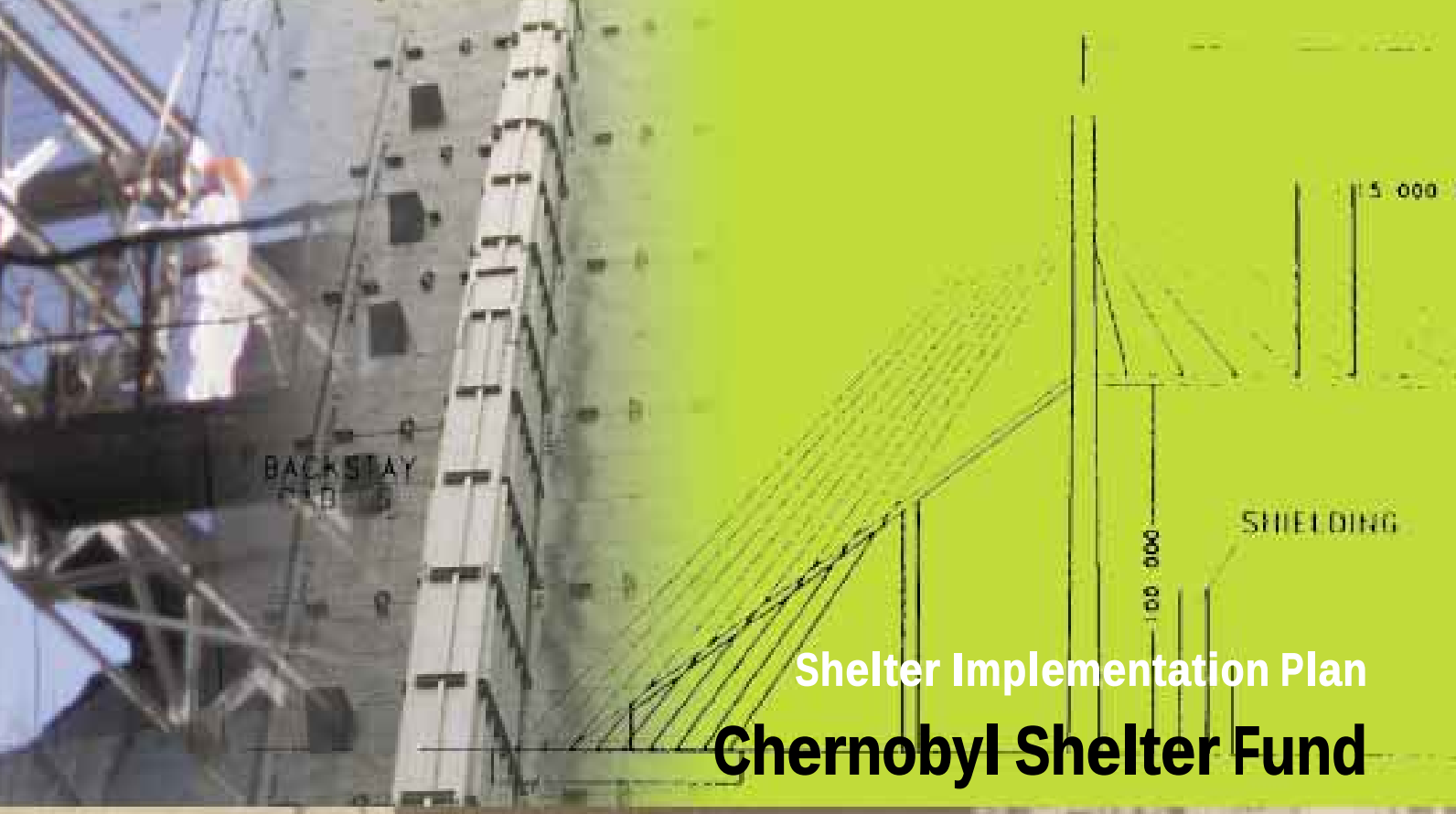
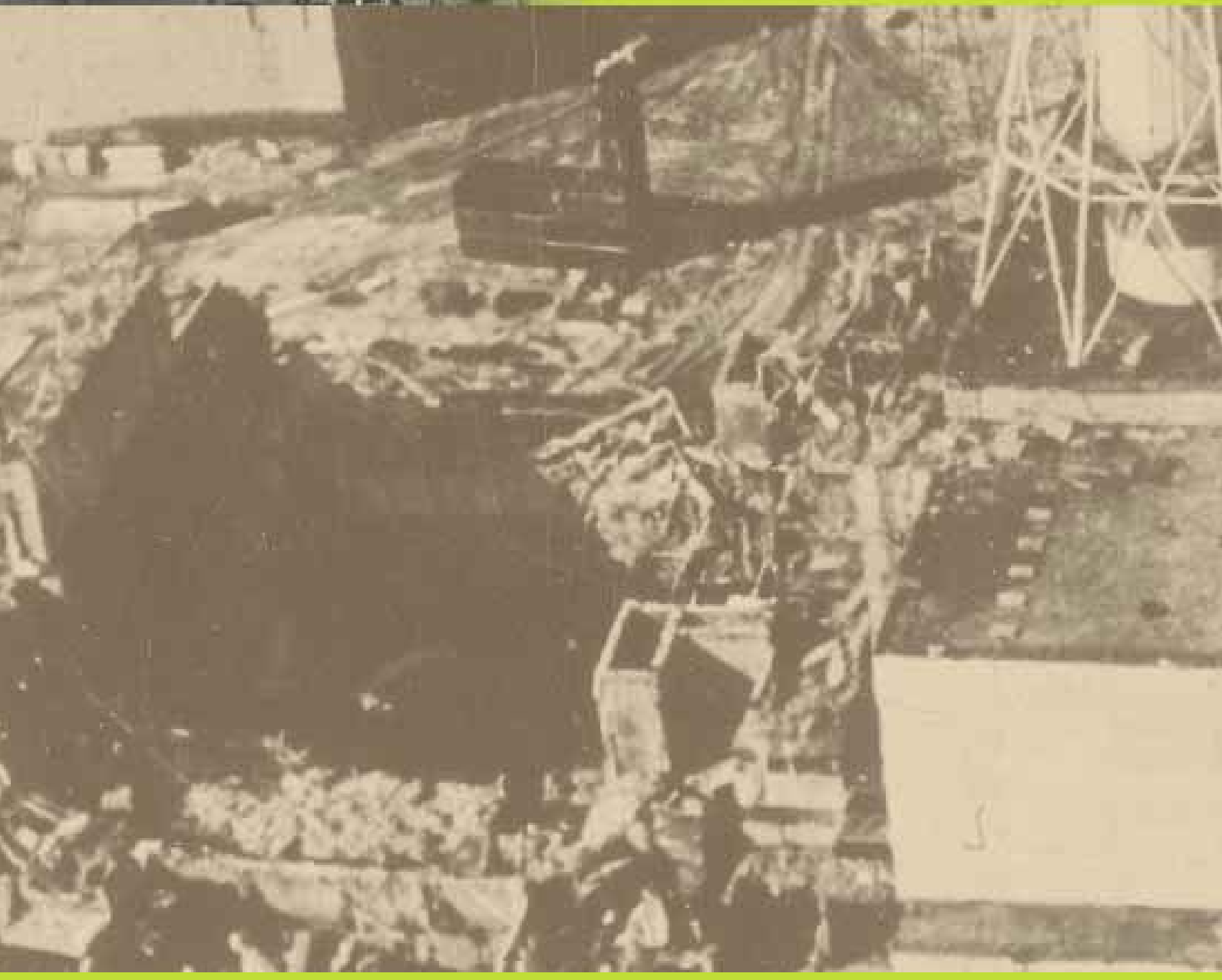
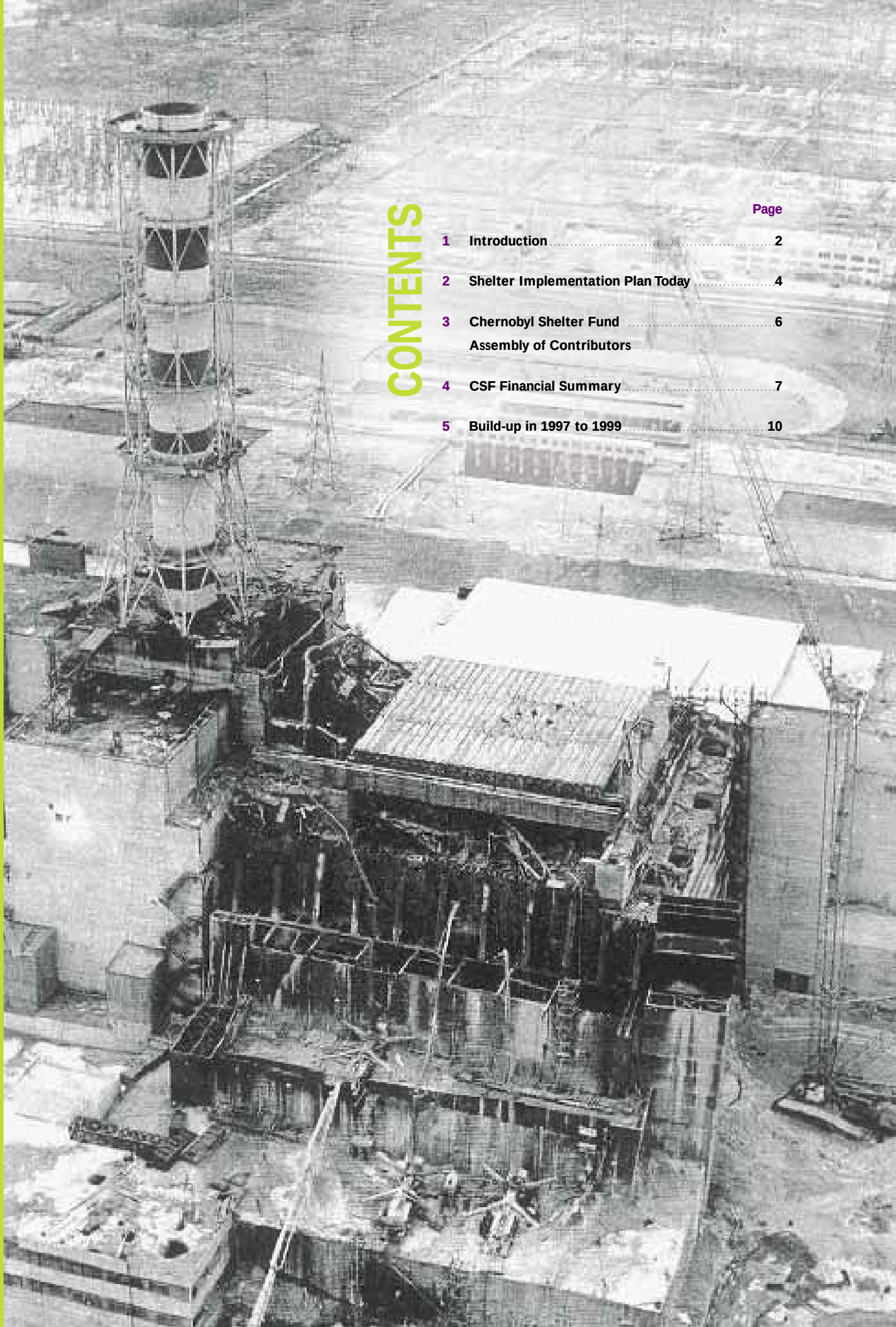


Shelter Implementation Plan

Chernobyl Shelter Fund



Creating a safer environment



CONTENTS

PREFACE

Hans Blix
Chairman of the Assembly

As Director General of the IAEA at the time of the Chernobyl accident, I was among the first to learn about the scale of the disaster and the need to assist Ukraine in dealing with the humanitarian and environmental consequences of this catastrophe.

Since then, Ukraine has closed Units 1 and 2 of the Chernobyl Nuclear Power Plant and is committed to close the last operating reactor of Chernobyl in 2000. The fragile state of the present Shelter and the nuclear material within, however, is still threatening.

As Chairman of the Assembly of Contributors to the Chernobyl Shelter Fund, I continue to be strongly committed to the international effort for creating a safe environment. In my view, the Shelter Implementation Plan, financed from the Fund, is a vital part of the answer to the consequences of the catastrophe of Chernobyl.

The plan has been followed successfully and this enormously important project has now reached the point where additional commitments to the Fund are needed this year in order to bring it to completion. Given the global significance of the project, I am confident that governments will further extend their financial support to the Chernobyl Shelter Fund.

Horst Köhler
President of the EBRD

The European Bank for Reconstruction and Development has been created to foster the transition to open market economies and democracy in central and eastern Europe while also promoting environmentally sound development. To administer the Chernobyl Shelter Fund is therefore fully in line with these objectives. In this endeavour, we are supported by our shareholders of 58 nations, the European Investment Bank and the European Community, who decided on the original establishment of the Chernobyl Shelter Fund.

The Shelter Implementation Plan is of utmost importance for Ukraine, but its environmental dimension transcends geographical and political borders. Today, we can note the substantial progress which the project has made since the initial funds were pledged in late 1997 in New York. More than € 265 million, approximately 80 per cent of the current financial commitments to the Fund, have already been allocated in moving the project through its first phase, including a number of emergency repairs. If the project is to proceed on schedule, new commitments are needed now.

The second pledging conference is planned for this year in Berlin with the objective to secure US$ 375 million of additional commitments to the Fund. The G-7 countries and the EU have already indicated their intention to contribute US$ 300 million. Through their further contributions the whole community of nations will have a good opportunity to confirm in a very practical way the allegiance to the universal goal of protecting humanity and preserving the environment for future generations.

Cover images:
Chernobyl Unit 4 immediately after explosion. Many people died and many more still suffer the consequences. Tens of thousands of people were evacuated and still cannot return to the 30 kilometre exclusion zone around Chernobyl Nuclear Power Plant.
In the upper section, from left to right, the Shelter, the on-going repairs, and sketch of one of the alternatives for the final confinement.

Picture left:
Shelter under construction. More than 300,000 "liquidators" were engaged to build this temporary structure in several months following the accident. At least 95 per cent of the radioactive content of Unit 4 remains inside the Shelter threatening the environment.
(Photograph is courtesy of IPSN and GRS).

1. INTRODUCTION

The consequences of what happened on 26 April 1986 in Chernobyl and the fear it spread around the world are still vivid in the memories of the general public after more than 13 years.

The Chernobyl Unit 4 catastrophe remains the worst accident in the history of commercial nuclear power. Humanitarian and environmental consequences of the accident caused by a combination of intrinsic design flaws of the RBMK reactors and the absence of operational procedures and discipline are still felt today.

The explosion of the reactor core sent up tons of radioactive material into the atmosphere. Within hours heavy contamination affected the population and natural habitat of vast areas of Ukraine, Belarus and Russia. Within days the wind dispersed radio-nuclides over many parts of Europe and even beyond.

Today, at the beginning of 2000, Ukraine continues to spend up to 5 per cent of its GDP on mitigation of the social, health and environmental consequences of the accident.

Units 1 and 2 of the Chernobyl Nuclear Power Plant have been closed permanently after defects and incidents made their continued operation non-viable. The Government of Ukraine is committed to shut down the last operating Unit 3 in the year 2000. A repetition of the 1986 catastrophe will then become impossible.

However, the inventory of the Shelter, the 'Sarcophagus' built hastily around the wrecked Unit 4 in 1986, continues to pose a threat to both humanity and the environment. Just a few per cent of the nuclear inventory of the Chernobyl Unit 4 contaminated two-thirds of the territory of Europe in 1986. More than two hundred tons of uranium and close to a ton of radio-nuclides, of which 80 per cent is plutonium, remain within the deteriorating Shelter.

The Chernobyl Shelter Fund (CSF) was set up in December 1997 with the purpose of funding the Shelter Implementation Plan (SIP). The main objective of the SIP, developed in a co-operative effort between the European Union, the United States and Ukraine, is to protect the personnel, population and environment from the threat of the huge radioactive inventory of the Chernobyl Unit 4 Shelter. At the end of the eight to nine year project, estimated to cost US$ 768 million, the Shelter will be transformed into a stable and environmentally safe system for many decades. The European Bank for Reconstruction and Development (EBRD) was entrusted with managing the CSF.

Uncertainties about the actual condition of the Shelter, primarily due to the high level of radiation, determined the nature of this uniquely complex project. The SIP is conceived as a decision-based process in which thorough investigation precedes each programmatic decision. Nevertheless, immediate risk of collapse mandated that the two most critical repairs be carried out without delay. From the environmental viewpoint the completion of the Shelter roof beam repairs in 1999 is certainly the most significant achievement so far, together with an earlier repair of the ventilation stack.



Less than two years since the CSF became operational, the SIP has approached the end of its first predominately investigative phase. The crucial programmatic milestone that will determine the Shelter stabilisation concept and shape the strategy of the confinement is scheduled for the second quarter of 2000. This decision will also mark the beginning of the transition into the next phase of the project characterised by new contracts for major construction activities. New Grant Agreements will have to be executed in 2000, in addition to € 265 million that have already been allocated for engineering, licensing and procurement of equipment and services, and for management.

As of January 2000, the European Union and 25 countries had committed US$ 395 million to the CSF. Following the statement of the June Summit in Cologne, the G-7 countries and the EU took the lead in preparing a doubling of their contributions. G-7 is organising a second pledging conference to take place in the first half of 2000. The initiative, fully supported by the non-G-7 members of the Assembly of Contributors, will allow execution of new Grant Agreements and ensure the important momentum of the project, which is so necessary for its timely and economic finalisation.

A view of the Shelter roof during construction. The circle indicates one of the locations of the main roof beams and the condition of the supporting wall. This continued to be the main threat for the collapse of the roof until the successful repair in 1999.



2. SHELTER IMPLEMENTATION PLAN TODAY

Two years after the first meeting of the Assembly of Contributors in December 1997, which made the CSF operational, the SIP has reached the final stages of its first phase. The first phase of this large, difficult and complex project has several primary objectives. An expedited review of structural collapse risks as well as design and implementation of the most critical corrective measures was vital due to the deteriorating condition of the Shelter. The vast majority of the scope is, however, of an investigative and engineering nature. The aim is to increase the knowledge base of the still uncertain condition of the Shelter and to generate studies, designs and technical specifications for structural stabilisation; accident risk management, improved personal and environmental safety and a long-term strategy for the conversion of the Shelter into an environmentally safe system. The site infrastructure also has to be developed and built in advance of the huge construction works in the second phase of the project.

The completion, in December 1999, of the emergency repair of the beams supporting the roof of the Shelter eliminated the most imminent threat of collapse. Structural stabilisation of the ventilation stack, whose collapse was threatening both the Shelter and the still operating Unit 3 of Chernobyl NPP, was completed in 1998 as an initial SIP task. The remaining stabilisation measures were reviewed in April 1999. Their implementation will be evaluated in the overall context of the structural stabilisation tasks and the entire SIP at the programmatic milestone due in the second quarter of 2000.

The main deliverables of the first phase of the SIP – engineering and investigative studies – are now close to 70 per cent complete. The procurement plan for the SIP equipment and the construction infrastructure, estimated at €150 million, is under realisation. Approximately 98 per cent of the procurement will be subject to open tendering in accordance with the EBRD's Procurement Policies and Rules.

Preparation for transition to the second phase of the project, which will start in mid-2000 and involves new project organisation structure and new contracts for management, engineering and major construction contracts, is on track.

Many prerequisites – institutional, organisational and cultural – had to be met in order to achieve this state of the project. An effective relationship with the Ukrainian authorities was instrumental for the creation of an environment in which the SIP can make progress.

Elevator and walk-ways were built for the critical repairs of the roof beams, completed by December 1999. High radioactivity was the main challenge and almost 400 workers had to be engaged in order to limit the individual radiation doses.

3. Chernobyl Shelter Fund - Assembly of Contributors

- Austria
- Belgium
- Canada
- Denmark
- EC
- Finland
- France
- Germany
- Greece
- Ireland
- Italy
- Japan
- Kuwait
- Luxembourg
- Netherlands
- Norway
- Poland
- Spain
- Sweden
- Switzerland
- Ukraine
- UK
- USA

The Assembly of Contributors, acting effectively as a Board of Directors of the CSF, authorises the grants financed from the CSF, approves all the documents that regulate the operations of the Fund, supervises the implementation and provides guidance to the EBRD, the Administrator of the Fund. The Assembly thus represents the top level of the strategic and financial control of the CSF and the SIP.

The Assembly exercises its governance through regular meetings. The eight meetings held between December 1997 and November 1999 have been characterised by a keen interest in the project progress issues and a very constructive attitude. The Bank's reporting and the discussions in the Assembly are complemented by frequent bilateral communications, in particular with the Chairman of the Assembly. This exchange ensures that the contributors to the Fund remain constantly aware of all the relevant project developments.

In March 1998, the Assembly elected Hans Blix, former Director General of the International Atomic Agency, as the Chairman. Dr. Blix was unanimously re-elected for another term in July 1999.

As of January 2000 the Members of the Assembly are 22 countries and the European Community.

CSF Assembly during one of the meetings at the European Bank for Reconstruction and Development.

4. CSF Financial Summary

Control of Funds

The EBRD, as an international financial institution, provides all the necessary expertise and services for an integrated funds management, which includes control of contributions, asset management, preparation and implementation of Grant Agreements, procurement, budget and disbursement control.

Multiple independent levels of control have been established for both commitment and disbursements as summarised in Table 4.1 below:

The administrative budget and the financial operations of the CSF are subject to an annual external audit which is presented to the Assembly for review and approval. Additionally, the EBRD reserves the right to undertake audits of any segment of the project or the entire project at any moment at its own discretion.

Table 4.1
Control of CSF Funds

Assembly	Review and approval of the scope and funding for Grant Agreements, financial statements and budgets
EBRD CSF team	Implementation arrangements and monitoring of Grant Agreements
EBRD CSF team	Tender and contract non-objection review
PMU and Client	Contract management and invoicing
EBRD CSF team	Contract and invoice control and sign-off
EBRD	Review and disbursement approval
EBRD	Disbursement
EBRD CSF team	Monitoring of disbursements and reporting to the Assembly

Status of Contributions and Financial Forecasts

Table 4.2
Pledged Contributions to the SIP as at 31 December 1999

Contributors	Total contrubutions US$ equiv.
Austria	2,776,250
Belgium	2,776,250
Canada	20,000,000
Denmark	2,776,250
EC	100,000,000
Finland	2,776,250
France	20,566,460
Germany	23,610,000
Greece	2,781,427
Ireland	2,776,250
Italy	16,820,000
Japan	22,500,000
Kuwait	4,000,000
Luxembourg	2,776,250
Netherlands	3,006,498
Norway	5,000,000
Spain	3,000,000
Sweden	2,776,250
Switzerland	4,442,000
Ukraine	50,000,000
UK	16,820,000
USA	78,000,000
Donors	
Iceland	10,000
Poland	1,001,350
Portugal	200,000
Slovak Rep.	2,221,000
Total:	393,407,308

Between December 1997 and January 2000 the donor countries and the EBRD signed 26 contribution or donation agreements. The funds, placed in accordance with the Investment Guidelines that were approved by the Assembly, generate interest that will help offset the effect of inflation on the project cost estimates that did not include escalation.

Financial commitments of the CSF are effected through Grant Agreements which define scope categories, associated funding, conditions for effectiveness and invoke Standard Terms and Conditions. The five Grant Agreements approved by the Assembly and signed with the Recipients are listed in Table 4.3. The scope of each category within the Grant Agreement may include various contracts that are to be placed and executed often over an extended period of time. This explains the differences between grant commitments, contract commitments and disbursements presented in Table 4.4.

The table also indicates that in accordance with the dynamics of the project, the cumulative value of Grant Agreements will exceed available funds in the course of the year 2000. Therefore, new pledges to the fund are now vital for the project to proceed on schedule while cash contributions to the CSF are needed in 2001.

At this stage of the project there are no developments that would warrant a re-examination of the original SIP cost estimate of US$ 768 million. Monitoring against the SIP cost baseline is a regular project activity. Individual cost estimates for each task will be adjusted as the project decisions are being taken and contracts awarded. Given the amount currently committed to the Fund the pledging target for additional donor pledges remains US$ 375 million.

Table 4.4 also shows several instalment scenarios for new contributions to the CSF and suggests that of the three linear scenarios, only the four-year equal instalment scenario safely meets the disbursement needs of the project. A likely optimum is a combination, which approximates the projected disbursement curve.

Table 4.3

SIP Short-term Financial Forecast

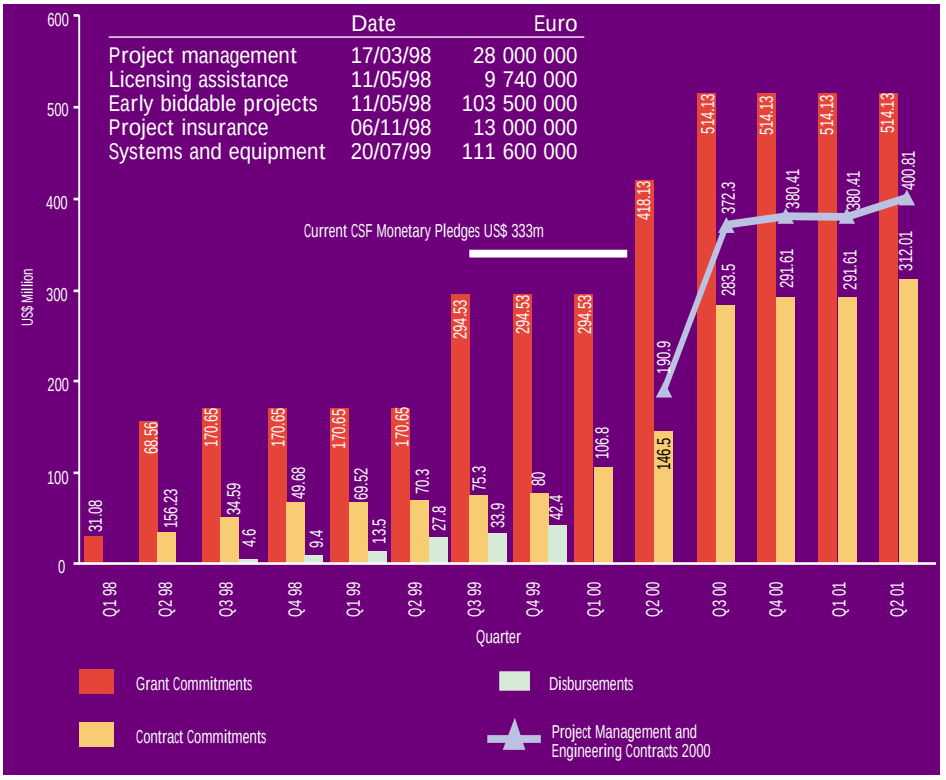
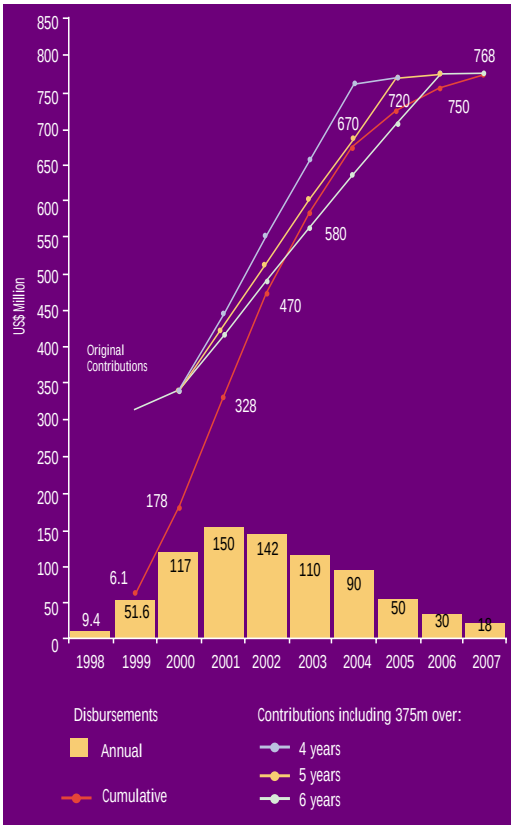


Table 4.4

SIP Cash Forecast



The long-term disbursement forecast presented in Table 4.4 is based on three elements. The first is the contracts already signed where the disbursement forecast is firm. The second element is the €150 million procurement plan, which is in the initial stage of implementation. The third, and by far the largest, is the remaining scope of the SIP for which the disbursements are projected in line with the original SIP schedule and cost estimate. It is this third element which will require up-dating as the key programmatic decisions, primarily P1 for stabilisation and P10 for confinement are taken and subsequent contracts signed (see Table 5.2).

Inside of the Shelter.
An early photograph from the Shelter Object archive.

5. Build-up in 1997 to 1999

Shelter - the "Sarcophagus"

Within a few months of the April 1986 Chernobyl accident the operators had built a Shelter over the wrecked Unit 4. This was an exceptional effort conducted under extremely dangerous and challenging conditions that involved around 300,000 people. The high radiation fields made it impossible to come close to the remains of the exploded reactor. Thousands of tons of material were dropped from the air to slow down the nuclear reaction and extinguish the fires. Then, using "arm's-length" methods, large steel fabrications were laid on the remains of the damaged reactor and partly on the new concrete shield walls, which are a dominant feature of the Shelter. The purpose was to provide weather protection and to prevent the spread of radioactive contamination. The extreme urgency of this work and the impossibility of direct access meant that the structure could not be constructed to normal building standards. Many connections between the major structural elements and the original reactor are either inadequate or are completely missing.

Since its construction, the Shelter structure has deteriorated. There has been serious weather penetration, the roof and other structural elements were or are in danger of collapse and basic uncertainties about the actual condition of the Shelter remain.

The inventory of the Shelter includes more then 200 tons of nuclear fuel in various forms, predominantly as a "lava" formed by the fusion of molten fuel, concrete and other structural materials, some 30 tons of fuel dust and approximately 2,000 tons of combustible materials. In the basement region of the Shelter, rainwater and finely divided fuel dust have formed a liquid, which is regarded as high level waste.

Collapse of the structure, conventional fire and water ingress which could affect the adjacent water table and possibly lead to a minor criticality, are some of the obvious scenarios that could lead to severe humanitarian and environmental consequences.



Shelter Implementation Plan (SIP)

Over the years, hundreds of proposals were made in subsequent attempts to find the ultimate technical solution for the deteriorating Shelter. Some of them provided very elaborate technical schemes and designs. The cost estimates were ranging from hundreds of millions to billions of dollars. None of the proposals, however, offered the necessary technical and economic optimum, primarily because of uncertainties associated with the actual condition of the Shelter.

Table 5.1
SIP Technical Goals

Reduce Collapse Probability - Structural Stabilisation
Reduce Collapse Accident Consequences
Improve Nuclear Safety
Improve Working and Environmental Safety
Long Term Strategy and Study for Conversion to Environmental Safe Site

The Shelter Implementation Plan (SIP), developed in early 1997, finally offered a way forward. Sponsored by the European Union TACIS programme and US Department of Energy, a team of Ukrainian and international experts, drawing heavily on previous studies, devised a technical strategy and the programme logic for conversion of the Shelter into an environmentally safe system. Table 5.1 shows the five principal technical goals.

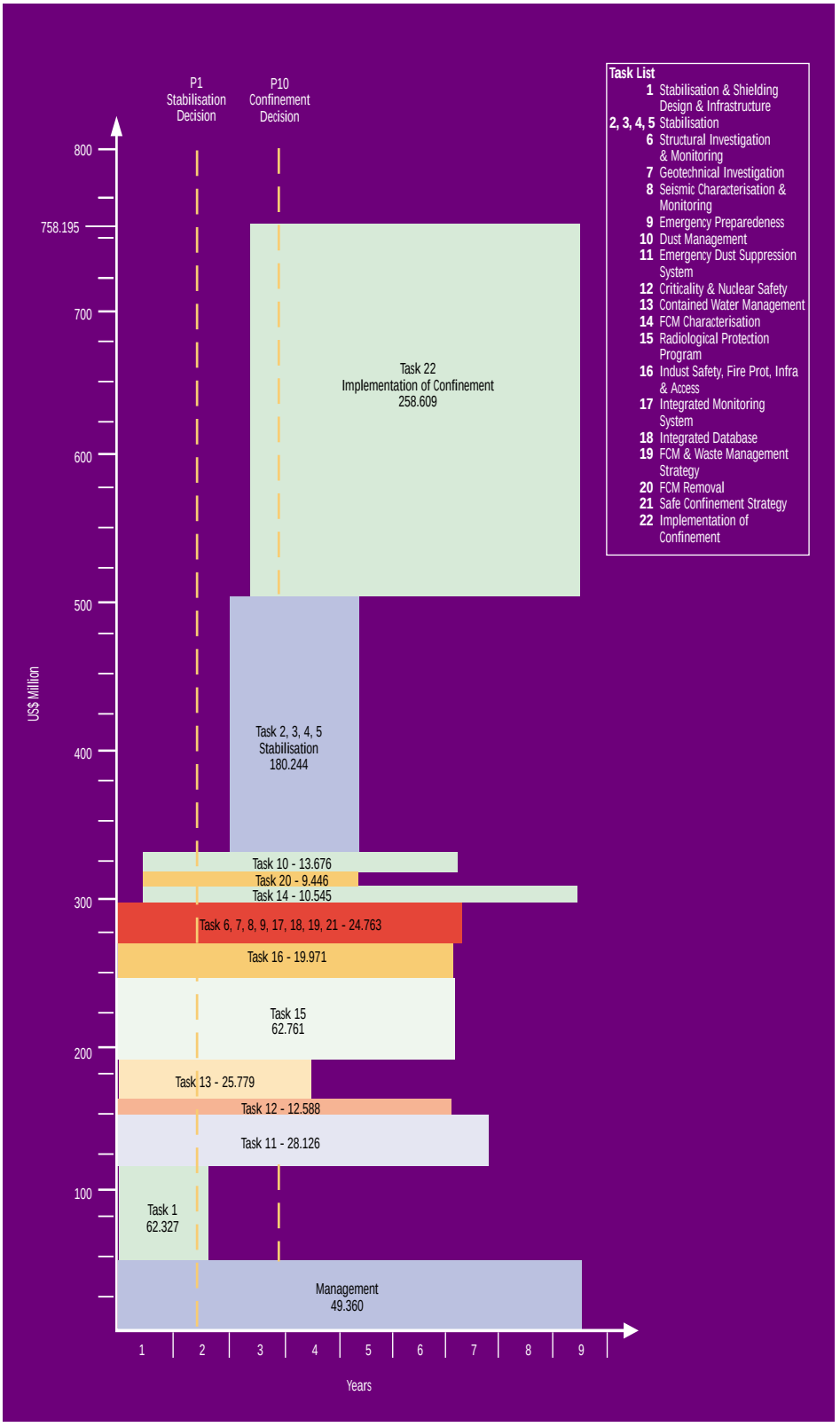
The 22 primary tasks were further developed into 297 activities, which served as a basis for the SIP schedule and cost estimates. The study established the SIP cost estimate of US$ 758 million and identified the need to fund the licensing of the SIP, which later increased the estimate to US$ 768 million. The project duration was estimated at eight to nine years from the point of the actual mobilisation of contractors. The original schedule and cost estimate for the 22 tasks is presented in Table 5.2.

The fact that the SIP project schedule in 1999 (covering only the first phase of the project) already includes more then 1,500 activities is an indication of the complexity of the project and the magnitude of management challenges. As engineering studies and technical specifications are developed, and the cost estimates ultimately confirmed through contracts, the SIP cost baseline remains an input and often criterion for project decisions. Constant monitoring against the SIP baseline is one of the priority tasks of the project.

The SIP provides a decision-based route to choosing technical options without, at this stage, defining the ultimate technical solution. Such an approach recognises and takes into account the absence of a complete and reliable data base to support immediate decisions. Instead, the SIP defined a number of programmatic, regulatory

Shelter - the buttress wall.

Table 5.2
SIP Cost Estimate and Schedule



and technical decision milestones, as well as the logic and the prerequisites for reaching them. Consequently, the scope of the first phase of the project is predominately of an engineering and investigative nature. The only exceptions are the mobilisation of the construction site infrastructure works in support of the second phase construction efforts and an expedited review of stabilisation measures in order to allow for urgent repairs to be undertaken without delay. The experience, to date, including completion of critical repairs in 1998 and 1999, confirmed the adequacy of the SIP approach.

An important outcome of the SIP study was the identification of a number of priority tasks termed "Early Biddable Projects". They have been grouped in four technical areas (see Table 5.3) which also became the basis for the terms of reference for the four engineering contracts for the first phase of the SIP awarded in 1998.

The principal difference between the originally conceived scope of the first phase of the SIP and the contracts currently in place is that the scope of the contracts also includes the technical specifications and procurement of the systems and equipment to support overall SIP objectives. The procurement and installation of these will mark the transition between the two phases of the SIP.

Table 5.3
Early Biddable Projects (EBP) Scope Breakdown

A -	**Civil engineering**
	Structural stabilisation design integration and mobilisation
	Structural investigation and monitoring
	Geotechnical investigation
	Safe confinement strategy
B -	**Operations and monitoring**
	Seismic characterisation and monitoring
	Radiological protection programme
	Industrial safety, fire protection infrastructure and access control
	Integrated monitoring system
	Integrated database/configuration management
C -	**Emergency systems**
	Emergency preparedness
	Dust management
	Emergency dust suppression system
	Criticality control and nuclear system
	Contained water management
D -	**Fuel containing material (FCM)**
	FCM initial characterisation
	FCM removal and waste management strategy
	FCM removal technology development

President Kuchma of Ukraine addressed the Pledging Conference in November 1997 in New York and will also sponsor the second Pledging Conference in Berlin this year.

Chernobyl Shelter Fund (CSF) - Denver, New York, London

Since June 1997, when Ukraine and the G-7 approved the SIP, the international community and the EBRD have acted speedily and decisively. The G-7 countries and the EU immediately pledged the initial US$ 300 million at the Denver G-7 Summit and initiated preparation of an international pledging conference. In September 1997, upon a request from the G-7, the Board of the EBRD approved the role of the Bank as Administrator of the Chernobyl Shelter Fund (CSF).

The Bank responded by accelerating the preparatory activities. By November 1997, the two key documents, The Rules of the Chernobyl Shelter Fund and the Framework Agreement, were agreed and signed with the Government of Ukraine.

The Pledging Conference was held in New York on 20 November 1997 under the sponsorship of President Kuchma of Ukraine and US Vice President Gore, and was co-chaired by the President of the EBRD. It generated momentum and before 12 December 1997, the date of the first meeting of the Assembly of Contributors, 14 countries and the European Community signed Contribution Agreements with the EBRD. By January 2000, the membership of the Assembly rose by eight and the pledged contributions had reached US$ 395 million.

Table 5.4
Principles of the Rules of the Chernobyl Shelter Fund

Open to contributions by all countries
Governed by Assembly of Contributors with consensus based decision making
Minimum commitment for membership in the Assembly € 2.5 million
No "earmarking" of contributions for specific portions of SIP
Fund life for duration of project (year 2007)
Administered by EBRD: Procurement Policies and Rules apply
Companies from Assembly member countries and EBRD's countries of operations are eligible for procurement contracts

Environmental Action Plan

The main objectives of the SIP clearly define it as a fundamentally environmental project. Within the EBRD, the SIP, as any other project, is subject to an environmental due diligence.

Indeed the first project contract, initiated in late 1997, was for an environmental audit of the Shelter and an analysis of the environmental and health and safety implications of the planned work. Most of the audit conclusions were related to issues already identified in the SIP and all the findings and recommendations applicable to the scope of the SIP were to be carried out within the corresponding specific SIP tasks. The environmental auditor's findings have thus become an integrated part of the SIP project plan. Periodical environmental project reports have also become a part of regular mandatory project reporting.

Institutional Framework and Organisation Structure

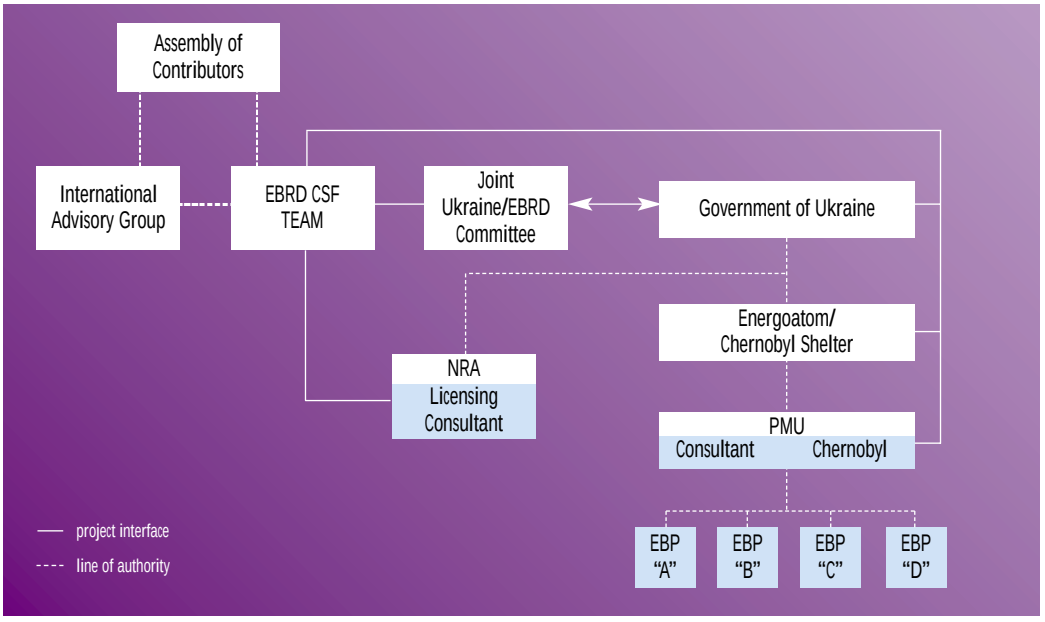
The intrinsic technical complexity of the SIP, the need to establish and maintain the institutional and infrastructure framework and multiple interfaces necessitated a relatively complex organisation scheme. The build-up started effectively with the first meeting of the Assembly of Contributors in December 1997 when the Assembly approved the Framework Agreement between Ukraine and the EBRD and the Rules of the Fund.

Between late 1997 and November 1998, the EBRD completed staffing of its CSF Operations Team. The team, with strong project management, technical and procurement expertise, benefited from the integration into the Nuclear Safety Unit and its experience in management of the Nuclear Safety Account since 1993.

The Joint Ukraine/ EBRD Committee, set up in July 1998 and founded on an already established relationship, has primarily a mission to ensure that the policies and institutional environment conducive to the

One of many farms in the Chernobyl exclusion zone abandoned due to high radiation after the 1986 accident.

Table 5.5
CSF Organisation Structure



smooth progress of the SIP are created and maintained. It has also served as a platform for periodic meetings between the senior management of the Bank, represented by Vice-president Joachim Jahnke, Co-chairman of the Joint Committee, and high levels of the Ukrainian authorities. The productive relationship also ensured continuity in the attention to the issues that affect the SIP. The result of this concerted effort and close co-operation with the Government of Ukraine is that the basic institutional framework was largely finalised by mid-1999.

The ratification of the Framework Agreement by the Ukrainian Parliament, in February 1998, set the legal basis for the CSF and SIP in Ukraine and was the first prerequisite for the project to proceed.

Ukraine acceded to the Vienna Convention on Nuclear Liability in 1997 and subsequently amended its domestic legislation accordingly and also authorised the "Nuclear Guarantee" to all contractors working on the SIP in February 1999. This was a key institutional milestone. In addition, the decree triggered the effectiveness of the conventional insurance.

Insurance against conventional, non-nuclear risks such as professional liability, third party liability and construction risk in the particular circumstances of Chernobyl, turned out to be either unavailable or very expensive for individual contractors. Therefore, the only way forward was to develop and implement a concept of an overall project insurance that covers all the participants in the SIP for the duration of the project. Independent audits confirmed that the necessary insurance coverage was achieved at the most competitive terms. It is believed to be unique in nature, scope and duration in the insurance industry.

Customs and tax-exempt status of the SIP, enacted in December 1998, was put into practice in the second quarter of 1999, when necessary implementation procedures became operational.

The in-kind contribution of Ukraine, which includes provision of project infrastructure and services as well as funding of Ukrainian projects integrated in the SIP, delivered the project's offices in July 1999 and critical funds in the last quarter of 1999.

International Advisory Group (IAG), an independent multidisciplinary expert team, was established in July 1998 to assist the Bank and the Assembly in key technical matters. The overall objective of the IAG is to provide the very highest level of independent technical advice in order to enable the EBRD to fulfil its oversight role effectively. Equally, the IAG, through periodic technical reviews, provides guidance against the current international nuclear safety principles, industrial best practice and technical principles

International Advisory Group (IAG) - in front of the Shelter 14 April 1999.
From left to right: Karl Schaller; Alexander Slavis (CSF Team); Antti Vuorinen; William White (PMU); Brian Gore (PMU) ; Edward Warman; Albin Janett; Valeriy Kukhar; Vince Novak (Head, CSF); Jean-Bernard Cherie; Carlo Mancini (IAG Chairman); Atushi Takeda; Pal Bergan; Michele Jamiolkowski.
Not pictured: Laurence Williams; Valentin Kupny (Technical Rapporteur).

established by SIP. The involvement of the IAG gives confidence to the Assembly that the project is proceeding in keeping with the principles of the SIP.

The IAG elected Dr. Carlo Mancini as Chairman in the inaugural session in September 1998. Since then, the IAG has been actively involved in all the strategic processes and technical decisions. Notable achievements include the leadership in achieving consensus on the approach to the prioritisation of stabilisation measures in April 1999 and the recent guidance on the programmatic decision P1 and technical dimensions of the organisation scheme for the next phase of the project.

All six major contracts (Project Management Unit, four engineering tasks - "Early Biddable Projects" and the licensing consultant) were awarded in the period from April to November 1998 and were followed by the immediate mobilisation of personnel. The backbone of the SIP project structure was in place. The successful consortia offered a good balance between international and Ukrainian skills and experience. It has taken a while, and will require continued attention, before the different management, regulatory and quality

CSF Team is integrated into the EBRD's Nuclear Safety Unit.

PMU technical leaders (from left to right: Francois Jouanneau; Sergey Deriuga; Elena Belichenko; David Crossley; Gregoire Richez) in front of the SIP project office building in Slavutych.

cultures start to fully deliver synergistic effects. This element of "change management" is, however, an inherent element of the SIP and vital for its progress.

Project Management Unit (PMU), which manages the SIP on behalf of Energoatom, National Nuclear Generating Company, is an integrated team composed of dedicated Energoatom staff and the experts from the Consortium of Bechtel, Electricité de France and Battelle Memorial Institute. The specific expertise of the Shelter and the local environment is thus combined with general project experience accumulated globally by the three companies. Teamwork and effective interfacing with the rest of the Energoatom's Chernobyl staff, are among the key elements of success for the SIP.

The four engineering consortia include both Ukrainian and Western expertise. NIISK, ISTC and KIEP are members of the consortium in charge of civil engineering. Technocenter is the leader of the consortium performing waste management and fuel containing materials engineering that also includes several Ukrainian and Russian companies. Many other Ukrainian institutes are involved in the remaining two engineering consortia. The common goal of the four consortia is now to finalise the engineering deliverables of the first phase of the project that are approximately 70 per cent complete at the end of 1999.

Strengthening and support to the State Nuclear Regulatory Authority (SNRA) in the unique task of the licensing of the SIP is another important element of the SIP concept. The Western Licensing Consultant, a consortium of Riskaudit and Scientech, has been assisting the SNRA to develop the procedures and manage the licensing process. Most of the evaluation work is being carried out by SSTC, the Ukrainian technical support organisation. Valuable experience has been gained from the licensing of the emergency repair of the Shelter roof beams B1/B2 implemented by the Ukrainian company Ukrenergobud.

The fifth Grant Agreement signed in July 1999, which provided € 111 million for the supply of SIP equipment and associated services, increased the total grant allocation to € 265 million. This will be sufficient to complete the Phase 1 engineering and investigations, build the construction site infrastructure and supply systems and equipment that support major tasks and objectives of the entire SIP.

Teamwork is a key for success. From left to right: Valeriy Kulishenko (PMU Co-director); Yuri A. Matveyev (Director, Ukrenergobud); Alexander Slavis (EBRD); Valentin Kupny (Director, Shelter Object); Richard Loos (PMU Co-director).

Procurement and Industrial Participation

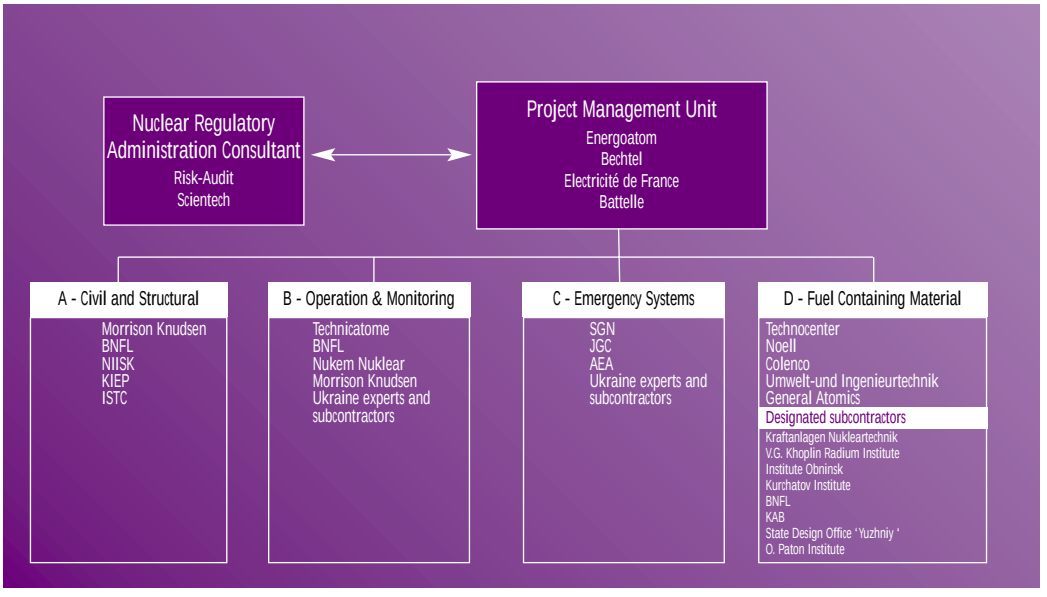
One of the prerequisites for the success of the SIP has been to attract interest and participation of the leading companies in the industry, both in Ukraine and internationally. The intrinsic difficulties of the project of such a complexity as the SIP could only be credibly handled by the "best in the class". Ukraine's intimate knowledge of the Shelter gained through years of operations and management of the Shelter needed Western expertise and vice versa.

The significance and size of the project indeed attracted many of the industry leaders. Ukrainian, Russian and other international companies mutually recognised advantages of teaming up and created a number of alliances. Open tendering and the strict application of the EBRD's Procurement Policies and Rules provided a highly competitive and level playing field. Energoatom and the State Nuclear Regulatory Agency (for the Licensing Consultant) fully implemented the procurement rules and conducted the evaluations flawlessly.

The outcome of the six major international tenders concluded in 1998 and presented in Table 5.6 is characterised by an impressive geographical spread. Ukrainian companies have been very successful. Their share in the first four engineering contracts exceeded 60 per cent in terms of man-months. This percentage has increased with the award of the SSTC contract in December 1998, miscellaneous subcontracts and the critical stabilisation contract with Ukrenergobud in 1999. Ukrainian companies will make an important technical contribution to the SIP. In turn, the SIP will make a significant contribution to the local employment and mitigation of social consequences of the Chernobyl accident.

Ukrainian participation will logically grow further when large construction contracts are placed in the second phase of the project starting in 2000. This also confirms the SIP as both an international and Ukrainian national project.

Table 5.6
SIP Phase 1 Industrial Participation



Companies from many countries are involved in the Phase 1. The participation of Ukraine is particularly strong. The second phase, which represents more than 90 per cent of the SIP in financial terms, will certainly attract many more companies.

For further enquiries please contact:

Mr.Vince Novak
Head, Chernobyl Shelter Fund
European Bank for Reconstruction
and Development
One Exchange Square
London EC2A 2JN
Tel: +44 20 7338 7195
Fax: +44 20 7338 7175

Design Unit
European Bank for Reconstruction and Development
Ref: 4386 SIP - February 2000