PREPARING FOR MEMBERSHIP OF THE EUROPEAN UNION: PROGRESS IN RADIOACTIVE WASTE MANAGEMENT STRATEGIES IN CENTRAL AND EASTERN EUROPE

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ABSTRACT

At Waste Management '99, Cassiopee presented a paper, which detailed the history of the consortium and the work it had done to that date with the countries of Central and Eastern Europe and the former Soviet Union. The consortium comprises the European Union (EU) national radwaste agencies: ANDRA (France), COVRA (The Netherlands), DBE (Germany), ENRESA (Spain), Nirex (UK), and ONDRAF/NIRAS (Belgium). Cassiopee works through the European Commission's (EC) PHARE and TACIS assistance programmes.

Since the late '90s, the work of the consortium has concentrated on providing advice in the areas of radioactive waste management to those countries applying for membership of the EU: Estonia, Lithuania, Latvia, Poland, Hungary, Czech Republic, Slovakia, Slovenia, Bulgaria, and Romania. As part of the application process the countries concerned are in the process of enhancing and modifying existing legislation to make them conform to EU Directives.

Cassiopee's role in the assistance programmes is mainly advisory. Typically it works with the nuclear authorities of the country concerned to analyse the radioactive waste management situation, help identify priorities and solutions and prepare terms of reference for their implementation.

INTRODUCTION

It is now some twelve years since the events of 1989 led to the collapse of the Berlin Wall and the subsequent liberalisation of the Iron Curtain countries of Central and Eastern Europe. Since that time, these countries have in the main established independent democracies, working towards free-market economies, no longer relying on the centralised command structure of the Soviet system.

During that same period, Western Europe has seen enlargement of the European Union, the creation of a single European market and a single European currency, and the disappearance of border controls between some Member States. This ever-expanding Union is now extending membership to the so-called Applicant Countries of Central and Eastern Europe.

As the European Commission recognise (1), rarely does an opportunity to unite Europe by peaceful means present itself. The Applicant Countries' economies are becoming increasingly integrated with those of the EU and the pre-accession strategy involves them more and more in Community programmes. However, before full membership is attained, certain requirements have to be met. Some are economic, some relate to the environment in general, and some to nuclear safety in particular; implicit in the last aspect is the safe and responsible management of radioactive waste.

The purpose of this paper is to show how the Applicant Countries are working towards achieving their commitment to responsible radioactive waste management.

By way of background all of the Applicant Countries, except Latvia and Estonia, have signed the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (2). Thus, they have acknowledged their international obligations to provide adequate resources for spent fuel and radioactive waste management.

INSTITUTIONAL ARRANGEMENTS IN THE EU

European Union Member States with civil nuclear programmes have established waste management organisations (WMOs) to take care of part or all of their radioactive waste. They are separate from both the waste producers (and financed by them under the "polluter pays" principle) and from the regulator. This model is often referred to as the "Classical Triangle" which ensures that there is no conflict of interest.

Within the EU the organisations are:

- ONDRAF/NIRAS in Belgium,
- ANDRA in France,
- BfS in Germany with operations sub-contracted to DBE,
- ENRESA in Spain,
- Posiva in Finland,
- COVRA in The Netherlands,
- SKB in Sweden, and
- Nirex in the UK.

In Denmark and Portugal, with no commercial nuclear reactors, the governments take direct responsibility for waste management; Italy is in the process of setting up an organisation to undertake repository siting.

The remits of the WMOs vary considerably in terms of the range of wastes dealt with and responsibilities. In Finland, Posiva's responsibility is the management of spent fuel, in Sweden, SKB manages all waste and in the UK, Nirex's responsibility is for intermediate level waste and some low-level waste. The remaining organisations deal with all categories of waste, with ENRESA, COVRA and ONDRAF/NIRAS additionally having decommissioning responsibilities.

THE APPLICANT COUNTRIES

The development of radioactive waste management policies in the Applicant Countries is directly linked to the development of organisational and institutional arrangements in recent years, which in turn is affected by three main issues:

- the scale of the nuclear power programme and the radioactive waste arisings,
- the social, political and economic context of the country, and
- the timescale for membership of the European Union.

Throughout the Applicant Countries, the complications of transition from central planning to market economies should not be underestimated. Such transition has sometimes been accompanied by the collapse of important sectors of the economy, high inflation and, in a few instances, civil unrest and political instability. Therefore, the re-organisation of the nuclear sector has not necessarily been a priority. Conversely, countries experiencing a relatively smooth transition tend to be further ahead in establishing their nuclear organisational infrastructure.

Some Applicant Countries have already created separate waste management organisations in response to the need to implement efficient waste management arrangements prior to membership, notably:

- PURAM in Hungary,
- Agency RAO in Slovenia and
- RAWRA in the Czech Republic (with the direct assistance of Cassiopee).

Three further nuclear power countries with significant waste arisings are Bulgaria, Lithuania and Slovakia. Each is in the process of reforming its legal framework, and draft legislation anticipates creating independent WMO. In particular, Cassiopee has now been asked by the Bulgarian Government to help set up the running of the new WMO.

The others do not have significant radioactive waste arisings and so the urgency to establish separate new organisations has not been as great. However, Estonia has created ALARA Ltd, and in Latvia, the RADON organisation, established under Soviet rule, remains responsible for waste management in an updated regulatory context; Cassiopee is currently working with these two countries on assistance projects as detailed later.

ADVISORY ROLE OF CASSIOPEE IN THE EU ASSISTANCE PROGRAMMES

Due to the nature and status of its members, Cassiopee has mainly aimed to play an advisory role to the EU in the front end definition of the assistance programmes, thus leaving the project implementation to industrial / engineering groups.

As a first step in providing technical assistance to the EU in the PHARE Programme, an analysis of the situation regarding spent fuel and radioactive waste management was undertaken by Cassiopee. A

regional study was carried out in 1993-1994 covering: Bulgaria, the Czech Republic, Hungary, Lithuania, Poland, Romania and the Slovak Republic (3). This study was focused on the identification of problems and their respective priorities, and the consideration of short and long-term solutions to these problems, as well as the elaboration of recommendations. The outcome of this study was later used to establish proposals for specific projects in technical, legal and institutional areas.

In order to complete the survey in the region, a similar study was carried out in 1997-1998 for Slovenia and for Latvia in 1998-1999.

A similar approach was followed for the Kola Peninsula in Northwest Russia, within the TACIS Programme. Cassiopee carried out in 1995 a contract for establishing an inventory of radioactive waste and spent fuel present in this region with the objective of developing in a further step an adequate regional waste management scheme.

Two expert missions were carried out to Hungary by Cassiopee. The objective was twofold: on the one hand, to provide an expert opinion on a draft report prepared by the Hungarian authorities on the site selection for detailed investigation and licensing, and, on the other hand, to obtain the relevant necessary information to prepare a PHARE assistance project for the characterisation of the candidate selected site.

Table I shows the different projects undertaken with the EC for the above tasks.

Table I: Assistance Contracts between the EC and Cassiopee

Project	Year
Detailed Regional Study of Management Schemes for the Back-end of the Nuclear Fuel Cycle, Radioactive Waste Management and the Decommissioning of Obsolete Nuclear Installations	1993-94
Expert support for site selection for LLW/ILW disposal in Hungary	1995
Assistance for waste management meeting with the PHARE countries	1996
Assistance to the EC in preparing TOR and in evaluation of tenders for projects of the PHARE programme	1996
Expert advice to Hungary on disposal strategies	1996
Assistance to the EC in a technical meeting with the PHARE countries	1997
Study on radioactive waste management scheme in Slovenia	1997-98
Assistance to the EC in a technical meeting with the PHARE countries	1998
Assistance to the EC in writing TOR and participation in Evaluation Committees	1998
Study on waste management scheme in Latvia	1998-99

PROJECTS DEFINED BY CASSIOPEE IN THE EU ASSISTANCE PROGRAMMES

Based on the final reports of the 1996 and 1997 PHARE meetings mentioned in Table I, Cassiopee prepared the Terms of Reference (TOR) for some projects identified as first priority for the PHARE countries. These projects, listed in Table II and III, are classified as follows:

- Regional studies aiming at analysing and proposing common methodological approaches (Table II),
- Country specific studies aiming at implementing the national programmes (Table III).

Table II. Regional Projects defined by Cassiopee

Title	**Beneficiary Co-beneficiary**	**Remarks**
Preparing remediation at Uranium mining and milling sites in the PHARE countries. Previsions of means to assess radiological risks	Czech Republic, Estonia, Hungary, Poland, Romania and Slovenia	Completed in 1998
Regional study on Soviet-designed research reactors in countries assisted by the PHARE programme (Tank type reactors)	Romania, Czech Republic, Hungary and Poland	Completed in 1997
Regional methodologies on L/ILW storage in PHARE countries	Slovakia	Completed in 1998
Technical basis and methodological approach to derive waste package acceptance criteria for surface and near-surface disposal facilities	Romania, remaining PHARE countries	Completed in 1999
Quality Assurance and Quality Control procedures for the safe management and disposal of L/ILW	Hungary, Estonia, Latvia, Poland, Lithuania, Romania and Slovakia	Completed in 1999
Regional Study on Soviet-designed research reactors in countries assisted by the PHARE programme (Pool type reactors)	Bulgaria and Latvia	Completed in 1999

Table III. Country Specific Projects defined by Cassiopee

Title	Beneficiary Co-beneficiary	Remarks
Establishing the radiologically safe state of Bohunice A1 damaged reactor in Slovakia	Slovakia	Completed in 1996, remaining some tasks
Closing the Rozan repository in Poland	Poland	Completed in 1997
Technical support to Lithuania in developing the basic tools and methodologies for preparing a preliminary decommissioning plan for Ignalina NPP and for assessing the cost estimates and funding needs	Lithuania	In progress
Technical support to Hungary in the selection of a disposal option and candidate site for L/ILW	Hungary	Completed in 1999
Technical support to the Czech Republic in establishing the National Radioactive Waste Management Agency	Czech Republic	Completed in 1998
Development of the General Radioactive Waste Programme for L/ILW in Romania	Romania	To be launched
Assistance to Hungary in the safety analysis of Puspokszilagy radioactive waste treatment and disposal facility	Hungary, remaining PHARE countries	To be launched
Assistance in the development of a siting methodology for L/ILW in Slovenia	Slovenia	To be launched
Solution for a closure of a chamber of the Richard underground disposal facility in the Czech Republic	Czech Republic	To be launched

OTHER PROJECTS

Cassiopee has developed some of the projects listed in Table II with the support of the EC. The following list of projects includes these and other work, which has been undertaken by some Cassiopee members involving the Applicant Countries:

'Radioactive Waste Management in Bulgaria'

The TOR for this project were prepared by the Project Management Unit in Bulgaria and Cassiopee was selected to develop this project in collaboration with other European companies finishing in February 1997. The objective was to assess the situation in Bulgaria, and make a number of recommendations. Specifically, the objectives were:

- to define the radwaste management institutional arrangements and harmonise its legislative base and standards;
- to finalise the solution of the L/ILW problem;
- to provide a feasibility study on the future of the Novi Han L/ILW disposal facility and a study on the wastes arising from NPP Kozloduy;
- to provide a feasibility study on the disposal of L/ILW in a new national facility;
- to define the necessary national regulations and standards; and the structure, responsibilities and financial arrangements for a national WMO.

'Technical Support to the Czech Republic in Establishing the National Radioactive Waste Management Agency'

This project, finished in December 1998, was carried out directly by Cassiopee as EC requested because of the nature of the project. The main objective was to provide technical assistance in establishing the WMO, and in developing all necessary documents and regulations for its operation, by transferring the experience gained in countries of the EU where this kind of organisations are now in operation. This project had also a regional dimension due to the fact that other PHARE countries in similar circumstances can also benefit of its development and results during their decision-making processes.

'Environmental Impact Assessment (EIA) and Geological Repositories for Radioactive Waste'.

(Undertaken by some Cassiopee members and SKB of Sweden and the University of Wales). As an extension to an ongoing study, this considered the EIA legislation in Applicant Countries and its relationship to radwaste disposal (4).

'Environmental Impact Assessment and Decommissioning Nuclear Power Stations'.

(Cassiopee, University of Wales, Imperial College, London and ECA of Spain). As part of the EU application process, Bulgaria, Lithuania and Slovak Republic have to provide plans for the decommissioning of some of their reactors (ongoing, report to be published).

'Schemes for Financing for Radioactive Waste Storage and Disposal'.

(Some Cassiopee members and PriceWaterhouseCoopers). Most western countries have established systems for financing radwaste disposal and decommissioning. Setting up such schemes in the Applicant Countries provides novel challenges, notably because some have economic uncertainty, the organisational structures and systems are not in place and the countries do not often have a history of successful financial planning (5).

'Bulgaria -Establishment of a State Body for Radioactive Waste Management and to the Activities of the RWM Fund'.

In June 1999, the Bulgarian Government adopted a radioactive waste management strategy based on proposals made by Cassiopee in an earlier project. This has now evolved into a full project to be carried out throughout 2001 and will be carried out using the experience of the Czech project.

'Long term Safety Analysis of the Baldone (Latvia) Radioactive Waste Repository and Updating of the Waste Acceptance Criteria', being carried out during 2000-01.

'Drawing up and Evaluation of Management Strategies for Radioactive Waste in Estonia', to be carried out during 2001-02.

THE TACIS PROGRAMME

Concerning the TACIS Programme only two projects have been carried out by the consortium:

- **'Management of Radioactive Waste in the Moscow Region'**. The aim of this project, finished in 1996, was to assess the situation of non-NPP waste management (medical and industrial sectors) in the Moscow Region. It also proposed some improvements to operational safety.

- **'Site selection for the disposal of radioactive waste in Ukraine'**. This project, carried out in 1996, was a part of the TACIS project no. U4.02/93 "A scheme for Safe Management of Radioactive Waste in Ukraine". The objective was to assist the Ukrainian authorities in the selection process of a site for an engineered near-surface repository for short-lived radioactive waste and another site for a possible deep repository and a rock laboratory.

CONCLUDING REMARKS

It is encouraging to see that the Applicant Countries are developing and implementing radioactive waste management strategies in the areas of financing, legal, and organisation. Whilst they sometimes face

economic uncertainty and special problems they appear to be heading towards achieving the goal of safe environmental management of radioactive waste.

The EU and the Applicant Countries are working closely on all fronts to develop systems consistent with best practice in the Member States in readiness for membership of the Union. By sharing experiences through formal and less formal contacts between WMOs of the EU and the Applicant Countries, the required skills to operate their industries in a cost-effective manner without compromising environmental safety are being developed.

REFERENCES

(1) Speech on enlargement to the European Parliament by Mr Romano Prodi, President of the European Commission, Brussels, 13 October 1999.

(2) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Adopted 5 September 1997. See www.iaea.or.at/worldatom/updates/convention.htm.

(3) 'Detailed Regional Study of Management Schemes for the Back-end of the Nuclear Fuel Cycle, Radioactive Waste Management and the Decommissioning of Obsolete Nuclear Installations'. European Commission 1994.

(4) 'Environmental Impact assessment and geological repositories for radioactive waste'. EC Report EUR 19152 (4 Vols.) Brussels 1999.

(5) 'Schemes for financing schemes for radioactive waste storage and disposal'. EC Report EUR 18185 Brussels 1999.