



Deliverable D7

ARGONA
Arenas for Risk Governance
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Focused science shop - Potential environmental impact of radioactive waste disposal in comparison with other hazardous wastes

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CO	Confidential, only for partners of the ARGONA project	

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INTRODUCTION

An important part of the ARGONA project is the testing and application of novel participation and dialogue approaches. The Czech Republic is one of the countries where these approaches will be applied and tested. The ways in this is being done include a series of events involving different stakeholders such as a focused science shop, a consensus panel and an interaction panel.

In the framework of these activities in the Czech Republic the focused science shop was held on March 12, 2008 in the Nuclear Research Institute (NRI) in Rez, and addressed the theme: “Radioactive waste management and radiation risk in comparison with other hazardous waste and risks”.

The main goal of this focused science shop was to increase awareness amongst the public of actual and potential effects of radioactive and toxic wastes and to prioritise questions/uncertainties that people might have in this field. The following topics were discussed:

- Differences in the general perception of nuclear waste in comparison with other toxic wastes;
- General public awareness of the issue of nuclear waste management and other toxic wastes management;
- Management and ultimate disposal of radioactive waste and other toxic waste in terms of the technology employed;
- NIMBY effect.

A broader audience was selected with a suitable mixture of specialists and interested technical and non-technical peers including representatives from NRI, universities, Ministry of Industry and Trade, Ministry of the Environment, State Office for Nuclear Safety and Radioactive Waste Repository Authority, representatives of municipalities and NGOs, and waste producers such as CEZ plc etc.

In the Czech Republic there is a general unwillingness by the public to actively participate in the NWM decision-making process. Therefore, despite all the efforts made by the project team, not all invited stakeholders attended the meeting.

Despite this, the meeting was very positively received by those who did attend and indicates the beginning of a closer cooperation between all parties concerned. On the basis of the discussion, a significant number of interesting results were obtained.

FOCUSED SCIENCE SHOP MINUTES

Date: 12 March 2008

Venue: Nuclear Research Institute, Rez plc

Theme: „ Potential environmental impact of radioactive waste disposal in comparison with other hazardous wastes “

Discussion rules

Hana Vojtechova as representative of NRI welcomed the participants and then invited Mr. Marek Valvoda from the company Comnika Ltd., who acted as mediator of the focused science shop.

Then the mediator presented the basic discussion rules and the main objectives and agenda of the meeting:

- Introduction of the participants – their names, position, their expectations of the science shop, and listing of individual participants' names
- Introduction by the science shop secretary (Hana Vojtechova) – methods for minutes distribution, discussion recording
- Time schedule – meeting time frame
- Proposal of working rules:
 - mobile phones – place in silent mode
 - only one participant can speak at a time
 - time limits for one discussion presentation – about 3 minutes per presentation
 - method for asking to speak – by putting up one's hand, the right to speak is managed by the moderator
- Presentation of the main aims of the meeting:
 - Mutual exchange of opinions and information on radioactive waste (RAW) and other hazardous wastes disposal
 - Identification of those topics where there is a general lack of information
 - Validation of this information exchange method by holding similar science shops in the future and possibly identification of suitable topics for the next meeting
- Proposal of the meeting program – discussion on the program, program approval

Brief introduction to the project ARGONA

Lucie Steinerova (RAWRA) presented brief introduction to the EC project ARGONA:

- The ARGONA project is conducted within the framework of the 6th Euratom program for the Support of Research and Education in the Field of Nuclear Power. The project was started in November 2006 and is scheduled for a period of three years.
- Work in the ARGONA project comprise both the theoretical analysis and practical implementation of various approaches to the involvement of the general public and investigation of better ways of providing information on the hazards with respect to various cultural aspects.

- One of the ARGONA project aims is to map and evaluate the situation concerning the problems of the participation of the general public in the decision-making steps in the field of the radioactive waste and spent nuclear fuel disposal in the Czech Republic.
- The RISCO model, i.e. a theoretical model of the risk communication, is among the approaches to dialogue that should be applied and tested in the Czech Republic within the framework of the ARGONA project.
- The ARGONA project is thus focused on the search for the so-called ‘safe areas’ of an open and transparent communication process for considering the issues of radioactive waste and spent nuclear fuel management. In the Czech Republic it concerns mainly the issues of the geological repository siting.
- Within the framework of these activities several seminars, science shops and discussion forums have been organized dealing with various topics on the relevant issues. These have involved the participation of professionals as well as members of the lay public. This Focused Science Shop, discussing “Radioactive waste versus other toxic wastes” is one of these activities.

Introduction to the discussion

Hana Vojtechova (NRI Rez plc) presented short papers on “Radioactive waste versus other hazardous wastes” as introduction into discussion.

Basic topics of the introductory presentation:

- RAW and hazardous waste definitions
- Production of the radioactive and other hazardous wastes in the Czech Republic
- Basic principles of handling RAW/SNF (spent nuclear fuel) and other dangerous wastes
- The legislative and organizational structure for the management of RAW/SNF and hazardous wastes
- Conditions for the acceptance of RAW/SNF and hazardous waste (HW) for disposal
- Safety approaches in the field of RAW and HW disposal
- Common factors influencing the management of both RAW/SNF and HW – the NIMBY (“Not in my backyard”) phenomenon.

The full text of the presentation is provided in Appendix No. 1.

Facilitated discussion

Discussed topics

1st Topic: Differences in the common understanding of RAW management in comparison with other HW

- **Discussion aim for the topic:**
 - To identify the differences in the perception of RAW and other HW
 - To identify the reasons and origins for the different perceptions
- **Sub-topics:**
 - How does the general public perceive the problems with RAW management in comparison with other HW?
 - Why is it so?

2nd Topic: The knowledge of the general public about the problems associated with the management of RAW and other HW

- **Discussion aims to the topic:**
 - To identify the level and sources of knowledge among the general public s on the modern technology for handling RAW and other HW
- **Sub-topics:**
 - What is your opinion on the level of knowledge among the general public on the problems of the management of RAW and other HW?
 - Why does the general public rarely accept the opinions and conclusions of experts?
 - What could improve the situation?

3rd Topic: Management and final disposal of RAW and other HW from the point of view of technology

- **Discussion aims to the topic:**
 - To identify the main pro and con arguments for the exploitation of nuclear materials as power sources
 - Getting acquainted with current technologies for the solution of final disposal of RAW and other HW
- **Sub-topics**
 - What are the main arguments against nuclear power production?
 - What are the main arguments for nuclear power production?
 - What do you think about the so-called final disposal of RAW and the present level of its technological development?
 - What are the basic criteria for the technical solutions for final disposal of RAW/SNF and HW?
 - What is the difference between a RAW repository and repositories for other HW?
 - What is the current situation as regards final disposal of RAW and why it is always suggested that the roblem is not fully solved?

4th Topic: NIMBY (“Not in my backyard”) phenomenon

- **Discussion aims to the topic:**
 - Understanding the NIMBY phenomenon
 - To identify the possibilities of working within the NIMBY phenomenon
- **Sub-topics:**
 - What would be your first reaction if a repository of HW would be situated close to your home?
 - What would be the consequences and in which life areas of the RAW repository or a repository of other HW for the public in the repository vicinity?
 - Try to distinguish between the objective (rational) and subjective (emotional) consequences?
 - How would it be possible to eliminate these consequences?

Summary and conclusions of the discussion to individual topics

1st topic: Differences in the common understanding of the RAW management in comparison with other HW

Basic reasons for the different perception of RAW management in comparison with other HW that emerged from the discussion are as follows:

- Generally, there is in the Czech society a great phobia with respect to all topics connected with radioactivity, mainly due to the Chernobyl disaster. This is why people perceive the problems with the radioactive waste disposal more sensitively than the problems with other toxic wastes. This is an issue of insufficient knowledgeability. The phobia is enhanced by the pressures of non-governmental ecological organizations that – due to insufficient actual and constructive arguments – take recourse to intimidation using just the example of the Chernobyl disaster.
- Disbelief of the population in the state institutions due to previous blunder in communication – the Chernobyl disaster is an example. People were not given truthful information and were not properly informed on the possible risks connected with this event. The building of the central interim store of the spent nuclear fuel in the NPP Dukovany is another example. It was the news media that informed first about this intention and only afterwards the respective local administrations were officially informed. This mistrust is then reflected in an enhanced sensitivity of population to the issues of the radioactive waste and SNF disposal and in their higher suspiciousness. In a certain degree this mistrust is transferred even to the professional sources and media.
- Incorrect approach of the state institutions – A long-term consistent and coherent political attitude of the Government and political parties in the Government with respect to the nuclear power perspectives in the Czech Republic is completely lacking. Under the present conditions dominating in the Government coalition it is improbable that there will be any change in this respect, i.e., a publication of a clear political decision. Due to the problems of political power everything is negated and postponed. These problems are reflected in the not-too-positive attitude of the general public to these topics and in the ever increasing sense of uncertainty. Moreover, an elaborate state strategy of purveying information in this field does not exist. Prior to launching any campaign it is necessary to have an elaborate strategy of purveying information, of the population education, and of the communication between the stakeholders. In the case of the RAW/SNF disposal in the Czech Republic such integral strategy is lacking, which causes great troubles.
- A trustworthy and fair-minded information source is missing – Media are not objective in their hunt for sensational news. With this aim some media diffuse half-truths and non-objective information. Thus, they participate on the formation of an atmosphere of distrust into the experts. Furthermore, the governmental institutions responsible for these issues (Ministry of Industry and Trade, Ministry of the Environment Protection) exert insufficient activities in the field of communication with media and general public. Also the public media do not give sufficient time and space to the issues concerning the disposal of RAW and nuclear power generally. The public media should have this aspect clearly declared in their jobsheet. To achieve the information source trustworthiness is a long-run business. The confidence into a certain institution or information source is formed on the basis of long-term experience of the public with them. In the field of the nuclear power production and namely in the disposal of RAW the past experience of the Czech public was in many cases negative. The recovery of the public confidence will be a very complicated and long process.
- Quality and clarity of the provided information – There are not any clear examples from the common life – i.e., numbers that could be used for an easy comparison of absorbed doses obtained, for instance, during a flight in an aircraft, by the radiological examinations, from the natural radiation background, from the operation of a NPP or another nuclear facility, from handling with materials commonly containing certain

amounts of radioactive substances as, e.g., the ashes from burning coal, etc. Based on such information even a laic could form his own notion on the levels of individual radiation sources into contact with which he can come. Also a comparison between the health risks due to the handling with RAW and other toxic wastes is lacking. From the point of view of general public radioactivity is something invisible, something what cannot be smelled and is thus difficult to identify.

- Unwillingness of the public to listen – From the opinion polls it turned out that only about 6 % of citizens from the localities selected for the geological repository is actively involved in the search for information on the project of the geological repository and on the issues of the radioactive waste disposal generally. Other people funk such information; have no interest to study them and to spend time on these issues.

In the discussion to this topic the problems with the NORM-type (Naturally occurring radioactive materials) materials have been mentioned. Materials or waste of this type are produced in large amounts and people come into contact with them without taking into account the fact. E.g., the wastes from burning coal can be rated among these materials. These materials are assumed radioactive waste and handling with them is governed by the Atomic Act and by the respective Directive. The general public knows very little or practically nothing on the risks with the release of these materials into the environment. Also the example of houses built of radioactive cinder-concrete shaped bricks – it concerned about 3000 houses – had been mentioned. Anti-radiation measures had to be adopted in these houses and after 1999 the owners of these houses were offered the possible surrender by the state. About 250 families used this offer.

2nd topic: General public knowledgeableness on the issues of handling with RAW and other HW

It came out that this topic is closely connected with the discussion to the previous topic. In this case the aim was to identify the level and also sources of the public knowledgeableness on the up-to-date technology of RAW and other HW management. Results that came out from this discussion:

- Generally speaking, the knowledgeableness of the general public in the field of wastes management is very low. Somewhat better knowledgeableness is in the management of dangerous wastes, on which there is an information campaign in primary and secondary schools and in the universities and also in the public media. This campaign concerns mainly the separation of municipal waste. The situation in the RAW disposal is much worse.
- RAWRA Information Center – it noticed a relatively low interest of the general public and also a very low knowledge on the RAW disposal issues and on the nuclear power production generally. This is true even for the university students. The worst situation is with seniors for the localities, who are influenced and intimidated by the mostly demagogic arguments and half-truths of the ecological activists.
- Media – press, radio, TV – The unconcern of media on the problems of nuclear power, particularly on the RAW/SNF disposal and on the search of the locality for the geological repository siting, and also the frequently non-objectivity of the published information are the biggest problem.
- State institutions – In contrast to the non-governmental ecological organizations the activities of the respective state institutions (Ministry of Industry and Trade, Ministry of the Environment Protection, etc.) on the knowledgeableness and communication with the

- public in the field of RAW/SNF disposal, on the geological repository siting and construction are at present insufficient.
- RAW/SNF producers and research institutes – Activities focused to the information and communication with the public should not be a domain of only state institutions responsible for the safe management with RAW and SNF. They should constitute also one of the aims of the producers of these wastes and of the research institutes dealing with these problems. At present these activities are outside the main interests of these organizations.
 - There do not exist any educational programs for the general public in the field of RAW disposal – In the state policy on the Czech Republic environment development and in the related documents there are well elaborated educational programs for the public on the disposal of municipal wastes and on the basic rules for the ecological behaviour of individuals with respect to the environment. These programs are developed for various groups of population: children in nurseries and primary schools, youth in secondary schools and universities and adults, seniors inclusive. However, there is a question how much they are adopted in practice. Unfortunately, similar educational programs do not exist on the education of public and providing information on the nuclear power production and on the radioactive waste and spent nuclear fuel disposal connected with it.
 - The distrust of public to institutions also participates on the low knowledgeable and on the *a priori* negative attitude of the public to the management with radioactive waste, to the geological repository, and to the nuclear power production generally. Some of the causes for this distrust and unwillingness have been mentioned in the discussion to the previous topic. This problem is also connected with their unwillingness to listen to the argumentation of experts and representatives of responsible bodies.
 - Organization of excursions or field trips for the representatives of the public to NPPs or to other nuclear facilities as, e.g., stores or repositories of radioactive waste, reference laboratories, etc., both in the Czech Republic and abroad (best of all in the western EU states as the problems with the Chernobyl disaster are still much alive) are one of the ways how to attract the public interest on the issues of radioactive waste, geological repository and nuclear power in general. Organizing meetings with people living in localities around nuclear facilities, i.e., with people who have long-term experience with a life in the vicinity of such facilities is another way. The Radioactive Waste Repository Authority (RAWRA) organizes every year excursions of this type for the local administration representatives from the selected localities and for the representatives of the non-governmental ecological organizations.
 - According to the local administration representatives (in the case of the geological repository siting) the confidence atmosphere will be enhanced if the communities would have the right of veto in the decision-making process of the geological repository siting. The citizens would be assured that – be their decision of any kind – their decision would be respected. However, under the present situation in the Czech Republic, this right of veto cannot be absolute. In the case that the local administrations will be given the right of veto, siting in all the selected localities will be blocked and the building of the geological repository will be impossible.
 - The so-called motivation programs are another way how to incite the public interest and to positively influence their attitude towards the RAW disposal, siting of the geological repository, and nuclear power production in general. Investments into the infrastructure of individual communities in the localities selected for the geological repository siting and also of the communities in the vicinity of the already existing nuclear facilities, financial contributions to the budgets of the given communities, sponsoring of various cultural and sport events, adoption of lower prices of electric power for the inhabitants of

the given localities, etc., could be included into the motivation tools. Some of these tools have already been used, e.g., in the case of building the spent nuclear fuel store in the NPP Dukovany. Such motivation programs meet often with the distrust of public, as they are understood as an attempt of bribery. The local administration representatives are thus sometimes accused of corruption and venality. Of this reason, the direct investments into the community infrastructure are a more suitable method of motivation than offering of financial contributions to the community budgets.

In this discussion several examples of the positive influencing of the public opinion have been mentioned:

- An example from foreign countries can be found in France, a country that has the highest percentage of nuclear electric power of all European countries and where more than 70% of population has a positive attitude to the nuclear power production. The government as well as the employees of nuclear facilities and research institutes exert for many year intense activities in the promotion and knowledgeableness in nuclear power production. E.g., they publish regularly periodicals and information leaflets on the actual activities in the given facility or organization. Moreover, they organize excursions even for the pre-school children so that they become acquainted with this problem already from their childhood. This approach also demonstrated the safety of the given facility. Furthermore, they support financially the development and social life in the neighbouring communities.
- Building of the spent nuclear fuel store in the NPP Dukovany is a positive example from the Czech Republic. Originally, there was a strong opposition of the public, which – as time went – was diminished by the very intense efforts of CEZ on the public knowledgeableness, by the travels of public representatives and of the non-governmental ecological organizations representatives to similar functioning facilities abroad. Moreover, CEZ sponsored the activities of formed associations and invested into the infrastructure of the communities in neighbourhood.

3rd topic: Handling and final disposal of RAW and other HW from the point of view of technology

The discussion to this topic was orientated to the identification of principal pro and con arguments in the utilization of nuclear materials and power sources and to the acquaintance with the up-to-date technological level of the final disposal of RAW and other HW solution. In principle there are two basic approaches to the management with spent nuclear fuel:

- Direct disposal of the spent nuclear fuel
- Spent nuclear fuel reprocessing – it does not solve the problem of long-lived radionuclides

In both cases building of geological repository is a necessity. None of the so far known technologies is waste-free and radioactive waste, that could not be stored on the surface for safety reasons, will always be formed.

- The aim of the spent nuclear fuel reprocessing is not only the recovery of useable fission materials as a raw material that could be utilized for the production of electric power, but also a substantial shortening of the period for the spent nuclear fuel storage to about 300 years.
- The so-called transmutation technology is another possible alternative and systemic solution of the “spent” nuclear fuel safe deposition. The subsequent deposition and storage of isotopes with relatively short decay half-time should not represent any substantial problem. However, due to the financial and technological demands of the

transmutation equipment it is a big question what are the outlooks that these technologies will be actually realized and within what time horizon.

- According to its statutes and plans, RAWRA has to support the development of new technologies (e.g., in cooperation with NRI Rez). It is therefore a question, what kind of waste and in what form will be disposed of in the geological repository. Generally, it is not assumed that the spent nuclear fuel will be disposed of in the present form.
- Provided that it will be decided that the spent nuclear fuel, declared as a radioactive waste, will be placed in the geological repository, it will concern its final disposal – without the possibility of its retrieval and further use.

In the discussion to this topic the issue of the possible establishment of regional (international) geological repository was discussed:

- There are several international programs dealing with the possibility to establish a regional geological repository. One of them is the international project SAPIERR. It turns out that the building of an international geological repository is very problematic. From this program it follows that under the present conditions the spent nuclear fuel disposal in a joint international repository is feasible only for countries with a limited nuclear program (for instance, the planned joint SNF repository of Slovenia and Croatia – these two countries jointly own only one NPP with one unit under operation).
- Some European countries elaborating for many years their national programs of the geological repository construction have certain problems with the idea of the regional repository, both for the political and economic reasons.
- The fact that there does not exist a unified European legislation concerning the RAW and spent nuclear fuel disposal is one of the important obstacles for the construction of a regional repository. There are several organizations as, e.g., WMA preparing the basic documents for the unified European legislation. However, it is highly improbable that this aim will be reached within the next 10-20 years, mainly due to the big differences between the approaches used in the national legislations of individual European countries in the field of RAW and SNF disposal.
- A majority of European countries have in their legislation a ban for import of the radioactive waste other than of their own origin. Therefore, only the reprocessed spent nuclear fuel originated in the territory of the given state can be re-imported. The spent nuclear fuel is not only high-level waste; it contains also the so-called nuclear materials. At present, there is the international agreement on the non-proliferation of nuclear weapons in the frame of which all the civilized states have their obligations.
- The possibility of the regional repository in the territory of the Czech Republic – there is a theoretical possibility that an international repository, if it will be established, could be situated in the territory of the Czech Republic. The idea of a regional repository cannot give to the ecological activists a fully clear guarantee that the geological repository will not be in the territory of the Czech Republic. Assets and drawbacks that could emerge from the location of the regional repository in the territory of the Czech Republic – the potential psychological and safety hazards for the inhabitants of the communities in vicinity would belong to the main drawbacks, the financial profits, political and technological prestige could be rated among the assets.

Due to the legislative limits of individual countries connected with the acceptance of foreign waste, but particularly also due to the strong refusal of the general public to accept these wastes or to tolerate transports of radioactive waste, the variant of the regional repository should be considered as only a theoretical one.

The support of the research in the field of nuclear technologies in the Czech Republic was another issue discussed within the framework of the possible technological approaches to the RAW and SNF management:

- Nearly all states of the world storing spent nuclear fuel work rather intensively on the preparation of geological repositories in spite of the parallel research in the field of the transmutation technologies.
- For several years the research and development works on deep geological disposal proceeds also in the Czech Republic with the aim to find the best solution under the actual conditions of the Czech Republic.
- A support that should be provided by the state to the research and development in this important field is not very pronounced. The responsible state bodies should spend on the safe management with RAW/SNF financial means comparable with those spent by other developed countries.
- Even in the case that the main stream of research and development in this field proceed abroad, it is necessary for the Czech Republic to have a certain group of experts participating on this research. They need not contribute significantly to the global progress but they must be on a comparable level so that they will be able to accept the prospective foreign technologies, to adapt them to the actual Czech conditions and to operate them safely afterwards. In the Czech Republic the research in this field is always postponed into future and it is little supported both personally and financially.

In principle, the discussion participants agreed that the development of the geological repository is a necessity. The only problem remains, whether the geological repository should be regional or national. The pro and con arguments are as follows:

- 1) Legislation of a majority of European countries does not allow any import of radioactive waste and SNF of alien origin.
- 2) The construction of a geological repository in the territory of the Czech Republic will represent a certain prestige from the point of view of the scientific and technological level of the Czech Republic and will need a preparation of new experts in this field.
- 3) On the other hand, there exists a strong opposition of the public against the construction of the geological repository in the territory of the Czech Republic.
- 4) It is highly probable that in future SNF will concern a strategic raw material and from the political point of view it is already so.
- 5) Any regional RAW and SNF repository is in an unforeseeable future and the situation concerning this issue is very uncertain.
- 6) Although there is a possibility of the construction of a regional repository, the development of our own national project of a geological repository is a necessity. It is necessary to work in a sufficient advance so that the necessary quality of all works from the development to the actual construction is guaranteed even in the case that the regional repository will not be constructed but a deep geological repository will be built in the territory of the Czech Republic.
- 7) The geological repository will present also certain benefits for the given state or region – a financial support, jobs, etc.

4th topic: NIMBY phenomenon (“Not in My Backyard” phenomenon)

Discussion to this topic aimed to getting acquainted with the NIMBY phenomenon and to the identification of the possibilities to work with it and to the solutions of this problem.

- NIMBY phenomenon (“Not in My Backyard”) is an important common factor influencing both RAW/SNF and HW managements
- The NIMBY syndrome was very strongly demonstrated also in the all-republic poll in six localities selected for the geological repository and in one locality not involved with the activities connected with nuclear power production and RAWRA activities. The opinion that the society should take care of the safe liquidation or disposal of RAW and SNF and that it must not defer the problem to the next generations prevailed. However, a majority of respondents was against the siting of the geological repository in their vicinity. A relatively better approach with respect to the NIMBY phenomenon was observed in communities in which live people with long-term experience of life in the vicinity of a nuclear facility.
- Even in the NIMBY phenomenon it is a problem of knowledgeableness, i.e., it concerns an honest communication with the public.
- Accumulated source – another reason for the NIMBY phenomenon is the accumulation of RAW/SNF in large amounts in one locality and the enhanced safety risks connected with it – this is a fact the people are mostly afraid of and it invokes the question ”Why just we?”
- The fear of the decrease of land and real estate prices and of the decrease of interest to live in the given area is another factor influencing the public opposition against the geological repository siting. It is also one of the main arguments of the non-governmental ecological organizations. However, an exactly opposite outcomes follow from the experience of the local administration representatives with the construction of the central interim store of spent nuclear fuel in the NPP Dukovany, among others also due to the creation of new job opportunities.
- The impossibility to affect the given risks by one's own efforts – Every human activity is connected with certain risks and a human being's attitude to the given problem is given by the fact whether he (or she) is willing or not willing to accept this risk. The problem therefore concerns the definition of “acceptable risk”. People better accept risks that they could affect by their own activities as it is, e.g., in driving a car. Travels in an aircraft and also life in the vicinity of an accumulated source of the ionising radiation as a nuclear power plant or the radioactive waste repository are opposite examples.
- Comprehensively formulated requirements on the radiation protection – The requirements on the radiation protection should be formulated comprehensively not only for the regulation (inspection) bodies and operators applying them but also for the general public. There are large reserves in this field, particularly on the side of those who prepare these rules (ICRP). At present another main document concerning the radiation protection is under preparation. It should replace the former document ICRP 60. However, even the regulators and inspection bodies themselves have problems to understand this document. The professionals who have to demonstrate these requirements on the radiation protection to the general public should have them in a comprehensible form so that they would be fully understandable and on simple examples explicable so that even laics could understand it.
- Faction leaders – Methods for affecting the public opinion from inside should be more applied, also by means of the so-called faction leaders – i.e., of a group of trustworthy representatives elected by the citizens of the given communities. The dialogue will be held between the experts and this group of trustworthy citizens. These representatives will then transmit the acquired experience and knowledge to their fellow citizens.

- The comparison of the proposal to build a geological repository with another questionable activity with negative impacts on the environment in the given locality could be used as another actual example how it would be possible to influence in certain extent the attitudes of the local administration representatives and also of the public itself to the problem of the geological repository siting. (This procedure was proposed by the mayor of Dolni Cerekev – in the next negotiations with the community representatives on the execution of the geological survey connected with the search for the suitable locality for the geological repository siting the responsible RAWRA representatives should present two different EIA analyses – i.e., together with the examination of the geological repository impact on the environment they should present also an EIA analysis of another questionable activity, namely of the operation of a quarry in the vicinity of the community, due to which already two hills had been completely levelled).

Conclusions and feedback of the focused science shop participants

The individual participants concluded the discussion with the evaluation of the shop session. The conclusions are summarized as follows:

Positives	Negatives
A step forward in the communication between the experts and representatives of the local administration	Too wide topics
Acquirement of new information and exchange of opinion between the participants	Absence of the non-governmental organizations representatives
Acquirement of contacts	Absence of political representatives (Ministry of Industry and Trade, Ministry of Environment Protection, Ministry of Finance etc.)

- In spite of the efforts the shop organizers were not able to provide for the participation of the non-governmental ecological organizations as Calla or DUHA, mainly due to their disinterest. They also did not succeed to provide for the presence of the representatives of the responsible ministries: Ministry of Environment Protection, Ministry of Industry and Trade and, last but not least, the Ministry of Finance.
- It has been proposed to organize similar meeting also only with the participation of the professionals. Such meeting could be used for the clarification of different approaches and opinions on the radioactive waste and spent nuclear fuel management that appear even among the experts.
- An opinion was presented that it would be useful to invite media to the next similar shop. It might be a way, how to attract also the representatives of the non-governmental organizations and of the responsible state bodies (except for RAWRA, SONS and SIRP).
- Cooperation between NRI Rez and RAWRA on one side and the present representatives of the local administration on the other side has been settled in the field of motivation the given political representatives to the participation in the next joint negotiations organized in the framework of the ARGONA project.

Detailed record of the discussion is presented in the Appendix No. 2.

List of Participants:

Number of participants	Name and Surname	Company / Institution
1	Hana Vojtechova	NRI Rez
2	Antonin Vokal	NRI Rez
3	Stefan Palagyi	NRI Rez
4	Vaclava Havlova	NRI Rez
5	Lucie Steinerova	RAWRA
6	Ivana Skvorova	RAWRA
7	Peter Lietava	SONS
8	Karel Jindrich	SONS
9	Jiri Hulka	SIRP Prague
10	Barbora Maresova	SIRP Prague
11	Tereza Rotreklova	SIRP Prague
12	Mecislav Kuras	Institute of Chemical Technology
13	Karel Stamberg	Czech Technical University – Faculty of Nuclear Science and Engineering
14	Vladimír Cerny	Municipality of Rouchovany
15	Zdenek Jirsa	Municipality of Dolni Cerekev
16	Lubos Mayer	Dolní Cerekev
17	Otakar Vojtech	Representative of public
18	Zdenek Prasil	Representative of public

Focused science shop – 12 March 2008

Radioactive Waste versus Other Toxic Wastes

Ing. Hana Vojtěchová (NRI Řež a.s.)

Any human activities cannot do without wastes. The radioactive waste can be rated among the most dangerous wastes – nevertheless, due to the ever proceeding radioactive decay they lose gradually their dangerousness. However, the general public considers their liquidation by permanent disposal as insufficient. Many other industrial or chemical wastes that are toxic and dangerous forever are commonly disposed of in dangerous wastes dumps and the public usually accepts this method of liquidation. Where is the problem?

- **RAW and hazardous waste definitions:**

Radioactive waste:

The Atomic Act No. 18/1997 Coll. defines the radioactive waste as waste, objects or equipment that cannot be used by its owner, the contents of radionuclides in them exceeds the limits stipulated by the operating regulation (SONS Decree No. 307/2002 Coll.). With respect to its activity the wastes are subdivided to: low-, medium, and high level wastes. With respect to their decay half-life they are divided to short lived (with the decay half-lives < 30 years) and long lived (with the decay half-lives > 30 years).

Hazardous wastes:

The Act on Wastes No. 185/2001 Coll. characterizes the hazardous wastes as waste listed in the List of Dangerous Wastes in the operating regulation and any other waste exhibiting one or more hazardous properties specified in the Appendix No. 2 to this Act. The hazardous properties of waste are as follows: explosiveness, oxidation ability, combustibility, tactility, unhealthiness, toxicity, carcinogenity, causticity, infectiousness, teratogenity, ability to release highly toxic or toxic gases in contact with water, air or acids, ability to release into the environment dangerous substances in the course of or after disposal, ecotoxicity.

- **Production of radioactive or other hazardous wastes in the Czech Republic:**

Radioactive wastes (information source: RAWRA):

- Low level wastes – 600 m³/year
- High level wastes – 1 m³/year, SNF – 100 t/year – it amounts to less than 1 % of the total RAW production but it contains more than 90% of the total RAW activity

Radioactive waste is produced in the nuclear power plants, in the utilization of radionuclides and ionising radiation in medicine, agriculture, industry, and research.

Hazardous wastes (Centre for the Waste Management – CWM):

- Total HW production in 2006 amounted to 1.3 million tons (1.4 million t in 2005) – i.e., 6.9 % of the total production of wastes
- Production of hazardous wastes decreases continuously since 2004 – due to the demotion of some wastes from the tally as they can be used as secondary raw materials (e.g., by-products in power plants)

- **Basic principles of the RAW/SNF and hazardous wastes management:**

Conception of the RAW and SNF management in the Czech Republic (2001-2025)

- It assumes further development of nuclear power production
- It declares principles, aims, and priorities for achieving optimum management of RAW and SNF
- The conception specifies actual activities prescribed by the legislative regulations
- It stipulates that RAWRA is the institution responsible for the preparation of plans and implementation of the Conception
- The Conception represents a framework for the decisions of RAW and SNF producers in their commercial or production strategies
- The Conception is the basic information on the intentions and priorities in the field of the RAW and SNF management in the Czech Republic

State policy in Environment Protection in the Czech Republic (2004-2010)

- Prevention of formation and diminishing of the hazardous properties of wastes
- Building of a network of technological facilities for handling with hazardous wastes (HW)
- Liquidation of wastes and equipment containing PCB till 2010
- An active participation of the Czech Republic in the Basel Treaty
- More active monitoring of the handling with HW
- Creation of a system of financial support for the construction and modernization of facilities for handling with HW, except of dumps and incinerators of municipal waste.

- **Legislative and organizational structure for the RAW/SNF and hazardous wastes management:**

RAW and SNF Management

Basic documents:

- Atomic Act No. 18/1997 Coll.
- SONS Directive No. 307/2002 Coll. on the radiation protection
- Acceptability conditions for the disposal in the existing RAW repositories – worked out by RAWRA and approved by SONS
- EIA for the new facilities (Act No. 100/2001 Coll., on the assessment of the impact on the environment)

Organizational structure:

- SONS – state administration and control of the nuclear power and ionising radiation exploitation
- RAWRA – provision of the safe disposal of RAW

Hazardous wastes management

Basic documents:

- Act on Wastes No. 185/2001 Coll.
- Directive of the Ministry of Environment Protection No. 383/2001 Coll., on the detail of the wastes management and Directive of the Ministry of Environment Protection No. 381/2001 Coll., publishing the Wastes Catalogue
- Directive of the Ministry of Environment Protection and Ministry of Health No. 376/2001 Coll., on the evaluation of the hazardous properties of wastes

- The Government Directive No. 197/2003 Coll., on the Plan of Waste Economy of the Czech Republic
- Act No. 100/2001 Coll., on the assessment of impacts on the environment

Organizational structure:

- Ministry of the Environment Protection (MEP?) – state administration and supervision in the field of waste economy
- Ministry of Health (MH?) – state administration and supervision in the field of public health in the waste management
- Regional and Municipal administrations – issuing approval for handling with HW

- **Acceptance conditions of RAW/SNF and HW for disposal:**

RAW and SNF:

The acceptance conditions are based on the safety analyses for the actual facility and the radioactive waste should meet the following conditions:

- Classification of the material and waste
- Waste form suitable for disposal (stable, low leachability)
- Conditions concerning RAW processing
- Acceptability conditions concerning the handling and transport
- Acceptability conditions for disposal

Facility types:

- Repository – 3 repositories in operation
- Geological repository (since 2065)
- Stores and interim stores for the SNF storage

Hazardous wastes:

Acceptability conditions are based on the fulfilment of technical requirements and conditions valid for different types of facilities. The hazardous wastes should meet the following conditions:

- HW stock-taking and characterization
- Stable form of wastes
- Miscibility conditions
- Leachability conditions, etc.

Dump types:

- S-OI – inert non-hazardous waste
- S-OO – other waste – wastes only in certain form (e.g., sealed canisters)
- S-NO – only solidified HW meeting the leachability conditions

In 2006 there were 250 waste dumps in operation, 18 of them were dumps of the S-NO category

- **Safety approaches in the field of RAW and HW management**

Radioactive waste

In the field of the radioactive waste and spent nuclear fuel disposal the safety approaches are based on the elaboration of the safety analysis for various possible scenarios of the repository development and for a very long time period after its closing – about 1 million years.

Monitoring programs:

- monitoring program proceeds during the repository operation and also after its closure (usually for 300 years)
- concentration of radionuclides is measured

Hazardous wastes

The risk assessment of the dangerous wastes dumps is made by means of the opinions of experts with the necessary authorization – usually for a period of about 30 years after the dump closure.

Monitoring programs:

- monitoring program proceeds during the dump operation and in a limited extent after its closure (usually for 30 years)
- evaluation of the composition of seepage waters – concentration of pollutants is determined

Is there not an evident discrepancy? Of what reason?

The NIMBY phenomenon - “Not in My Backyard” – is an important common phenomenon influencing the management with both RAW/SNF and HW.

What are the possibilities to deal with this phenomenon and how could this problem be solved?

Detailed transcription of the discussion recording:

Marek Valvoda (moderator): - As already mentioned, this seminar is orientated first of all to the mutual exchange of ideas and information concerning the problems of RAW management in comparison with other toxic wastes. Particularly – what differences there exist, how it is perceived by the public and what is the professional view on these issues. Another aim is to find out the areas where information is generally lacking, both in the laic and professional public. Among others, it would be profitable to mention in the discussion what the professionals know about the opinions of the laic public. The third aim is to test the workshop form of the information exchange, whether it is useful and how effectively it works. In the discussion conclusion I shall ask you to make an evaluation of the discussion outcomes. As to the discussion itself, the topics and subtopics are presented on the board. Now, let us turn to the first topic entitled “Differences in the common perception of the problems of the management with RAW waste and other HW”.

Otakar Vojtech (representative of the public) – A difference is made between RAW and HW, but there is still the third group of materials (wastes) that are produced in large amounts and the communities likely do not know about them. It is the radioactive waste from the burning solid fuels, in amounts of the order of hundred million tons that are freely dispersed into the environment, already for nearly one hundred years. They contaminate the landscape and enter into the cycle of human life and this fact is not talked about. For instance, the ashes of some types of coal had been used for the production of shaped bricks for building houses. Nobody could live in them as their radioactivity was very high. I make an appeal to the communities and to the representatives of responsible institutions to establish yet another category of wastes, i.e., a category of this type (materials of the NORM/TENORM type).

Zdeněk Prasil (representative of the public) – I would like to add also the problems with radon from the subsoil the alpha radiation of which is more hazardous than all RAW disposed of in a repository. I think that the general public knows very little or nothing about this problem.

Karel Jindrich (SONS) – You need not be alarmed. I have to put the problem, mentioned by the colleague, right. You need not be afraid as in the Czech Republic the handling with natural radionuclides is under control so that the basic principles of radiation protection are fulfilled. This means that certain limits for the population, dose limits cannot be exceeded. The handling with these wastes is thus controlled. It concerns also the secondary raw materials produced by the mining, processing and treatment of the uranium ore, in mining of minerals in which uranium and its decay products are present as accompanying radionuclides. All this is in the Czech Republic under control and the basic limits defined in the Atomic Act and in the respective regulation must not be exceeded. So, do not worry. And speaking about the NORM type materials, i.e., about the commonly encountered materials contaminated with natural radionuclides it should be mentioned that these materials or, better, handling with them is in the Czech Republic regulated and the handling with them is described in the regulation and according to it the control bodies should supervise the handling with them. I would not be worried of them. The attitude of the state is without any problems and is also required.

Antonín Vokal (NRI Rez) – I have only a brief remark. The point is in the comparison between the impacts of RAW repositories with these types of wastes and also with other hazardous wastes. Actually, in the case of RAW repositories the safety analyses are very conservative and even under the potentially worst conditions the doses from these repositories would by far not reach the values of doses from naturally occurring radionuclides. This is the

core of the problem – people generally do not accept the geological repository in spite of the safety analyses that demonstrate that they are fully safe even in the worst case. I, personally, cannot understand it, namely in comparison with hazardous wastes. Among them we can rate also heavy metals that obviously will not be hazardous only for 30 years for which the safety analysis is made but will remain hazardous for many million years. They will remain in the HW dumps in an unchanged form and concentrations forever. It cannot be said that people are not interested in these facts but on the other hand they do not object so strongly as in the case of RAW repositories.

Ivana Skvorová (RAWRA Information Center) – Only a short note. I work in the RAWRA Information Center, to which come excursions from the secondary schools and universities. When I expected the first excursion from the universities, I was abhorred what kind of questions they will have and whether I will be able to answer them. But they knew practically nothing. I do not know what they are taught but on RAW they know absolutely nothing. Perhaps something about the municipal wastes. They are looking at this with great surprise. Much worse is the situation with people in the localities. Any grandma or grandpa hearing the word “radioactivity” is horrified. And if an ecological activist frightens them with a six-legged calf, they will believe him. And the activists just do such things. They concoct untruths that are beyond everyone. So, the lack of knowledgeableness both among students and general public is very high.

Lucie Steinerová (RAWRA) – I would like to mention the polls organized by RAWRA last spring in six localities selected for the geological repository plus a poll in one locality, into which RAWRA never intervened with any activity. The NIMBY syndrome manifested itself very strongly. In statewide polls the public expressed the opinion that high-level waste should be disposed of by the Czech Republic itself. The present generation should solve the problem and must not transfer the problem to the next generations. The generation that generated the wastes should dispose of them. We, our generation, have to be responsible to ourselves. On the other hand, every locality differs from another one, depending on history and economic backgrounds in the given regions. I think that we have here the representatives of communities that could express what their attitude to this project is. It is so, because Mr. Cerny is the mayor of Rouchovany. The repository of low-level wastes in the NPP Dukovany premises is on the cadastre of Rouchovany. He and his fellow citizens from his community live with the nuclear power plant already for more than twenty years. Moreover, Mr. Jirsa is a representative of a community that is willing for a long time to communicate with us very openly. In his community a civic group exists with which he has to struggle. Let me say it, the group disseminates obscurantism. These representatives are those, who could tell us in full relevance what are the people afraid of and why the arguments do not work.

Karel Stamberk (FNSPE – Czech Technical University) – My remark concerns the future. It is well known that there are experts who are already for many years working in the field of nuclear fuel technology and its reprocessing and also for a long time in the problems of the so-called transmutation reactors. All these efforts are aimed to the fact that the disposal of the so-called spent nuclear fuel in a geological repository for eternity is very uneconomic. I would even say that it is an economic crime as the fuel is exploited by only 4 to 6 per cent. Just imagine how much energy was produced, how much it remained in the fuel and how much we dispose of it. Only with great efforts our great-grandchildren will get them out. On the other hand, for already minimum ten years, this problem is elaborated and various scenarios of the fuel retrieval exist. In certain sense, it is an old problem. For instance, when the works with fast reactors started, it was thought that it would be a hybrid, something like VVR TERARY – a combination of a thermal and fast reactor. However, nowadays-new types of reactors are taken into consideration. The aim is not only to utilize the energy but also to decrease the time period necessary for storage. By an order of magnitude, no, by two orders of magnitude.

Today a period of 10^6 years is considered and it should be about 300 years, which is a relatively short time in this respect. But mainly it concerns a higher utilization of nuclear power. It annoys me that in spite of the fact that all this is well known and that infrequently something reaches even the general public, occasionally some newspapermen write about it something that hair stand on end to any expert who knows something about it, but in spite of all this the plans do not take this perspective into consideration.

Vaclava Havlova (NRI Rez) – I would like to go back to what has already been said by Mrs. Steinerová. I think that pure phobia of radioactivity prevails in the society. People are so stricken by the Chernobyl disaster that they cannot imagine the real facts and only the word “activity” causes a fear from something unknown, what cannot be seen and what – from their point of view – cannot be measured. I can remind you of a recent example: here, in the premises of NRI, in the Institute of Inorganic Chemistry, a trivial accident took place. However, newspapers presented it as an explosion in the Nuclear Research Institute. I was called by my relatives who asked whether a reactor exploded here and what kind of nuclear accident happened. This demonstrates how uninformed people are and that they mostly have no idea about the real facts. At the same time they have no idea that if they pass, e.g., an examination by scintigraphy, they will get a dose of radiation exceeding the dose that we, who work in the NRI with radioactivity, get during the whole year. It is a problem of the whole society that is on the one hand affected by the Chernobyl accident and on the other hand little educated in this field.

Zdenek Jirsa (mayor of Dolni Cerekev) – Many aspects have been mentioned already, but, after all, the problem is a question of knowledgeableness. We are always going round and round one single topic, namely that people really suffer from that phobia, their fear, instigated by the activists, is insufferable for them. In the last negotiations with RAWRA, in the presence of Mr. Andersson, a specialist from Sweden, I have said one unpleasant thing, namely that it can be realized only with great difficulties. It seems to me, that there is no unambiguous political statement concerning the state concepts in electric power production. It should be the politicians who should regulate these problems and then there will be no space for the civic initiatives that do not behave correctly. My experience since 1993 proves that their presentations are highly unfair. This does not mean that they are not professionally well based. Up to a certain point they use a professional argumentation, which suddenly stops and then comes the intimidation. And people are willing to listen to them. Recently, I had the opportunity to participate on the discussion in the narrower council of the Highland Region (Vysocina) head officer on the nuclear energy future in this region. Mr. Vladimir Cerny will discuss here what will happen with the NPP Dukovany after the expiration of its projected lifetime in 2017 or 2018. The question is whether its operation will continue or not. In this respect the Highland Region wants to help the state institutions. It will approve the enlargement or innovation of the NPP Dukovany. It is the question of economy and utilization of its equipment. After all, when the Dukovany NPP was built, the political decision was unequivocal and there was no discussion. At this moment I can state that if you will go to Rouchovany or Dukovany to ask the people how they live close to the nuclear power plant and in a region where the nuclear power is well renowned and represents a principal fact of the Trebic district, so these people will have no problem with it. However, we all, and the experts particularly, know quite well that RAW cannot be disposed of into formations that do not meet the requirements. It simple cannot be to stuff the waste from the power plant anywhere and the problem will be solved, as some people believe. I have already heard such views as: “Put in Prague under the St. Venceslas statue”, “Shove it into the former uranium mines in Joachimsthal”, etc. The “ecologists” infected this fallaciousness into the people's minds very deeply – “not in my backyard” as Mrs. Vojtechova presented it here – so that this attitude prevails. It would be therefore fruitful if there would be a clear political decision.

However, we are all aware that under the present coalition conditions in the Government it is not possible.

Minister Bursik's people (Green Party) will have problems with it forever. It is the same as in Germany, when the Green Party was in the coalition, the problems there were and still are and the public has no precise information. For the political power reasons everything is negated, postponed and stalled. At present there seems a relatively good situation in the Ministry of Industry and Trade. Mr. Riman, minister, started to provide the press with correct information, finally also the non-coalition, opposition parties joined these efforts but all this is still insufficient. People should realize that the danger of a negative power production balance exists and that the renewable power sources are not a solution. And somebody should make the people aware that without nuclear energy this state cannot survive. I always use the following example: if the Dukovany NPP will be switched off for two days, it will mean not only a blackout, but an economic collapse of the state for a long time.

Marek Valvoda (moderator) – Thank you. The question was: Why there is a different perception of the radioactive waste and other hazardous wastes? Why are the people generally more afraid of RAW in comparison with their fear from the hazardous differently toxic waste?

Otakar Vojtech (representant of public) – I would like to mention briefly something to this problem. If the people, countrymen, know what dose they obtain just from the landscape in which they live and which can be easily measured and at the same time what dose they obtain during a flight in an aircraft and from the NPP Dukovany, they will only laugh. I can remember that once a truck was going from Dukovany and at the border it was stopped as it was discovered that it is radioactive. Do you know why? Its axle was made of steel from the Vitkovice ironworks. On other words: they should see the difference between various types of radioactive materials with which they are commonly in contact and the existence of a nuclear power plant in their vicinity. By the way, I personally can be rated among the partisans of nuclear power.

Ivana Skvorová (RAWRA Information Center) – Only a short note. I am not sure that they will believe us. Because when we speak with them, they say: “How can we believe you? How can we believe to the government? How can we believe just to somebody?” It is also a case of motivation. Perhaps some people will believe it, but many of them will not, for sure. There is a great mistrust into the institutions. And this is a difference from the situation in Sweden.

Vaclava Havlova (NRI Rez) – It is a problem of the whole society, a problem of perception, problem of the attitude of the society to authorities. It seems that the Swedes believe more to the authorities than it is the case here.

Ivana Skvorová (RAWRA Information Center) – But it took a long time to them as well.

Vaclava Havlova (NRI Rez) – Yes, but all the same, I believe that it is in a certain extent given also by the different national character of Swedes and Czechs.

Marek Valvoda (moderator) – I think it would be worthwhile to make a record on these reasons. So, they are as follows: mistrust to the institutions, to professional sources, to media.

Otakar Vojtech (representative of the public) – Yes, it is a problem of media and mistrust in them.

Hana Vojtechová (NRI Rez) – I rather think that the problem is more in the non-objectivity of media in their pursuit of sensations.

Vaclava Havlova (NRI Rez) – I believe that people are missing illustrative examples from the common life – radiation doses from therapy and examinations, flights in airplanes, etc. In short, numbers for comparison.

Marek Valvoda (moderator) – So it is not only mistrust but also the quality of information.

Zdenek Jirsa (Mayor of Dolni Cerekev) – I think that it is connected also with the cumulation, it concerns an accumulated source and people are afraid of just these amounts. Moreover,

everybody will say – what will be after one hundred thousand years? What will do our grandchildren and great-grandchildren? I liked the situation that arose in RAWRA in 2004 when there was the WATRP mission (evaluating the preparations of the geological repository in the Czech Republic): when the discussion, during which the Greenpeace representatives could pose any questions, was terminated and the head of the mission asked them “How this planet will look like after one hundred thousand years?” – there was suddenly a dead silence. This is the core of the problem: “cumulation” and “why just we?” I myself am not a believer but I am more concerned with the locality than the orthodox believers. I do not want to criticize the believers. However, take Lovosice and North Bohemia as an example. We shall always increase the consumption and on the other hand we are not willing to sacrifice anything for the benefit of environment.

Lucie Steinerova (RAWRA) – One of the biggest problems is that the public is not willing to listen. The polls revealed that only 6 % of population in the localities is actively involved and seek information on the geological repository project and on these problems. Other people avoid information, do not want to study the problem, they are not willing to invest time and efforts in them, to spend their time with them. It is generally much easier to declare “I am against it, I do not agree” than to spend hours with the search for information and to strive to understand the information obtained. It is evident that RAWRA is not an impartial organization and it is not a fully objective source of information. We want to build the repository.

Antonin Vokal (NRI Rez) – If I may make a remark, I will be somewhat critical to the state bodies and I would be on the green side. As mentioned by Mr. Jirsa, it is really a cumulated source of danger and we cannot neglect this fact. We cannot argue that it is comparable, for instance, with the fact that we are continuously irradiated anyway because even a small increment of the total dose could be harmful. It is my opinion that it is the case of state bodies, not only of RAWRA but also of the Ministry of Industry and Trade and SONS to support and take care of the research in this respect. Abroad it is already proceeding for thirty years. I can admit that even in our country it is already starting. Here, in the Nuclear Research Institute, we make this research, but the problems persist. Unfortunately, it is the state organs who say that the situation is not so hazardous and that we can take over the results from abroad. But this cannot be done. I believe that we should be frank even to ourselves: the state organs should invest the same financial means into the safety research as it is in other developed countries. And only then the experts could prove that the facility is safe.

Marek Valvoda (moderator) – Thank you, I will make a note on the other reason mentioned, i.e., the lacking neutral information source. Mr. Prasil is asking to take the floor, then I will give the floor to Mr. Jirsa and Mr. Jindrich.

Zdenek Prasil (representative of the public) – I think that the complete ignorance of the problems is not so hazardous, because people who know nothing are usually willing to absorb any information. The semi-ignorance, semi-intelligence, semi-idiocy is much worse. I believe that mass media create an atmosphere “do not believe to the experts”. This is the most dangerous approach that does not concern only radioactivity but all problems. The people will start to believe that “the experts are only speaking in their own interests”. You should tell the people that we also want to protect ourselves, we also have children and families, we want them to live in a healthy environment. We have certain professional knowledge in this respect. The only viable approach is to take them into localities where something similar was already constructed, so that they can speak with people who live in the vicinity of an institution or facility processing radioactive materials.

Marek Valvoda (moderator) – Thank you. So, you say that another reason is a lack of well-founded information in the media.

Zdenek Jirsa (mayor of Dolní Cerekev) – I shall continue in this respect. The problem is in the insufficient level of information media, not so much that RAWRA or MIT neglected something but it is rather a question of the present approach of the public media that do not give a sufficient space to these problems. This duty should be clearly specified in their jobsheets. We all are quite well aware of the fact that at the present 1.7 per cent annual increase of power consumption within a relatively short period of time we shall stop to be the producers of certain overproduction of electric power. I would like to make a remark to the media, corresponding to the already presented opinions. For instance, I would like to mention the case of the central interim store of the spent fuel in Dukovany NPP. The media were the first who informed about it and only afterwards we, who were directly involved, obtained the information through the official channels. Such information sequence, media and only afterwards the representatives of local municipalities, must not go on! How could we create confidence in the public if the state deals thus with us? I repeat once more, it is not RAWRA who created this situation. It is the MIT and the Government of this state. If, by chance, in our community of Rohozna we would like to obtain more information, I would like to get to us first the political representatives of the type of, e.g., the vice-minister of MIT, who would be able to tell us something about the Czech power industry and its perspectives. If the state institutions do not know how to deal with us just from the beginning, it cannot be expected that we shall believe them that the geological repository will be built in compliance with the proper technological parameters. I quote here the attitudes of common people, though I do not feel it so. Here among us, I am quite well aware where the problem is, but it is difficult to invoke the same interest among common people. This cannot be done without a clear declaration of the state's power production policy. Now we expect only more problems, always only evasions. Mr. Andersson expressed it precisely – I must come out with the truth, I must be relevant and I must not have any B program (ulterior intentions). This is a common attitude in this state – if I cannot break through straightforwardly, I must achieve it by a roundabout way.

Marek Valvoda (moderator) – So another point is the improper approach of the state.

Karel Jindrich (SONS) – I shall mention something quite well known from the experience abroad. The creation of the information source credibility is a matter of long preparation before launching any campaign concerning a technical topic. It is most important to have this strategy well prepared and to have a credible information source available. However, what is a credible information source? That is a question for a psychoanalyst, not for us. Only a psychoanalyst is able to say what is credible for an individual of the population. We all are only technical experts for which it is difficult to orientate themselves in the problem. There are many foreign professional studies how the stakeholders should behave. If this is not properly prepared, the state faces a problem. In this case it had already encountered the problems, but the same situation is also in other fields. And to gain the credibility is already very difficult. And then a good advice is beyond price.

Otakar Vojtech (a representative of public) – I would like to mention that France has now the highest percentage of electric power produced from nuclear power and it has a relatively vast nuclear program. I worked there for some time and I had the opportunity to observe how they coped with this problem. How, for instance, worked a similar research institute like the Nuclear Research Institute Rez or a facility for reprocessing nuclear fuel. Workers of these institutions organize excursions even for the children from nurseries so that they become acquainted with these problems already from the early childhood. They demonstrate thus the safety of this facility. And they tell them that they need not worry, because everything is concentrated, properly secured and under permanent surveillance. Just in contrast to other radioactivity sources existing freely in the environment. It is necessary to pass this information to people as they do not know it. From my own experience I know how the

research institute in Marcoule, France, works in this field. On the other hand, the Nuclear Research Institute in Rez exerts practically no efforts in this respect. Along to the excursions for laics the research institute in Marcoule also sponsors various activities in the community and about once per month it issues a journal in which it informs the public on the actual events in the institute, whether there was, e.g., an accident or breakdown, etc. It also informs on the solution of the situation and that common people need not worry. It does not concern one single institute, or Government, promotion in newspapers or in other mass media. It concerns a whole system orientated to truthful and fair information of people. In our country they submit either none information at all or only a very biased information.

Marek Valvoda (moderator) – So, according to you, a well worked-out state strategy in the information of public is missing?

Otakar Vojtech (representative of the public) – This cannot be controlled by the state. All the people in the posts of the research institute managers and of all involved institutions, as well as common employees, should be active. They should explain to people what radioactivity is, to give examples from the everyday life, so that people will start to understand it. Of course, there will always be people who will not be interested in these topics but those who are interested will have an access to reasonably unbiased information.

Hana Vojtechova (NRI Rez) – I have only one short note to the educational programs of the public. For instance, I know quite well that there are well elaborated educational programs in the state environmental policy and in the related documents concerning the education of the public in the management of municipal wastes and generally in the environmental behavior of individuals. These programs are orientated to various groups of population as, e.g., youth in primary and secondary schools, in the universities, to the actively working middle-age generation, and also to seniors. However, there is always a question how these programs are practically applied. Why not to take over these programs or to use them even in the knowledgeable on radioactive waste and nuclear power generally? Perhaps, it could be one of the possible ways.

Vladimir Cerny (mayor of Rouchovany) – Though I seem to be old, I am still rather young. Many older people from our community remember times when three communities had to be demolished due to the construction of the Dukovany NPP and to the three-kilometer safety belt. Many of them lost thus their homes. From the point of view of present days it seems perhaps good that the problem was then solved by a directive, nobody was allowed to speak into it and the plant was built. Then came the year 1990 and the Dukovany NPP faced the problem of siting the store of low- and medium level wastes. Suddenly there were the rights of local municipalities and the possibility of common citizens to express his attitude to everything. A situation arose that is also known from the localities assigned for the geological repository. Of course, the power plant worked, the local municipalities were somehow informed and the opposition of population was great. It was openly stated that nobody believes to Prague. All said: “Put it into Prague”. So all people coming from Prague were untrustworthy, be it a scientist of any renown. Simply, the countrymen did not believe any arguments, because they came from Prague and were thus directed “from above”. That was the first problem. The second problem was with the construction of the spent nuclear fuel store. It was just approved but only due to the fact that ČEZ realized that it is necessary to turn the public opinion to certain extent. The knowledgeable of citizens improved, excursions to places where similar facilities have been built and are operated, best of all in western countries as the Chernobyl problem was still much alive, have been offered to the representatives of communities and of various non-governmental organizations. Then ČEZ realized that it is also necessary to support the activities of such organizations, to give some money to the kindergartens, to schools, to buy some balloons, etc. Finally, in 1993, the ČEZ directorate decided on a certain financial compensation for five nearest communities in the

height of 50 million Czech crowns so that the communities will not protest against the construction of the spent nuclear fuel store, already the second one. In the years 1999 and 2000, when we were already well informed, we faced the public discussion on the land use decision and the EIA and SEA requirements concerning the building of the second store of spent nuclear fuel in the Dukovany NPP. The session was held in the gymnasium in Rouchovany. This session was attended also by Mrs. Dana Kuchtová (NGO South Bohemian Mothers), at that time freshly nursing mother. She opposed very vehemently against the building of the SNF store No. 2. However, in Rouchovany, in a community with long-term experience with life in the vicinity of a nuclear power plant, she did not achieve a positive acceptance. NGO South Bohemian Mothers had not any platform in the community. Later on, they protested against the procedure of the land use decision. We, as the mayors of the involved communities, were asked to join them in their protest. All the mayor unequivocally objected: "But what will happen to the power plant if there is nowhere to place the spent fuel?" Simply, everything was solved after the year of gaining knowledgeableness, mutual respect, acquaintance, etc. Everything turned to the other direction. With respect to the geological repository one basic tool is perhaps missing: the local municipalities should be provided with the right of veto, similarly as it is so in Sweden, where practically seven localities contested with SKB on the siting of the geological repository and reference laboratory. Finally, only three remained and one voluntarily withdrew. Nowadays, there are two localities that contest for the siting of the geological repository. The veto right means that people know that their decision, be it positive or negative, will be respected. So far this is not so. And one aspect more: The state should not change its policy every four years. It should declare quite unequivocally (already since 1990): "Yes, we have decided to use the nuclear power, to build the remaining part of the Temelín NPP. All our policy will be aimed to this purpose, we shall support the nuclear power production including also the fuel cycle final stage, i.e., the geological repository."

Marek Valvoda (moderator) – If I understand it correctly, according to your opinion the atmosphere of confidence would improve if the communities have the right of veto in the decision process on the geological repository siting. Also a long-term consistent policy of the state, that is so far missing, would help the situation. I have to add my remark as a moderator: We have now only five minutes for the discussion to this topic. Perhaps we have already exceeded the proposed time. Then we shall have a 15 minute pause and thereafter the session will continue. Mr Jirsa will now take the floor, Mr. Prasil will be the next speaker.

Zdenek Jirsa (mayor of Dolni Cerekev) – In Sweden, as mentioned in the previous seminar, the right of veto is not absolute, because under the present conditions, in this time and space, we cannot find full understanding. If somebody gives the local municipality the right of veto, in that moment we must forget the possibility that the siting in a Czech locality will be viable. I can state with full responsibility: the problem is not only a question of money. In the localities with the primary source its construction is enforced relatively easier as already mentioned by Mr. Cerny of Rouchovany. We should be aware that we cannot affect the situation around us. We, in Dolni Cerekev as the only community, have the so-called Memorandum on Mutual Understanding signed with RAWRA concerning the siting of the geological repository. It might be taken as my vanity, but all this would be very difficult to enforce if I would not have certain renown among the people, arising from other fields and my other activities. Without this prestige I might expect even a knife in my back. I say it quite openly, such is the atmosphere in the country, who is not there, who does not live there, cannot put himself into our shoes and imagine the situation. I can only appreciate the work that RAWRA does. However, they came to an already badly started work. And it is very difficult to straighten the already crooked relation between the stakeholders. This situation will last for a long time. There is a long journey before us and to gain the public confidence is

not only the question of money. When you mention the RAWRA or MIT motivation program, in that moment everybody will start asking: “Yes? And what is your profit from it?” This is caused by the corruption atmosphere prevailing here. This atmosphere is partly supported even by the mass media. They should be involved in these problems as a whole and not only to stress the negative aspects in which they are only interested. They should also present the positive aspects and to inform the public objectively. For people every mayor is a scoundrel who was bribed because this is what the commercial TV stations as Prima or Nova present in their news.

Zdenek Prasil (representative of the public) – I would like to mention that it is not sufficient to complain about the attitude of the mass media. It is also the problem of experts who are not willing to present themselves in the media, who underestimate these activities, or who believe that it will be of no avail. In short, I think that the experts should exert more efforts to present their views in the media.

Hana Vojtechová (NRI Rez) – However, if there is an interest in their opinions.

Otakar Vojtech (representative of public) – My personal experience is negative. After the revolution (in 1989) when I wished to make an attempt to promote science in the Czech media, I was told that people are not interested in it. Nowadays, the mass media are interested predominantly in negative news as accidents, when somebody is run over by train, or when somebody kills his own child. But an information how to solve the power production problems in the Czech Republic is presented – if at all – in the station Radio Prague 2 or in the afternoon programs of ČT 2.

Zdenek Jirsa (mayor of Dolni Cerekev) – One sentence more: At this moment everything is working. The power production is in order, nobody feels any troubles, so why to worry?

Pause 15 min

Marek Valvoda (moderator) - Let's go back to the problems of RAW management from the point of view of technology. Let us discuss the question whether it is possible to state that a situation will arise that – due to the possibility of the nuclear fuel reprocessing and reuse – it will not be necessary to build a geological repository because there will be practically no HLW?

Antonín Vokal (NRI Rez) – I would like to put it right. Such situation is not possible because always there will remain radioactive waste that should be disposed of and the deposition of which on the surface will not be acceptable from the safety reasons as they will contain certain amounts of long-lived radionuclides.

Karel Stamberg (FNSPE – Czech Technical University) – I have already mentioned in the first half of the session that one of the transmutation technology's aims is to decrease the time necessary for the deposition of the remaining wastes. Really, there is no wasteless technology. And this is true even for the transmutation technology.

Lucie Steinerova (RAWRA) – I would like to remind the fact that in the statute of RAWRA and in its plans there is a support of the new technologies development. For instance, it is just the cooperation with NRI Rez by which it supports research in these fields. More or less, we do not expect that the nuclear fuel will be disposed of in its present form. It is necessary to stress the fact that the spent nuclear fuel is not a waste. SNF is still the property of CEZ a.s. and only if CEZ will decide that it cannot be exploited any more, that it will not be reprocessed or used in other types of reactors, briefly: that it is not useful for them, only then the SNF will be declared RAW. At this moment RAWRA will take over this material as RAW for disposal.

Karel Jindrich (SONS) – You have omitted one thing. SONS has the same power.

Peter Lietava (SONS) – I would like to make more precise one aspect that has been mentioned here several times: that the period of deposition will be such and such. The time for the waste deposition is infinite if the waste will be disposed of in a geological repository. It is not assumed that it will be retrieved in future and transported somewhere for reuse. To speak about 300, 1000 or million year is somewhat misleading. These times are times for guaranteeing the disposal safety. But it is sure that the radioactive waste once that will be disposed of in a geological repository will remain there forever, even after the repository closure. And with respect to the economic advantages or disadvantages of the fuel reprocessing, there are many discussions and I personally am rather skeptical to these proposals or analyses. There are various scenarios but perhaps always we shall have to base our strategy on foreign technologies that are already under operation and generate insignificant amounts of waste, or technologies that still do not exist in a commercial scale. We do not know their price, what will be the precise outcomes of them, etc. It seems to me rather naïve and partly irresponsible to argue with these facts and to be against the construction of the geological repository. It is most probable that sometimes in future a geological repository will be built in the territory of the Czech Republic. The problem is what wastes will be disposed of in it, whether it will be the waste or spent fuel that will be declared as waste. However, with the highest probability any future development of the nuclear power production is unthinkable without the geological repository.

Karel Stamberk (FNSPE – Czech Technical University) – I would like to say that speaking of the time necessary for deposition no absolute time is meant, a time after which something will be done with the waste. This is always given by the level of radioactivity, usually by the level corresponding to the radioactivity of the uranium ore that was mined, of which the fuel was manufactured, etc. When I was speaking about 300 or million years, I had this meaning in mind.

Peter Lietava (SONS) – Obviously, but it is not the time of disposal.

Jiri Hulka (SIRP) – I would like to pose a question that could be interesting for the mayors and for other discussion: “What do you expect concerning the European legislation development in the possibility to dispose of the RAW in the territory of other European states?” At this moment it is not possible, but we should take into consideration the European Union development and the development of attitudes in EU in the last fifty years. A crucial question is why we are interested in building a geological repository in the Czech Republic even if the new European legislative will make it possible to dispose of the RAW somewhere abroad. My answer to this question is that we all wish the Czech Republic to achieve the highest possible technological level. The management with RAW, similarly as the nuclear power production itself, is part of these efforts. That is my personal view.

Karel Jindrich (SONS) – I would like to react to what has been said by Mr. Hulka. There are two aspects to this question. The spent nuclear fuel is not only a high level waste, it also contains the so-called nuclear materials. At present, there is an international agreement on the nonproliferation of nuclear weapons and in the framework of this agreement all civilized states of the world have their duties. To put together in one place all these nuclear materials in such enormous amounts as they are produced in the whole Europe, as proposed in the past by Ukraine or Russia, will not be allowed, even in distant future, to such states to have such unique RAW repository, that is simply impossible. So much can be said from the political point of view. It is not a question of professional abilities, it is not a question of other aspects comprising the information for the decision on the geological repository construction. For instance, the Russians have a sufficient professional background but nobody will dare to allow it for political reasons.

Antonin Vokal (NRI Rez) – I wanted so say something similar. There are small groups of people who discuss it worldwide and in the EU but these are rather groups active somewhere

at the margin of the present research main stream. And even in the case that it would be by chance realized, it does not mean that we can rely on it, do nothing and assume that somewhere somebody will perhaps build a joint repository. Simply, it cannot be solved in this way.

Peter Lietava (SONS) – Just to follow up with what had been already said. First, there is no any unified European legislative in this field and I believe that there will be none for a long time. There are various organizations as, e.g., WNA who are striving to prepare some documents that could constitute a basis for the European legislation in the field of RAW management but it would be rather naïve to expect that it will be realized in a span of 10-20 years. It will not happen. The historical relations, reasons, and conditions, under which the legislation of individual EU countries with respect to the RAW management has been formulated, were so different and incompatible that any unification will be very, very difficult and complicated. In the case of the international or regional RAW repository we again encounter the NIMBY phenomenon, when the general public supports the idea provided that it will not be in their country. This is a standard attitude. Every or, better, nearly every European country has in its legislation the ban of the radioactive waste import, except of the waste of its own origin. It means that only reprocessed spent nuclear fuel, the origin of which was in the given country, can be imported. This is also our own case. No other RAW can be imported to the territory of the Czech Republic. I would be very careful in this problem and I personally believe that the policy of European countries in this respect will not change for a long time. Thus, the idea of a regional or international repository, in spite of the fact that it is unequivocally a positive idea and that it would be fine to have such a repository available, becomes a science fiction and fairy tale. Moreover, there is nowhere a guaranty that the repository will not be in the territory of the Czech Republic, provided that such situation will arise.

Stefan Palagyi (NRI Rez) – I would like to say something to the problem of the geological repository from the point of view of the scientific research, from the point of view of a scientist. Even though we let the research in this field to others, there still should be here a group of people that would be able to take over the given technology and to work with it. This is true even in the other branches of science and research in the Czech Republic. Even small states should be at approximately the same level as large states, so they must work in this research. My opinion is that it is necessary to deal with this topic in the Czech Republic even at the scientific level. Another problem is that the research in this field is always stalled somewhere to future and that it is little supported both with manpower and funds. And I as a scientist really regret that the corruption problems do not avoid even us, though in a lesser degree than elsewhere. Even among us there are pressures to write a positive or negative reference, according to the requirements of the commission.

Otakar Vojtech (representative of the public) – A comment to what was just said: It is an enormously important idea that should appear in the conclusions of this seminar. It is very naïve to believe, in any branch of science, that we can accept everything that was thought out somewhere in Japan or China and that we do not need our own experts. It had never paid off and it will never pay off. Every state and every society should have experts for the given field. They will perhaps not contribute fundamentally to the global progress in this field but at least there will be here somebody who will be able to express a professional opinion to the issue. I have experienced such situation several times in my life when it was not so and the outcomes were catastrophic even from the financial point of view. Because, finally, CEZ or somebody else will have to buy the technology together with the experts and it will pay for it several times more than if it would have even a small group of experts who will understand the problem. People, who can participate professionally in the negotiations. What Mr. Palagyi

said here is extremely important and I am firmly convinced that it should constitute one of the results of this meeting.

Jiri Hulka (SIRP) – One thing more. First: your reaction to my comment exudes in me an impression that it would be worth more discussion. I have got a feeling that you would like to brush off the problem and this is always a signal for the moderator that the problem should be discussed in more detail. Four years ago I was honored by the chairmanship of one section in the International Atomic Energy Agency for the management with wastes so that I could understand the actual state of the affairs, for instance in the case of the Scandinavian repository and what are the activities of Switzerland. It is not true that an international repository cannot be realized within the next fifty years. In the U. S. they also have not a repository for every member state and they build the Yucca Mountains repository. It can happen that you will persuade the public here and after five years the Government will say: No, we shall dispose of our SNF in Scandinavia. You should take this into consideration. I say it quite openly. It could happen. And I would like to say one other thing: we are and will be keen on the construction of a geological repository of the same reason as we wish to continue the operations of the Dukovany NPP. Because there is a certain benefit in it. There is a loss in a potential psychological risk for the given community, on the other hand there is a benefit of money that it will bring to the community. Maybe, I put it incorrectly. There will be jobs for people, their life standards will increase, etc. People should be told about it. This is the reason, why we perhaps would be keen on having such international repository in the Czech Republic as it is a question of prestige. Similarly as the nuclear power industry is a question of prestige. Czech Republic has certain tradition, similar to that of France, etc. That is my argument. And I shall make still one more digression. Already for many years I am working in the radon program. You cannot persuade people that radioactivity means no risk. Even in our institute we have a colleague, who is very cognizant of the matter and nevertheless he is very afraid of it. The owners of radioactive houses of the clinker-concrete bricks wanted, perhaps back in 1999, to go to the parliament with cobblestones, because it was the Government who caused the situation, those 3000 family houses of clinker concrete. In the moment when the Mr. Pithart's Government made it possible to purchase these houses for their actual market prices, the problem suddenly ceased to exist. People used this opportunity only in about 250 cases of the total 3000 houses. There should be balance in the attitudes. It is stupid, but people will believe that you attempt to bribe them, they will call it “funeral money”, it was the same in Northern Bohemia. However, the French do it well and they do it this way.

Vaclava Havlova (NRI Rez) - A remark to the international repository. It is evident that something similar is not possible within the span of five years. If ever at all, then it is an actually distant future. I do not know of any European program that would take it into consideration. There are already well worked out programs, there are programs that were turned back of political reasons, but the possibility of an international repository is nowhere mentioned. Perhaps in a distant future, when EU will achieve another level of thinking and legislation, but till that time... Moreover, the idea is connected with such uncertainty that we cannot rely on it and we must work out our own program.

Zdenek Jirsa (mayor of Dolni Cerekev) – The case of an international repository, that has been discussed here, should not be underestimated but also overestimated. And we should not appease ourselves by the idea that this proposal could be realized in near future. I participated in a discussion in radio by a direct confrontation with Mrs. Jitka Seitlova, at present the deputy of ombudsman, who profited on it politically; in this discussion I was asked what shall I do with the hole in the earth afterwards. I could only say that in contrast to the state institutions who manage in a not fully responsible manner with other commodities, this would be the best investment into future, even if the prepared repository will not be used. The most

important thing is not to forget the necessary time demand for the project, if it will finally turn out that we shall need it. If the works are executed under time pressure it will lead only to an inferior quality of works. In a locality like Dukovany, where is a primary nuclear source, the problems with anything related to radioactivity is negotiated much easier. In Dukovany we have already from 1993 the central interim store of SNF, a deep repository, and we do not feel any decline in the interest for building houses and living in our community, that the prices of real estates will drop, as presented by the ecological activists. We observe the exactly opposite trends. This is one of the half-truths that are disseminated. When there are no more arguments, statements like this should suffice. I would like to add another example. If a mine would be built, we know very precisely what kind of mining technology will be used, what amounts of material will be transported away daily, and with what frequency. On the other hand, there is a quarry in our vicinity, where already two hills disappeared. This problem does not interest the ecological activists. Two hills leveled to the earth! With respect to the Memorandum of Understanding with RAWRA I have asked to obtain two EIA analyses on my desk – the disappearance to those two hills and the construction of the geological repository. This is the only approach to the public as the activists are already lacking arguments that people are willing to hear. However, on the other hand it should not be underestimated. I am not against the ecologists if their argumentation will be at the same level as the arguments of the professional public. Then there will be parity in the negotiations. This is not the case when there are no more arguments and only intimidation remains.

Lucie Steinerova (RAWRA) – I would like to go back and to react to the contribution of dr. Havlova concerning the international repository. Unfortunately, there exists an international project called SAPIERR dealing with the international repository. It is very problematic. Several countries joined together to solve the possibility to dispose of the SNF in a joint international repository. This project revealed that the joint repository is feasible only for countries with a limited nuclear program. It is perhaps logical that countries like Croatia and Slovenia, who own one reactor and use it together, will build most probably a joint repository. Because they separated and due to the historical and political circumstance it will be already an international repository. I am a member of the Forum of Stakeholders Confidence under OECD/NEA and this project appeared on its December meeting. Most of the countries that presented there their programs of geological disposal had problems with it. It would be nice to have a European project solving the possibility of international disposal. However, during three years assigned for these programs this problem cannot be solved. It is a complicated political problem. It also undercuts the national programs as it given the opponents a weapon in their hands that there is an international program of an international repository. However, it is fully theoretical, without any practical impacts and basis, but it gives a weapon to the opponents, that this is the way how to solve the problem. But nobody could guarantee it to us. Further, the countries with the already well advanced national programs, as Sweden, Finland, France, also protest against this program. It would be unfair if Europe will forsake them in this respect. They struggle with the problem for twenty years, solve their difficulties and suddenly the European Union comes, after twenty years, and says: “Well, you have already solved it, so you can leave it there, when you solved it at your own expenses, we shall now try it otherwise.” So, it is unfair also to those who have already solved it.

Vaclava Havlova (NRI Rez) – I would like to ask the representatives of municipalities who communicate with the ecologists protesting against these activities: did you ever ask them whether they take care also about the current problems concerning the environment pollution by the people themselves, by those who live in the given towns and communities? I do not know whether you noticed the fact that in the last two years the quality of air deteriorated rapidly in small towns and communities, because of the increasing prices of all heat sources.

People burn practically everything, including painted boards, etc. This is a much worse pollution and hazard than anything else.

Marek Valvoda (moderator) – I beg your pardon, Mr. Jirsa, I shall give you the floor just after Mr. Hulka, who asked for the floor before you.

Jiri Hulka (SIRP) – I will go back to the contribution of Mrs. Steinerova. If this first international project will prepare a route, it will be, unfortunately, a precedent in the European legislation. I know from the example of personal dosimetry that other countries protect their dosimetric monitoring systems. France and Germany do not want even to adopt the common units. Here is a similar situation: every state invested some money into it and they want to keep it. Let us do it also. We would be stupid not to do so. However, I would like to add that within few decades there will be a very hard international struggle for the geological repository business. I believe that Croatia-Slovenia will be the first precedent. Afterwards, the European legislation could evolve in another direction. It is a marginal note but I think that it would be of advantage for you to know this information so that nobody could surprise you. This is all what I wished to say. Thank you.

Marek Valvoda (moderator) – Mr. Jirsa, before I shall give you the floor, I would like to note that we can leave the issue of the geological repository technological solution, whether the geological repository is or is not necessary, and whether to build an international or national repository. In principle, we have agreed that the repository is necessary. There remains the question whether to build a national repository or a joint European or regional repository. The pro and con arguments are summarized on the blackboard. I shall read them:

- 1) Legislation of most European countries does not permit the import of radioactive materials and SNF;
- 2) The construction of a geological repository will represent certain prestige of the Czech scientific and technological achievements and the preparation of new experts in this field;
- 3) Most probably, even in future it will concern a strategic material and from the political point of view it is already so;
- 4) So far the international repository is not in sight and the situation with it is uncertain;
- 5) If the geological repository is built in advance, the works could be made in better quality than if it is built in the last moment;
- 6) The geological repository will give also some advantages to the given state or region – financial support, jobs, etc.

We could now go to the next topic and this is the NIMBY phenomenon. I ask now Mr. Jirsa to take the floor.

Zdenek Jirsa (mayor of Dolni Cerekev) – I believe that Mrs. Havlova hit the mark. My own personal experience is that when the problems with the central interim store of spent nuclear fuel started, we sent our comments to the formulation of the Atomic Act – e.g., the right of veto (but under a pressure, now I can already say it, we all know the present formulation of the Atomic Act). They included us into the Economic Committee of the Parliament and we could present our comments. If you become involved with the ecologists, as it happened to me, because I came to the Parliament as a non-entity, what could I represent there? Mr. Sequens and Mr. Beranek came there (two guys with rucksacks), sat down, each of them recited his own slogan, prepared beforehand, they left and suddenly the mass media put me into an alliance with them. The worst thing the ecologists do is that they mention only the fragments in which they are interested and nothing else. When WATRP was held in Prague in 2004 and the mission chief asked the representatives of Calla, DUHA, and Greenpeace: “What do you do with other toxic wastes that were transported from France to Germany where they were disposed of in a safe dump but under the open sky? Do you solve also such problems? Here the humankind tries to close the fuel cycle and to face the problem in a very

transparent way and with full responsibility.” Only silence was the answer. Simply, other wastes do not interest them. Wastes are something that can be covered with soil and it will stay there. The fact that I am examined by X-rays and get a dose – well, that is a dose that will help me, but never doses from the RAW, but still I want electric light! The ecologists do not solve the concepts and – I beg your pardon – it is due to the fact that there is a political party in the government coalition that gives them the floor. It opens a debate that all fees will increase (for the electric power, gas, etc.) in spite that the society has no economic means to meet these expenses. I can understand that certain regulation should exist but not at all costs! Then, we all breathe it, mainly in the country, where people have somehow different incomes than Minister Mr. Bursik and his colleagues imagine. No, they do not propose any conception, they are always interested only in a fragment that is attractive for media, could made them visible and is thus interesting for them. Unfortunately, that is the fact. Such is my experience.

Marek Valvoda (moderator) – I can only remark that the representatives of the ecological initiatives were also invited but, unfortunately, they did not come.

Zdenek Jirsa (mayor of Dolni Cerekev) – I would say the same thing even if they would be here.

Hana Vojtechova (NRI Rez) – I have just said here that it would be very interesting to hear their reaction to what had been said here. To know their opinions. But, alas, in spite of all my efforts they again proved their disinterest in any discussion and they did not come.

Peter Lietava (SONS) – Perhaps if there were the media they would come. Here, it is difficult to become more visible.

Hana Vojtechova (NRI Rez) – That's true, I did not promise them any publicity. They were offered only certain financial support for the participation in this seminar and, perhaps, in the ARGONA project. This is not an attractive topic even for the media.

Jiri Hulka (SIRP) – One more experience from the Vienna conference in 2004: Similarly as the nuclear group, also the “waste” group accepted the philosophy of ecologists and of other groups – “You evaluate that the risk is 10^{-5} but it is not sufficient for us, we want 10^{-8} .” This is a route to hell. The same thing happened with EIA in the case of the Temelín NPP and the same thing happens even here. I remember one American lady who came out with it. For instance the following problem was discussed: “200 years ago, there was the French revolution. How can we know what will happen after another 200 years?” Whether there will be people who, for example, will not be able to cope with it and will be irradiated, etc. And the audience accepted this idiocy. Nobody came out with an opposite idea: “Just imagine the following scenario: we shall not put it into a repository, into bitumen, etc., but let us imagine the worst possible case: by mistake, somebody will put it into a nursery garden. What will happen? It will turn out that practically nearly nothing serious will happen. Primarily, it is shielded so that the doses are minimal. Even if somebody will dismount it, the scenario will be the same as in the case that happened about 6 years ago in Georgia with the lost strontium source left there by the Russian army: several people will be irradiated so that they will get the radiation sickness as it was the group of woodcutters in the case mentioned above. Usually a physician will recognize it. That other group that will come to see the accident... I have prepared a scenario that it will be discovered by savages. Those who will come first will be killed by the radiation sickness. However, those who will come later will realize the danger, will be more careful and will get a dose that is not immediately lethal, that will cause the so-called stochastic effects, i.e., a higher risk of cancer and tumors. This means a dose of 1-2 Gy and if you take into account the risk coefficient of 5×10^{-2} per Gy, it means 5 per cent. This means that in the group that will be exposed to a maximum dose so that they will not die immediately there will be a risk by 5 per cent higher that they will get cancer. The risk of spontaneous appearance of cancer is 25 %. That will be second worst irradiated group. My conclusions were that few members of such group of savages will die and the survivors will

make from the place a taboo and will not go there any more. I do not know whether you can remember it, but there were scenarios worked out on the situation when the civilization as we know it will come to an end, whether it will endanger the human beings as such. There is a trend to find out what will happen in the worst possible case and it turns out that practically nothing serious will happen. In comparison with automobile accidents the risks are nearly negligible. This argument is nearly never used, similarly as the arguments with natural analogues, e.g., the natural nuclear reactor Oklo. The ecologists pose a question what will happen, where it will spread in the underground. This example from the nature, without any engineering barriers, demonstrates that they spread nearly nowhere.

Marek Valvoda (moderator) – So, if I understand it correctly, the problem would need a more elaborated argumentation strategy. And sometimes to use a not fully classical argumentation that is generally used.

Jiri Hulka (SIRP) – I think that it is not good to be always in defensive and to accept their not fully fair arguments.

Vaclava Havlova (NRI Rez) – And to present it positively. I have noticed in the comment of Mrs. Steinerova, already in one of her first sentences, she used a formulation that the geological repository is a menace to some communities. Nothing similar should appear in communications with the public. All advantages should be more pronounced and positive examples presented. Of course, it is not possible to cheat them but the overall approach should be positive.

Lucie Steinerova (RAWRA) - Naturally, in our communication with press we never use such sentences. I only quoted the opinions prevailing in the communities.

Karel Jindrich (SONS) – Well, it is also necessary to present the radiation protection requirements in a comprehensible form. Not only for those who enforce them, i.e., the regulators and operators who apply them, but also to the general public. It must be clear what the rules mean. My opinion is that in this respect there is a great debt on the side of those who prepare these rules, i.e., on the international community of people working in radiation protection. They should take this more into consideration. They already started to do so, several documents of this type have been already prepared. Another crucial document on radiation protection is now under preparation. It seems that it will end similarly as the preceding document ICRP 60. The regulators themselves as well as the inspection bodies and those who had written it have problems with this document. That is the core of the problem. We, the professionals should be able to present these issues to the public so that it would be comprehensible and easily explainable on a simple example. If we are not able to prepare it in such form, how could we expect that the general public would be able to apprehend such complex problems?

Jiri Hulka (SIRP) – I would like to mention one experience that turned out from another meeting with individual stakeholders: a group of American experts (I believe that they were from the Yucca Mountain) never negotiates with the public as they are not able to communicate with them. They adopted another approach: the given community delegated to these so-called experts a group of trustworthy citizens, in America these were usually a parson or vicar, a physician, a teacher. The experts tried to answer their questions. This group of confidants returned to the community and tried to explain it to the community inhabitants. This is an experience from the so-called “faction leaders”.

Vladimir Cerny (mayor of Rouchovany) – So the RAWRA representatives should never go to people because they are nearly experts. For instance, they also did not start very successfully when they came to us with a data projector and said: “This is what we would like to build here”. My comment ends here.

Marek Valvoda (moderator) – So we came back to the problem of communication between stakeholders. Now Mr. Vokal asked for the floor. I only want to remind you that we have only about 10 minutes more for the discussion.

Antonin Vokal (NRI Rez) – I would like to go back to the NIMBY problem. My information is that it is a global problem and that people accept it only in localities where they are already accustomed with nuclear energy. This means that there is a nuclear power plant or another facility, e.g., for the fuel reprocessing. I discussed the problem with many people and they were convinced that these are the only places where people accept also the idea of a geological repository. This is a signal for us that it is necessary to involve the public more in these issues and to make them more acquainted with the nuclear power production. Only then it would be more probable that they will get used to it. It could become their personal job. And thus they might also better accept even the geological repository.

Stefan Palagyi (NRI Rez) – It is a pity that the “greens” are not present as some of their arguments have no real basis. However, we, the nuclear power partisans either from conviction or profession, must deal seriously with their objections. By the way, we the “waste experts” or “nuclear facilities decommissioners” will always be here even if the nuclear power utilization will stop. We must react with respect to it. I would not like to be personal, but it had been mentioned here how to use the arguments of the so-called deterministic effects. I do not wish to support the opinions of activists but they will for sure come out with the question: “And what about the stochastic effects? Effects that will appear only in next generations even after a small dose of radiation?” It is only an example that this could happen and we should be able to answer such questions. Really, about 30 years ago I was in America on a course and Mr. J. Fabricant, an expert of Argonne National Laboratory, discussed there the meaning of an acceptable risk. People are willing to sit in an automobile fully aware of the fact that daily 20-30 people die in an automobile accident. On the other hand they enter an aircraft with unpleasant feelings or a fear: “What if the aircraft falls down?” even if they know that the percentage of people perishing in an aircraft accident is disproportionately lower. The reason is that people face much better a risk that they themselves can affect. I would like to paraphrase the statement of Mrs. Vojtechova that not only every human activity is connected with wastes but every activity is also connected with risks. And my attitude to the problem depends on my acceptance or non-acceptance of the risk. In the case that I can affect it, i.e., if I have the feeling that I have the wheel in my hands and I can avoid the danger, I am able to accept the risk. This is not so in an aircraft. This attitude acts also with the NIMBY effect: if I have it already in my “backyard”, I cannot do anything with it and I cannot avoid the fact that there is a nuclear power plant in vicinity. Thus I propose to act as Roosevelt did: we need to influence the public psychologically and from within. Man is a sociobiological being so that he can listen to such arguments. Even if economy permeates in it. I am convinced that in many regions, if CEZ would fulfill its promises of a cheap energy in connection with the construction of the Temelin NPP and putting out of operation the coal-burning power plants that consume one of the most precious chemical raw materials, the attitude of the public would be different. CEZ should guarantee to the inhabitants of the locality lower prices for electric power as the repository was built in subsequence of its production. That they would not pay 4.50 CZK for one kWh but, e.g., only 40 halers. Well, maybe I overdid it somehow... but it concerns the principle. That is the President Roosevelt's method of “sugar and whip”. As far as our population is not so educated, even such “tricks” should be used. All cost money, not only education but the stupidity too. Sometimes even more so.

Karel Jindrich (SONS) – I will mention only one experience that should be considered by those who wish to build a geological repository in our region. How the people from the Dukovany NPP succeeded to persuade the people in Dukovany that they like more the towers

of the Dukovany NPP than the “windmills”? How to achieve it? Mayor of Rouchovany should perhaps tell us how it was possible that people grasped the fact that the power plant is more important for them than the windmills around?

Vladimir Cerny (mayor of Rouchovany) – It was quite simple. Last July we held a poll in our community on the wind power plants. There was a question there: “Do you agree with the erection of wind power plants in the territory of Rouchovany – YES – NO?” ČEZ, a.s., sent in advance some printed materials to the households, then there was a big advertisement in Horacke noviny (Highland News) published on Friday so that it had little effect on Saturday because only about 5 % of people read it. All these activities were without any financial support from the municipality that we would say to them: 10 windmills mean 2.1 million CZK annually into the municipality budget, etc. We have left the problem entirely on the people. They knew what they knew. 76 % of population was against it, 24 % for the windmills. But it was polling not on wind power plants but rather on CEZ itself. Some people in Rouchovany came from Skryje, Lipnany and Hermanice, some of them lost 5, 10 or even 20 hectares of land due to the construction of the nuclear power plant. Other people were employed there and due to the transformation of the company and saving of manpower they were fired. So it was voting on CEZ, on its promises (or promises of the state) that there will be a cheap electric power, that we shall have a zero tax on real estates, that there will be a trolleybus line Trebic as the district center, and that in a wide region around the NPP the people will obtain heat from the cooling towers. Nothing of these promises has been realized. People have it fixed somewhere in their brains and they say: “Well, when CEZ or the society as such had promised so much and nothing turned out of it, what they will do now? They will make a promise again and again they will do nothing.” Now, after the last reportage from Novy Hradek, that presented a view of two windmills with cables dismantled from the body and are standing there deserted, people say: “It is good that we did not want it, they would stand here as well.” Mr. Josef Sedlák from CEZ sat with us in the local authority and I said him: “Josef,” I am on first name terms with him, “what are the costs for the assembly of one windmill?” He said: “About five millions.” Then I said him. “Fine, so you will give us to our account blocked by the notary 5 millions for every windmill so that we will have funds for their dismantling after you will finish your works here.” That was the end of the discussion. Such is the reaction to the situation when our people did not give their consent. And as concerns the nuclear power support: in the negotiations dealing with the intention to build the construction of wind power plants several citizens stood up and said: “We do not care for the windmills, build us another unit of the nuclear power plant!” Which is a great asset for this our discussion? On the other hand, the same citizens ask: “Mayor, what will be with the spent fuel, with those containers, when the government hesitates and is not able to find an actual locality? Where will you dispose of it?” That again is the NIMBY-type question.

Marek Valvoda (moderator) – I am sorry, but we agreed that we shall discuss the matter till one o'clock. However, this topic is very wide and we did not succeed to cover all the problems that we planned to negotiate. So, Mr. Jirsa, it is the last floor I give you.

Zdenek Jirsa (mayor of Dolni Cerekev) – Only one fully technical and pertinent notice: it would be necessary to explain to the nation what the electric power dependence is, what the price of power is, et cetera. Full stop, that's all what I wished to say.

Marek Valvoda (moderator) – In our last topic we should put together the pro and con arguments that were mentioned in the discussion. Finally, I would like to hold you up a little more and to ask you for a brief assessment of the seminar outcomes. What you liked and vice versa, whether it was worthwhile for you and what you would recommend to organize in another way in the next seminar. Is it possible? Yes, Mr. Vojtech, take the floor!

Otakar Vojtech (representative of the public) – Short remark: first I expected that it would have been very useful and it indeed was so, but the topics were too wide. There are too many

problems and everyone wished to express his ideas. I believe that a still higher number of such meetings should be organized but with more limited scope. Also the general public should be present at them, not only the public that came together here, because we all hold more or less the same opinion.

Marek Valvoda (moderator) - If I understand it correctly you miss here the presence of opponents.

Otakar Vojtech (representative of the public) – Yes, and moreover, there should be somebody as skilled as you are, who would be able to draw certain conclusions from the discussion. The conclusions should be recorded and pushed forward.

Zdenek Jirsa (mayor of Dolni Cerekev) – Also somebody with influence on the media should be present, for instance from the Ministry of Industry and Trade. A head of a department or his deputy as a minimum. These people should come at least once and listen to our complaints. So that it would become a pilot program of somebody who is able to push it into the mass media.

Marek Valvoda (moderator) – How should I put it in a written form? A political representation is missing?

Zdenek Jirsa (mayor of Dolni Cerekev) – Yes, certainly. Perhaps even a minister of the shadow cabinet.

Lucie Steinerova (RAWRA) – Also one senator was invited.

Hana Vojtechova (NRI Rez) – This is not exactly correct. The representatives of individual ministries were invited, namely the representatives of the Ministry of Environment Protection, Ministry of Industry and Trade, and also of the Ministry of Finance. None of them exerted an effort or was willing to participate in this seminar. There were efforts from our side, similarly as we tried to bring here also the non-governmental organizations. However, we have no means how to compel them to come.

Otakar Vojtech (representative of the public) – Write these conclusions in newspapers!

Vaclava Havlova (NRI Rez) – Could RAWRA as a state institution responsible for these problems issue a memorandum on the presentation of these problems in this seminar and to point out that nobody from the respective ministries wanted to come?

Lucie Steinerova (RAWRA) – We can issue a press release, we can write letters. On the other hand it does not work this way. We cannot simply say: “We had prepared this and that, we had invited you and you did not come!” We can inform the RAWRA Council.

Hana Vojtechova (NRI Rez) – Even the RAWRA Council was invited.

Vladimir Cerny (mayor of Rouchovany) – Just a short remark, the RAWRA director is appointed and disengaged from his function by the Ministry of Industry and Trade so you cannot expect that somebody will go against his founder. Do not ask RAWRA to do so. It is a problem of the founder himself!

Zdenek Jirsa (mayor of Dolni Cerekev) – I think that finally it will be our business as we are those who act as the intermediates between the state and the citizens. We can afford it. For us it is irrelevant who just the steersman in the Ministry of Industry and Trade is. We wish to move these problems ahead in principle. I already mentioned it during the pause: we shall make an appeal to them and if they will not react, in that moment a negative response will appear and you can be sure that (some) media will gladly publish it.

Hana Vojtechova (NRI Rez) – I would like to react to this remark. So, if it would not pose any problems to you, we would gladly come to you next time and ask you for help and cooperation. Other events are being prepared as, e.g., “Consensus panel” in which we would like to gather all stakeholders. It would be propitious if you addressed them from the point of view of local municipalities.

Zdenek Jirsa (mayor of Dolni Cerekev) – I would be discussed, you can be assured.

Hana Vojtechova (NRI Rez) – We can also invite the media but it is questionable whether they will be interested. In this respect and with regard to our previous experience I am rather skeptical.

Marek Valvoda (moderator) – I shall now stop for a moment to be a mediator. If the media come, the others will come for sure.

Karel Jindrich (SONS) – Something similar to what was just held here could be organized in one of the selected localities. And you can be sure that if they will chase you out with forks, the newspapermen will write about it!

Zdenek Jirsa (mayor of Dolni Cerekev) – Before the moderator will stop the discussion I would like to say that the most difficult thing is to incite the opponents for any discussion. Even if the forks will be kept somewhere in the antechamber, the main thing is to instigate them to come! Because when they are not in a predominance to beat down your pragmatic arguments, they are not willing to discuss at all.

Marek Valvoda (moderator) – Well, is there still something to these methods of information and meeting?

Peter Lietava (SONS) – It would be appropriate to organize a meeting similar to the present one also only for the professional public. We have heard here various opinions even within the framework of professionals that were antagonistic and even in our Office there does not exist any consistent opinion to the problems of the geological disposal as an end of the fuel cycle. So it seems worthwhile to organize a seminar for the professional public and to discuss very profoundly the attitudes and to formulate the arguments why the national repository yes/no, why the regional repository yes/no, why reprocessing yes/no, why the transmutation technologies yes/no. It would be worth the efforts and perhaps it would make the professional public more unite.

Antonin Vokal (NRI Rez) – This was one of the seminars denoted as Focused Science Shop where more professionals than laics are present.

Vladimir Cerny (mayor of Rouchovany) – One plus argument is that this seminar was organized at all.

Vaclava Havlova (NRI Rez) – I would like to add one plus more: I am usually in contacts with people at the other end of the spectrum and I have little opportunity to meet people who are directly influenced by the nuclear power plant or by the siting of the geological repository. The meeting was for great avail to me, both from the points of view of information and contacts.

Otakar Vojtech (representative of the public) – I have one proposal to the mayors. Go, for instance, to France to the communities where they have a nuclear power plant or another related facility and have a look on the ways how the mayors live there and how they administer the community. I know it. Years ago I was there and I discussed the matter with one of the mayors of these communities. You will be surprised that they have many positive views on the nuclear power of which we here know nothing.

Zdenek Jirsa (mayor of Dolni Cerekev) – In this respect I would like to appraise the RAWRA activities in the organization of various excursions. This is a moment when, lacking more cogent argument, the ecologists will say: “You are going there for state money!” Now, if we want to send somebody there, the said person is afraid of falling back socially in the region where he lives if somebody will mark him as a nuclear protagonist, etc. You should feel these pressures for yourself. It is a good idea as we have not been there yet and about 78% of people there are for nuclear power. It would certainly be interesting. From our travels in France we know that there is a power plant, a small lake nearby, a highway, it is a small fragment of France as the castles on Loire. It would really be instructive and good. But the question remains how to get the people there? RAWRA is doing a lot. Even things that Mrs. Vojtechova and RAWRA do now are a progress in some direction. Up to now it was only

treading water. We did not know what can we dare to do, we in the municipalities have been in an enormous defensive to the citizens. Nowadays, we already reached some parity even in the field of professional knowledge. You have certainly recognized that we are not totally laics and only representatives of local municipalities that we are already better informed and this attitude is also transferred to the people. So I say: more such activities!

Marek Valvoda (moderator) – So, if there is nothing to discuss more, I thank you. For my person I would like to thank you for your activity and for your presence at this meeting. Many thanks.

Hana Vojtechova (NRI Rez) – I would like also to thank you for your participation on this Focused Science Shop and for your inspiring presentations in the discussion. And I hope that we shall meet again in the next similar events organized within the framework of the ARGONA project.

Abbreviations used:

HW – hazardous waste

RAW – radioactive waste

SNF – spent nuclear fuel

NRI – Nuclear Research Institute

RAWRA – Radioactive Waste Repository Authority

SONS – State Office of Nuclear Safety

FNSPE – Faculty of Nuclear Science and Physical Engineering

SIRP – State Institute of Radiation Protection

MIT – Ministry of Industry and Trade

MEP – Ministry of the Environment Protection

MF – Ministry of Finance

CEZ – Czech Electricity Company