

## 1 INTRODUCTION

To finalize two Ukrainian nuclear power plants at Khmel'nitsky and Rivne (K2/R4) the state-owned power company, Energoatom, has asked the European Bank for Reconstruction and Development (EBRD) for respective loans.

According to the procedures of the EBRD a public participation procedure has to be undergone and was announced by Energoatom on 18 August 1998.

The Austrian Government requested and received the project documentation from Energoatom. The present report prepared for the Austrian Government examines the methodology and the validity of both data and conclusions drawn from the project documentation. It was prepared by a team of experts co-ordinated by the Federal Environment Agency. It also examines the extent to which the EBRD procedures have been met. The highlights of the findings are summarized below.

The following institutes contributed to the present report:

- Austrian Energy Agency (EVA)
- Austrian Institute for Applied Ecology
- Federal Environment Agency Austria (FEA)
- Institute of Risk Research (IRR)
- Institute of Meteorology and Physics of the University of Agriculture, Vienna
- Science and Technology Policy Research, University of Sussex (SPRU)
- Vienna Institute for Comparative Economic Studies (WIIW)



## 2 PROJECT DESCRIPTION

The construction of two VVER 1000/V-320s MW nuclear power plants, Khmel'nitsky 2 (K2) and Rivne 4 (R4), was started in 1985/86 and stopped in 1991 as a result of a moratorium by the newly established Ukrainian parliament. Since the cancellation of the moratorium in 1993, the intent has been to complete the units.

A Memorandum of Understanding of 1995 signed between G7 countries, the European Commission and Ukraine stipulates that Ukraine and the G7 countries will work with international financial institutions, European Bank for Reconstruction and Development (EBRD) and Euratom, in preparing loan-financed projects based on the least cost principles and complying with Ukrainian energy sector strategy supporting the closure of Chernobyl nuclear power plant.

The current estimate of the total cost of completing sequentially both units of K2 and R4, starting up the units and providing support to the Nuclear Regulatory Authority is US\$ 1.725 billion (ECU 1.590 billion).

The maximum amount of financing that the EBRD is considering is US\$ 190 million (ECU 175 million) as a sovereign-guaranteed loan to Energoatom. A substantial Euratom loan and a significant financial contribution by the Ukrainian authorities is also envisaged, along with financing from export credit agencies and Russia.

In 1997, the Ukraine energy sector was reformed. Ownership of the NPPs was taken over by a new umbrella energy organisation, ENERGOATOM. Under the reorganisation, ENERGOATOM absorbed the corresponding activities of GOSKOMATOM and became the authority responsible for the completion of the NPPs.

A Project Management Group, which is a consortium of the "Kiev Institute" ENERGOPROJEKT in cooperation with, among others, the Russian organisation MOHT<sup>1</sup> and experts of EDF (Electricite de France), developed a Ukrainian Modernisation Programme for K2/R4 during 1994 and 1996. The overall objective of this programme as stated by Energoatom on 19 August 1998 is to "achieve a level of safety comparable with western plants of the same age and comply with all national requirements, norms and rules".

The programme was evaluated by IAEA and Riskaudit, but not all recommendations of IAEA and Riskaudit for improvement have been adopted in the Modernisation Programme.

Based on the Memorandum of Understanding, the EBRD has been asked by the G-7 already on 16 January 1996 to investigate the possibility of providing a portion of the required financing, together with other potential providers of funds.

EBRD loans require that the submitted project meets "normal sound banking principles". In addition, the proposed project would need to satisfy EBRD's conditions for lending in the nuclear sector e.g. according its Energy Operations Policy:

- be financially viable;
- satisfy environmental and public consultation requirements;
- satisfy western nuclear safety principles; and
- be part of a least cost option.

Similar conditions are required by the European Commission as far as EURATOM loans are concerned.

During 1996 the EBRD charged an international panel of experts to prepare an economic assessment of the Khmel'nitsky 2 and Rivne 4 nuclear reactors project in Ukraine. This report

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<sup>1</sup> MOHT is an association of Russian organisations including: Atomenergoprojekt, OKG Gidropress, Kurchatov Institute, VNIIAES, Rosenergoatom, etc.

was presented to the EBRD, the European Commission (EC) and the US Agency for International Development (USAID) on 4 February 1997.

All but one member of the Panel concluded that the project is not economically sound because, in their opinion it does not satisfy the least-cost requirement, and completing the reactors by 2000 would not represent the most productive use of EBRD/European Union (Euratom) funds in support of the development of Ukraine's energy sector.

In 1997 the Austrian Government commissioned a report of the Austrian Institute of Risk Research to provide a technical assessment of the completion project of the NPPs Khmelnitsky unit 2 (K2) and Rivne unit 4 (R4). The main task of this report was to treat highly relevant *safety issues* and to review and evaluate whether these are properly addressed. A second task was to determine whether adequate *measures* for solving problems concerning these safety issues are proposed within the frame of the completion project for K2/R4. In principle, the focus is mainly on *plausibility*, firstly regarding the completeness of issues, and secondly regarding the adequacy of corresponding measures.

This report was finished in June 1997 and submitted to EBRD, the Ukraine, the G7 member states and the EU 14 member states. It concluded that "the important EBRD requirement that the project satisfy Western nuclear safety principles will not be fulfilled".

In May 1998 the US-based consulting company Stone & Webster released a new study to the EBRD, concluding that "the decision to complete both Khmelnitsky 2 and Rivne 4 in 2002 is likely to be the least-cost and least risky economic choice".

Based on the results of the Stone & Webster study and the previously finished studies concerning nuclear safety issues, done by Riskaudit, EBRD decided to continue the project preparation. The French company Mouchel Ltd. was commissioned to elaborate the Environmental Impact Assessment.

On 18 August 1998 Energoatom announced the begin of the public participation procedure, which should end on 15 December 1998.

The following documents were released by Energoatom:

1. Project Presentation
2. Least-Cost Electric Power System Development Analysis
3. Final Safety Assessment for the Loan Approval Procedures
4. a. Environmental Impact Assessment for the Completion of Khmelnitsky Unit 2 Nuclear Power Station  
b. Environmental Impact Assessment for the Completion of Rivne Unit 4 Nuclear Power Station.

Consequently the Austrian Government commissioned a team of national and international institutions co-ordinated by the Austrian Federal Environment Agency to comment on the project documentation released by EBRD and/or the Project Sponsor.

### 3 PROCEDURAL REMARKS

Several deficiencies concerning the procedures stipulated by the EBRD were observed till now:

In a letter dated 22 July 1998 the Austrian Minister of Finance officially informed the EBRD that Austria wished to be included in the public participation procedure concerning the K2/R4 project. In its reply dated 18 August 1998 the EBRD noted that "with respect to issues of notification and the application of the Espoo Convention, the bank is committed to encourage Ukraine to engage in a broad public participation consultation process based on openness and transparency. In this respect the Bank understands that Ukraine will supply in a timely manner neighbouring countries with the results of the EIA and least cost studies. These materials will also be open to other countries through the Secretariat of the Espoo Convention (UN ECE) which has indicated its willingness to assist in this exercise."

Until mid of November 1998 no documentation was available from the Secretariat of the Espoo Convention and no clarification of questions about the role of the Secretariat was received by Austria, an issue raised in a letter dated 25 September 1998.

Apparently the Austrian request to participate in the public participation procedure was not forwarded to the Project Sponsor by the EBRD.

According to the Environmental Procedures of the EBRD the requirements outlined in the Espoo Convention for operations involving transboundary impacts must be followed, irrespective of ratification of or accession to this Convention by the sovereign state hosting the project. In principle, it is EBRD policy that release of information is the responsibility of Project Sponsors. Nevertheless, it has to be noted that the Espoo Convention inter alia contains responsibilities of the „Party of origin“ with respect to the notification and consultation of „affected Parties“. The Environmental Procedures do not provide any guidance on the distribution of responsibilities between the Project Sponsor on the one hand and the „Party of origin“ on the other hand.

On 25 August 1998 still no project documentation was available at the Bank.

An addition to the EIA's was made public about one month after the date of the beginning of the public participation procedure.

A comparison of all documents available to Austria in late August 1998 showed that there are several different versions (see attached table).

**In the FOPC – K2/R4 background paper dated from 1 July 1998 EBRD announced that "the Riskaudit report and answers to the Austrian report<sup>2</sup> on nuclear safety will be released to the public". Following a memorandum of Mr. Heiner Luschin, the Austrian Director at the EBRD, from 27 July 1998, Mr. Nigel Carter on 6 August 1998 confirmed the EBRD's intention to distribute the Austrian report together with the Environmental Appraisal. In the end, this IRR-report and the pertinent Riskaudit comments were not released as a part of the project documentation by EBRD nor Energoatom.**

On 1 October 1998 the Austrian Environment Agency had sent a list of requested documents to Energoatom and in copy to the Environmental Appraisal Unit of the EBRD. On 16 October a revised list of requested documents was sent to Energoatom and the EBRD. Until now no documents have been received from the project sponsor. Nevertheless Energoatom declared its readiness to participate in a public hearing in Austria, which is currently scheduled for early December 1998.

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<sup>2</sup> The report "Safety Relevant Issues and Measures: Khmel'nitsky 2 and Rivne 4 NPPs ", elaborated by the Vienna based Institute of Risk Research was finalised June 1997 and sent by the Austrian Government to the EBRD, the G7 Member States and the EU 15 Member States.

## Synopsis

| ENERGOATOM [EA]<br>(paper version)   | EBRD  | EA-Internet Release  | EA-CD ROM   |
|--|---|--|---|
| Project presentation (EA)  | the same in SGS98-205   | Total missing  | <b>App. 1 &amp; 2:</b> maps missing   |
| Least Cost<br>(Stone & Webster)  | SGS98-131 Add.1, paper version:<br>in parts differences in listing;<br><b>Appendix A:</b> „Rehabilitation cost – \$78 Million per unit over 10 years“ missing;<br><b>Appendix B:</b> in case summary in EBRD-Document only 107 cases, in Kiew-version 123 cases; last page: Overview at case summary missing<br><i>elektronic version:</i><br>in parts differences in listing<br><b>Appendix A:</b> „General Study Planning Data“ (1 page) missing; | Differences in appendices:<br><b>Appendix A:</b> „Planning data for existing thermal plants – retirement date or end of service life“ (1 page);<br>„Planning data for rehabilitated fossil plants, planning data for new fossil plants“ (1 page); „In-Service Date Capital Costs (US\$/kW)“ (4 pages) missing<br><b>Appendix B:</b> 123 cases listed; last page overview missing<br><b>Appendix C:</b> only 1 of 3 pages of the Decision-Tree included<br><b>Appendix D:</b> ident<br><b>Appendix E:</b> ident | Differences in appendices:<br><b>Appendix A:</b> „Planning data for existing thermal plants – retirement date or end of service life“ (1 page); „Planning data for rehabilitated fossil plants, planning data for new fossil plants“ (1 page); „In-Service Date Capital Costs (US\$/kW)“ (4 pages) missing<br><b>Appendix B:</b> 123 cases listed; last page overview missing<br><b>Appendix C:</b> only 1 of 3 pages of the Decision-Tree included<br><b>Appendix D:</b> ident<br><b>Appendix E:</b> ident |
| Nuclear Safety<br>(financed by TACIS )<br>Riskaudit Report No. 120             | SGS98-131; document includes additional Riskaudit-Comment (Report No. 136) to IRR-Report  | Riskaudit-Report No. 120   | Riskaudit-Report No. 120  |
| Environmental Impact Assessment for K2<br>(financed by TACIS)<br>Mouchel-study | Executive Summary in SGS98-205; Complete version available from EBRD-Business Information Center (includes in comparison to EA-Kiew-version coloured copies of several maps, but based on bad copy quality no reading possible)   | Only Executive Summary   | Includes TACIS/Mouchel-study; graphs and tables no readable or not existing   |
| Environmental Impact Assessment for R4<br>(financed by TACIS)<br>Mouchel-study | Executive Summary in SGS98-205; Complete version available from EBRD-Business Information Center (includes in comparison to EA-Kiew-version coloured copies of several maps, but based on bad copy quality no reading possible)   | Only Executive Summary   | Includes TACIS/Mouchel-study; graphs and tables no readable or not existing   |

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