateral Agreement on the Exchange of Information on Nuclear Safety, concluded between the two states in 1989 so as to correspond to the achieved level of confidence and the needs of the signatories, including a reliable Info-Hotline.

Respecting the sovereign right to select their own energy policy, the two countries share their interest in a high level of nuclear safety of nuclear installations. The Czech side recognises the specific interest of the Republic of Austria as a neighbouring state in a high level of safety of Czech nuclear power plants.

The Czech Republic is exclusively committed to the provisions of Vienna Convention on Civil Liability for Nuclear Damage and Joint Protocol to the application of the Vienna Convention and the Paris Convention. The Republic of Austria is fully committed to the Austrian Nuclear Liability Act of 1999.

Chapter I - Info-Hotline

The Info-Hotline was installed immediately after the negotiations in Melk and its functionality is positively assessed by the signatories.

The Czech side has been providing information also on putting into operation the non-nuclear part of the first unit as well as information on the second unit of the Temelín NPP.

The Czech Republic and Austria agree that the Info-Hotline constitutes a useful measure, also with regard to nuclear and non-nuclear testing of both units, that its functionality will be regularly assessed within the bilateral Agreement on Information Exchange and that, if needed, measures will be taken to increase its effectiveness.

Chapter II - Early Warning System

An automatic monitoring device in `Ceské Budjovice provided by Austria was installed on April 24, 2001 and the supply of data on radiation levels from the monitoring network continues without any problem.

The signatories agree that this measure fully meets its purpose and will remain in operation.

With a view to establishing a regional network in the long-term, which could be included into ECURIE, the possibilities of exchanging data with other national monitoring networks will be explored.

Chapter III - Energy Partnership

The Czech Energy Agency has been co-operating with the Austrian Energy Agency in the fields of energy efficiency and reconstruction of tenement houses, exploitation of renewable energy sources and the use of co-generation units. The signatories will make further efforts to intensify this co-operation.

Chapter IV - Safety Issues

The Czech and the Austrian side appreciate the role played by the European Commission in establishing and facilitating a “trialogue”, launched to find a better mutual understanding on the issue of the Temelin NPP related to nuclear safety.

During the process, twenty-nine issues of Austrian concern have been identified. All of them were documented and addressed. The expert mission under the Melk Protocol regarded nine issues as closed, meeting the purpose of the Melk process. Due to the nature of the respective topics, the expert mission found another ten issues suitable to be followed-up in the framework of the pertinent Czech-Austrian Bilateral Agreement. Finally, the Melk process helped to narrow gaps in the understanding of remaining ten issues.

Even if it was not possible to reach an agreement on all the technical issues at stake, all participants agreed that the aim foreseen in Melk, namely to facilitate the dialogue between the Czech and Austrian governments, has been achieved.

In order to enable an effective use of the Melk process achievements in the area of nuclear safety, the Annex I to this Protocol contains details on:

- Process and documentation of the “trialogue”
- Specific actions to be taken as a follow-up to the „trialogue“ in the framework of pertinent Czech-Austrian Bilateral Agreement.

The signatories are fully aware of the AQQ/WPNS Report on Nuclear Safety in the Context of Enlargement, in particular the recommendations pertaining to the NPP Temelín contained therein. The signatories agree that the peer review procedure foreseen by the EU to monitor the implementation of the recommendations should serve as another important tool to handle remaining nuclear safety issues.

Furthermore, the Czech Republic and Austria agree to intensify bilateral co-operation on emergency preparedness.

Chapter V - Environmental Impact Assessment

With the ‘Melk Protocol’ the signatories agreed on a comprehensive and full-scope environmental impact assessment of the Temelín NPP guided by the Council Directive on the assessment of the effects of certain public and private projects on the environment (Council Directive 85/337/EEC as amended by Council Directive 97/11/EC), in particular with regard to the participation of neighbouring countries.

To this end, a four-member Commission on the Assessment of Environmental Impact of the Temelín NPP was set up on the basis of a resolution of the Government of the Czech Republic.

The Commission on the Assessment of Environmental Impact of the Temelín NPP presented a report and recommended in its Position the implementation of twenty-one concrete measures (Annex II).

The signatories agree that the implementation of the said measures will be regularly monitored jointly by Czech and Austrian experts within the bilateral Agreement on the Exchange of Information.

Furthermore, the Czech Republic and Austria agree to intensify bilateral co-operation on emergency preparedness.

Chapter VI - Commercial Operation

Unit 1 and 2 of the Temelín NPP will only be put into commercial operation following the successful termination of commissioning and trial run. During these stages all tests prescribed by the programmes approved by the State Office for Nuclear Safety and required by the Czech legislation have to be performed and all relevant criteria corresponding to the state-of-the-art safety criteria prevailing in the Member States of the European Union have to be fulfilled, including this Protocol. In any case the implementation of those safety measures enumerated in Annex I, which are conditional for the safe operation of the NPP Temelín in line with Czech legislation, is a prerequisite of commercial operation.

Chapter VII - Free Movement of Goods and Publicity in the Media

The signatories positively assess the efforts to maintain and respect free movement of goods and persons. The signatories agree also in this respect to continue to honour their pertinent commitment of the “Melk Protocol”.

Chapter VIII – Enlargement

Based on the understanding that the Czech Republic will inform the Accession Conference comprehensively of the technical and procedural substance as well as of the binding character of this document and based on the understanding that the common position of the EU on the Energy Chapter will adequately reflect the information to the Accession Conference mentioned above, the Republic of Austria will agree to contribute constructively to start the next steps for the Energy Chapter as foreseen in the “road map” of Nice in order to start the implementation of the Protocol.

Closing provisions

The signatories shall – irrespective of the ownership of the NPP Temelín – guarantee the implementation of the conclusions of this Protocol in accordance with domestic legal regulations of the Czech Republic and international agreements.

The signatories state that the implementation of specific steps of this "Conclusions of the Melk Process and follow-up" will be monitored by the Deputy Prime Minister and Minister of Foreign Affairs of the Czech Republic and the Minister of Agriculture and Forestry, Environment and Water Management of the Republic of Austria.

A "road map" regarding the monitoring on technical level in the framework of the pertinent Czech-Austrian Bilateral Agreement as foreseen in this Protocol will be elaborated and agreed by the Deputy Prime Minister and Minister of Foreign Affairs of the Czech Republic and the Minister of Agriculture and Forestry, Environment and Water Management of the Republic of Austria by 10 December 2001 at the latest.

In accordance with the importance attached by the EU to nuclear safety, as underlined by the European Council in Cologne and Helsinki, both sides will actively support and promote a high level of nuclear safety in the enlarged EU.

Austria and the Czech Republic agree on the common objective to include the bilateral obligations contained in these "Conclusions" in a Protocol to the Accession Act.

Brussels, 29 November 2001

Annex I

According to the Chapter IV of the Protocol, the parties established „an expert mission with trilateral participation“ which was dispatched first to Vienna, on 2 February 2001, to identify the Austrian main issues of concern. During a subsequent mission to Prague and the Temelin NPP, on 15 and 16 March 2001, the same expert mission heard the explanations given by representatives of the Czech Republic on these issues of concern. Five issues of major concern to Austria were selected and discussed in depth. Two additional workshops were organised by the Czech side in February and in April to accommodate specific technical issues. An IAEA Operational Safety Review Team mission lasting for three weeks in February 2001 reviewed the operational safety of the plant. The conclusions were presented to the trilateral expert mission. A final joint meeting took place in Brussels, on 14 and 15 May 2001, in order to find solutions to the identified problems, on the basis of the state-of-the-art relevant in the Member States of the European Union. A final discussion between heads of delegation took place in Brussels on 30 May 2001, at the request of the Austrian side.

This process is documented in a Working Paper Summarising the outcome of the Expert Mission with Trilateral Participation Established Under the Melk Protocol (July 2001). It has been drafted under the sole responsibility of European Commission experts involved in the process. It summarises the work of the tripartite mission. For each of the twenty-nine issues of concerns identified, this paper provides a summary of the discussions that have taken place. To limit the size of this paper recording the positions of the parties, these have been summarised. The summaries therefore do not always present the full scope of the concerns expressed or the details of the information provided.

To enable an effective „trialogue“ follow-up in the framework of pertinent Czech-Austrian Bilateral Agreement, a seven-item structure given below will be adopted. Individual items are linked to:

- Specific objectives set in licensing case for NPP Temelin units;
- Description of present status and future actions foreseen by the licensee and SUJB respectively.

Each item under discussion will be followed according to the work plan agreed at the Annual Meeting organised under the Czech-Austrian Bilateral Agreement.

Having in mind the peer review procedure foreseen by the EU to monitor the implementation of the recommendations of the AQG/WPNS Report on Nuclear Safety in the Context of Enlargement the Czech and Austrian side understand that the first two items below in particular would be subject to this peer review procedure.

Item No.1 High Energy Pipe Lines at the 28.8 m Level (AQG/WPNS country specific recommendation)

Objective:

Ensure that the safety case demonstrating appropriate protection against high energy pipe breaks and consequential failures of the steam and feed water lines, complies with requirements and practices widely applied within the EU and that an appropriate combination of measures are in place.

Present Status and Specific Actions Planned:

The issue of protection against high energy pipe breaks and consequential failures of the steam and feed water lines is included in the existing licensing case of Temelin unit No.1. To solve the difference in opinions of experts with regard to this issue, the Regulatory Authority initiated revisit of the safety case documentation in order to re-evaluate its compliance with requirements and practices widely applied in the EU. Alternative methods of assessment are being applied for this purpose as well as data collected during unit No. 1 commissioning tests. The result of these efforts will be made available to the Regulatory Authority till the end of September 2002 for final decision. Depending on the result, schedule for implementation of additional safety measures may be included into the above – mentioned regulatory submittal¹. The signatories understand that additional safety measures for both units will be considered by the Regulatory Authority and if needed included into the above mentioned regulatory decision in order to meet the objective of this item.

Item No.2 Qualification of Valves
(AOG/WPNS country specific recommendation)

Objective:

Demonstration of reliable function of key steam safety and relief valves under dynamic load with mixed steam-water flow.

Present Status and Specific Actions Planned:

Demonstration of reliable function of key steam safety and relief valves is included in original licensing case of Temelin unit No. 1. To solve the difference in opinions of experts with regard to this issue, the Regulatory Authority initiated revisit of the qualification documentation in order to re-evaluate validity of Temelin key steam safety valves qualification. The result of these efforts will be made available to the Regulatory Authority till the June 2002 for final decision. Depending on the result, schedule for implementation of additional safety measures may be included into the above-mentioned regulatory submittal¹. The signatories understand that additional safety measures for both units will be considered by Regulatory Authority and if needed included into the above - mentioned regulatory decision in order to meet the objective of this item.

Item No.3 Reactor Pressure Vessel Integrity and Pressurised Thermal Shock

Objective:

The reactor pressure vessel (RPV) integrity under pressurised thermal shock (PTS) conditions shall be maintained with a sufficient safety margin against brittle fracture throughout the NPPs service life.

¹ For details see Sixth Additional Information to the Position Paper on Chapter 14 „Energy“ submitted to the EC in September 2001

Present Status and Specific Actions Planned:

The NPP Temelin is commissioned and operated respecting pressure-thermal (PT) curves calculations developed according to Westinghouse methodology. These calculations will be expanded with set of the further PTS analysis for both units using a step by step approach with full respect of the IAEA Guidelines for the PTS analysis. The PTS analysis will be finished in accordance with approved project work plan for this item.

Item No. 4 Integrity of Primary Loop Components – Non Destructive Testing (NDT)

Objective:

Selected safety classified primary circuit components shall be inspected using certified NDT methods to maintain their safety function.

Present Status and Specific Actions Planned:

The NDT qualification programme is being applied in accordance with the European Network for Inspection Qualification (ENIQ), recommendations from the European regulators (document EUR 16802) and IAEA principles. The qualification of inspection procedures using test blocs will be conducted not later than its first application within the in-service inspection programme.

Item No. 5 Qualification of Safety Classified Components

Objective:

All safety systems shall be qualified for their dedicated safety function.

Present Status and Specific Actions Planned:

The seismic qualification is completed. The EMC (Electro Magnetic Compatibility) qualification is completed. Respective documentation is completed and filed. In the case of environmental qualification, all processes (tests and/or analyses) required by licensing procedure have been performed. Qualification of I&C and electrical supplies, which represent the majority of the equipment relevant for qualification, is documented and filed in a standard format. In a limited number of the cases (where the equipment was procured in the beginning of the nineties), regulatory authority requested a transfer of qualification documentation to standard format till the end of 2001. This submittal will be a subject to regulatory review and approval taking into account requirements for accessibility of documentation according to state-of-the-art standards.

Item No. 6 Site Seismicity

Objective:

Siting of the installation shall take into account seismic as one of the possible external hazards.

Present Status and Specific Actions Planned:

The NPP Temelin underwent a thorough siting procedure in relation to possible seismic hazards. The Czech standard for this procedure is based on IAEA recommendations. A set of written documentation was released prior and in course of the “trialogue” giving evidence of

this process. Due to the complexity of this issue and in order to foster mutual understanding, a topical workshop will be organised in the frame of the bilateral co-operation.

Item No. 7 Severe Accidents Related Issues

Objective:

Effective prevention and mitigation of consequences of beyond design basis accidents (severe accidents).

Present Status and specific Actions Planned:

A set of preventive and mitigative measures is, at present, applied in NPP Temelin with respect to beyond design basis accidents. These include software and hardware measures, among others, e.g. Symptom Based Emergency Operating Procedures, Technical Support Centre, Post Accident Monitoring System, Emergency Preparedness.

For the purpose of emergency preparedness, the PSA was employed with the aim to identify and group events with different initiating occurrences, but with similar end-effects. On the basis of this assessment the relative risk was estimated for specific events in order to select those which will serve for the determination of emergency response activities (pre-planned, reactive).

Severe Accidents Management Guidelines (SAMG) as a state-of-the-art tool will complete the whole system of mitigation measures with respect to the beyond design basis accident management. The project for SAMG development is scheduled to be finished by end 2002 to be followed by validation.

To foster mutual understanding two lines of activities will be followed within the framework of the bilateral agreement:

- a) A Working Group on comparison of calculations regarding the radiological consequences of BDBA with a view to harmonise the basis for emergency preparedness will be established.
- b) The exchange of information related to SAMG will include discussion on the analytical basis as well as on corresponding software and hardware measures.

Annex II

With the target to minimise stress feelings mainly of the Austrian public, the Commission recommends (besides standard monitoring of the Temelín NPP Radiation Inspection Laboratory, standard monitoring within the national grid of the Czech Hydrometeorological Institute, respectively others) to ensure independent super-standard monitoring of the nuclear power plant operation wastes.

The optimal solution for super-standard measures is implementation of research task financed from the funds for science and research within the framework of the Czech Republic Governmental Council.

1. To establish a system for continuous informing of wide public both on current values of the factors affecting the environment as a consequence of the Temelín NPP operation (on-line outlets) and on development of time sequence of selected parameters of the environmental impacts monitoring (continuously updated diagrams, photos of the Earth remote examination, bio-monitoring results, and so on) as well as on other important facts (for instance earthquake in Alps indicated on seismological stations in South Bohemia, ...). All of these data would be shown on the Internet pages of the Temelín NPP, on publicly available monitors in Týn nad Vltavou and in Ěeské Bud jovice, and in the Temelín NPP information centre.
2. To ensure continuous measurement of gaseous radioactive outlets within the framework of the operating network of the investor of the Temelín NPP.
3. To continuously improve and modernise the existing radiation monitoring network operated by the state authorities of the Czech Republic.
4. To regularly inform the public in the Czech Republic, Austria and the Federative Republic of Germany on all measurements.
5. To permanently monitor the impacts of the Temelín NPP cooling towers on climate even in wider region (through the existing meteorological stations network of the Czech Hydrometeorological Institute).
6. To ensure independent and continuous monitoring of the Temelín NPP operation impacts in the following fields:
 - Assurance of supply and quality of drinking water from the point of view of the nuclear power plant as well as nuclear power plant impacts on the water resources in the Temelín NPP surroundings;
 - Assurance of supply and quality of technological water from the point of view of the nuclear power plant;
 - Impacts of emissions on water system and risk of radioactive pollution of the recipient as a consequence of tritium water and other water effluents, including assessment of temperature impacts, accumulation and synergic impacts of harmful substances (including eutrofisation) in Orlik water reservoir;
 - Impacts of emissions on atmosphere, verification of thermal pollution and evaporation of water on cooling towers;
 - Impacts on agricultural activities and forest economy.

7. To order elaboration of soil map of the nuclear power plant surroundings in a digital form for surface generalisation of the impacts on pedosphere (soil sphere) from the point of view of further dynamic development.
8. To ensure conditions for seismic monitoring (including establishment of the monitoring centre located within the Temelín NPP area, eventually in the Information Centre). The basic objective of this centre will be to inform the public, state organisational units and local municipal governments on earthquake impacts on the locality and on the surroundings of the Temelín NPP.
9. To guarantee continuous maintenance and restoration of all technical equipment and devices of the nuclear power plant in such a way to correspond with the up-to-date status of the technique development as well as with the knowledge in the field of seismic engineering.
10. To ensure determination of radioactive substances in surface water, underground water and drinking water resources as well as in the food basket elements within the programme of the Radiation Monitoring Network of the Czech Republic.
11. To create conditions for implementation of the health condition monitoring study of about 30,000 of inhabitants in the surroundings of the Temelín NPP by means of epidemiological and radiobiological methods (for instance using chromosome analysis).
12. To establish a concept of continuous sociological examination of the population within wider surroundings of the Temelín NPP, to create conditions for implementation of the proposed programmes and related measures in the field of informatics and cultural - educational activities.
13. To discuss revitalisation of the area around the Temelín NPP as a compensation for impacts on the Temelín NPP area surroundings during its construction, to discuss reverse revitalisation in damaged sectors of river basin including initiation of discussion on revitalisation system in the effected area of Stropnice river basin.
14. To ensure maintenance (mitigation of undesirable succession) on sub-xerophyte locations of the former military area of Litoradlice and on areas of valuable marshes around new retention reservoir in Strouha river basin.
15. To ensure monitoring of radionuclide accumulation in biological materials - bryophyte, forest soil and pine bark and to maintain monitoring of radionuclides in fish.
16. To monitor impacts of waste and rain waters by means of separate chemical and biological monitoring
 - In Býšov in Strouha river basin;
 - Monitoring of oxygen and temperature of selected sectors of Vltava;
 - Season occurrence of plankton in Hnívkovice, Koøensko and Orlík reservoirs, and in selected model pond reservoirs in the surroundings of the Temelin NPP, while maintaining, eventually extending monitoring of changes in chlorophyll concentration in Orlík water reservoir with emphasise on plankton share assessment with one sampling point under Koøensko;
 - To extend monitoring of changes in water ecosystems by monitoring of changes in zooplankton composition because of its sensitiveness on changes in water temperature and subsequent changes in water ecosystem trophic structure.

17. To establish long-term monitoring (even retrospective) of changes in landscape character by means of multispectral satellite data analysis, especially suitable for monitoring of humidity and temperature changes of landscape related to changes in vegetation structure and functions. We recommend annual assessment of satellite data and related creation of ground key for satellite data including definition of key biotopes comprising forests on satellite photos and to ensure regular generalisation in this context in five-year intervals. With respect to the range of individual photos it is possible to ensure objective assessment of changes, which could exceed the borders with Austria and the Federative Republic of Germany.
18. To create conditions for financial security of care for residuals of preserved intangible cultural values in the surroundings of the Temelín NPP (including prospects for about 65 cultural monuments) from the side of the Temelín NPP operator as a compensation for affection of the landscape historical structure during construction.
19. To decide on further use of spent fuel or to ensure definite storage in permanent underground storage within 65 years in accordance with the concept on spent fuel disposal approved by the Czech Republic Government.
20. To eliminate high conservativeness of design accident calculations and to transfer to assessment of best estimate type; to compare inland calculation diagrams with the foreign ones.
21. To improve eventual accident occurrence indication system including its assessment; to train emergency preparedness for this purpose and eventually to update emergency plans (conditions for fast information, ability to perform actions and coordination of emergency measures).

ANNEX B

LIST OF AUSTRIAN PROJECTS

Austrian Projects Identification

PN 1	Severe Accidents Related Issues	[Item No. 7a]*
PN 2	High Energy Pipe Lines at the 28,8 m Level (AQG/WPNS country specific recommendation)	[Item No. 1]*
PN 3	Qualification of Valves (AQG/WPNS country specific recommendation)	[Item No. 2]*
PN 4	Qualification of Safety Classified Components	[Item No. 5] *
PN 5	Chapter V – Environmental Impact Assessment	
PN 6	Site Seismicity	[Item No. 6]*
PN 7	Severe Accidents Related Issues	[Item No. 7b]*
PN 8	Seismic Design	
PN 9	Reactor Pressure Vessel Integrity and Pressurised Thermal Shock	[Item No. 3]*
PN 10	Integrity of Primary Loop Components – Non Destructive Testing (NDT)	[Item No. 4]*

* The Items are related to ANNEX I of the “Conclusions of the Melk Process and Follow-up”

ANNEX C

OVERVIEW ON IMPLEMENTATION OF 21 MEASURES

According to web-page of the EIA-Commission

http://kostelec.czu.cz/temelin/op04/op_2004.html

Souhrn plnění závazku vyplývajících ze „Záveru melkského procesu a následných opatření“ v roce 2004 dle přílohy II (21 opatření)

Stanovisko Komise	Organizace	Stav řešení
1. Založit systém průběžného informování široké veřejnosti jednak o aktuálních hodnotách faktoru ovlivňujících životní prostředí provozem Jaderné elektrárny Temelín („výpuste on-line“), jednak o vývoji časových rad vybraných parametru monitoringu vlivu na prostředí (průběžně aktualizované grafy, snímky dálkového průzkumu Zeme, výsledky biomonitoringu apod.) i o dalších významných skutečnostech (zcela příkladem: napr. odraz zemetresení v Alpách na seismologických stanicích v jižních Čechách ...), a to na www Jaderné elektrárny Temelín, na veřejně přístupných monitorech v Týně nad Vltavou a v Českých Budejovicích a v informačním středisku Jaderné elektrárny Temelín v Temelíně.	CEZ JETE Komise	Opatření je průběžně naplnováno. Kromě informačních zdrojů uvedených přímo v opatření c. 1 jsou založeny a postupně aktualizovány internetové stránky Komise, které si kladou za cíl informovat zájemce zejména o činnosti Komise, dostupných informačních zdrojích o výsledcích monitoringu vlivu JETE na životní prostředí a systémem odkazu propojit jednotlivé online informační zdroje. Sekretariát Komise je zarazen do adresáře JETE pro zasílání informací o mimořádných událostech. Stav plnění opatření (podrobnosti)
2. Dále zajišťovat kontinuální měření plyných radioaktivních výpustí ve stávající Radiacní monitorovací síti České republiky a provozovatele	CEZ	Provozovatel pokračuje v kontinuálním monitorování radiacní situace. Řešení je bez podstatných problémů. Dle dosavadních výsledků průběžného monitoringu je patrné, že vypouštění radionuklidů do ovzduší je nižší nežli úroveň efektivní dávky (40 uSv za rok). Opatření se průběžně plní. Stav plnění opatření (podrobnosti)
3. Průběžně zdokonalovat a modernizovat stávající radiacní monitorovací síť provozovanou státními orgány České republiky.	SÚJB	Stav plnění opatření (podrobnosti)
4. Pravidelně informovat o všech měřeních veřejnost v České republice, v Rakousku a Spolkové republice Německo.	SÚJB	Stav plnění opatření (podrobnosti)
5. Trvale monitorovat vlivy provozu chladících věží Jaderné elektrárny Temelín na klima i v širším regionu (prostřednictvím stávající sítě meteorologických stanic Českého hydrometeorologického ústavu).	CHMÚ	Plnění úkolu probíhá průběžně v souladu s měřicím programem stanic uvedených v předložené studii. Jedná se především o činnost meteorologické observatoře CHMÚ v Temelíně, která kromě klasických synoptických a klimatologických pozorování provádí speciální měření pro účely zajištění provozu JE v normálních i havarijních podmínkách. Dále jsou to klimatologické stanice CHMÚ v okolí JE Temelín do vzdálenosti cca 60 km a profesionální MS stanice Kocelovice. Tato část opatření je hrazena prostřednictvím VaV MŽP. Stav plnění opatření (podrobnosti)

Stanovisko Komise	Organizace	Stav řešení
<p>6. Zajistit v následujících okruzích nezávislou a průběžnou kontrolu dopadu provozu elektrárny Temelín: zabezpečení dodávky a kvality pitné vody z hlediska elektrárny a vliv elektrárny na vodní zdroje v okolí elektrárny Temelín; zabezpečení dodávky a kvality technologické vody z hlediska elektrárny; dopady emisí na vodní prostředí a riziko radioaktivního znečištění recipientu v důsledku vypouštění tritiových a dalších vod, včetně hodnocení teplotních vlivů, akumulace a synergického působení škodlivých látek (včetně eutrofizace) ve vodní nádrži Orlik; dopady emisí na ovzduší, verifikace tepelného znečištění a odparu vody na chladících věžích; dopady na zemědělskou činnost a lesní hospodářství.</p>	<p>VÚV TGM PrahaJCUCIŽP</p>	<p>Sledování a hodnocení výpusti radioaktivních a neradioaktivních látek s odpadními vodami JETE ve Vltavě probíhá dle schváleného programu. Tepelné znečištění, resp. zvýšení teploty vody ve Vltavě pod zaústěním odpadních vod z JETE bylo velmi malé a vyhovovalo Smernici Rady o kvalitě sladkých povrchových vod vyžadujících ochranu nebo zlepšení za účelem podpory života ryb. Plnění opatření je zajišťováno prostřednictvím VaV MŽP. Součástí opatření c.6 je sledování vlivu na zemědělskou činnost a lesní hospodářství. Sledování je zajištěno do roku 2005 smlouvou mezi JE a JcU České Budějovice a nejsou známy žádné skutečnosti, které by ukázaly na kvantifikovatelné vlivy JE Temelín na sledované ekosystémy.</p> <p>Stav plnění opatření (podrobnosti)</p>
<p>7. Zadat vypracování podnětné mapy okolí elektrárny v digitální formě pro plošnou generalizaci dopadu na pedosféru z hlediska dalšího dynamického vývoje.</p>	<p>CZU v Praze</p>	<p>Úkol spocívající ve zpracování digitální podnětné mapy v okolí JETE se průběžně plní. Etapa prací pro rok 2004 je splněna. Nadále jsou upřesňovány vybrané mapovací jednotky terénním průzkumem. Dále byly odebrány podnětné vzorky pro provedení adsorpčních experimentů s prvky K (draslík) a Cs (cesium) a kalibraci adsorpčních křivek. Finanční prostředky pro zajištění úkolu jsou poskytovány prostřednictvím VaV MŽP. Nejsou známy žádné skutečnosti, které by ohrožovaly závěrečné provedení úkolu v roce 2005.</p> <p>Stav plnění opatření (podrobnosti)</p> <p>Stav plnění opatření (podrobnosti)</p>
<p>8. Zajistit podmínky pro seismický monitoring (včetně vytvoření centra monitoringu, umístěného v areálu Jaderné elektrárny Temelín, případně v jeho Informačním středisku). Základním posláním tohoto centra bude informování veřejnosti, organizačních jednotek státu a místních samospráv o dopadech zemetřesení na lokalitu a okolí Jaderné elektrárny Temelín.</p>	<p>SÚJB</p>	<p>Stav plnění opatření (podrobnosti)</p>
<p>9. Garantovat průběžnou údržbu a obnovu veškerého technického vybavení jaderné elektrárny tak, aby odpovídala aktuálnímu stavu vývoje techniky a poznatků z oblasti seismického inženýrství.</p>	<p>SÚJB</p>	<p>Stav plnění opatření (podrobnosti)</p>

Stanovisko Komise	Organizace	Stav řešení
<p>10. Zajistit v rámci programu Radiacní monitorovací sítě CR stanovení radioaktivních látek v povrchových vodách, podzemních vodách a zdrojích pitné vody a ve složkách potravinového koše.</p>	SÚJB	<p>Stav plnění opatření (podrobnosti)</p>
<p>11. Vytvorit podmínky pro realizaci studie sledování zdravotního stavu cca 30000 obyvatel v okolí Jaderné elektrárny Temelín epidemiologickými i radiobiologickými metodami (např. s použitím chromosomové analýzy).</p>	<p>SZÚ Praha, Laborator genetické ekotoxikologie</p> <p>Zdravotní ústav se sídlem v Kolíne, pobočka Praha & Ústav experimentální medicíny AV CR</p> <p>Výzkumný ústav veterinárního lékarství, Brno</p> <p>Ústav preventivního lékarství LF MU</p>	<p>Dosažené výsledky cytogenetické analýzy u zaměstnancu JETE a JEDU neprokazují profesionální klastogenní zátěž. Frekvence chromozómových aberací nalezená u potenciálně exponovaných osob je srovnatelná s hodnotami spontánní úrovně v české dospělé populaci.</p> <p>Lze se domnívat, že nejsou-li zjišťována poškození genetického materiálu u pracovníku profesionálně exponovaných nízkým dávkám ionizujícího záření v jaderných elektrárnách, nebudou jaderné elektrárny představovat riziko ani pro populaci, která žije v jejich okolí.</p> <p>V této etape bylo provedeno zhodnocení dat, získaných šetřením u reprezentativního vzorku dospělé populace v užším a širším okolí Temelína a v srovnávacích oblastech. Šetření bylo zaměřeno na zjištění výskytu hlavních determinant zdravotního stavu. Ve většině posuzovaných kategorií zdravotního stavu (subjektivní hodnocení vlastního zdraví; prevalence vybraných onemocnění, včetně nádorových) a životního stylu (BMI, kouření, fyzická aktivita) se sledované lokality statisticky významně nelišily. Žádná ze sledovaných lokalit se v hodnocených ukazatelích zdravotního stavu neprofilovala jako významně horší, nebo významně lepší než ostatní.</p> <p>Stav plnění opatření (podrobnosti)</p>
<p>12. Založit koncepci soustavného sociologického šetření populace v širším okolí Jaderné elektrárny Temelín, vytvořit podmínky pro realizaci navržených programu a na ne navazujících opatření v oblasti informatiky a kulturně-vzdělávacích akcí.</p>	FSV UK	<p>V roce 2004 pokračovaly výzkumné práce podle harmonogramu kvantitativním výzkumem. Na základě schválené metodiky standardizované Centrem pro podporu zdraví (Centre for Health Promotion – CHP) při kanadské University of Toronto byl připraven strukturovaný dotazník Quality of Life Profile (Adult Version), který lze uplatnit na specifický i obecný vzorek populace. Dotazník byl doplněn a zpřesněn podle biografických a polostandardizovaných rozhovorů a odladen v pilotním výzkumu na vzorku 100 respondentů. Po tomto zpřesnění bylo provedeno šetření v terénu na dospělé populaci jižních Čech, tj. obyvatelích starších patnácti let majících zde své trvalé bydliště. Po deseti letech vykazuje sociální systém jistou míru adaptace na danou situaci. Obyvatelé jižních Čech se smířili s existencí jaderné elektrárny Temelín. Pocit ohrožení transformovali do pocitu neklidu.</p> <p>Stav plnění opatření (podrobnosti)</p>

Stanovisko Komise	Organizace	Stav řešení
<p>13. Projednat revitalizaci území v nejbližším okolí Jaderné elektrárny Temelín jako kompenzaci za vlivy na okolí areálu Jaderné elektrárny Temelín během výstavby, projednat zpetnou revitalizaci v poškozených úsecích povodí, včetně iniciace projednání systému revitalizace v dotčené části povodí Stropnice.</p>	<p>JCU České Budejovice</p>	<p>Revitalizace horních úseku toku, postižených technickým i úpravami během výstavby JETE, je prováděna v rámci postupné likvidace zařízení staveniště JETE. Vecná stránka pro řešení revitalizace Stropnice je prakticky připravena (odvodněna). Zatím však nejsou dorešeny právní aspekty okolnosti, že zásah do toku Stropnice byl uplatněn v rámci tzv. náhradních rekultivací za zábor ZPF při výstavbě JETE podle aktuálně platné legislativy (uloženo státním orgánem dle zák.c. 124/1976 Sb.). Současný provozovatel se tímto postupem státních orgánů dnes necítí vázán s ohledem na následné postupy při vlastní realizaci opatření dle příslušných rozhodnutí (provádecí subjekty, rozsah, účel). Stav plnění opatření (podrobnosti)</p> <p>Stav plnění opatření (podrobnosti)</p>
<p>14. Zajistit údržbu (tlumení nežádoucí sukcese) na subxerofytních stanovištích bývalého vojenského prostoru Litoradlice a na plochách hodnotnějších mokradu v okolí nové retenční nádrže v povodí Strouhy.</p>	<p>JCU České Budejovice</p>	<p>Proveden opakovaný přírodovedný průzkum, v současné době není třeba provádět zásahy určené k tlumení nežádoucí sukcese, poněvadž nebyly indikovány jevy tohoto typu, které by mohly souviset s provozem JETE. Je prováděno pravidelné snímkování – (jde o návaznost na opatření c. 17), z důvodu sledování sukcesních změn (Litoradlice) či vývoje při případné zvýšené eutrofizaci (Strouha).</p> <p>Případná potřeba údržby sledovaných ploch bude proto i nadále vyhodnocována v souvislosti s výsledky plnění opatření c. 17. Lze doporučit, aby toto opatření bylo včleneno do opatření c. 17.</p> <p>Stav plnění opatření (podrobnosti)</p>
<p>15. Nadále zajišťovat sledování kumulace radionuklidu v biologickém materiálu – mechorosty, lesní hrabanka a borová kura a zachovat monitoring radionuklidu v rybách.</p>	<p>SÚJB</p>	<p>Stav plnění opatření (podrobnosti)</p>
<p>16. Vliv odpadních a dešťových vod nadále sledovat samostatným chemickým i biologickým monitoringem na soustavě Býšov v povodí Strouhy, sledování zonace kyslíku a teploty na vybraných profilech Vltavy na nádržích Hnevkovice, Korensko, Orlík a vybraných modelových rybníčních nádržích v blízkosti Jaderné elektrárny Temelín sezónní výskyt planktonních sinic, přitom zachovat, eventuelně rozšířit monitoring změn koncentrace chlorofylu ve vodní nádrži Orlík s důrazem na hodnocení podílu sinic, s jedním odběrným místem pod profilem Korensko rozšířit monitoring změn ve vodních ekosystémech o sledování změn ve složení zooplanktonu z důvodu jeho citlivosti na změny v teplotě vody a následné změny v trofické struktuře vodního ekosystému</p>	<p>VÚV TGM Brno</p>	<p>Úkol byl pro rok 2004 personálně i organizačně zajištěn. Finančně byl úkol zabezpečen zcela prostřednictvím VaV MŽP ČR. V souladu s programovaným rozsahem šetření pro rok 2004, byly uskutečněny odběry vzorku, cílené na chemické, rozsáhlé komplexní biologické a mikrobiologické analýzy v souladu s programem:</p> <ol style="list-style-type: none"> 1. Soustava Býšov v povodí Strouhy. 2. Zonace teploty vody a rozpuštěného kyslíku na vybraných profilech Vltavy. 3. Současně byly provedeny chemické, biologické a mikrobiologické analýzy ve vybraných horizontech, sledování výskytu fytoplanktonu se zvláštním zretelem na zastoupení sinic na nádržích Hnevkovice, Korensko, Orlík a vybraných modelových rybníčních nádržích v blízkosti JETE. 4. Dále probíhá sledování změn ve vodních ekosystémech a ve složení zooplanktonu z důvodu jeho citlivosti na změny teploty vody. Sledování probíhá současně při měření teplotních a kyslíkových poměrů. <p>Stav plnění opatření (podrobnosti)</p>

Stanovisko Komise	Organizace	Stav řešení
<p>17. Založit dlouhodobé sledování (i retrospektivní) zmen krajinného prostředí prostřednictvím analýzy multi-spektrálních satelitních dat, zejména vhodné pro sledování vlhkostních a teplotních zmen krajiny vztažených na změnu struktury a funkce vegetace. Doporučuje se roční vyhodnocování družicových dat a návazné vytvoření pozemního klíče pro družicová data, včetně definování klíčových biotopu včetně lesních porostů na družicovém snímku. V tomto kontextu zajišťovat pravidelné zobecnění v petiletých intervalech. S ohledem na rozsah jednotlivých snímků lze zajistit objektivní vyhodnocení zmen, které by mohly překračovat hranice Rakouska a Spolkové republiky Německo.</p>	JCU České Budejovice	<p>Plnění úkolu proběhlo v souladu s programovaným rozsahem šetření pro rok 2004 na Aplikacní pracoviště DPZ v rámci Laboratoru aplikované ekologie ZF JCU. Výzkum byl proveden na všech referenčních plochách (celkem patnáct lokalit) jako měřicích stanovišť pro podpurná měření (včetně obou ploch z opatření c. 14). Pro podpurná měření DPZ jsou osazena všechna stanoviště automatickými záznamníky dat pro měření vlhkosti a teploty, se zretelem k referenčním plochám. Byla provedena aktualizace pozemního klíče na základe další etapy hodnocení stavu bioty na všech stanovených referenčních plochách</p> <p>Stav plnění opatření (podrobnosti)</p>
<p>18. Vytvořit podmínky pro finanční zajištění péče o zbytkově zachovalé nemovité kulturní hodnoty v území kolem Jaderné elektrárny Temelín (včetně výhledu cca 65 dalších kulturních památek) provozovatelem Jaderné elektrárny Temelín jako kompenzaci za ovlivnění historické struktury krajiny výstavbou.</p>	JcÚSPÚ České Budejovice	<p>Zpracování úkolu bylo úspěšně završeno k 31. 12. 2003.</p> <p>Stav plnění opatření (podrobnosti)</p>
<p>19. V souladu s vládou České republiky přijatou koncepcí o nakládání s vyhořelým palivem rozhodnout o jeho dalším využitím nebo v horizontu 65 let zajistit definitivní uložení v hlubinném úložišti.</p>	MPO	<p>Příprava hlubinného úložiště (HÚ) je prováděna v souladu s Koncepcí nakládání s radioaktivními odpady (RAO) a vyhořelými jadernými palivy (VJP) v ČR, schválenou usnesením vlády c. 487 dne 15. 5. 2002 a v souladu s tříletým a dlouhodobým plánem SÚRAO.</p> <p>Vzhledem k tomu, že se většina obcí vyjádřila odmítavě k perspektive budování hlubinného úložiště na jejich katastrálním území, bylo navrženo pozastavit geologické práce v lokalitách o pet let, tj. do roku 2009. Toto období by mělo poskytnout jak pro stát tak i pro obce dostatek prostoru pro hledání oboustranně přijatelných podmínek umožňujících další postup prací v lokalitách, respektive jejich zúžených částech. Pozastavení geologických prací ve zkoumaných lokalitách bylo vzato vládou na vědomí usnesením vlády c. 550 ze dne 2. června 2004.</p> <p>Stav plnění opatření (podrobnosti)</p>
<p>20. Odstranit vysokou konzervativnost výpočtu projektových havárií a přejít na hodnocení typu best-estimate; srovnat tuzemské výpočtové programy se zahraničními.</p>	SÚJB	<p>Stav plnění opatření (podrobnosti)</p>

Stanovisko Komise	Organizace	Stav řešení
21. Zdokonalovat systém indikace vzniku případných havarijních stavů včetně jeho vyhodnocování; za tím účelem procvičovat havarijní připravenost a případně novelizovat havarijní plány (podmínky pro rychlou informovanost, akceschopnost a koordinaci havarijních opatření).	SÚJB	Stav plnění opatření (podrobnosti)