

Dealing with uncertainties in the process of planning geological disposal for high-level radioactive waste in the Czech Republic

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The Czech Republic is one of the countries that use nuclear power plants to generate electricity. As such, it is faced with the question of what to do with its used nuclear fuel and high-level radioactive waste. Similarly to a number of other European countries, its preferred answer to this question is the construction of deep geological disposal (GD). But as in the other countries, it turns out that the planning and the construction of GD is a complex socio-technical endeavour that is characteristic by a number of uncertainties that implementers, scientists, and the public have to face: there are uncertainties about the future availability of drinking water near the GD, about the future development of local real estate market or tourism, while there are also scientific uncertainties related to metal corrosion or interaction of bentonites in granite environment. At the same time, governments and implementers have set goals that specify when GD is to be constructed (e.g. EC 2009, p. 9, MPO ČR 2001). Therefore, there is pressure to deal with these uncertainties.

The aim of this paper is to investigate ways in which some of these uncertainties are handled in the process of negotiating geological disposal. The first part of the paper will consist in a discussion of the most important policy documents that frame the management of highly radioactive waste in the Czech Republic. The aim of this part is to see whether and how uncertainties are addressed in these documents. The second and the major part of the paper will consist in an investigation into how some uncertainties are articulated and handled in specific situations of negotiating geological disposal in the Czech Republic. The aim of this part is to see how different actors articulate and frame uncertainties, how they try to reduce them or make them more visible, bypass them or mobilise them to support their arguments.

Risk governance literature has developed various categorisations for different types of risks. For instance, Klinke and Renn (2002) distinguish between “simple”, “complex”, “uncertain”, and “ambiguous” risks, with consequences for how these risks should be treated (see also Renn 2005). However, such distinction reduces uncertainty into a specific category and a special condition within risk management, and as such it has recently been disputed: de Vries et al. (2011) argue that risk problems may move between the four categories, and therefore policies based on this distinction are misleading (de Vries et al. 2011, p. 497). They propose to turn the problem around – to put uncertainty forward while considering risk a special case, “namely as a condition that may come about when the efforts to translate uncertainty into (calculated) risk have been achieved successfully.” (*Ibid.*) It is in this framework that this paper will proceed. In the case of planning GD it is clear that – mainly due to the extremely long time frame, which can be in terms of human experience described as “eternity” – it is problematic to speak of quantifiable risks. Rather, it seems much more appropriate to focus on uncertainties, and consider risks only as potential special (and probably very rare) cases. In this respect, the paper will follow the recommendations of de Vries et al. (2011) and the WRR (2009).

The paper is based on interviews with different actors who take part in the process of negotiating geological disposal in the Czech Republic – members of staff at the implementing organisation RAWRA,¹ mayors and representatives of the concerned municipalities, members of

1 RAWRA stands for “Radioactive Waste Repository Authority”. It is a state organisation established on the basis of

NGOs, and a scientist. It also draws on empirical material collected during several public debates as well as official documents and technical reports.²

Uncertainties in policy documents – handling uncertainties by means of a process?

In policy documents, the presence of uncertainties in radioactive waste management is generally expected and accepted. However, the references to them seem to be rather superficial. For instance, the European Council directive 2011/70/EURATOM refers to uncertainties twice: first, in paragraph 34 of the preamble, it states that

“The documentation of the decision-making process as it relates to safety should be commensurate with the levels of risk (graded approach) and should provide a basis for decisions related to the management of spent fuel and radioactive waste. This should enable the identification of areas of uncertainty on which attention needs to be focused in an assessment of safety.” (European Council 2011, p. L199/51)

The Council directive expects uncertainties, and it expects the national radioactive waste management programmes to take them into account when carrying out safety assessment. It relates uncertainties to risks: a graded approach which helps address different levels of risk should also help identify uncertainties. Nevertheless, the directive is not more specific on how to deal with these uncertainties.

Second, paragraph 3 of Article 7 of the directive talks about licensing and the related safety demonstration. It calls for a rigorous demonstration which is “commensurate with the complexity of the operation and the magnitude of the hazards associated with the radioactive waste and spent fuel, and the facility or activity.” (European Council 2011, p. L199/54) The very last sentence of the paragraph states that the approach outlined “shall identify and reduce uncertainties” (*Ibid.*). Here again, uncertainties are expected, and they are expected to be identified and reduced by employing a thorough licensing process with safety demonstration. Thus, in both cases mentioned here, it seems that the European Council directive expects that there will be uncertainties in radioactive waste management. It asserts that attention needs to be paid to them, and in both cases it expects that an appropriate *process* can be used to handle them. In the first case, a decision-making process which employs a graded approach sensitive to different levels of risk is advised. In the second case, a thorough licensing process is expected to help identify and reduce uncertainties.

David Durant makes a similar observation when analysing the Canadian radioactive waste management programme. At a certain phase of the process, Durant observes, it was being differentiated between “ineradicable uncertainty” and “uncertainties expert judgement had already resolved.” (Durant 2009, p. 908) Durant further argues that “the contentious middle ground of remaining uncertainties was said to be resolvable by adherence to management principles.” (*Ibid.*) Thus, it seems that adherence to processes or management principles is indeed sometimes seen as a way to handle uncertainties, and not only in policy documents, but also in radioactive waste management praxis. However, Durant's observations tell us more than that. Although he does not say it explicitly, when he mentions that some uncertainties were said to be resolved by experts, others were supposed to be dealt with by following management principles, and yet others were said to be ineradicable, he shows that in that specific situation, uncertainties were handled by means of categorisation. Some uncertainties were identified as resolved, others as resolvable by means of an

the Czech Atomic Act in 1997. It is responsible for the management of all kinds of radioactive waste in the Czech Republic. Organizationally, it is established by the Ministry of Industry and Trade. (For more information on the institutional background of radioactive waste management in the Czech Republic, see e.g. Svačina and Konopásek 2012, p. 3.)

2 The empirical material used in this paper is being collected during our work on the InSOTEC project, which is funded by FP7 Euratom (www.insotec.eu). The topic itself is a part of my doctoral research.

appropriate management process. Thus, what remained was a relatively smaller category of uncertainties that could not be done away with. Apparently, such categorisation was seen as legitimate: Durant observes that in that situation, “disposal technology was considered sufficiently advanced, and adaptable enough to local sites.” (*Ibid.*) In sum, it seems that at a policy level, a way of handling uncertainties can be to categorise them and delegate them to various domains, such as expert or scientific work or management principles.

The Czech government adopted a policy document called “Strategy for dealing with radioactive waste and spent nuclear fuel in the Czech Republic” in 2001 (MPO ČR 2001). This is a binding document that RAWRA follows. Among other things, the document states that geological disposal is the preferred choice in long-term high-level radioactive waste management. It also provides a schedule for finding a site for and implementing the geological disposal. According to this schedule, a “primary” and a “backup” site “with best geological conditions” for geological disposal need to be identified by 2015. By 2025 the choice will be confirmed by detailed site investigations. By 2030, the construction of an underground laboratory needs to be prepared, and finally, by 2065, the repository is to be opened (MPO ČR 2001, p. 22; cf. also Svačina and Konopásek 2012, p. 8).

The Czech governmental strategy document does not mention the possibility of uncertainties related to geological disposal preparation and implementation. It mentions several risks, such as the risk of insufficient funds due to the shortened operational life of the Czech nuclear power plants,³ or due to unexpected macroeconomic circumstances (MPO ČR 2001, p. 24). Another possible risk that is identified is that of not finding a suitable site in terms of “safety, technical obstacles, or public opposition” (*Ibid.*). Nevertheless, this chapter in the Strategy seems to be somewhat underdeveloped (it is the very last chapter of the document and it is half a page long).

All in all, while uncertainty seems to be acknowledged in some policy documents, specific ways of dealing with it are not developed there. After all, it is reasonable to say that it is impossible to address uncertainties specifically in a general policy document. That gives us yet another reason to pay attention to specific situations where uncertainties appear. Therefore, the following part of the paper will have a look at the process of negotiating geological disposal in the Czech Republic, and see how uncertainties are articulated and handled in some specific situations.

Negotiating site investigations

According to the official schedule for implementing geological disposal in the Czech Republic, the main present task for RAWRA is to find suitable sites for constructing the repository. To this end, in the early 2000s RAWRA announced six areas as potentially suitable. This selection was said to be based mainly on preliminary aerial and surface investigations of the geology. This announcement was followed by strong local public protests in the municipalities concerned – a social conflict developed around the issue of siting geological repository. Partly as a result, the Ministry of Industry and Trade declared a five-year moratorium on the process. This moratorium was concluded in 2009 with a conference called “Towards geological disposal without conflict”.

Since 2009, RAWRA is trying to negotiate with the six areas, and most recently it added an additional area to the list. Therefore, presently there are seven areas identified as potentially suitable, and they comprise of 39 municipalities⁴. In 2010, a national “Working group for the dialogue about geological disposal” was established. The group brings together mayors from the

3 According to the legislation, a “Nuclear fund” was set up, and radioactive waste management is financed from this fund. By law, the producers of nuclear waste have to contribute to this fund. As for the nuclear power plants, their operator pays 50 CZK (about 2 Euros) for each Mwh produced in a nuclear power plant. Therefore, should the operating lifetime of the nuclear power plants be shortened, the operator would pay less than had been expected.

4 For a more detailed account of this history, see e.g. Svačina and Konopásek 2012, p. 5.

affected municipalities, members of local and national NGOs, people from RAWRA as well as from several ministries and other state offices. One of its main aims is to “improve the transparency of the site selection process with respect to the public concerns” (Pracovní skupina pro dialog o hlubinném úložišti 2010, p. 1). So far, the group has focused on how to change existing legislation in terms of strengthening the position of municipalities in the negotiation and planning process.

The current situation is that RAWRA is trying to obtain consent of the municipalities with geological site investigations. RAWRA as well as representatives of the Ministry of Industry and Trade have repeatedly stated that the consent with geological research does not mean a consent with the repository. In October 2012, first two municipalities signed a contract with RAWRA that expresses their consent with the investigations. Nevertheless, most of the municipalities have refused to give their consent so far.

At a public meeting in Věžná in April 2012, Jiří Slovák, the head of the geological disposal development programme at RAWRA described the proposed site investigations as following:

The geological research will be relatively simple, there certainly will not be any major drilling before 2018. In all cases, there will be surface geophysical research, which means that a small team will walk around, set up some cables and carry out measurements. Geochemical research means drilling shallow holes approximately 2 to 5 metres deep, depending where the bedrock is, and taking samples of soil and rock from this bedrock and their analysis. Subsequently, or in parallel, there will be geological and hydro-geological mapping. Only afterwards a decision on drilling several deep drills will be made. We suppose that these will be two to three drills 500 metres deep, and one to two drills 1000 metres deep.

(Jiří Slovák at a public meeting in Věžná, April 2012)

One of the reasons for the refusal of the municipalities may be that there are many questions related to what the site investigations will be like, specifically. For instance, at a meeting of the Working group in June 2012, one of the mayors said:

“I need to know: what is it going to look like? There also needs to be a binding contract on how it will be constructed, what will be excavated, and so on.”

(A mayor at the meeting of the Working group, Prague, June 2012) (Mayor A)

The mayors and local people are concerned with questions related to how the site investigations are going to be carried out, but they also feel that there may be wider uncertainties related to the site investigations: in interviews, they expressed their concern about the future availability of drinking water, about the development of the local real estate market, and about the immediate environmental consequences of drilling very deep boreholes (interview with a mayor and a focus group at a preselected site, May 2012).

One may think that some of these questions could be clarified if RAWRA was giving out more specific technical information. For instance, one of the mayors complained about the way RAWRA provides technical information about the proposed site investigations. When I asked him, “does RAWRA talk with you about what the site investigations will actually look like?” he replied:

It is very unprofessional. They do not really talk to us, they say a general sentence: “research drills will be made.” Period. Only when some people inquire, ... they answer in a very unprofessional manner. I remember one answer: “it will look just as if a regular water well was drilled.” For your information, water wells are drilled 40 metres deep, while these drills are supposed to be some 400, 500, 600 metres deep. And if you ask what the drilling equipment will look like, they answer that it will be as if you drilled a water well. Such a drilling machine is on a V3S,⁵ but in this case, I think that they do

5 V3S is the name of a light-weight off-road lorry that was produced in Czechoslovakia between 1950s and 1990s,

not even know how to describe it, that they do not even know what kind of equipment they would use. And then, if you ask them how many acres of forest they would need to cut down, they say “nothing, it will be just a little spot.”

(Interview with a mayor of one of the concerned municipalities, May 2012) (Mayor B)

The mayor complains that RAWRA is reluctant to provide specific information, and suggests that they do not even know this information. Indeed, there are controversies about what the drills will be like. For instance, a geologist working in a nearby coal mine published an article saying that although there is a strong history of mining and drilling in the Czech Republic, drills into granite of such depth have never been done here. He also argues that such drills necessarily need a large area for the equipment on the surface, and that the immediate environmental effects may be quite severe (Svejkovský 2012a). Against this statement there is that of RAWRA, which says in one of its bulletins distributed in the concerned municipalities that using modern drilling technologies, the drilling does not have such impact any more (RAWRA 2012, p. 6).

In any case, for the purpose of this paper it is interesting to see what happens with the uncertainties related to the proposed site investigations: the mayors mobilize these uncertainties to refuse to give consent with the site investigations. As Mayor A said, “I need to know: ...” He suggests that he needs to know detailed information in order to make a decision. Similarly, Mayor B says later in the interview:

I think that even drills of this size must destroy the nature severely, because otherwise I do not understand why they do not give us the information. Either they do not know it, which means that they are unprofessional and should not be doing this job, or they do not say it because they do not want to. And I think this is more likely.

(Interview with Mayor B)

Here the mayors mobilize something that is uncertain to refuse the investigations. As a matter of fact, sometimes it seems to be a reason to refuse the whole project of the repository. People tend to see the proposed investigations as a first step in the construction of the repository itself. For instance, Mayor B says:

Site investigations? And what for? It would be nonsense. Why should I agree with a research drill, if I do not want this [the repository].

(Interview with Mayor B)

Even more strongly, people from a local association in Lubenec area have argued that the consent with geological research means a consent with the repository – Svejkovský argues that once first deep drills are made, more and more will be needed to confirm the suitability of the site, and that in effect, the research works cannot easily be distinguished from the actual construction of the repository (Svejkovský 2012b). This view is supported by several national NGOs, albeit from a different perspective. According to a legal analysis commissioned by them, the only time when the municipality is a formal participant in the decision-making process is when the consent with geological research is issued. In all steps that would follow, the municipality's position from a legal perspective is significantly weaker (interview with a member of a national NGO). However, the argument that a consent with site investigations leads to a consent with the repository has been heavily contested by RAWRA as well as by the Ministry of Industry and Trade. Since the moratorium ended in 2009, they have gradually put more and more emphasis on *phasing* the process of geological disposal development, and most significantly, on a careful separation of the geological research from the construction of the repository.

and used extensively for all kinds of applications. As it is now only scarcely seen in use, for many people it is a symbol of industrial production in the socialist Czechoslovakia.

Phasing as dealing with uncertainties

In the current situation of negotiating the Czech geological disposal, phasing is explicitly as well as implicitly referred to by different actors in various situations.⁶ Let us see just three examples as an illustration: first, during a meeting of the Working group in June 2012, the minister had an argument with a representative of one of the municipalities:

Minister: Do not be irrational. The research does not mean the construction.

Municipal representative: But the people feel that the research does mean the construction!

Minister: That is what I am talking about. Let us make it clear: this is research, this construction, and this is operation...we want a clear description of the situation.

(Meeting of the Working Group, June 2012)

Second, in the opening of the public debate in Věžná, the director of RAWRA emphasized: “We are not talking about the repository now, only about geological research.” (Jan Prachař, RAWRA director, public debate in Věžná, April 2012). Third, the contract that RAWRA wants to sign with the municipalities where they would express their consent with the site investigations contains a clause saying that the consent with the site investigations does not imply a consent with the repository.

The process of geological disposal development is extremely long and complex. Therefore, in many ways it seems reasonable to phase it, to split it into smaller steps. With regard to the Czech situation, the more we go into the future, the less clear things are: at present, the municipalities feel that there are uncertainties about the site investigations. But there are also uncertainties about what *the repository* will actually be like. There is no specific technical project, only a very general “reference project”, which is situated at a hypothetical site. What happens during the repository's operation and after its closure is not even a topic in the public discussions in the Czech Republic. Phasing the process, clear separation of site investigations from the construction of the repository, makes concerns about such uncertainties somewhat irrelevant, illegitimate, and the demand to “know everything” irrational. In this sense, phasing the process may be seen as a way of dealing, or “doing away” with uncertainties that are farther in the future.

In an interview a RAWRA employee said about the technical aspects of repository construction: “Conclusions cannot be made until geological research is carried out, including deep boreholes at the sites ... The whole development is an iterative process.” (Interview with a member of staff at RAWRA, August 2011) Here it is acknowledged that certain things cannot be known in advance, and this is taken as a reason to go forward with site investigations – “we need to carry out site investigations *to know more*. Thus, uncertainties about the geology at a particular site are here not something that would prevent technical intervention, as articulated by the mayors (“We need to know everything to make a decision”). On the contrary, once they are separated from the first phase, they are a reason to enter this first stage of the implementation process (“We need to do research to make things clear”).

Here we have seen that phasing seems to help render concerns about future uncertainties and the demand to know everything somewhat illegitimate, while it helps make initial technical intervention (in the sake of reducing future uncertainties) legitimate. The other side of this coin is that it also makes legitimate the uncertainties that are in the future – “yes, there are things *in the phases that will follow*, that we now cannot know”. During the public meeting in Věžná, Jiří Slovák was asked about the size of the surface area needed for the repository. His answer was following:

⁶ Phasing of the Czech geological disposal negotiation process is a theme of a current case study, which is being carried out by Zdeněk Konopásek and me within the InSOTEC project. Therefore, in this paper I do not want to discuss phasing of the process as such. Rather, I would like to focus mostly on its implications for dealing with uncertainties in the process.

We had a so-called “reference project” of what the surface area could look like at a hypothetical site. There it was 18 – 20 hectares. We then considered some specific sites and there we got to only a few hectares. That means around six...

(Jiří Slovák at a public meeting in Věžná, April 2012)

Here, Mr. Slovák gives an initial figure of 18 – 20 hectares, which is calculated with respect to a general, hypothetical site. In specific circumstances, Mr. Slovák says, the figure *could be* much more favourable. But these specific circumstances are presently uncertain. Similarly, Mr. Slovák was also asked about the necessity for a protected area around the repository. His answer was following:

We had a risk-assessment study carried out in 2002. And if – the largest risk is the “hot chamber”, which is a place where the Castor container will be opened, the spent fuel will be taken out and will be put into the containers for disposal. If this facility is – even if this facility was – on the surface, the study said that it is of course a question of local weather conditions, the proximity of villages and so on, that if an airliner fell on this spot, there probably would not need to be a protected area. If this facility is underground, then based on this study we suppose that the protected area will not be needed in any case.

(Jiří Slovák at a public meeting in Věžná, April 2012)

In both of these cases, it seems that uncertainties are taken for granted – we do not know the specific conditions because the site is not known, therefore we cannot describe the specific circumstances. At the same time, this uncertain state of affairs lets Mr. Slovák choose the best or the most favourable option from the range of options that the uncertain situation offers him. In the first case, he arrives at the conclusion that although the reference project worked with an area of 18 – 20 hectares, it is possible that only six will be needed. In the second case, he arrives at the conclusion that probably no special protected area will be needed. But there is always this caveat of “specific conditions”, that are not known. In other words, it seems that the uncertainties related to specific conditions at the unknown site enable Mr. Slovák to “manoeuvre” in a wider number of possibilities, and most importantly, they let him choose to present the most favourable ones. Such strategy resembles a strategy described by Flyvbjerg, Bruzelius and Rothengattner in their analysis of the planning of “megaprojects” (Flyvbjerg et al. 2003).

It should be added that the need to phase the process is emphasized not only by people from RAWRA and the Ministry of Industry and Trade. So-called “step-wise approach to the long-term management of radioactive waste” has been advised strongly also by the Forum on Stakeholder Confidence of the Nuclear Energy Agency within OECD (FSC 2008). FSC says that “the new view of decision making focuses on designing a phased, staged, or stepwise process, composed of incremental steps that are to some extent adjustable and reversible.” (FSC 2008, p. 1)

All in all, while phasing of such a complex and long-term process is in many ways rational, we have seen that it also has consequences for how uncertainties situated in different phases of the process are handled – sometimes, phasing renders concerns about them irrelevant, while other times, it renders the uncertainties legitimate and moreover, it legitimises the technical intervention which is supposed to reduce them. Last but not least, uncertainties about the specific site for the repository let the implementers present the most favourable yet hypothetical parameters of the facility.

Uncertainties in the process: narrowing down the options, or keeping the options open?

The previous section discussed the recent emphasis on phasing the geological disposal development process and its implications for dealing with some uncertainties. However, there are also

ambiguities about the process itself. On the one hand, clear separation of site investigations from the construction of the repository is emphasized. At the same time, RAWRA representatives publicly admit that negotiations are carried out simultaneously at two different levels: within the National Working group, and directly between RAWRA and the individual municipalities (Jiří Slovák at the public meeting in Věžná, April 2012). While the Working Group seems to be at a stalemate with trying to implement a “veto” in the legislation⁷ (Svačina and Konopásek 2012, p. 15), RAWRA wants to sign contracts with municipalities in which the municipalities would express their consent with site investigations. On the one hand, by signing the contract, municipalities would implicitly accept and enter into the phased process of geological disposal development, while on the other hand, the contract does not specify the phases of the process that would follow the site investigations.

Therefore, it seems that on the one hand, RAWRA is keeping the options (in terms of different negotiation strategies) open, while on the other hand, there is a pressure to narrow down the options. This narrowing down is done by means of phasing discussed above, as well as in other practical ways. For instance, in a bulletin distributed to the preselected sites in September 2012, there is a graph that shows the proposed progress in identifying the site for geological disposal. According to this graph, in 2012 there are seven sites as potentially suitable for geological disposal. Between 2012 and 2018, geological research is carried out at four of them, and in 2018, only two of these sites remain as a “Candidate site 1” and a “Candidate site 2” (RAWRA 2012). The number of options in terms of potential sites is gradually narrowed down, while options for different types of negotiation strategies are kept open.

Where are the scientific uncertainties?

This paper has hardly discussed *scientific* uncertainties so far. For instance in Sweden, the question of copper corrosion has become an important scientific (Macdonald and Sharifi-Asl 2011, Kärnavfallsrådet 2009) as well as social (MKG 2011) issue. In the Czech Republic, however, scientific uncertainties seem to play a much more subtle role in the process of planning geological disposal. A geologist who studies the properties of bentonites in environments similar to those of the future repository confirmed in an interview that there are many uncertainties regarding this topic. At the same time, several times during the interview he assumed that there are no such uncertainties in other disciplines related to geological disposal (such as engineering) (research interview, May 2012). Nevertheless, in the public discourse these uncertainties do not seem to be visible. For instance, in presentations given by the RAWRA staff during public meetings it is said that the question of how to build the repository is clear (public meeting in Věžná, April 2012, FSC community visit, October 2012). Similarly (and perhaps even more importantly), in the summary assessment of the environmental impact of the future repository, the Czech geological disposal Reference project states:

The isolation of radioactive waste from surrounding environment is based on a multi-barrier principle (engineered and natural barriers). The disposal system does not endanger the health of future generation or the environment. Technological procedures will ensure permanent isolation from individual parts of the environment. Technical

⁷ The Working Group loosely follows the deliberative principles formulated by the “Riscom” model for public participation. This model is designed to increase transparency and trust in political decision making (cf. Vojtěchová 2009). However, critique towards the ways in which similar efforts are being carried out has recently appeared within the field of STS (e.g. Sundqvist and Elam 2010, Lezaun and Soneryd 2007). Our preliminary research within the InSOTEC project also shows that the Czech implementation of RISCOCOM “has shaped the current public involvement into a rather narrow, rigid and localized form, organized ‘from the top’” (Svačina and Konopásek 2012, p. 17). Here it could be argued that the Riscom technology for public participation has contributed to the fact that some uncertainties are being left out of the public debate, but a more detailed discussion would fall out of the scope of this paper.

solution will eliminate all risks (radiation, toxicity, heat).
(EGP Invest 1999)

However, at some occasions, the scientific uncertainties do appear also in public meetings: for example during the public meeting in Věžná, Mr. Slovák was asked about the possible effects of the repository in terms of “heating up” the surrounding environment. His answer was following:

...the only effect will really be in that the massive will be heated up, and the temperature will gradually move to the surface. But this heating up and the actual temperature on the surface is a very difficult question ... so it is difficult to say today, what kind of real effect this will have. It depends on the specific situation on the site, and on all the factors that there will be.

(Jiří Slovák at the public meeting in Věžná, April 2012)

While Mr. Slovák acknowledges uncertainties related to the heat output of the waste, his answer implies that first, the outcome depends on the specific site, and second, it cannot be known at the moment. To sum up this part, the fact that scientists acknowledge and talk about uncertainties within their own discipline may be seen as a way to legitimise their ongoing research and “maintain a degree of control” over the uncertain issue (cf. Soneryd 2007, p. 308-309). At the same time, scientific uncertainties seem to play a minor role in the public discourse Czech situation. Whereas they may be acknowledged, they do not seem to take over as “issues” (cf. Marres 2007).

Conclusion – summary

In this paper I tried to explore different kinds of uncertainties as they emerge during the process of negotiating geological disposal for highly radioactive waste in the Czech Republic, and the ways these uncertainties are handled. It was seen that in some situations, uncertainties about proposed site investigations may be used as a resource to refuse not only these site investigations, but also the whole project of the repository. Conversely, phasing, or separating the process of repository development into steps, may be seen as a way to make some of these uncertainties legitimate, while at the same time making them a reason to start technical intervention on the preselected sites. Further, it was observed that uncertainties about specific site conditions may give opportunities to describe the future repository project in the best possible parameters. It was also observed that there are some uncertainties about the process itself: while there is pressure to gradually narrow down the number of potential sites, options for different types of negotiation strategies are kept open. Finally, it seems that scientific uncertainties, although sometimes implicitly acknowledged, are kept outside of the public debate on the Czech geological disposal.

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