



**European Bank**  
for Reconstruction and Development

**THE NUCLEAR SAFETY ACCOUNT  
AND  
THE CHORNOBYL NUCLEAR POWER PLANT**

Dr. Fulcieri Maltini  
Senior Banker

International Atomic Energy Agency  
United Nations Department of Humanitarian Affairs  
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## **I. International Initiative to Help Improve Nuclear Safety**

At their Munich Summit in 1992, the G-7 heads of state and government offered the countries of *central and eastern Europe and the former Soviet Union* a *multilateral programme of action* to improve the safety of their nuclear power plants. As part of this programme, the G-7 advocated the setting up of a supplementary mechanism to address short term safety upgrades at civilian nuclear reactors, with a clear priority given to VVER-440/230 and RBMK types of reactors. Moreover, it should supplement bilateral and European Union assistance programmes, focus on the purchase of equipment and, as a grant fund, should not substitute for commercial sources of financing where they are available.

In 1993, the G-7 officially proposed that the European Bank for Reconstruction and Development (EBRD) set up the Nuclear Safety Account (NSA) and act as the Account's secretariat. The Bank's Board of Directors approved this proposal and the Rules of the NSA on 22 March 1993 and the NSA became effective on 14 April 1993.

## **II. Purpose of the Nuclear Safety Account**

The NSA is a multilateral fund supplementing existing bilateral and multilateral assistance programmes for nuclear safety improvements in the region. It co-ordinates its activities with these programmes and works in close co-operation with the G-24 Secretariat. The *Assembly of Contributors* exercises overall supervision of the management of the Account.

The NSA finances, through grants, operational and near-term technical safety improvements for Soviet-designed nuclear reactors in the countries of the former Soviet Union, central and eastern Europe. Priority is given to those reactors which present the highest level of risk that can be significantly reduced by short-term and cost-effective safety improvements, and which are necessary to ensure the continuing electricity supply in the region. Efforts are therefore focused on VVER 440/230 and RBMK types of reactors and on the purchase of equipment as opposed to studies, which a number of donors already fund. Agreements are sought with the countries concerned on timetables for the shutdown of the less safe reactors as part of agreed strategies for their power sub-sectors. Finance from the NSA is not used to extend the operating lifetime of unsafe reactors.

By 31 December 1995, 14 countries and the European Union had made pledges to the NSA, totalling ECU 245 million. The countries are: Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdom and the United States of America. To date the NSA Assembly of Contributors has approved five projects and Grant Agreements have been signed with recipients in Bulgaria (ECU 24 million - signed June 1993), Lithuania (ECU 41 million - signed February 1994) and Russia (ECU 76 million - signed June 1995).

Negotiations for a project in Chornobyl will soon begin with Ukraine.

## **III. Project Preparation and Implementation**

The Bank prepares specific projects in close co-operation with the potential recipients, design institutes, bilateral agencies, the G-24 Secretariat, the IAEA and other institutions. The NSA

has benefited from the results of previous work undertaken by these bilateral and multilateral activities and programmes. This also ensures consistency and complementarity of all international co-operation efforts with the recipient countries.

The Bank then submits the draft projects to its Safety Review Group for review and finally to the Assembly of Contributors of the Nuclear Safety Account for approval. On the basis of mandates given by the Assembly, the Bank negotiates grant agreements with the recipient countries.

These agreements address issues that go beyond the implementation of the projects' technical content. They pave the way for least-cost planning activities in the power sectors of the countries concerned, including the commitment (or at least the reasonable prospect) of replacing the less safe reactors in the most cost-efficient manner. The agreements favour a large transfer of knowledge and methods in the energy, nuclear safety and procurement areas. For example, a number of utilities in NSA recipient countries already utilise NSA procurement rules and standard documents for their own procurement activities.

Once an agreement is signed, the utility operating the nuclear power plant concerned is charged with the implementation of the NSA project. For this purpose it sets up a Project Management Unit (PMU) which is in charge of day-to-day project implementation. The PMU includes a western engineering firm fully integrated with the plant staff. The major tasks are the drafting of technical and commercial specifications, issuing tender documents, negotiating contracts with suppliers, planning and supervising installation and commissioning as well as assisting the plant in the licensing procedures.

The Bank assists the recipient in setting up the PMU and then monitors the implementation of the NSA project. It reports regularly to the Assembly on the status of ongoing projects.

#### **IV. Status of the current work programme**

By the end of 1995, five projects had been approved by the Assembly of Contributors and grant agreements had been signed by the Governments of Bulgaria, Lithuania and Russia, the utilities, the Russian Nuclear Safety Authority (Gosatomnadsor) and the Bank (on behalf of the NSA).

The plants involved in the projects are: Kozloduy, Ignalina, Kola, Novovoronezh and Leningrad.

Two of these projects concern RMBK reactors: Ignalina Units 1 & 2 and Leningrad Units 1, 2, 3 and 4.

At Ignalina, a PMU is responsible for project management jointly with the plant staff. The safety improvement programme includes major diagnostic and Inservice Inspection equipment, safety valves, a full scope simulator, emergency reactor trip systems, radiation, hydrogen and seismic monitoring systems as well as fire protection equipment.

In addition to the equipment supply, a plant specific in depth Safety Analysis Report is produced by the plant with the assistance of a group of western consultants and reviewed by a panel of experts.

Total cost of the project is 41 million ECU.

The grant agreement specifies that no rechannelling will be undertaken and that Unit 1 will be shut down in 1998 unless the Lithuanian Safety Authority Vatesi will grant further operating licence following the recommendations of the panel of experts.

At Leningrad, a PMU implements a safety improvement programme with provision of equipment similar to the one at Ignalina in collaboration with Russian engineering institute.

Total cost of the project is 30 million ECU.

An additional grant has been signed with Gosatomnadsor to provide assistance by a western and Russian Technical Safety Organisation for the licensing procedures.

In parallel, EBRD is assisting Lithuanian and Russian Authorities with Energy sector studies in order to identify suitable conventional power projects and energy efficiency programmes to be financed by means of loans.

## V. The NSA Chernobyl Project

This project differs from previous NSA initiatives in that it combines limited short-term safety improvements to the Unit 3 with the provision of facilities for the ultimate decommissioning of Units 1, 2 and 3.

Project preparation started in December 1994 as part of the Action Plan proposed to the Ukrainian Authorities by the G-7 Summit in Naples (8-9 July 1994). The NSA's project team undertook a number of missions to Kiev and Chernobyl over the past year to discuss technical aspects with representatives of the plant as well as with the relevant governmental organisations (energy, nuclear power and safety authorities).

As a result of this initial work, the Bank was able to identify a package of safety improvements to Unit 3 which largely correspond with the recommendations of a March 1994 IAEA Mission to Chernobyl (RBMK-RD-004). These safety improvements were taken from a comprehensive list of safety measures for Unit 3 approved by the Ukrainian State Committee for Nuclear and Radiation Safety, which last year was subsumed within the new Ministry for Environmental and Nuclear Safety.

Major items to be funded are: In-service inspection equipment for reactor fuel channels and for the main steam/water circuit, plant and personnel radiation monitoring systems, neutron flux instrumentation, reactor control rods, a hydrogen monitoring system, and essential spare parts for electrical and diesel generators.

The definition of the second part of the project (decommissioning facilities) draws upon the results of an EC/TACIS-sponsored decommissioning strategy study performed by AEA Technology. This study identified, *inter alia*, a number of facilities required to be completed at closure that would permit decommissioning work for Units 1, 2 and 3 to commence to reach IAEA Stage 1 decommissioning stage.

It is currently envisioned that the NSA would finance a Low and Intermediate Level Liquid Radwaste Treatment Plant (35,000 m<sup>3</sup>) and a Spent Fuel Storage Facility (26,000 assemblies), while the European Union through TACIS would finance the remaining facilities.

To complement the Chernobyl Project and as part of the Action Plan, the Bank completed a least cost plan for the long term development of the Ukrainian power sector, which takes into account the expected closure of Chernobyl NPP. Its conclusions will be used as a basis for

power sector investments to be considered by EBRD and other International Financing Institutions in the future.

In the wake of an agreement between the G-7, the European Union and Ukraine on a Memorandum of Understanding (MOU) signed on 20 December 1995, the Assembly of Contributors approved the NSA Chornobyl Project in the amount of approximately 100 million ECU.

Main objective of the MOU is to secure a shutdown of the Chornobyl plant by the year 2000 in the context of a comprehensive energy strategy largely financed by the western countries.

The Bank is currently negotiating with the Ukrainians on the project organisation and the basic elements of a grant agreement.

The total amount of grants and loans that EBRD, the NSA, the World Bank, the European Union and bilateral donors are making available in Ukraine for nuclear safety, Chornobyl decommissioning preparation, the rehabilitation of the energy sector as well as the social sector has an approximate value of 2.3 billion US\$.

We expect that this substantial and important financial commitment from the international community will go a long way towards accelerating the important restructuring of the energy sector currently underway along with the reduction of the risks of the Chornobyl plant operation until its final closure and decommissioning.

**MEMORANDUM OF UNDERSTANDING  
BETWEEN  
THE GOVERNMENT OF THE G-7 COUNTRIES AND  
THE COMMISSION OF THE EUROPEAN COMMUNITIES  
AND  
THE GOVERNMENT OF UKRAINE  
ON THE CLOSURE OF THE CHERNOBYL NUCLEAR POWER PLANT**

**THE RESPECTIVE GOVERNMENTS OF THE G-7 COUNTRIES AND THE COMMISSION OF THE EUROPEAN COMMUNITIES, herein referred to as the “G-7” and THE GOVERNMENT OF UKRAINE, hereinafter referred to as “Ukraine”, have developed a cooperative approach on the elaboration and implementation of a Comprehensive Programme to support the decision of Ukraine to close the Chernobyl Nuclear Power Plant by the year 2000, as formulated by President Kuchma in his statement of 13 April, 1995, and in his letter of August 8, 1995, to G-7 Leaders. The Programme will thus implement the commitments of the leaders of the G-7, made in Naples, Italy, in 1994 and Halifax, Canada in 1995.**

## **COMPREHENSIVE PROGRAMME OF THE G-7 AND UKRAINE TO SUPPORT THE CLOSURE OF THE CHERNOBYL NUCLEAR POWER PLANT**

### **I. LIST OF NON-REVENUE GENERATING PROJECTS PROJECT AND CORRESPONDING MOU PARAGRAPH**

- 1. Decommissioning of The Chernobyl NPP**
  - 1.1 Stage 0 (5 Years)  
Preparatory Work Prior to Decommissioning of Chernobyl NPP**
  - 1.2 Stage 1 (10 Years After Completion of Stage 0)  
Fuel and Waste Management**
  - 1.3 Stage 2 (9 Years After Completion of Stage 0)  
Decommissioning of Chernobyl NPP.**
- 2. Plan to deal with social impact related to Chernobyl NPP**
- 3. Short Term Nuclear Safety Improvements for Chernobyl NPP Unit 3**
- 4. Transformation of "Shelter" into a n Environmentally Safe System**
- 5. Power Sector Restructuring**

### **II REVENUE GENERATING PROJECTS**

- 6. Completion of Rovno 4 and Khmelnitsky 2**
  - 6.1 Safety Improvements and Completion of Khmelnitsky  
and Rovno 4**
  - 6.2 Construction of HV Transmission Lines to  
Khmelntisky and Rovno Units**
- 7. Rehabilitation of Thermal Power Plants**
- 8. Construction of Dniester Pumped Storage**
- 9. Energy Efficiency and Demand Side Management**
- 10. Relocation and Construction of 750kv Switchyard Outside  
Contaminated Area at Chernobyl**

**G-7/UKRAINE COMPREHENSIVE PROGRAMME FOR THE CLOSURE OF CHERNOBYL**

**SUMMARY OF CURRENT FINANCIAL RESOURCES  
FROM THE INTERNATIONAL COMMUNITY  
(US \$ MILLIONS)**

	<b>GRANTS</b>	<b>IFI AND EURATOM LOAN FINANCING</b>	<b>TOTALS</b>
<b>POWER SECTOR RESTRUCTURING</b>	43		43
<b>ENERGY INVESTMENT PROGRAMME</b>	102	1,809	1,911
<b>NUCLEAR SAFETY AND DECOMMISSIONING</b>	349		349
<b>SOCIAL IMPACT PLANNING</b>	4		4
<b>TOTALS</b>	498	1,809	2,307