



HOW SAFE IS SAFE ENOUGH - CHERNOBYL REACTORS IN THE EU?

**A Friends of the Earth Paper
on the nuclear power plants
in the EU accession countries.**

October 2000

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Summary

EU enlargement was welcomed as an opportunity to improve the environment in the accession countries in general. One of the priorities is reducing nuclear risk throughout Europe. Seven of the ten central and eastern European countries applying for accession have nuclear reactors currently in operation.

The European Union is facing one of the most urgent questions concerning its enlargement process - How safe is 'safe enough' for the EU with regards to the Soviet-design nuclear power plants in Central and Eastern Europe.

Ten years of co-operation in the nuclear field via PHARE etc. have not solved the basic question of how much safety is going to be required as condition for EU accession. One of the reasons is that nuclear safety is not a part of the *acquis communautaire*. The Council conclusion demanding "*high standards of nuclear safety*" (Vienna European Council resolution) are only a guideline which has to be transferred into clearly applicable rules.

In September the first Council session (Working Party on Atomic questions) discussing the question of nuclear safety standards for candidate countries took place. The mandate from the Council is to prepare a study of how to judge the nuclear safety level before the end of the year 2000.

This paper "How safe is safe enough" offers a short Who's Who in nuclear safety and explains FoEE demands. Friends of the Earth Europe is against double standards, higher nuclear safety standards for the "West", and lower for the "East". This is not only immoral, but would inhibit progress in nuclear safety in the EU. Instead Europe needs clearly defined and agreed safety targets. The case – by – case safety assessment without clear rules is not acceptable. This approach is being followed by pro nuclear organizations like WENRA (Western European Nuclear Regulators Association) who operate without any political mandate and exclude the non nuclear EU member states. This year WENRA is going to present its second report on nuclear power plants in accession countries and hopes to end the discussion. The main goal seems to be to prevent any nuclear safety standards for the EU accession countries. Our goal is to prevent Chernobyl reactors in the EU.

HOW SAFE IS SAFE ENOUGH – CHERNOBYL REACTORS IN THE EU?

by Patricia Lorenz

Friends of the Earth Europe (FoEE)

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1. Introduction

The European Union is facing one of the most urgent questions concerning its enlargement process - How safe is 'safe enough' for the EU with regards to the Soviet-design nuclear power plants in Central and Eastern Europe.

This Friends of the Earth Europe paper addresses the question of how nuclear safety standards should be defined, an issue which is currently being discussed by the EU Council working group on Atomic questions.

The nuclear safety upgrading programs (PHARE etc.) and several bilateral agreements did not solve this basic question. The often demanded "Western safety level" or "internationally acceptable safety level" or even "high nuclear safety" are still empty phrases without a clear technical definition.

For a general background on nuclear safety in CEE and the history of EU involvement in this area, read Annex: Nuclear Safety and Enlargement.

2. Enlargement and safety standards for nuclear power plants

EU Enlargement is seen as the key opportunity to improve the environmental situation in the former communist countries.

People throughout Europe are aware of the disastrous consequences of insufficient nuclear safety after Chernobyl in 1986. Diminishing this nuclear risk supposed to achieve.

Ten years of co-operation have still not solved the basic question of what safety target should be achieved. The EU has not agreed on any comprehensive definition of safety standards or how to achieve them - nuclear safety is not a part of the *acquis communautaire* and probably will never be.

The question *How safe is safe enough?* must now be answered:

Are we going to accept the new EU member states with their lower safety standards, thus endangering the whole of Europe with potential nuclear catastrophes? Apart from this worst-case-scenario, the lower standards would have two further consequences for the enlarged EU:

- they could give the nuclear industry in existing member states the argument, that they do not have to maintain or increase their safety level, because new member states nuclear power plants are allowed to operate at lower standards;
- lower standards for nuclear power plants means lower investment costs, lower upgrading costs, lower upkeep costs and this constitutes a form of unecologic market advantage in the EU electricity market. This could drive the environmentally friendly electricity generation and energy saving measures out of the market.

On behalf of the existing EU member states, the Council working Party on Atomic questions has been tasked to design safety standards for nuclear power plants in candidate countries.

3. Working Party on Atomic questions (WPAQ)

On September 13th, the first Council session discussing the question of nuclear safety standards for candidate countries took place. The mandate from the Coreper is to prepare a study of how to judge the nuclear safety level before the end of the year 2000. The mandate of the Working Party on Atomic questions is to *“monitor and examine current work on drawing up a list of essential items and methodology”*. Worth mentioning is the fact that the study should draw information from *all* relevant reports from the Commission and Member States. However, explicitly mentioned in the WPAQ task description is only the WENRA report (Western European Nuclear Regulators Association). This is a clear sign that WENRA, who operates without official political support, has succeeded in taking a step towards an official mandate.

WPAQ is supposed to produce a report on how the applicant states can achieve the *“high standards of nuclear safety”* as was demanded by the European Council resolution (1998, Vienna, recalled in Helsinki).¹ The meetings take place in Brussels. The WPAQ is made up of diplomats from the permanent representations of the member states to the EU.

¹ The European Council in Helsinki recalled *“the importance of high standards of nuclear safety in Central an Eastern Europe”*.

4. FoEE demands for safety standards in accession countries

- **No double standards:** Higher safety level for the “West”, and lower for the “East” is not only immoral, but would inhibit progress in nuclear safety. A minimum safety standard for the Soviet pressurized water reactor VVER has to be the nuclear power plant Loviisa in Finland. At Loviisa, upgrading has been carried out already and there is no reasonable argument why applicant countries should do with less nuclear safety.
- **No case-by-case approach:** The approach of judging the safety of each nuclear power plant without clear safety targets and without methodology laid down before the safety assessment is started is intransparent and unfair. In the case-by-case approach, each nuclear power plant is assessed according to information given by the plant operator or the nuclear authority on basis of their own principles (this approach was used for WENRA report No 1 in 1999). Instead, agreed upon safety targets, and approved methods for showing whether they are met, have to be the EU approach.
- **No IAEA standards:** IAEA standards are insufficient and lower than those applied in EU-member states and therefore cannot be accepted as a guideline for defining the safety level for new EU member states. The IAEA never asked for the closure of any nuclear power plant, including Chernobyl. The reason for the IAEA’s weakness is the internal conflict of interests between promoting and regulating nuclear power. Moreover, the IAEA is not a transparent organization; most reports and results of its’ missions are not available to the public and therefore cannot be a basis for EU decisions.
- **Current nuclear safety standards must be applied.** It is not acceptable that safety standards established in the 1960s and 1970s, at the time of original design or construction of the nuclear power plants, are used for assessing safety levels today. Clear technical regulations are necessary for all reactor parts, mainly the containment, emergency cooling system, reactor core, etc. Each of these parts’ sufficient functioning has to be proved according to modern scientific approach.
- **Complete information must be made public** to all interested parties (national governments, NGOs etc). Information on the nuclear power plants in applicant states has to be made available without exception. Safety and risk documentation from both the plant operator and the regulatory authority must be accessible. For example, the practice of the Czech nuclear authority of claiming that studies on seismic risk at the Temelin plant are the property of the operator and can therefore not be given out is not acceptable.

5. Who's Who in nuclear safety

Acquis communautaire

The common EU legislation does not include nuclear safety regulations. Instead EU member states have their own national regulations.

EURATOM (European Atomic Energy Community)

The EURATOM Treaty does not deal with nuclear safety. It is limited to radiological protection, supply of nuclear fissile materials and the related nuclear safeguards for materials. For more information go to:

<http://www.europa.eu.int/comm/environment/nuclear/legislation.htm#euratom>

EU Commission

In Agenda 2000 (1997), the Commission presented its goals for nuclear power plants: *"The timetables agreed by the governments concerned, subject to certain conditions, for the closure of non-upgradeable units must be respected. (This applies to Bohunice in Slovakia, Ignalina in Lithuania and certain units at Kozloduy in Bulgaria)."*

The EU Commission has made it clear that the closure of high-risk reactors (or at least the agreement on closure dates) is a condition for EU entry negotiation. The Commission, who is the leading EU entry negotiations, has a very high interest in solving the safety issue as soon as possible, but seems to have no interest in particularly high safety criteria. A problem might arise for the achieved closure date agreements, because Slovakia started reevaluating the closure dates after WENRA made its positive judgement public.

Last year DG Environment tried to install a working group that would answer the question of nuclear safety. Joint lobbying efforts by eastern plant operators and WENRA stopped this. Furthermore, the nuclear safety unit was recently moved from DG Environment to the pronuclear DG Transport and Energy.

IAEA

The UN International Atomic Energy Agency in Vienna was founded in 1957 to promote the peaceful use of nuclear energy. Contrary to widespread belief, the IAEA has only an advisory function and does not guarantee nuclear safety in any of its member states. There are no sanctions for member states that fall short of implementing IAEA recommendations. Furthermore, the recommendations are very vague and amount to the lowest common denominator in nuclear safety. All IAEA inspection reports that look into safety and other related matters are not made available for anyone but the government, the regulator and plant operator of the country that invited the IAEA to make the inspection. Adopting IAEA safety recommendations as "good enough" would be a step back for the EU. A clear example is the Chernobyl reactor type, the RBMK. The EU declared this type a non-upgradeable high-risk reactor. The IAEA on the other hand never called for the closure of the RBMK reactors.

WENRA

WENRA is the Western European Nuclear Regulators Association and is made up of regulators from EU member States with nuclear power programs,

and Italy. WENRA makes its own reports on the nuclear power plants in EU candidate countries. They do not have any political mandate, but they invest heavily in lobbying the various EU institutions.

On March 26th 1999, WENRA sent its first report to the European Institutions on the situation of nuclear safety in the Eastern European candidate countries. The report was also sent to the Regulatory Bodies of the CEE countries, as well as to EU member states that do not participate in WENRA.

WENRA is now working on a second report (the first one was not accepted because of its very low quality) on the safety of soviet-designed reactors. The objectivity of this second report may be called into question since several countries that were assessed has demanded a better rating.

It can be expected that this year's WENRA report is going to be positive in its judgement of the safety levels. The technical standard applied as criteria is unclear and there is no attempt to use a transparent methodology. The goal of the report is clear: To declare the nuclear power plants in candidate countries safe enough.

An example is Slovakia's high-risk reactor Bohunice V1. Already in spring 2000 WENRA chairman Lacoste said - months before the second report was supposed to be finished - that in their opinion the EU made a mistake by calling some nuclear power plants in applicant countries non-upgradable to Western safety standards.²

The nuclear authority UJD in Slovakia said in March that the WENRA report on the nuclear power plant V1 Bohunice will be positive.³ This means that WENRA sent a positive assessment already in March, while the upgrading program officially ended three month later, in June. V1 Bohunice (a first generation VVER reactor) is considered to be one of the most dangerous nuclear power plants in the world. Not even the announced upgrading project was fully implemented as a study of last year confirmed.⁴

Foratom and other pro-nuclear lobbying groups do not want any action taken at the EU level and try to prevent any transparent discussion and decision. The co-operation between East and West against clear high safety standards has been working to maintain the status quo for the last 10 years.

As a consequence of the Chernobyl accident in 1986, the West (G7), supported by the Western nuclear industry, had to save their own nuclear programs by stating that only the Soviet design reactors are risky and not the Western ones. Since then, upgrading in the CEE and NIS countries became the last source of income for the Western nuclear industry and so therefore they revised their stance. Against the position of the G7 and the EU, industry-lobbying groups like FORATOM are campaigning heavily for these reactors to now be declared "upgradable". They also claim that the responsibility with nuclear safety lies only with the operator of a nuclear installation and no new rules are needed.⁵

² Nucleonics week, 16.3.00, p 6

³ Slovak daily Hospodarsky Dennik, 21.3.2000

⁴ Institute of Risk Research of the Academic Senate of the University of Vienna: Questions concerning the Reconstruction of Bohunice NPP V1. Vienna, August 1999.

⁵ Foratom position paper, 21.12.1999, at www.foratom.org

6. Nuclear Safety: An Introduction

How to compare the varying nuclear safety levels now prevailing within the EU with the various types of Soviet-designed reactors in candidate countries is not yet resolved. The methodology and correct terminology is not agreed upon. The more general discussion in media and political fora tends to loosely throw about terms like containment or claim mistakenly that VVER reactors are operating in the EU and therefore all VVER have to be accepted.⁶ For this reason the main focus here is on the containment, although of course there are several other as important safety features.

Containment

One of the most widely discussed technical safety-features is the issue of containment. The containment is a steel shell around the reactor core. In the late 60s, the containment was introduced in Western Europe to avoid a release of radioactive material into the environment. Moreover, the containment is a protection against events from outside (e. g. plane crash) for the reactor.

Most of the soviet-design reactors (RBMK and first and second generation VVER) do not have a containment and this was seen as one of their crucial design failures, which led to the urgent demand for their closure. In recent years some countries (mainly Slovakia) have tried to re-evaluate their nuclear power plants. Attempting to justify this evident safety deficit, these states started claiming that other safety features compensated for the lack of containment. A “confinement” is becoming equivalent in their descriptions to “containment.”

Are there Soviet design reactors like Temelin or Bohunice in EU member states?

Some argue that the discussion about the soviet-design reactors is unnecessary and claim that VVER reactors are already operating in the EU, referring to the Loviisa plant in Finland. This argument names Loviisa as an operating soviet- design reactor VVER 440 and compares it with Mochovce (VVER 440-213) in Slovakia, and lately also Temelin (VVER-1000) in the Czech Republic.⁷

But the experimental backfitting of western safety technology to a soviet-design reactor after commercial start, or even close to end of lifetime, is a practice carried out only in CEE countries. In the case of the Finnish nuclear power plant Loviisa, the design changes were made *prior to the beginning of construction* and involved close cooperation between Soviet and western designers over an eight-year period. These changes included major improvements, including a containment, which is not the case for any one of the candidate countries for technical and financial reasons.

All VVER reactors that were built outside Eastern Europe, e.g. Finland (VVER 440 Loviisa) or Cuba (Juragua, construction stopped) were equipped with a

⁶ Socialist UK MEP Gordon Adam (also a member of the EP's research and energy committee), on September 8th in EP Plenary in Strasbourg: "To put all this in context, Finland has now got what the Czechs will."

⁷ Ibid.

containment. Even current valid Russian safety standards (OPB – 88) state that a containment is necessary.

The question of what exactly a containment is and what safety requirements it should fulfill has yet to be answered. If not answered, it is not possible to have a level baseline for the assessment of nuclear safety. This unclear method of judging safety levels was used by WENRA in its first report made in 1999.

Other design deficiencies of VVER 440/230 – comparison of a VVER in candidate countries with the improved Loviisa reactors in Finland

The following comparison is between first generation VVER (440/230) and the VVER- 440/230 in Finland. The second generation VVER 440/213 saw some minor improvements, but still no containment. As a replacement a bubble-condenser was introduced, but it was never sufficiently tested. The third generation VVER-1000 has a containment, but due to the fact that it is not on ground level, a containment bypass cannot be excluded.

Comparison VVER 440/230 and the VVER Loviisa in Finland

“When Finland ordered VVER-440 reactors from the USSR 20 years ago, it was determined that safety standards should meet Western requirements,” starts the article *Loviisa: the VVER exception*.⁸ After major design changes the two units were put into operation in 1977 and 1980.

“Adaptations for Loviisa:

Emergency core cooling: Redundant physically separated emergency core systems were designed, comprising high pressure and low pressure injection systems, and including core flooding accumulators. This is in contrast to the V-230, which only has a high-pressure injection system...

Containment: Also a containment capable of coping with the design basis accident pipe break had to be designed. The Westinghouse-type ice condenser containment was selected....The leaktightness of the confinement of the type V-230 is limited, and furthermore it is furnished with valves designed to open directly to the atmosphere if the design pressure is exceeded.

Instrumentation and control. Another area where important departures were made from the original design is instrumentation and control...

Pressure vessel embrittlement. Of special significance is the embrittlement of the pressure vessels of the VVER – 440 reactors. This was recognized at an early stage at the Loviisa plant and effective measures to decrease the embrittlement rate were taken...”

The measures mentioned here do not mean that this is the way of how to achieve highest nuclear safety levels, but this list shows what was already 25 years ago considered not Western standard.

⁸ Regnel, B.: “Loviisa: the VVER exception.” Nuclear Engineering International March 1991. p. 22-24

7. Conclusions

FoE Europe demands high nuclear standards for applicant countries, since it is not acceptable to have lower standards in new member countries than in the existing EU member states. This double standard could be the start for a downward trend in nuclear safety in the whole EU. The political responsibility for preventing this lies with the Council and should not be dominated by organizations like WENRA (Western European Nuclear Regulators Association) or other pro nuclear interest groups who do not have a political mandate. Instead an open process of setting up and checking clearly defined safety targets that fulfill all criteria for high nuclear safety has to be started now.

Nuclear Power Plants in operation in accession countries (status June 2000)

COUNTRY	PLANT DESIGN	TYPE	COMMERCIAL START	OUTPUT (MWe Installed)
Bulgaria	Kozloduy 1-4* Kozloduy 5-6	VVER-440 V230 VVER-1000	1974, 75, 81, 82 88, 93	3760
Czech Republic	8. Dukovany 1-4*	VVER-440 V213	1985, 86, 87	1760
Hungary	9. Paks 1-4*	VVER-440 V213	1983, 84, 86, 87	1760
Lithuania	10. Ignalina 1-2*	RBMK-1500	1985, 87	3000
Romania	Cernavoda 1	CANDU	1996	700
Slovak Republic	Bohunice 1-2* Bohunice 3-4* Mochovce 1-2*	VVER-440 V230 VVER-440 V213 VVER-440-213	1979, 81 1985, 86 1998, 99	2640
Slovenia	Krsko 1	PWR-664 (Westinghouse)	1983	664

* NPP without any containment at all: Bohunice 1-2, Bohunice 3-4, Dukovany 1-4, Ignalina 1-2, Kozloduy 1-4, Mochovce 1-2, Paks 1-4

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8. Annex: FoEE paper on Nuclear Safety and Enlargement (June 20, 2000, presentation in the European parliament)

Nuclear Safety and Enlargement

June 20, 2000

Introduction:

EU enlargement was welcomed as an opportunity to improve the environment in the accession countries in general. One of the priorities is reducing nuclear risk throughout Europe. Seven of the ten central and eastern European (CEE) countries applying for accession have nuclear reactors currently in operation. Before describing the situation of nuclear safety now and making recommendations, I think it is necessary to give the question of nuclear safety in the accession countries a political frame. My presentation focuses on the role of the EU and does not include Ukraine and the Newly Independent States nor international efforts related to nuclear safety.

Milestones:

1986: Chernobyl unit 4

The worst nuclear disaster made clear to the whole world how dangerous the nuclear installations behind the iron curtain are and showed clearly how big the devastation can be.

1992: At the G7-meeting in Munich the multilateral action programme for improving nuclear safety in Eastern Europe was agreed upon.

“The international community responded by adopting a nuclear safety strategy at the G7 summit in Munich in 1992: Reactors of Soviet design were classified, and this was done in two categories: those that could be upgraded at reasonable cost, and those that could not and therefore should be shut down. Two complementary tracks were laid out:

- *Short term: independent and competent safety authorities had to be set up, and nuclear plants had to be made safer through both technical upgrading.. [...and]*
- *Longer term: replacing less-safe reactors with alternative energy sources, improving energy efficiency [...]*⁹

The Western nuclear industry used this opportunity to point out, that not nuclear power plants themselves are dangerous, but mainly those of Soviet design. The West agreed that RBMK reactors (Chernobyl type) have the worst design deficiencies (note that Ignalina in Lithuania also is of RBMK design). The Soviet pressurized water reactors VVER were considered extremely unsafe as well, mainly the first generation VVER 440/230 (Bohunice units 1-2

⁹ EU Commission paper by Suzanne Frigren, DG Environment, “Nuclear Safety in the Eastern Countries”, 3.2.2000

in Slovakia, Kozloduj units 1 – 4 in Bulgaria) and were defined as high-risk reactors. Both the RBMK and the first generation VVER were considered non-upgradable high-risk reactors and the goal was to close them down as soon as possible.

1997: Agenda 2000, the EU’s blueprint on enlargement was published.

The need for high nuclear safety was confirmed and closure timetables were established: for Kozloduj 1998, Bohunice 2000 and Ignalina 2002. The reason given for not closing the plants earlier was that no alternative electricity supply is available.

Achievements by the year 2000:

How many reactors were closed? Was the “complimentary” track successful in terms of lowering the dependency on nuclear power? Not one single reactor was closed - instead 4 new VVER reactors increased the dependency on nuclear power.

Table 1: Development in reactor closures in candidate countries between 1992-2000

Year	Number of reactors in operation
1992	20
2000	24

Dependency on nuclear energy in candidate countries?

This is widely believed misinformation. The truth is that all accession countries with nuclear power plants are net electricity exporters.

The share of nuclear in total electricity generation has grown since 1992. Either because new reactors started operation or because other non nuclear capacities were used less or their modernization was delayed. In addition, the installed overall nuclear capacity has been higher than consumption since 1990 in all the candidate countries with nuclear programs. To offset this surplus of electricity generation, countries such as Bulgaria, Czech Republic and Slovakia became net electricity exporters – exporting to EU countries mainly.

Why was the goal of closing down not reached?

Several agreements on closing down reactors have been reached. In exchange for agreeing to close down, the countries received funds for short term upgrading measures. But the governments in the region were allowed to ignore the intentions of agreements previously reached and continued to operate the nuclear power plants. Western partners, including the EU, have not been determined enough to seek the closures. Instead the policy, serving only the nuclear industry, stayed in place. Only months before the so-called second wave countries were to be admitted at the Helsinki summit in 1999, the EU Commission quickly agreed with the countries on new closure dates. It is not known which objective facts these decisions were based on.

As can be seen in the table below, the new closure dates falls short of the commitments undertaken in Agenda 2000.

Table 2: Agreed and delayed reactor closure dates

Nuclear Power Plant	Reactor	Agreed closures as in Agenda 2000	New Proposal in Helsinki 1999
Kozloduy (Bulgaria)	Unit 1 and 2 Units 3 and 4	Spring 1997 End 1998	2003 not agreed yet
Ignalina (Lithuania)	Unit 1 Unit 2	1998 2002	2005 2009
Bohunice (Slovakia)	Units 1 and 2	2000	2006-8

Friends of the Earth recommendations:

Now is the last possibility to give the Enlargement process a direction. People in Western Europe and in the accession countries expect that EU enlargement will improve the environment and make another Chernobyl impossible. But we have to take the right decision now: I see two scenarios: the high-risk scenario and the Safe energy scenario.

High-risk scenario: The current inconsistent nuclear policy stays in place. Highly unsafe reactors stay on the grid and get more dangerous every day simply by aging, new untested prototype reactors like Temelin in the Czech Republic start operating. This obviously prolongs and increases the risk Soviet design reactors pose to the whole of Europe. The needed radical change of energy systems – like finally raising energy efficiency which was not tackled up to now - will be delayed: Another one or two lost decades. It is clear that public resistance, economic factors (ever growing investment costs) and fuel shortage (uranium supply is not around forever) make the nuclear path the least possible energy strategy in the long run.

The often-used nuclear argument, that all other energy forms are not commercially viable, is a self-fulfilling prophecy. Alternative energy sources have never been supported on the level that nuclear has for decades. Germany for example spent about 100 billion DM public money on nuclear power in the last 40 years.¹⁰ Who would therefore invest in alternative energy forms, knowing that in whole of Europe there is installed surplus capacity and investments, research and subsidies keep going into nuclear power?

Safe Energy for Europe scenario: The current unclear, industry driven approach is stopped. Instead of purely political negotiations behind closed doors, real transparency is introduced. This would mean that not only environmental organizations should be informed, but the people living in the countries concerned as well. Today even EU member states very often have a

¹⁰ Rolf Kreibich, Direktor of Institut für Zukunftsstudien in Berlin (Der Standard, 24. 12. 1999)

hard time finding out what is going on. To accomplish these goals a fresh start is needed:

The definition of “safe” or what the safety standards requirements should be for joining the EU has to this day not been laid out. Now everything is done without a clear set of technical rules, where for instance upgrading measures are being undertaken without a clear target. (The status of the enlargement negotiations now raises the key question of just how safe reactors in countries entering the EU must be.) On the political level the EU summit 1998 concluded that the nuclear safety in accession countries should “*reach a level corresponding to the technological, regulatory and operational state-of-the-art in the Union*”. Today discussions are held behind closed doors and dominated by pro-nuclear institutions such as FORATOM and the Western European Nuclear Regulator Authorities WENRA. In May 2000 a new working group was established at the EU Commission. But this working group again does not see themselves as responsible for coming up with the needed safety standards for Soviet design reactors (the category high risk reactor, like the Chernobyl type, is still being considered nonupgradable but nuclear industry is trying to change even this). The process of defining European nuclear safety standards must be a European effort and cannot be left to nontransparent, openly pro-nuclear organizations like the IAEA (International Atomic Energy Agency).

After the German unification the East German VVER reactors were evaluated in terms of safety and economic efficiency. They were closed down in 1990. This evaluation should be taken into account and could serve as a benchmark for measuring nuclear safety in Europe.

FoEE's position on nuclear safety and EU enlargement:

- High-risk reactors are not upgradable to acceptable safety standards
- The national Nuclear Safety Authorities in accession countries cannot be considered as independent and therefore they cannot guarantee the implementation of the safety upgrades or nuclear safety in general (e.g. Bohunice upgrading in Slovakia)
- It is not acceptable to have two kinds of safety standards. Higher ones for Western reactors and lower ones for reactors in countries in Central and Eastern Europe.
- EU should not rely on the IAEA concerning safety of NPP: The IAEA is neither objective nor giving information to the public.
- no electricity exports to the EU from-high risk reactors (they are for export and at the same time are being subsidized via EU programmes)
- no electricity exports to the EU from unsafe reactors as EU position
- No more EU funds for nuclear programmes under the current conditions (PHARE, EURATOM, Export credit agencies).
- Waste problem has to be assessed and the money available for decommissioning etc. has to be calculated. It has to be made clear, that the EU is not going to finance the solution of the waste problem or the decommissioning in accession countries.
- Public participation process and Environmental Impact Assessment has to be conducted before any nuclear project starts.
- EU position has to be that nuclear is not eligible under the Kyoto protocol (Joint Implementation)

Concerning nuclear power plants we call for:

- no upgrading projects for nuclear power plants
- absolute transparency of nuclear policy (information and involvement of NGOs and citizens in time before decisions)
- undelayed closedown of the most dangerous reactors (Chernobyl, Bohunice, Kozloduy, Ignalina)
- closing down of nuclear reactors under construction (Chmelnitsky, Rovno, Mochovce, Temelín)
- no funding for high-risk reactors
- no lifetime extension of nuclear power plants

Concerning new energy policy we call for:

- the white book on renewable energy to be incorporated in the energy strategies already before EU-entry
- investments in energy efficiency projects and implementation of sustainable energy sources
- national governments to prepare with EU – support national energy strategy plans comprising phase-out and decommissioning without fossil replacements and a direct replacement with energy savings and renewables

- introduction of special programmes for countries phasing out nuclear energy (e.g. PHARE funds for decommissioning, structural funds for sustainable energy)