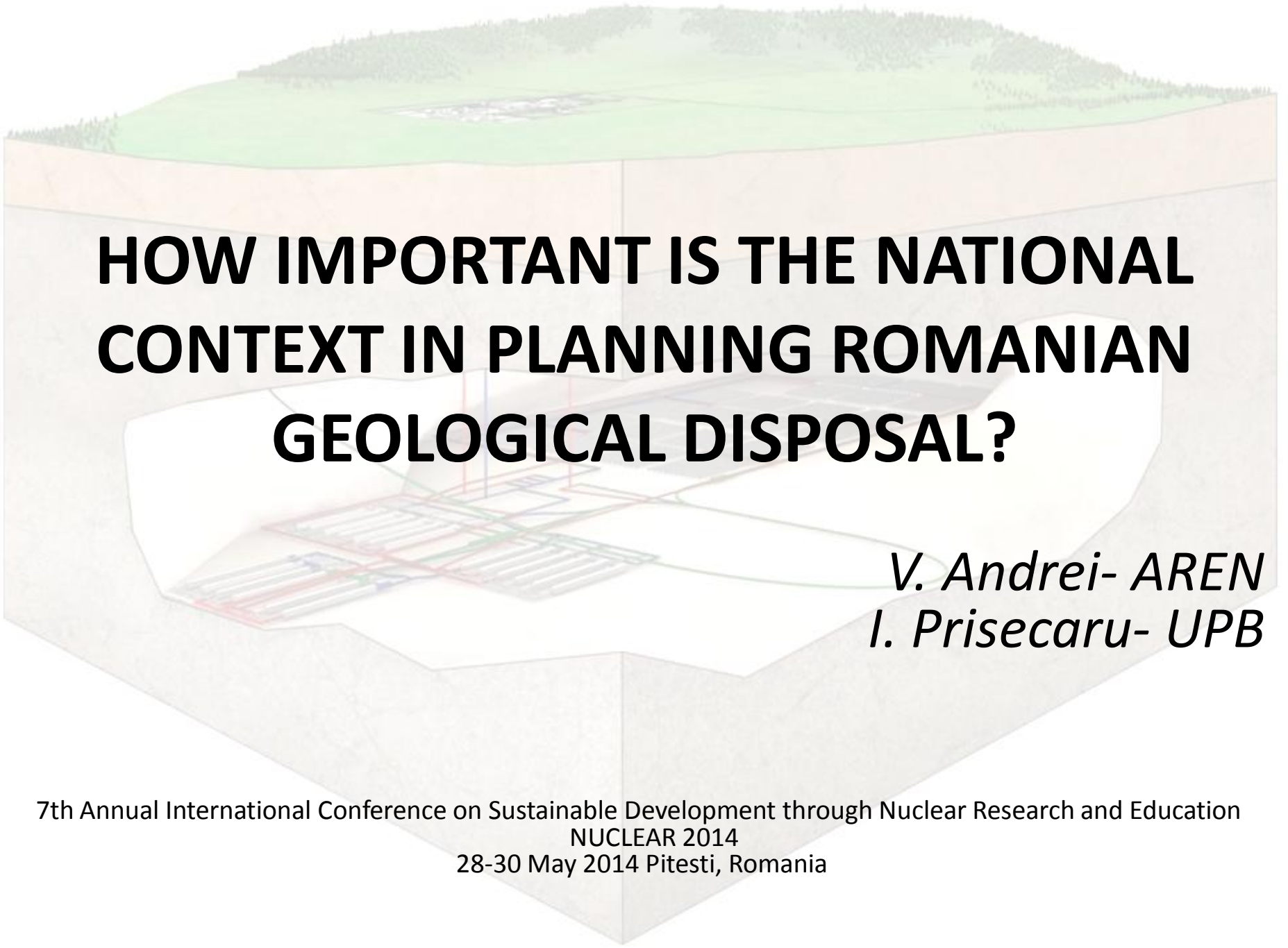

HOW IMPORTANT IS THE NATIONAL CONTEXT IN PLANNING ROMANIAN GEOLOGICAL DISPOSAL?

V. Andrei- AREN
I. Prisecaru- UPB

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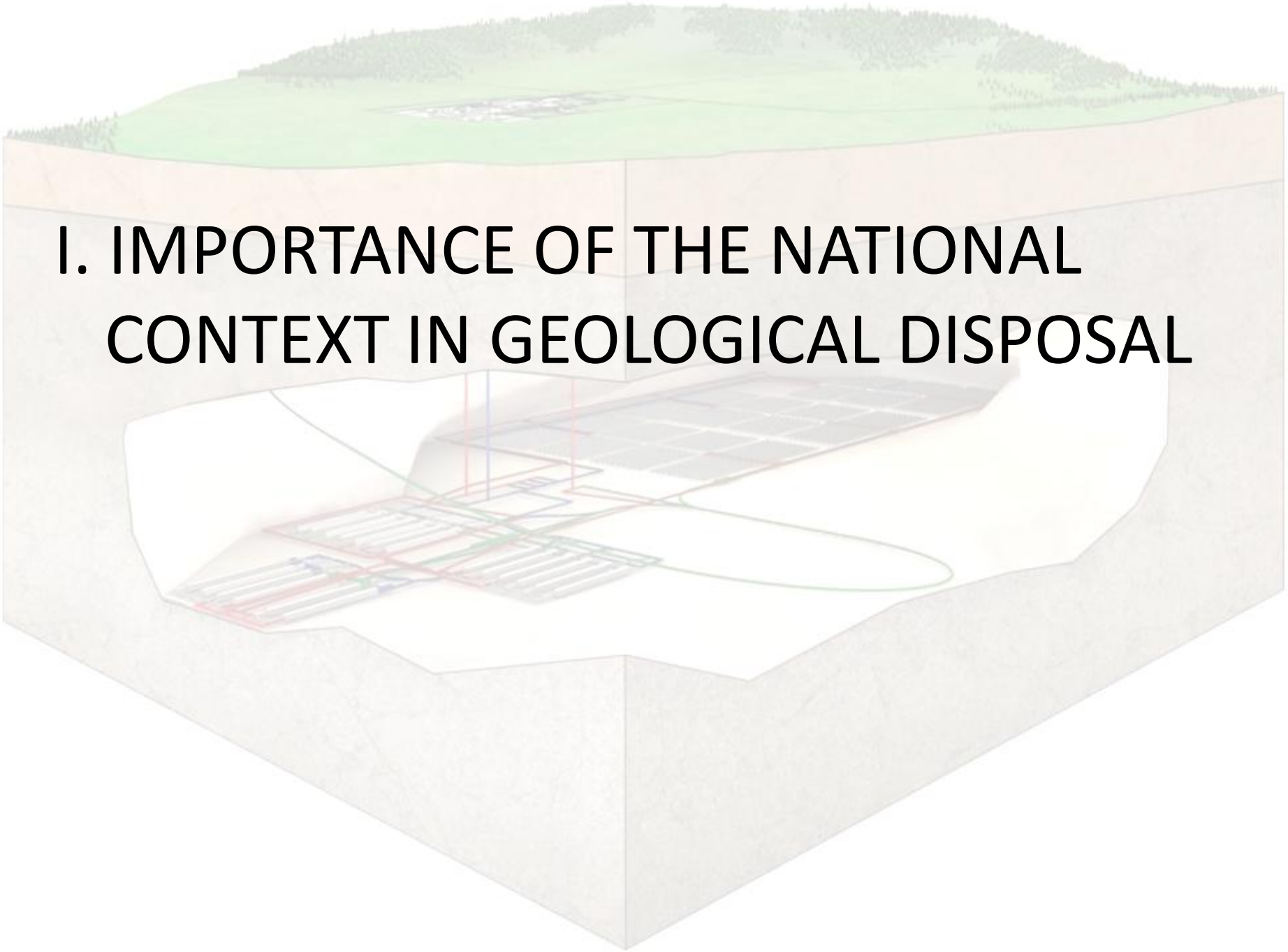


I. IMPORTANCE OF THE NATIONAL CONTEXT IN GEOLOGICAL DISPOSAL

Introduction/Context towards a decision for a GR program

- By general consensus, geological disposal (GD) is the solution for the backend of the open or closed nuclear fuel cycles.
- The process for siting a geological repository (GR) started early in ’80s and where it successfully concluded with an approved site it has taken about 25-30 years.
- First geological repositories are planned to be commissioned by 2025 (Finland, Sweden, France). This means that currently, a reasonable time duration for commissioning a GR might be considered to last about 35-40 years.
- Governmental commitment for effectively starting a GR program is a major prerequisite to have trust on the reasonability of the schedule. *[A French expert declaration in IFNEC Meeting in Bucharest, May 2014*]
- Further to the in principle-declarations and declarations of support for organization responsible with GD, the Governmental commitment, in fact the State commitment, might need to be highly substantiated. Reason for that is the reality of several national GR programs which have registered failures in schedules or even reconsidered the siting process.

Approach to failure of a GR program

- Formally, reasons for suspension or reconsidering of GR programs were due to insufficient support from the society

  [“the objections of local mayors and environmental groups had not been properly considered.”(Czech Rep. Environ. authority- Jan. 2014)]
- No technical reasons were invocated in suspending the programs. However, technical activities obviously, have been jeopardized by these decisions.
- In the case of the advanced programs (e.g. USA, Canada, UK) that were delayed/suspended there has been a tremendous existing luggage of valuable work done and experience for learning from feedback or lessons learned and these supported reconsideration of the programs.
- The intrinsic national capacity for adapting and setting such kind of situations also played a crucial role.

Approach to failure of a GR program(cont'd)

- Background for handling delays/failures in GR program might not be relevant in some cases in countries which are at the beginning of GD implementation.

  ["we do not know from where to start again" – a Czech governmental official said in a meeting organized within the Euratom FP7 IPPA project, in Prague, in Sept. 2013]

- International knowledge and experience is tremendous and international cooperation is necessary during development of a GR program.
- However, international expertise could not guaranty that delay/failures would not appear.

So, where to look more to find out why failures happened?

Questions and potential answers in case of GR program failures

1. Where might have been weak points which were not proper addressed or at all?

Answer:

- In any international standard and report, national specificity is recognized as an important factor to be taken into account when approaching the geological disposal.
- The national specificity exceeds the competence and environment of the organization responsible for GD.
- If the analysis of national context to develop the repository program was not well defined, acknowledged and addressed by the Governmental factors/State from the elaboration phase of the program, a failure in GR program might be possible.

Questions and potential answers in case of GR program failures (cont'd)

2 Should these weaknesses concentrate to the social acceptance field?

Answer:

- Weaknesses *should not only concentrate* to the social acceptance field.
- There is not a guideline on what national specificity means and there are not criteria allowing to make it proper for developing the program.
- Hence, a systematic analysis should be approached to identify weakness.

Questions and potential answers in case of GR program failures (cont'd)

3 Are these weaknesses easy to handle?

Answer:

In fact, weakness could be risks that have high likelihood to trigger or some of them are already triggered. To handle all of them might also need a systematic approach.

Remarks:

- The answers in detail are not at all easy. Case by case, an expert analysis is necessary.
- International expertise could help to answer in many aspects.
- However, there might be some parts of the answers that traditional international expertise could entail large uncertainties in any analysis made on a very early national GR program.
- A systematic study of the national context for developing a sustainable NGR program might be strongly recommended.

Systematic approach of the NC vs. "seeing and do" approach

- We define here "Seeing and do" approach which means the management identify and handle the issues:

  i) on a case by case basis, when activity or action of the program is planned or

  ii) during the implementation of activity(ies) or action(s) of the program when impact of issue(s) is encountered.

i) Evolution of existing GR programs indicates to analyze issues as early as necessary and in an integrated manner.

ii) Not recommended

In support of a systematic approach

- Potential issues of the national context are mentioned in standards and guidelines but their enunciation or description might be general. They could represent start points for analysis but real issues could be in more depth of the aspects of the national context.

Systematic approach of the NC vs. “seeing and do” approach (cont’d)

- Real issues could be picked up from other national experiences but:
  - These needs every time expertise to detect them,
  - Most of the time are time consumers and
  - When identified, it might be late to apply their treatment solutions
- The real issues picked up from other national experiences might have different weaknesses/causes in the country preparing a GR program.
- The individual issues or different weakness are often interrelated and the interrelations could not be easily recognized or they can be seen only by a knowledgeable eye.
- To identify, analyze and handle the issues there is a need to involve experts with extensive knowledge on how the national context acted in other nuclear projects and extensive background to propose effective treatment solutions inspired adopted both from national and international experiences. There might a problem to get them every time they are necessary.

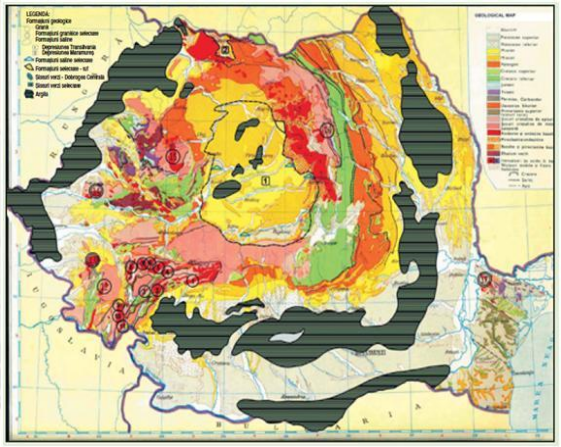
Systematic approach of the NC vs. “seeing and do” approach (cont’d)

How deep systematic approach should be?

- Keep it simple even it might involve complex matters.
- Concentrate on issues of the national context that represents or could evolve in significant risks.
- Use tools and expert/engineering judgment that facilitates:
  - Analysis and identification of significant risks;
  - Identification of causes that need treatment between risk breakdown structures; and
  - A staged approach for optimizing treatment of the risks

II. SISTEMATIC APPROACH THROUGH A PESTEL ANALYIS IN ROMANIAN NGR PROGRAM

Romanian NGR strategy



- In Romania, on-map and desktop studies for identification of potential host rock for a geological disposal repository have been initiated since 1995.
- During 2008-2009, based on preliminary investigations and international experience a deep geological repository strategy for commissioning the NGR in 2055 was elaborated by Romanian experts supported by IAEA experts.
- The strategy schedule is delayed today.
- The intention of this presentation is not to provide reasons for delays but it is in support of a more systematic approach based on efficient tools and expert judgment to develop the NGR program.

SWOT or PEST Analysis ?

SWOT Analysis

Situation analysis in which internal strengths and weaknesses and external opportunities and threats faced by it are closed examined to chart a strategy. SWOT stands for strengths, weaknesses, opportunities and threats.

PEST Analysis

- A type of situation analysis in which political-legal (governmental stability, spending, taxation) , economic (inflation, interest rate, unemployment), socio-cultural (demographics, education, income distribution), and technological (knowledge, generation, conversion of discoveries into products, rates of obsolescence) factors are examined to chart an organization' s long-term plans.

(http://www.businessdictionary.com/definition/)

PESTEL Analysis

- A PESTEL (PEST+ Environmental and Legal) analysis was made being:
  - a first approach of the geological disposal field in Romania
  - a tool for an audit of the national context allowing in principal the identification of those issues induced by the “luggage” of national specificity with potential impact on program elaboration.
  - based on targeted information from several international standards, studies and reports and a comprehensive information from formal and public documents related to the development of the project of a geological repository in Romania.

The process adopted in the PESTEL analysis

- For each factor of the PESTEL analysis there were identified aspects characterizing the current national environment for initiating the NGR program.

Limitations

- Accent has been put on screening issues that are outside or beyond the control of a single organization having main responsibilities in disposal of radioactive waste in Romania (i.e. ANDR) by law.

  Note: *There were not considered any internal risks within the environment of the current ANDR organization in relation with any external factors identified in the PESTEL analysis. It was assumed the NGR program will be elaborated by a dedicated organizational structure established and empowered by ANDR and its supervisory Ministry.*

- A realistic horizon for analysis of the national context was considered from elaboration of the NGR program till the stage of construction license.

The process adopted in the PESTEL analysis (cont'd)

The aspects describing the current national environment mainly resulted from a knowledgeable and attentive combination of the following:

- Screening the PESTEL analyses factors recommended for development of large projects/business that can be appreciated similar with the project of a geological repository;
- Observation of a PEST analysis made for US nuclear industry;
- Taking into account applicable questions and answers from the questionnaire on geological disposal issued under IAEA GEOSAF II project;
- Observation of state-of-art in geological disposal planning at international level by using international standards and reports published by IAEA, OECD/NEA or EC;
- Overview of the lessons learned/issues specific to the development of new built nuclear projects (e.g. lessons learned from EIA process for Cernavoda Units 3&4, environmental and safety licensing of Spent Fuel Interim Storage Facility –DICA).

Identified aspects for characterizing the current national environment

POLITICAL

- Political parties' opinions
- Radioactive waste disposal strategy
- Financing of national radioactive waste disposal strategy
- Roles of institutions involved in radioactive waste management
- IAEA and EC
- Taxes

ECONOMICAL

- Interest rates
- Inflation
- Economical growth
- Exchange rate
- Level of accumulated financial resources and financing mechanisms for their increases

SOCIAL

- Decision and responsibility
- Organizational legitimacy
- Public participation
- Nuclear industry's liaison with public
- Antinuclear NGOs

TECHNOLOGICAL

- Status of radioactive waste geological disposal
- Preliminary phase in geological disposal repository program
- Medium term strategy for nuclear spent fuel and long-lived radioactive waste

ENVIRONMENTAL

- Approach for SEA and EIA processes
- Environmental licensing procedure

LEGAL

- Specific regulations in nuclear field
- Licensing/Approval of repository siting
- Environmental Agreement
- Correlation between legislative requirements preceding approval of siting in Parliament

Several important issues resulted from the PESTEL analysis

- Several important issues likely to develop significant risks in NGR program if not addressed are further presented (*Source: CIEM 2013, The use of PESTEL analysis in development of the Romanian Geological Repository*).

POLITICAL	ECONOMICAL	SOCIAL
• Political decision on continuation of nuclear power program at Cernavoda NPP should be substantiated. • It is not clear if the revision of national energy strategy announced by Government will include capacity for a new NPP. • National research strategy for 2014-2020 should include objectives that allow building national research and development capacity in deep geological disposal of radioactive waste.	• The funds collected from actual operational Cernavoda NPP units are kept in deposits at State Treasury in Ro lei with a low interest annual rate of 2%. • During the period 2007-2013, the evolution of inflation and interest rate globally affected the financial resources collected for radioactive waste disposal.	• Decision and responsibility on developing and implementing a geological disposal program are concentrated at Government and State authorities levels. • There is no experience on public involvement in the decision making process for projects with a long time horizon and needing extensive research-development to be confirmed such as the NGR project is (see today's confusions registered in the debates of shale gas explorations/exploitations).

Some important issues resulted from the PESTEL analysis (cont'd)

TEHNIC	ENVIRONMENTAL	LEGAL
• The Romanian Deep Geological Repository Strategy (2009-2055) has to be updated. • Foreign expertise can help with how to build the NGR program but for national specific aspects many of them treated in this PESTEL analysis understanding of things, identification of problems and their solving are very difficult to come from outside.	• In Romania there is no experience in Strategic Environmental Assessment or Environmental Impact Assessment processes for a radioactive waste repository. • Environmental requirements have to be correlated and integrated with other requirements mainly those introduced by the Nuclear Regulatory Authority-CNCAN for the different stages of licensing.	• Presently, there are no any specific regulations in the field of geological disposal • The present legal requirement (Ordinance No. 7/2003 modified and approved by Law 57/2006) that siting of radioactive waste disposal facilities is approved by law (by Parliament) on the basis of National Strategy for developing the nuclear field and licenses issued by the Regulatory Body.

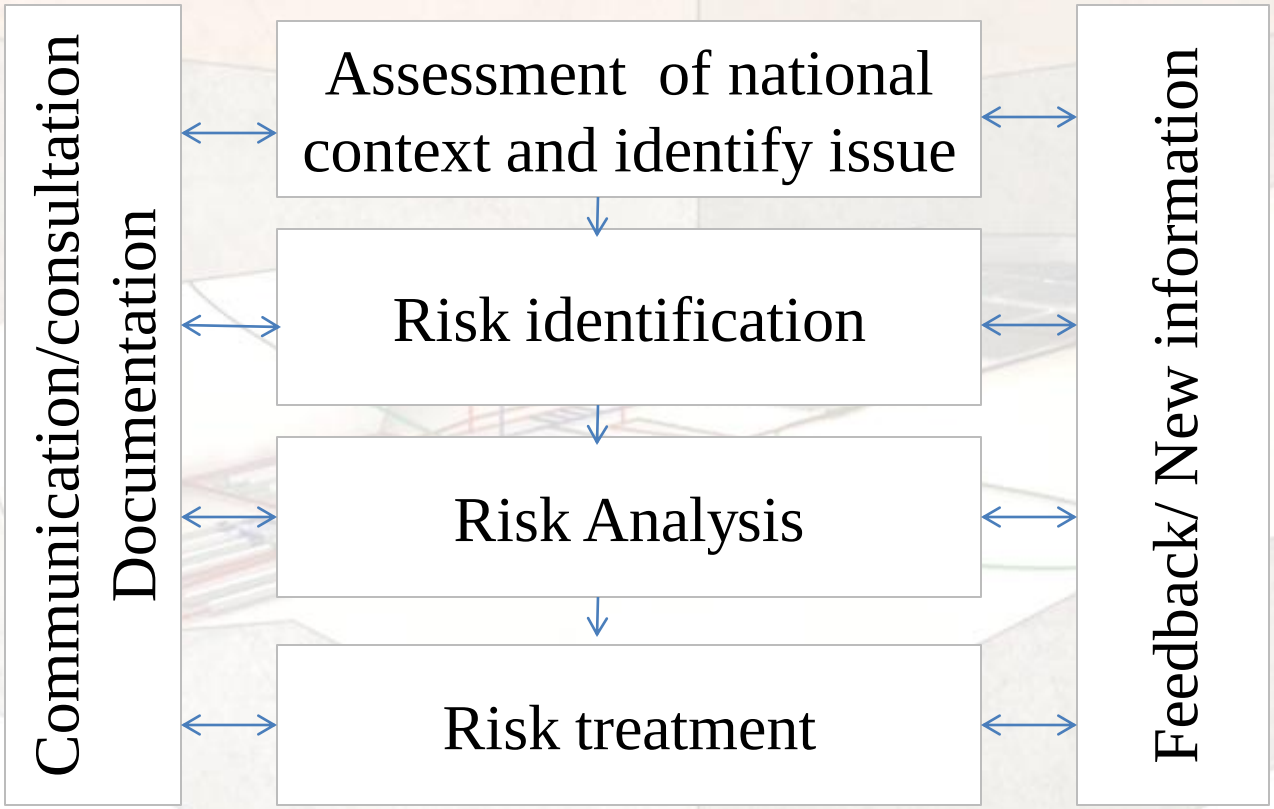
Follow-up to PESTEL analysis

- The focus of PESTEL analysis usually is on identifying the issues rather than trying to resolve them.
- In this PESTEL Analysis:
  - Broadly implications of each issue that might evolve in a certain risk for developing the NGR program have been described

    (Analysis of NC and identification of issues -1st step in a risk management process)
  - Description of issues has allowed identification and analysis of potential risks (impact) for NGR program

    (Risk identification and risk analysis-2nd and 3rd steps in a risk management process)
- The description of issues has revealed clear needs to address incipient solutions for some significant risks very early in the elaboration of the NGR program. Questions such as: *which are these risks, how to priorities them, what treatment solutions to adopt or how to integrate these solutions in a rational manner,* need more systematic study and for providing answers extensive knowledge and expertise are needed.
- The PESTEL analysis could become an integrative part of a risk management process.

Follow-up to PESTEL analysis (cont'd)



National Context Risk Management Process scheme

Conclusions

- National specificity is recognized as an important factor to be taken into account when approaching the geological disposal.
- In authors' opinion, in case the analysis of the national context to develop the geological repository program has been not well defined, a failure in program could be early possible.
- The PESTEL analysis in Romanian geological disposal:
  - has proven being an optimum tool for describing and identifying issues of the national context to developing the NGR program,
  - could become an integrative part of a risk management process for developing a sustainable NGR program.
- Further to the PESTEL Analysis, a national context risk management process could be further defined to allow treating risks in an integrated manner since a case by case approach increases likelihood of failures.

THANK YOU FOR YOUR ATTENTION!

veronica_andrei@yahoo.com

prisec@gmail.com

Other authors'papers on same topics:

- Veronica ANDREI, Ilie PRISECARU, *The use of Pestel analysis in development of the Romanian Geological Repository***,** U.P.B. Sci. Bull., Series C, Vol. 76, Iss. 4, 2014, ISSN 2286-3540.
- Veronica Andrei , Ilie Prisecaru, *Risk Management Process for National Geological Repository Program,* WEC CENTRAL & EASTERN EUROPE REGIONAL ENERGY FORUM – FOREN 2014, 22-26 June 2014, Bucharest, Romania, PROCEEDINGS - PAPERS AND POSTERS ISSN-L: 2284-9491

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