

INTERNATIONAL EXPERT TASK FORCE *for the MOSCOW NUCLEAR SAFETY SUMMIT*

NEW DIRECTIONS

Ten Years after Chernobyl

**REPORT AND RECOMMENDATIONS
TO THE LEADERS OF RUSSIA
AND THE G-7 NATIONS**



APRIL 1996

Center for Russian Environmental Policy • Natural Resources Defense Council • Bellona Foundation

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Introduction

The world changed after the accident at the Chernobyl Nuclear Power Plant in April 1986. The disaster served as a catalyst for the demise of the Soviet Union and the end of the Cold War. Yet ten years later, there are still millions suffering from the consequences of the accident. There are still 67 Soviet-era reactors operating in the former Eastern Bloc, at least a third of which are considered to be particularly dangerous. There are large nuclear weapon arsenals still to be dismantled and nuclear weapon materials to dispose of. Finally, there are increasing concerns about nuclear terrorism and proliferation.

Our organizations see the April 1996 Nuclear Safety Summit as an extraordinary opportunity for President Yeltsin, President Clinton and the other G-7 leaders to move in a bold new direction to reduce these nuclear threats. We were very pleased that 46 distinguished nuclear safety, security, and energy experts from Russia and each of the G-7 nations agreed to join with us in developing and articulating a set of initiatives for consideration and adoption by our leaders.

We decided to focus on a limited number of issues which were of key importance and relevance to all G-7 countries and Russia and where there were practical policy solutions. Over the course of the last months, the International Expert Task Force has developed policy recommendations for the Nuclear Safety Summit in four areas:

- Nuclear Safety
- Nuclear Democracy

- Sustainable Energy Development
- Irreversible Nuclear Weapon Reductions and Security of Weapon-Usable Fissile Materials

The recommendations have already been widely disseminated among U.S., Russian, and G-7 policy makers preparing for the Summit in hopes of affecting the decisions made at the Summit. We sincerely hope that our leaders will accept and implement our recommended initiatives to shutdown dangerous reactors worldwide, reduce nuclear weapons arsenals, increase security of weapon-usable fissile materials, and promote openness on nuclear issues. We are publishing these recommendations to establish benchmarks by which to measure the performance of our leaders at the Summit and to encourage further discussion and action on the agenda we have set forth.

We also want to call attention to the excellent proposals prepared by two additional groups of Russian experts—including a number of members of our Task Force—which were organized by the Center for Russian Environmental Policy. These proposals, to be released jointly with this report, address the consequences of the Chernobyl accident and the management of radioactive waste.

Ten years from now we hope we can look back at the Moscow Nuclear Safety Summit as a time when our leaders truly began to understand the lessons of Chernobyl and to take concrete steps to reduce sharply the risks of nuclear disaster.

Summary of Recommendations

NUCLEAR SAFETY

The Task Force calls upon the G-7 countries and Russia to meet the challenge of taking new and meaningful actions to reduce the risk of nuclear accidents a decade after the Chernobyl disaster. The leaders at the Summit should focus on eliminating the dangers posed by those reactors with the most serious design and operational deficiencies. We urge the leaders to announce their agreement to:

1. Identify, on an urgent basis, the fifty most hazardous nuclear reactors worldwide for priority shutdown within ten years, including all Soviet-designed RBMK and VVER-440/230 reactors.
2. Commit to providing sufficient near-term capital and technical assistance for power to replace the reactors identified for priority shutdown, particularly in countries operating RBMK and VVER-440/230 reactors; and encourage development of longer-term funding mechanisms, such as utility-rate surcharges, for the permanent and safe decommissioning of these reactors.

NUCLEAR DEMOCRACY

The Task Force urges the G-7 and Russia to take steps to ensure the free flow of nuclear information and meaningful public participation in decision-making on nuclear issues, and to encourage all other countries with nuclear facilities to join in these measures. We call upon the G-7 and Russian leaders to:

1. Declare their commitment to declassify promptly all environmental, safety, and health information, with few exceptions; establish systematic declassification reviews for existing documents containing environmental, safety, and health information; and initiate negotiations on an international convention on access to information, transparency, and public participation regarding nuclear issues.
2. Publish openly the rules and guidelines regarding classification of nuclear information; ensure that these classification rules explicitly prohibit classification of environmental, safety and health information, with few exceptions;

and involve non-military personnel in decisions on classification.

3. Establish public information laws requiring that the government supply the public with environmental, safety, and health information upon request, with few exceptions; and create the legal framework for judicial review of government decisions to deny citizens access to such information.
4. Establish a framework for meaningful citizen participation in environmental impact reviews and decision-making on siting, licensing, construction, and operation of nuclear installations, radiation sources, and storage sites.
5. Institute a regulatory framework for independent civilian inspection of *all* nuclear facilities, including weapon-related and other military installations.

SUSTAINABLE ENERGY DEVELOPMENT

The G-7 and Russia should accelerate the development of economic and environmentally-sustainable energy alternatives to RBMK and VVER-440/230 reactors, and others identified for priority shutdown. We urge the G-7 and Russian leaders to commit to:

1. Identify, on an urgent basis, the best alternatives to replace the most dangerous nuclear plants, particularly in countries operating RBMK and VVER-440/230 reactors, and give priority to energy efficiency measures, renewable energy, natural gas, and conventional power supply improvements.
2. Create a \$10 billion Sustainable Energy Revolving Fund (SERFUND) to finance these sustainable energy projects.
3. Provide support for the development and implementation of integrated energy planning as an appropriate framework for sustainable energy policies and electric power sector regulation in these countries.
4. Undertake an intensive multi-pronged market intermediation and development program designed to overcome serious transactional

and market barriers to sustainable energy alternatives.

5. Establish an integrated electricity brokerage market between the European Union, Eastern Europe, and states of the former Soviet Union designed with appropriate consumer and environmental safeguards.

IRREVERSIBLE NUCLEAR WEAPON REDUCTIONS and SECURITY OF WEAPON-USABLE FISSILE MATERIALS

The Task Force urges the G-7 and Russia to accelerate nuclear weapon reductions and halt further production and proliferation of weapon-usable fissile materials and technology. We call upon the G-7 and Russian leaders, particularly Presidents Clinton and Yeltsin, to:

1. Jointly and unambiguously declare their commitment to fulfill their obligations under the nuclear Non-Proliferation Treaty by beginning negotiations promptly on a START III agreement that would make further deep, irreversible reductions in strategic nuclear delivery vehicles and nuclear warhead stockpiles (U.S. and Russia); initiate intergovernmental discussions among all the weapon states on the modalities of eliminating nuclear weapons; and inform the United Nations each year of progress in the elimination of nuclear weapons.
2. Ratify START II with the necessary collateral conditions to ensure Duma approval (Russia) and accelerate implementation of the required reductions in operational forces jointly (U.S. and Russia) well before the 2003 deadline specified in the treaty.
3. Declare a policy of "No First Use" of nuclear weapons, without caveats and conditions (U.S., Russia, U.K., and France); revise military doctrines to reflect this "No First Use Policy" and to de-emphasize the importance of nuclear weapons in defense postures (U.S. and Russia); and jointly commit to taking all nuclear weapons off "day-to-day" alert status to ensure that no nuclear weapons are poised for immediate launch.
4. Declare their commitment to cease permanently all field preparations and test site operations connected with underground nuclear tests, and not to exploit advanced nuclear experimental and computer simulation capabilities for the purpose of continuing the development of nuclear weapons under a Comprehensive Test Ban (U.S., Russia, U.K., and France).
5. Make prompt public declarations of the overall size and breakdown of the nuclear weapon arsenals and fissile material inventories, and commit to updating these declarations periodically (U.S., Russia, U.K., and France).
6. Initiate a program for developing and demonstrating the operation of a monitoring and safeguards regime for nuclear-weapon states covering intact nuclear weapons, nuclear weapon components in storage, and weapon-usable materials. (Such a program should begin with the U.S. and Russia, but could be extended whenever appropriate to include other nuclear-weapon states and eventually the international community, represented by the IAEA or similar organizations.)
7. Permanently halt reprocessing—chemical separation—of plutonium for weapons purposes, and, at minimum, defer further civilian spent nuclear fuel reprocessing until excess plutonium stockpiles have been eliminated (Russia, France, U.K., Japan, U.S); and assist all reprocessing-client countries to develop the safest and most secure spent fuel management regime possible.
8. End the use of highly-enriched uranium (HEU) in naval vessels and in all civil applications.
9. Accelerate the replacement of Russia's plutonium production reactors at Seversk and Zheleznogorsk, and the conversion of the plutonium cities at Ozersk, Seversk, and Zheleznogorsk to the production of goods and services exclusively for peaceful purposes.
10. Establish a "working group" to set up a timeline and specific implementation programs for long-term disposition of weapon-usable fissile materials in order to accelerate the disposition process. The group should evaluate the relative safety, proliferation resistance, and cost of disposition options such as the mixture of weapons plutonium with reprocessing wastes and glass (called "vitrification") for direct disposal in a permanent underground repository, or with uranium to make "mixed-oxide" (MOX) fuel for existing reactors. In our view, a credible comparison would conclude that vitrification is the preferred disposal option. Meanwhile, vitrification programs should be developed for non-weapon-usable residues already produced in spent fuel reprocessing.

Nuclear Safety

This section addresses the urgent need to reduce risks associated with the operation of unsafe nuclear power plants worldwide. We propose structural solutions designed to correct fundamental flaws in current international safety assistance efforts, and to achieve prompt, safe, and permanent shutdown of the most dangerous reactors.

INTRODUCTION

Ten years after the devastating accident at the Chernobyl Nuclear Power Plant, the worst nuclear accident in history, 67 Soviet-designed reactors still operate in Eastern Europe and the former Soviet Union. Western nuclear experts generally agree that at least one-third of these units—

reactors of the models RBMK (Chernobyl-type) and VVER-440/230—present serious safety risks. There are 15 RBMK reactors still operating in Russia, Ukraine, and Lithuania, and 11 VVER-440/230 units operating in Bulgaria, the Slovak Republic, Russia, and Armenia. There are also serious safety concerns about the newer-model VVER-440/213's and VVER-1000's operating and under construction throughout the region. Moreover, economic upheaval in many host countries has created conditions which make safe operation of these plants difficult or impossible.

The G-7 pledged at their 1992 Munich Summit to work toward the shutdown of the most dangerous of these reactors as soon as possible. Despite this commitment, however, insufficient capital has been invested in the development of efficiency and power sources to replace them. Most notably, hopes to close reactors at Kozloduy in Bulgaria, Ignalina in Lithuania, and Chernobyl in Ukraine have thus far gone unfulfilled. Moreover, in 1995 one of the riskiest reactors in the region—Armenia's Metsamor 2, which had been shut-down following the disastrous 1988 earthquake in Armenia—was restarted. This failure to close the most hazardous reactors has been due, in great part, to the lack of sufficient capital to supplant the electricity produced by these reactors with greater energy-efficiency and alternative power sources.

The problem of nuclear reactor safety is, of course, not limited to Eastern Europe and the former Soviet Union. Recently in the United States, serious concerns have been growing about the effect that the present trend towards deregulation of the electric utility industry is likely to have on nuclear safety. In Japan, the Monju reactor accident has raised awareness in that country and worldwide about nuclear safety.

The International Convention on Nuclear Safety, the result of three years of international negotiations, is a very weak agreement. The Convention does not require the phase-out of nuclear plants with the highest accident risks. It does not establish substantive technical or procedural standards by which nuclear

installations should be evaluated. It does not provide a framework for independent third-party oversight of nuclear facilities. It is little more than a political smokescreen for the U.S., France, Japan, and other countries fearful of international oversight and regulation of nuclear safety.

International safety assistance for Soviet-designed reactors—the G-7 Nuclear Safety Account, for example—has focussed primarily on technical assistance for upgrades to existing plants. This approach, when taken alone, addresses neither the root problem of reactors that cannot be upgraded to acceptable levels of safety, nor the inefficient energy economies and lack of developed

indigenous power sources to replace the old, unsafe plants. The World Bank, International Energy Agency (IEA), and the European Bank for Reconstruction and Development (EBRD), charged by the G-7 to study means of using alternative energy sources to replace the most unsafe plants, concluded in June 1993 that it would be technically feasible to meet electricity demand in Eastern Europe and the former Soviet Union while closing the higher-risk plants (RBMK's and VVER-440/230's) by the mid-1990's. While the short-term cost to replace these plants will be substantial, a significant reduction in the future risk of an accident is well worth the investment.

Since 1990, electricity consumption has declined between 20 percent and 30 percent in countries

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operating many of the most dangerous reactors. Between 1990 and 1994, consumption declined approximately 20 percent in Russia and 25 percent in Ukraine. This decline in Ukraine alone equals 68 TWh, or almost seven times the combined 1994 output of the two reactor units at Chernobyl. Now is the time to aggressively introduce alternative energy replacement packages for the electricity output of dangerous plants while a cushion of excess generating capacity exists. (See the section on Sustainable Energy Development.) The resumption of growth in energy demand could complicate substantially efforts to shut down the most dangerous reactors.

SUMMIT DECLARATION

The Task Force calls upon the G-7 countries and Russia to meet the challenge of taking new and meaningful actions to reduce the risk of nuclear accidents a decade after the Chernobyl disaster. The leaders at the Summit should focus on eliminating the dangers posed by those reactors with the most serious design and operational deficiencies. We urge the leaders to announce their agreement to:

1. Identify, on an urgent basis, the fifty most hazardous nuclear reactors worldwide for priority shutdown within ten years, including all Soviet-designed RBMK and VVER-440/230 reactors.
2. Commit to providing sufficient near-term capital and technical assistance for power to replace the reactors identified for priority shutdown, particularly in countries operating RBMK and VVER-440/230 reactors; and encourage development of longer-term funding mechanisms, such as utility-rate surcharges, for the permanent and safe decommissioning of these reactors.

DISCUSSION

Prioritization of Reactors for Shutdown (POINT 1)

The G-7 and Russia should announce their intention to prioritize, by no later than the end of 1996, the most dangerous reactors for prompt, safe, and permanent shutdown within ten years. This priority list would be used to determine how international assistance for replacement power will be distributed most effectively.

Now is the time to aggressively introduce alternative energy replacement packages for the electricity output of dangerous plants while a cushion of excess generating capacity exists.

The G-24 Nuclear Safety Working Group, established after the 1992 G-7 Summit, should be charged with evaluating the safety of individual reactors and ranking them for shutdown, with input from independent, nongovernmental organizations. Thus far, the Nuclear Safety Working Group has served to coordinate individual countries' reactor upgrading assistance efforts, and is familiar with the risks associated with particular reactors. Its function should now be expanded to include coordination of multilateral efforts to replace these unsafe units.

This "Most Dangerous Reactors" list should rank at least the top fifty most dangerous reactors worldwide for priority shutdown. This list should include those Soviet-designed reactors commonly placed in the higher-risk category by safety experts—reactors of the types RBMK and VVER-440/230. Both reactor designs are known to pose serious safety risks that cannot be "fixed" with technical upgrades. RBMK's, of the ill-fated Chernobyl design, have an irreparable design flaw that makes their operation unstable at low power or in the event of a loss-of-coolant, and allows for a runaway power surge like the one that caused the Chernobyl explosion. RBMK's also use a graphite moderator (to facilitate the nuclear chain reaction) which can burn. Neither reactor has a Western type secondary containment that would prevent the release of radioactivity in the event of an accident. Both reactor designs also lack adequate core-cooling systems to prevent overheating that could lead to a meltdown. Later Soviet models—the VVER-440/213 and the VVER-1000—also have serious design deficiencies such as inadequate instrumentation and control systems and fire-protection mechanisms.

Capital for Replacement and Decommissioning (POINT 2)

The Summit nations should announce their commitment to provide sufficient capital for replacement power for the most dangerous reactors, including Soviet-designed reactors of the types RBMK and VVER-440/230, and should encourage development of longer-term funding mechanisms, such as utility-rate surcharges, for the permanent and safe decommissioning of these reactors. Upon completion of the "Most Dangerous Reactors" list, bilateral and multilateral negotiations should commence immediately between

the G-7, Russia, and countries operating the most unsafe reactors in order to develop assistance packages for prompt replacement of these units. Progress in these negotiations should be reviewed at least biannually by the Nuclear Safety Working Group. A timeline for closure of at least two to three reactors per year should be strictly adhered to.

While such a multilateral effort is already underway between the G-7 and Ukraine for closure of Chernobyl Units 1 and 3, progress has been too slow. In December 1995 a G-7/Ukraine Memorandum of Understanding was signed for closure of Chernobyl by 2000, with the condition that Western funds be provided for replacement power and decommissioning. If this agreement is implemented promptly in such a

way as to guarantee that maximum use is made of Ukraine's massive potential for improved energy efficiency, and that replacement power sources will be as safe and sustainable as possible, this assistance package and cooperative effort could serve as a prototype for other multilateral negotiation efforts.

These bilateral and multilateral efforts will require major capital investments. The Task Force has proposed a Sustainable Energy Revolving Fund (SERFUND), to be capitalized at an initial level of no less than U.S. \$10 billion, for development and funding of sustainable energy projects to supplant electricity from unsafe reactors. (See the section on Sustainable Energy Development.)

Nuclear Democracy

This section addresses the need for the disclosure of nuclear information and for public participation in the nuclear decision-making process. The Summit leaders should recognize the public's right to environmental, safety, and health information, and should develop standards for nuclear openness accordingly.

INTRODUCTION

Since the dawn of the atomic age, governments have typically treated nuclear information as highly secret. Since the end of the Cold War, the U.S., Russia, and other countries have made significant strides towards relaxing secrecy.

Recent events, however, have reminded us that all countries—especially the weapons states—have far to go towards achieving true freedom of information for their citizens. The recent arrest for espionage of retired Russian naval officer Alexander Nikitin—who is a researcher with the Bellona Foundation on radioactive contamination of the Kola Peninsula—and secrecy surrounding recent accidents at Chernobyl and Monju in Japan, have highlighted the delicate relationship between government secrecy and the public trust.

To most people living in democratic societies, it is axiomatic that government openness is a necessary cornerstone of a successful society. The free flow of information is absolutely essential for citizens to make informed policy decisions, to choose government leaders, and to hold them accountable. The citizens must be guaranteed that they will not be penalized or persecuted by their government for seeking nuclear information that is not classified for reasons of national security or other compelling public interests, such as security against terrorist attack or the non-proliferation of nuclear weapon design information.

While all governments must keep some secrets in the interest of national security, there are many instances when the public is denied information for reasons other than compelling public interests. In the United States, for example, the recently uncovered story of radiation experiments performed on humans during the Cold War shows that national security was

sometimes invoked to justify classification of information solely for public relations reasons.

The public's right of access to environmental, safety, and health information usually outweighs any national security considerations. When a government places its citizens at risk, those citizens should expect to be informed, both about the exposure to risk and about the consequences of that exposure. This important public interest should always be weighed against the temptation of government entities to automatically classify all nuclear information.

Unnecessary secrecy does not always end once clear and fair classification rules are in place. In the absence of a legal requirement for public access to government information—such as the Freedom of Information Act (FOIA) enacted in the U.S. in 1966—even unclassified information can, for all practical purposes, be out of the public's reach. Moreover, even in countries with such legal requirements, informal administrative secrecy often prevents the public from gaining access to unclassified information.

In addition to free public access to information regarding environmental, safety, and health risks, it is also essential to the democratic process that public participation in decision-making on nuclear issues be allowed and encouraged. Citizens in a democratic society must have the right to take part in the decisions that will affect their lives. Unfortunately, however, often the citizens who will be most affected by the siting or construction of a nuclear plant or a waste storage facility are intentionally excluded from the decision-making process.

SUMMIT DECLARATION

The Task Force urges the G-7 and Russia to take steps to ensure the free flow of nuclear information and meaningful public participation in decision-making on nuclear issues, and to encourage all other countries with nuclear facilities to join in these measures. We call upon the G-7 and Russian leaders to:

1. Declare their commitment to declassify promptly all environmental, safety, and health

Recent events have reminded us that all countries—especially the weapons states—have far to go towards achieving true freedom of information for their citizens.

information, with few exceptions; establish systematic declassification reviews for existing documents containing environmental, safety, and health information; and initiate negotiations on an international convention on access to information, transparency, and public participation regarding nuclear issues.

2. Publish openly the rules and guidelines regarding classification of nuclear information; ensure that these classification rules explicitly prohibit classification of environmental, safety and health information, with few exceptions; and involve non-military personnel in decisions on classification.
3. Establish public information laws requiring that the government supply the public with environmental, safety, and health information upon request, with few exceptions; and create the legal framework for judicial review of government decisions to deny citizens access to such information.
4. Establish a framework for meaningful citizen participation in environmental impact reviews and decision-making on siting, licensing, construction, and operation of nuclear installations, radiation sources, and storage sites.
5. Institute a regulatory framework for independent civilian inspection of *all* nuclear facilities, including weapon-related and other military installations.

DISCUSSION

Declassification and Accessibility of Environmental, Safety, and Health Information (POINT 1)

The G-7 and Russia should announce their intention to promptly declassify all environmental, safety and health (ES&H) information with few or no exceptions, and to initiate negotiations on an international convention on access to information, transparency, and public participation in regard to nuclear issues. Declassification of ES&H information is an instance where the public interest most clearly outweighs any national security interest in keeping information classified. Information about the storage and handling of radioactive waste and spent nuclear fuel from power plants, or about radiation releases from power plants, is clearly unconnected with military secrets and should not be withheld from the public.

Recent U.S. Department of Energy guidelines on the classification of new documents containing environmental, safety, and health information provide a model for ensuring that this type of information is accessible to the public. In a June 1993 departmental memorandum, Energy Secretary Hazel O'Leary called for the following guidelines to be observed in the creation of "any document or database containing information related to the environment, health, and safety of departmental employees and contractors; or the public:"

1. Classification or other dissemination restrictions will be used only when the document clearly contains information that we are required by law or regulation to protect.
2. If the essential information in the document can be conveyed without including specific classified or otherwise restricted information, do not include classified information.
3. In cases where classified information is essential to communicating or supporting the thesis of the document, whenever possible keep the primary document unclassified and include the necessary classified information in an attachment, appendix, or supporting document.
4. In cases where classified information must be an integral part of the document, consider also creating an unclassified version if significant environmental, safety, or health information can be coherently communicated.¹

The Summit nations should commit to amending their respective atomic energy laws to include requirements for the availability of ES&H information such as those outlined above. Moreover, the Summit nations that have not already done so should promptly establish systems for declassification review of existing documents containing ES&H information. In general, the burden of proof should be shifted from the proponents of declassification to advocates of classification.

Publication of Categories of Classified Information (POINT 2)

The Task Force calls on the Summit nations that have not already done so to require their government agencies to immediately publish their classification

¹ Secretary Hazel R. O'Leary, U.S. Department of Energy, to all Departmental Elements Directors, Department of Energy Laboratories, 25 June 1993, "Classification of Departmental Information Relating to Environment, Safety and Health."

guidelines in the open literature, and to involve non-military personnel in decisions on classification. The guidelines for dissemination of ES&H information proposed above can only be useful if the public can be assured that ES&H information is not improperly classified.

In November 1995, President Yeltsin signed edict Number 1203, "Approving the List of Information Classified as Secrets." This "list" was subsequently published. Unfortunately, this edict allows for unlimited classification of "information on the design, installation, operation, or security support of facilities of the nuclear complex" (paragraph 10), as well as classification of "information on the choice or assignment of parcels of land, underground areas, or bodies of water for the construction of [operations] facilities . . ." (paragraph 15).²

This presidential edict, by prohibiting access to any information related to civilian and military nuclear facilities, violates recently adopted Russian legislation. The 1992 *Law on Environmental Protection*, the 1993 *Law on State Secrets*, and the 1995 *Law on Information, Informatization and Protection of Information*, all support the public's right to obtain information on the environment and environmental pollution. The *Law on State Secrets* explicitly prohibits classification of information pertaining to public health and the environment. And other recently adopted legislation—the 1995 *Law on the Use of Nuclear Energy* and the 1996 *Law on Radiation Safety*—specifically address the public's right to information on the nuclear complex and to public participation in decision-making on nuclear issues. Edict 1203 or its implementing directives should be amended to specifically acknowledge the legitimate public interest in ES&H information, in accordance with the principles cited above. In Russia and in all the G-7 nations, this important public interest in ES&H information must *always* be weighed against the temptation to automatically classify all nuclear-related information.

Moreover, discussion about new information control policies should be open to the public, with ample opportunity for public input. Decisions on

information control policies should not be limited to government officials within the agencies establishing the guidelines.

Laws Governing Freedom of Information (POINT 3)

The Task Force urges the Summit nations to immediately establish an affirmative legal requirement that the government must provide the public with access to unclassified information. Without such a legal requirement, citizens have no guarantee that they will have access even to unrestricted information.

The Summit nations that do not recognize a legally-enforceable public right to government information should immediately establish such a law. Freedom of Information law should limit exemptions only to matters of national security and other compelling public interests such as preserving personal privacy or the integrity of ongoing law enforcement investigations. Every attempt should be made to provide citizens with unclassified ES&H information, even when it is contained in a classified document (by document abstraction, segregation of

classified information, etc.). In cases where citizens are denied such information, the government's reasons should be stated clearly.

The Summit nations should also commit to establishing a legal framework that allows for judicial review in cases where ES&H information has been denied to the public. Such a framework would serve as a mechanism to prevent information from being improperly denied citizens by their government.

Public Participation in the Environmental Review Process (POINT 4)

We urge the G-7 nations and Russia to commit to the principle of full public participation in the environmental review and decision-making process, and to immediately implement mechanisms to ensure this participation. Summit nations have already written into law requirements for public participation in environmental impact studies for the siting of nuclear installations, radiation sources, and waste storage sites. However, structural mechanisms to ensure compliance with the law—and to ensure that state decisions will be made with a view to the concerns of public organizations and citizens—are not yet in place in all Summit countries. Such structural mechanisms should include: public hearings on facility construction or

In Russia and in all the G-7 nations, the important public interest in ES&H information must always be weighed against the temptation to automatically classify all nuclear-related information.

² President Yeltsin, Edict, "Approving the List of Information Classified as State Secrets, Presidential Edict No. 1203," *Rossiyskaya Gazeta*, 27 December 1995.

licensing procedures; mechanisms for citizens to become formal parties in the facility licensing process; judicial review of final decisions; and citizen enforcement suits against facilities in violation of safety regulations.

The new *Russian Atomic Energy Law* (1995) lays a solid framework for such public participation. It requires that government agencies "conduct discussions of questions connected with the location, design, and structure of facilities using nuclear energy, with the participation of organizations, including public organizations (or associations), and citizens, if these nuclear installations, radiation sources, or storage sites are to be located within their territory."³ In reality, however, citizens still have little opportunity to provide input into the decision-making process in Russia, as few mechanisms for public participation are yet in place. And although many such mechanisms are in place in the U.S., citizens are often provided with insufficient information to give informed input to the environmental review process, and the rights of disadvantaged or under-represented citizens are often overlooked in the siting, licensing, and construction of facilities located in their territory.

In addition to a formal structure for public participation in environmental review, the Summit nations should commit to the principle that independent organizations must be allowed free access (consistent with legitimate security concerns) to gather information about radioactive contamination and the safety of nuclear installations. Otherwise, there will be no guarantee that public discussion about the risks of

accidents or contamination will be honest and unbiased.

Civilian Inspection of All Nuclear Facilities (POINT 5)

The G-7 countries and Russia should announce their intention to immediately establish regulatory frameworks within which independent civilian regulatory bodies have power of inspection over all nuclear installations and waste storage facilities, including nuclear-weapon related and other military sites. Unbiased review of the safety of weapon-related and other military installations cannot be ensured under the jurisdiction of a non-civilian body. An inherent conflict of interest arises when the body charged with promotional responsibilities is also charged with regulatory duties.

Although Russia's civilian nuclear oversight agency, Gosatomnadzor (GAN), is responsible for inspection and licensing of nuclear weapons production facilities, civilian nuclear plants, and other nuclear installations owned and operated by the Ministry for Atomic Energy (Minatom), it has no enforcement authority backed by national legislation. Moreover, Russian Executive Order 350 (July 1995) placed oversight of nuclear defense facilities in the hands of the Defense Ministry. GAN should be given legal enforcement authority, its power to inspect all nuclear facilities should be reinstated, and it should be provided with adequate funding to perform its mandate. In the U.S., the Nuclear Regulatory Commission or another independent civilian regulatory body should be granted oversight of the U.S. Department of Energy, as recently recommended by an independent high-level commission.⁴ The U.S. and Russia must set a clear precedent for the rest of the weapons states, which should all allow for civilian inspection of weapons facilities and other military installations.

³ *Federal Law on Use of Nuclear Energy*, Federal Law No. 170-F3 Article 14 (21 November 1995).

⁴ Advisory Committee on External Regulation of Department of Energy Nuclear Safety, *Improving Regulation of Safety at DOE Nuclear Facilities*, Final Report, December 1995.

Sustainable Energy Development

This section addresses the development of sustainable energy projects to supplant electricity generated from unsafe nuclear reactors. The Task Force recommends that the G-7 provide capital for energy efficiency, renewable energy and natural gas projects, and conventional power supply transmission and distribution improvements, using a combination of integrated energy planning and market-based strategies to aggressively implement these projects.

INTRODUCTION

Soviet-designed reactors of the types RBMK-1000/1500 and VVER-440/230 are still operating in six countries of Eastern Europe and the former Soviet Union. These countries are Russia, Ukraine, Lithuania, Bulgaria, Armenia, and the Slovak Republic. In addition to these most dangerous plants, three plutonium production reactors continue to operate in Russia, supplying electricity and heat from cogeneration for the cities of Seversk and Zheleznogorsk.

RBMK and VVER-440/230 plants have inherent design flaws and a demonstrated history of operational difficulties. In addition, economic upheaval in many host countries has left nuclear plant operators owed millions of dollars in unpaid bills, creating conditions which make safe operation of these plants difficult.

Nonetheless, power generated from unsafe facilities is, at present, an important part of the electricity generation mix in these countries. These reactors represent nearly 20,000 Megawatts (MW) of generating capacity, generating 10 percent of the total electricity consumed in the six host countries, and are important sources of revenue and power for certain countries such as Lithuania. (In 1994, over 85 percent of Lithuania's electricity, but only 5 percent of Ukraine's electricity, came from the most dangerous nuclear plants.)

Public safety and environmental quality will be substantially enhanced if the RBMK, VVER-440/230,

and plutonium production reactors are retired as quickly as possible. However, any debate on the closure of these facilities is moot without the development and realization of viable alternatives to meet the host countries' energy needs. In some cases, improvements in energy efficiency alone could make up for the output of these plants, although local and regional issues of transmission grid stability and heat supply also must be considered. If there is to be prompt phase-out of the most dangerous plants, replacement generating capacity must also be supplied in some cases.

Thus far, international assistance efforts to increase nuclear safety have in great part been focussed on technical safety upgrades to the most dangerous plants. At their 1992 Summit in Munich, the G-7 created the \$160 million Nuclear Safety Account (NSA) for the development and implementation of safety measures for unsafe nuclear plants. Since 1992, however, the actual expenditure of these funds has been slow. Moreover, it is the opinion of most Western nuclear experts that technical fixes cannot increase the safety of RBMK and VVER-440/230 reactors to acceptable levels.

There has been even less commitment from the G-7 to finance replacement power for these most dangerous power plants. The urgent next step is to develop, fund, and implement packages of energy efficiency, renewable energy and conventional power system improvements targeted specifically to regions served by the nuclear facilities in question. Such projects will be the most effective and economic means for replacing electricity from these dangerous nuclear plants.

SUMMIT DECLARATION

The G-7 and Russia should accelerate the development of economic and environmentally-sustainable energy alternatives to RBMK and VVER-440/230 reactors, and others identified for priority shutdown.

Any debate on the closure of dangerous reactors is moot without the development and realization of viable alternatives to meet the host countries' energy needs.

We urge the G-7 and Russian leaders to commit to:

1. Identify, on an urgent basis, the best alternatives to replace the most dangerous nuclear plants, particularly in countries operating RBMK and VVER-440/230 reactors, and give priority to energy efficiency measures, renewable energy, natural gas, and conventional power supply improvements.
2. Create a \$10 billion Sustainable Energy Revolving Fund (SERFUND) to finance these sustainable energy projects.
3. Provide support for the development and implementation of integrated energy planning as an appropriate framework for sustainable energy policies and electric power sector regulation in these countries.
4. Undertake an intensive multi-pronged market intermediation and development program designed to overcome serious transactional and market barriers to sustainable energy alternatives.
5. Establish an integrated electricity brokerage market between the European Union, Eastern Europe, and states of the former Soviet Union designed with appropriate consumer and environmental safeguards.

DISCUSSION

Since the energy crises of the 1970's, a wealth of new technologies and practices have been developed for more efficient energy consumption and for the production of renewable energy and other environmentally safer sources. In particular, expanded use of natural gas, especially in industrial cogeneration, is a logical complement to energy efficiency and renewables in providing replacement power for dangerous plants. The reliability and efficiency of natural gas turbines have increased while their cost has substantially decreased.

Compared to the projections of the early 70's, current global energy consumption is over 30 percent lower than forecast. This reduction is due, in large measure, to improved energy efficiency, which has become the largest "new" source of energy on the planet during the last 20 years. The potential for energy efficiency gains in the six countries operating RBMK's and VVER-440/230's is enormous. Most estimates show that energy intensities in these countries could be reduced by 30-50 percent or more with equipment and management practices being used in Western Europe today. Examples of measures that can

be taken include efficient lighting, efficient appliances and motors, industrial process changes, variable-speed motor drives, automatic controls, better energy accounting and management, and load management to reduce consumption peaks. Energy efficiency improvements are possible through investments to upgrade existing infrastructure and equipment, and through replacement of inefficient equipment, buildings, and industrial processes.

Large energy efficiency gains in heating systems (to replace lost heating energy from the Seversk and Zheleznogorsk plutonium production reactors; for example) are possible with better building and pipe insulation, introduction of controls and meters, and improved maintenance. In addition, promoting fuel diversity for heating can reduce reliance on electric space heating in many regions. For example, household gasification strategies should be examined as an alternative to electricity system expansion driven by electric space heating.

In many parts of the world, renewable energy technologies, particularly electricity generated from wind and biomass, have become significant contributors to the electricity system. Costs for solar thermal and photovoltaic electricity technologies are rapidly becoming competitive for large grid-based applications, and hold distinct cost advantages in off-grid applications and in certain transmission and distribution upgrade circumstances. Indeed, if subsidies to environmentally unfriendly energy sources and market distortions resulting from ignored environmental externalities were eliminated, renewable power generation would be far more prevalent than is currently the case. Favorable wind and biomass resources have been identified in several areas (Lithuania, Kola Peninsula of Russia, Ukraine) where dangerous plants are located. Serious evaluations of these potentials should be undertaken to quantify the contribution these resources can make to a replacement power package.

Despite the performance and promise of sustainable alternatives, their penetration in the six countries operating RBMK's and VVER-440/230's has been slow due to numerous market, financial, structural, and technical barriers. The five points of the Summit Declaration are intended to address these barriers as described more fully below.

Identification of Replacement Power Alternatives (POINT 1)

We urge the G-7 and Russia to commit to identifying, as quickly as possible, packages of alternative energy sources to provide reliable replacement for power generated from the most dangerous nuclear facilities. These packages would combine efficiency

measures and renewable energy with natural gas generation projects, and other conventional power system upgrades.

The G-7-sponsored effort underway to replace Chernobyl in Ukraine involves looking at ways to reform the entire power sector and recommending legal, regulatory and administrative measures to promote greater economic and energy efficiency in the sector. The Task Force suggests modifying the Ukrainian program to include a higher priority for targeted energy efficiency programs and more incentives to promote renewable energy.

A typical approach would be to identify a target region or country and analyze its energy needs, taking into consideration the requirements of the entire power system. The opportunities to capture energy resources, whether through energy efficiency, renewable energy, transmission and distribution system upgrades, industrial cogeneration, natural gas power supply, or other improvements to the existing supply system should be thoroughly investigated and evaluated for cost-effectiveness. The lowest-cost measures should be given top priority for financing through the G-7-sponsored fund described below. Emphasis should be placed on using indigenous contractors and materials to create local production infrastructure and expertise to handle future needs.

Sustainable Energy Revolving Fund (POINT 2)

We call on the Summit nations to establish the Sustainable Energy Revolving Fund (SERFUND), capitalized by G-7 members and countries containing dangerous reactors at a level of not less than U.S. \$10 billion, which would give top priority to energy efficiency measures, renewable energy and natural gas ventures, and would provide bridging funds for conventional power sector development and improvement projects. This fund would complement the institution-building, integrated energy planning and market intermediation and development activities described below by providing an initial pool of readily available capital for appropriate projects. SERFUND funds would be disbursed by the EBRD or World Bank to qualified national on-lending intermediaries with appropriately structured guarantee and collateral mechanisms. Repayments to the fund (at concessional

rates) could be used for subsequent ventures and eventually become self-sustaining. As the SERFUND becomes self-sustaining, the original donors could recover their initial investment.

The SERFUND would act as a fund consolidator and perform due diligence on nationally-based on-lenders. These local on-lending bodies would disburse funds to support sustainable energy projects sponsored by a variety of institutions, including electric utilities, distribution companies or private energy service

companies (ESCOs). The responsibility for ensuring the viability of funded projects would rest with the approved national entity. This system will allow for a wider and more timely distribution of funds and will enhance the development of local capability to identify, manage and implement sustainable energy projects. Promising project implementors could be targeted for intensive intermediation assistance, as discussed below, in preparation for final project investment.

Another possible source of funding for this account is a minor sliding-scale levy on electricity produced from nuclear reactors world-wide. The sliding scale could be based on a "score" derived from

a power plant's safety evaluation, production cost, reliability, and other factors. Higher-scoring plants would have a reduced levy as a reward for safer and more economical operation. The larger levy would act as an incentive for more problematic plants to improve their performance. Safety performance and economy could be certified by an international nuclear safety body—the G-7 Nuclear Safety Working Group, for example—according to standard criteria. It is unlikely that this levy would exceed 2–3 percent of the revenues from nuclear-generated electricity worldwide.

Development of Sustainable Energy Policies and Regulation (POINT 3)

The sustainable energy packages described above for financing through the SERFUND must be developed within an appropriate policy and regulatory context. Unfortunately, insufficient attention has been given to developing an adequate institutional basis for crafting sustainable energy policies. Relationships need to be clearly established between government policy makers, regulators, energy producers and consumers. The responsibilities of each of these actors also needs to be legally established.

We call on the Summit nations to establish the Sustainable Energy Revolving Fund (SERFUND), capitalized by G-7 members and countries containing dangerous reactors at a level of not less than U.S. \$10 billion.

The Task Force urges the G-7 to enhance current bilateral and multilateral efforts to develop policy-making and regulatory bodies. Areas of special emphasis include:

- a. development of contract law and the legal, regulatory and administrative institutions that underlie efficient energy markets;
- b. establishment of requirements for integrated energy assessments that allow comparison of investments in demand-side and supply-side measures;
- c. establishment of regulations governing private entrance into power markets and transactions within those markets;
- d. development of energy performance codes and standards for buildings and certain kinds of energy-using equipment.

Market Intermediation and Development Programs (POINT 4)

Many transaction barriers exist that can prevent or limit the implementation of integrated, market-oriented sustainable energy strategies. Market intermediation and development can overcome these barriers and must be a high priority in the implementation of these approaches. This aspect of the Task Force proposal directly addresses ways to overcome transaction barriers.

Current institutional barriers to market-based sustainable energy solutions include incomplete or underdeveloped legal and regulatory regimes, monopoly production in many industries, energy quotas, and lack of ownership and incentives. Financial barriers include high inflation rates, the absence of developed capital markets, and currency conversion problems. Information barriers include a lack of information about technical opportunities and performance, baseline consumption and thus potential energy savings, costs of equipment and installation, and potential business partners and sources of finance. Experiential barriers include a lack of trained personnel who are familiar with sustainable technologies, analytical methodologies, and installation and maintenance. Technological barriers include the technical character and large sunk investment in some existing infrastructures that can make equipment replacement difficult.

These barriers have, in general, been seriously underestimated by the architects of new market-based institutional structures proposed for the electricity sector of formerly centrally-planned economies. Consequently, sufficient resources have not been

allocated to overcome these barriers. Therefore, we call on the G-7 nations and Russia to urgently implement the following key market intermediation and development efforts in the six target countries:

- a. institutional development of market intermediaries such as energy service companies, utility companies, electricity market brokers, and information clearinghouses;
- b. training of key managers and officials in project identification, evaluation, preparation, and finance;
- c. development and dissemination of information about consumption patterns and options for meeting those consumption needs efficiently;
- d. support for joint venture production through assistance in partner identification and evaluation, capitalization, and marketing; including support for the private banking sector to undertake energy efficiency and renewable energy lending.

Continental Electricity Market and Brokerage (POINT 5)

We urge the Summit nations to take steps to establish an integrated continental electricity market and brokerage. The benefits of larger-scale integration of electricity systems have been well demonstrated. Current efforts to establish market-based electricity sectors in countries housing RBMK and VVER-440/230 reactors could be expanded beyond individual countries to the integration of the West and East European and former Soviet electricity markets. Although such linkages would likely stop short of full integration and synchronous operation, the spread of time zones could significantly reduce total peak demand, similar to the 10,000 MW reductions achieved by the Russian integrated energy system, and surpluses could be more reliably delivered. Moreover, the establishment of a G-7- and Russian-sponsored energy brokerage could serve to overcome the political concerns of some nations about reliance on other countries in the region for their energy supplies.

Proper market development and coordination would provide a much broader base for competition and help reduce disparities in access to energy services for countries with lesser developed systems. Shutting down the most dangerous reactors would require that existing capacity in Western and Eastern Europe and the former Soviet Union (principally non-nuclear thermal), increase its capacity factor by 5 percent or less. The expense of providing adequate transmission system interconnection for a continental brokerage

could be partially defrayed by the Sustainable Energy Revolving Fund discussed above.

It is vital that instituting a wholesale market not reduce electricity to a mere commodity and create a system that ignores the profound societal interest with which electricity is imbued. Electricity consumption and production are integral to economic development, and human and environmental well-being. For this development to be sustainable, energy development must be clean, economical, and include the costs associated with environmental pollution. Energy use also has inextricable links with global warming, nuclear proliferation, air and water pollution, land-use and biodiversity.

To ensure that environmental and consumer safeguards are adequately addressed, a non-bypassable line charge should be added to all electricity sold to final consumers through the wholesale market or through distribution companies. This charge would likely range from 3 percent to 5 percent of a consumer's energy bill. Revenues from this charge would be made available for energy efficiency programs, support for low-income consumers, research and development, renewable energy development and other programs that benefit the system as a whole. Programs partially capitalized by the SERFUND could draw on these funds to complete the financing package.

Irreversible Nuclear Weapon Reductions AND Security of Weapon-Usable Fissile Materials

This section addresses the need for accelerated progress toward implementation of further deep, irreversible reductions in U.S.-Russian nuclear weapon stockpiles, and environmentally sound, proliferation-resistant strategies for disposition of weapon-usable nuclear materials. Limiting access to weapon-usable plutonium and highly-enriched uranium (HEU) is the primary technical means of preventing nuclear weapons proliferation.

INTRODUCTION

Pursuant to the START I Treaty, Russia and the United States continue to reduce the number of nuclear weapons carried by their long-range strategic nuclear forces. It is hoped that this trend will continue if and when Russian Duma ratification of START II brings that treaty into force. However, the U.S.-Russian failure to reach agreement on a host of verification, mutual transparency, and fissile material disposition issues is delaying, and may ultimately derail, further progress toward deep, irreversible reduction and eventual elimination of global nuclear arsenals. The Russian Duma's consideration of START II has been protracted, due at least in part to U.S. attempts to interpret the Anti-Ballistic Missile (ABM) Treaty as allowing for defense against theater-class ballistic missiles. Russia and the U.S. continue to modernize nuclear weapon delivery systems. Both nations appear intent on maintaining unnecessarily large nuclear weapons research and development establishments under the multilateral Comprehensive Test Ban Treaty nearing completion in Geneva.

Moreover, the mounting global inventory of nuclear weapon-usable materials, both military and civilian, represents a continuing threat to all humankind. Capping and reducing these inventories should be the top "nuclear safety" priority for the G-7 and Russia. In conjunction with START and various

unilateral U.S. and Russian initiatives, some 16,000 warheads have been or soon will be dismantled. Neither Russia nor the U.S., however, has made serious progress on the permanent disposal of fissile materials from these weapons, a large fraction of which will be stored in weapon-component form. Meanwhile, Russia's military and civil reprocessing programs continue to separate weapon-usable plutonium from spent nuclear fuel, and three Russian production reactors continue to produce weapon-grade plutonium at least until the year 2000 pending provision of replacement power, with nothing stronger than paper declarations to insure against the future use of this material in weapons.

In September 1994, Presidents Clinton and Yeltsin promised to exchange information on U.S. and Russian stockpiles of nuclear weapons and weapon-usable materials. This effort, however, has been stalled by the failure to agree on the terms of the legal instrument that would permit Russia and the United States to exchange classified data. Likewise, in the past year there has been virtually no progress on verification of warhead dismantlement or on related transparency measures. The U.S. purchase of HEU from Russian weapons (blended to low-enriched

uranium for use as fuel in U.S. power reactors) has been slowed by persistent disagreements over price and verification measures.

The worldwide public and official reaction against the resumption of French nuclear weapons testing in the South Pacific illustrates the widespread desire to move forward with the task of nuclear disarmament. The general public the world over harbors continuing concern about nuclear weapons and the spread of weapons to unstable regions and governments. The leadership of the G-7 and Russia should build on the political foundation of this global sentiment to launch a series of bold new disarmament and fissile material security initiatives.

The mounting global inventory of nuclear weapon-usable materials, both military and civilian, represents a continuing threat to all humankind.

SUMMIT DECLARATION

The Task Force urges the G-7 and Russia to accelerate nuclear weapon reductions and halt further production and proliferation of weapon-usable fissile materials and technology. We call upon the G-7 and Russian leaders, particularly Presidents Clinton and Yeltsin, to:

1. Jointly and unambiguously declare their commitment to fulfill their obligations under the nuclear Non-Proliferation Treaty by beginning negotiations promptly on a START III agreement that would make further deep, irreversible reductions in strategic nuclear delivery vehicles and nuclear warhead stockpiles (U.S. and Russia); initiate intergovernmental discussions among all the weapon states on the modalities of eliminating nuclear weapons; and inform the United Nations each year of progress in the elimination of nuclear weapons.
2. Ratify START II with the necessary collateral conditions to ensure Duma approval (Russia) and accelerate implementation of the required reductions in operational forces jointly (U.S. and Russia) well before the 2003 deadline specified in the treaty.
3. Declare a policy of "No First Use" of nuclear weapons, without caveats and conditions (U.S., Russia, U.K., and France); revise military doctrines to reflect this "No First Use Policy" and to de-emphasize the importance of nuclear weapons in defense postures (U.S. and Russia); and jointly commit to taking all nuclear weapons off "day-to-day" alert status to ensure that no nuclear weapons are poised for immediate launch.
4. Declare their commitment to cease permanently all field preparations and test site operations connected with underground nuclear tests, and not to exploit advanced nuclear experimental and computer simulation capabilities for the purpose of continuing the development of nuclear weapons under a Comprehensive Test Ban (U.S., Russia, U.K., and France).
5. Make prompt public declarations of the overall size and breakdown of the nuclear weapon arsenals and fissile material inventories, and commit to updating these declarations periodically (U.S., Russia, U.K., and France).
6. Initiate a program for developing and demonstrating the operation of a monitoring and safeguards regime for nuclear-weapon states covering intact nuclear weapons, nuclear weapon components in storage, and weapon-usable materials. (Such a program should begin with the U.S. and Russia, but could be extended whenever appropriate to include other nuclear-weapon states and eventually the international community, represented by the IAEA or similar organizations.)
7. Permanently halt reprocessing—chemical separation—of plutonium for weapons purposes, and, at minimum, defer further civilian spent nuclear fuel reprocessing until excess plutonium stockpiles have been eliminated (Russia, France, U.K., Japan, U.S.); and assist all reprocessing-client countries to develop the safest and most secure spent fuel management regime possible.
8. End the use of highly-enriched uranium (HEU) in naval vessels and in all civil applications.
9. Accelerate the replacement of Russia's plutonium production reactors at Seversk and Zheleznogorsk, and the conversion of the plutonium cities at Ozersk, Seversk, and Zheleznogorsk to the production of goods and services exclusively for peaceful purposes.
10. Establish a "working group" to set up a timeline and specific implementation programs for long-term disposition of weapon-usable fissile materials in order to accelerate the disposition process. The group should evaluate the relative safety, proliferation resistance, and cost of disposition options such as the mixture of weapons plutonium with reprocessing wastes and glass (called "vitrification") for direct disposal in a permanent underground repository, or with uranium to make "mixed-oxide" (MOX) fuel for existing reactors. In our view, a credible comparison would conclude that vitrification is the preferred disposal option. Meanwhile, vitrification programs should be developed for non-weapon-usable residues already produced in spent fuel reprocessing.

DISCUSSION

Nuclear Arms Control and Disarmament Initiatives (POINTS 1-4)

The U.S. and Russia should move forward immediately with bold new initiatives toward the twin goals of ultimately eliminating all nuclear weapons and foreclosing the prospect of further nuclear weapons proliferation. The failure of Russia and the United States to progress beyond what had been agreed as of January 1993, when the START II Treaty was signed, is obstructing completion of other important treaties on the international arms control agenda, such as the multilateral Comprehensive Test Ban (CTB) and Fissile Material Cutoff. Most countries view these arms control agreements not as ends in themselves, but as part and parcel of the broader nuclear weapon-state obligation under the Non-Proliferation Treaty (NPT) to proceed down the path toward nuclear disarmament, as reiterated in the decision on "Principles and Objectives for Nuclear Non-Proliferation and Disarmament," adopted in conjunction with the indefinite extension of the NPT at the 1995 Review and Extension Conference.

The currently operative U.S.-Russian joint statement on the subject of further nuclear arms reductions is a convoluted formulation from the September 28, 1994 summit, in which the two governments announced their intention to "intensify their dialogue to compare conceptual approaches and to develop concrete steps to adapt the nuclear forces and practices on both sides to the changed international security situation and to the current spirit of U.S.-Russian partnership, including the possibility, after ratification of START II, of further reductions of, and limitations on, nuclear forces." Since then, the two governments have not registered any substantive progress on further nuclear arms reduction measures. Rather, both have taken a step back by reinforcing the continuing centrality of nuclear weapons in their respective military doctrines.

While more than six years have passed since the collapse of the Berlin Wall, and though both Russia and the United States claim to have de-targeted their strategic missiles, both countries still maintain thousands of nuclear warheads on alert, ready to be launched on short notice. While the CTB Treaty has been part of the international negotiating agenda for

forty years, the nuclear weapon states are still having difficulty reaching a definitive agreement on the need for eliminating all nuclear explosions, no matter how small their yield or "peaceful" their avowed purpose. The United States and France have announced plans for experimental programs in nuclear weapon physics that are intended to blunt the impact of a CTB on their nuclear weapon design capabilities.

While possessing the world's largest stockpile of weapon-grade plutonium, the Russian Ministry of Atomic Energy (Minatom) continues to produce more of this material. Meanwhile, the United States contin-

ues to spend hundreds of millions of dollars annually to maintain and upgrade its military plutonium separation facilities at the Savannah River and Idaho National Laboratory reprocessing sites—ostensibly for the very purposes of "waste management" that it encourages other countries to forswear—even as threshold nuclear weapon states, such as India and Pakistan, are enjoined to agree to an immediate fissile material production cutoff for weapons purposes. The cumulative effect of such foot-dragging and "hedging" by the nuclear-weapon powers is to deprive them of moral and political leverage on the vital question of preventing further nuclear weapons proliferation.

Russia should immediately ratify START II with the necessary collateral conditions to ensure Duma approval, and negotiations should begin promptly on a follow-on treaty, START III, that would reduce the total Russian and U.S. stockpiles of intact nuclear weapons to 1,000 or less on each side. From a technical perspective, such a reduction could easily be achieved within the next seven years—that is, on the same time-scale now envisioned for full implementation of START II. Entry into force of a Russian-U.S. agreement on reductions to this level would set the stage for negotiations on multilateral reductions including the other three permanent members of the UN Security Council, none of whose stockpiles exceed 500 weapons. The G-7 and Russia should not await completion of START III to commence multilateral negotiations, but should announce their intentions to initiate discussions as soon as possible among all weapons states on the modalities of reducing and eliminating nuclear weapons. The Summit nations should also establish a formal system of submitting annual reports to the United Nations detailing the types and numbers

The U.S. and Russia should move forward immediately with bold new initiatives toward the twin goals of ultimately eliminating all nuclear weapons and foreclosing the prospect of further nuclear weapons proliferation.

of nuclear warheads and associated delivery systems dismantled and eliminated over the past year, whether unilaterally or under arms reduction treaties.

An important political step in the process toward global military denuclearization is a joint declaration or multilateral convention among nuclear weapon powers extending unqualified assurance of "No First Use" of nuclear weapons to all states, including other nuclear weapon states. While primarily a political step, over time such a declaration or convention would tend to encourage, and be reflected in, a movement away from force employment doctrines and postures that now emphasize maintaining capabilities for early use of nuclear weapons in a conflict, either to thwart a conventional attack or preempt an adversary's nuclear attack. Military doctrines should be revised to reflect this "No First Use" policy. Similarly, a joint commitment to take all nuclear weapons off "day-to-day" alert would reduce international tensions by ensuring that a sudden, deliberate nuclear attack could not be mounted by any weapon state, and by reducing the risk of accidental or unauthorized launch. Such a de-emphasis and de-legitimization of the role of nuclear weapons in national or alliance defense should serve to strengthen the nuclear nonproliferation regime—particularly if complemented by robust collective security arrangements that can moderate the national insecurities and ambitions which prompt countries to acquire nuclear weapons.

Verification and Fissile Materials Security (POINTS 5 AND 6)

Plutonium of any isotopic composition (except for very high purity Pu-238) and HEU (defined as uranium with > 20 percent U-235) can be used to make nuclear weapons. Weapon-usable plutonium includes plutonium from dismantled warheads (weapon-grade) and plutonium separated from the spent fuel of commercial nuclear reactors (reactor-grade). The Nagasaki weapon was fabricated with 6.2 kg, and similar designs were subsequently fabricated with 15 to 20 kg of HEU (~93 percent U-235). The plutonium cores of some modern boosted fission primaries contain substantially less plutonium, on the order of 2 to 3 kg. If reactor-grade plutonium is used, then the penalty in performance may be considerable or insignificant depending on the weapon design, but the resulting explosion is not likely to be less than about 1000 tons of chemical high explosive.

According to the U.S. Department of Energy, the Clinton Administration has determined that 38.2 tonnes of plutonium and 174.3 tonnes of HEU from U.S. military stocks are now "excess" to U.S. military needs and can be permanently transferred to the civil

sector. Russia has agreed in principle to sell to the United States up to 500 tonnes of HEU from weapons "blended-down" to low-enriched uranium suitable for use in civil reactor fuel, but has yet to declare that any of its huge stockpile of weapon-grade plutonium (the world's largest at about 150–170 tonnes) is "excess" to its future military needs. Moreover, Russia continues to chemically separate 2 to 3 tonnes of weapon-usable plutonium annually from military and civilian spent reactor fuel in its reprocessing program.

The G-7 countries and Russia should make prompt public declarations of the size and breakdown of their nuclear weapon arsenals and other fissile material inventories, and commit to updating these declarations periodically. The Summit nations should also announce their support of a joint U.S./Russian or multilateral laboratory project to research, develop, and demonstrate, on a bilateral basis, a monitoring and safeguards regime that covers *all nuclear weapons and weapon-usable materials* in the weapons states. The ultimate goal should be the implementation of an internationally verified safeguards regime on all fissile materials in all states.

This would mean an expansion of the U.S./Russian Lab-to-Lab effort to include development and in-plant demonstrations of a safeguards system to improve the physical containment, surveillance, control and accounting of all fissile material in weapon states. A safeguards regime for the weapons states will become essential as we move into deeper reductions in the global nuclear arsenals. In order to convince other weapons states to reduce their own arsenals significantly, the U.S. and Russia will need to demonstrate that weapons retired under current arms agreements have been dismantled and that all weapon-usable materials are accounted for to the fullest extent practicable.

Reprocessing of Spent Nuclear Fuel (POINT 7)

Several countries in Europe and the former Soviet Union are nearing or have exceeded their spent fuel storage capacity. In order to deal with this critical waste problem, many of these countries are seeking or have already signed reprocessing contracts with Russia.

In light of the current and projected worldwide glut of separated plutonium, the proliferation, environmental, safety, and health risks associated with separation of plutonium, and the excessive costs of reprocessing in comparison with other forms of spent fuel management, the Summit leaders should call for an immediate and permanent halt to separation of plutonium for weapons purposes, and for the deferral of civilian spent fuel reprocessing at least until such

time as excess plutonium stockpiles have been eliminated and the risks and costs of civil plutonium use have been dramatically reduced. No further reprocessing contracts should be signed between governments or industries.

The U.S. and other G-7 nations should also commit to establish, on an urgent basis, the safest and most secure spent fuel management program possible, and pledge to work with reprocessing-client countries (and potential reprocessing clients) on (i) performing safety analyses of, and financing upgrades to, existing spent fuel storage facilities, and (ii) developing the capability in these countries for dry cask storage as needed until long-term disposal sites are developed.

Ending Use of HEU (POINT 8)

The Summit nations should call for termination of the use of HEU in naval vessels and in civil applications. While U.S. Government policy is to discourage the use of HEU fuel for nonproliferation reasons, it is currently cooperating in feasibility work on the use of HEU fuel in the core-conversion of the Russian plutonium reactors. In addition, Germany has plans to build a new research reactor (FRM-II) near Munich that is designed to use HEU, and EURATOM reportedly intends to import this HEU from Russia. These steps would directly undermine ongoing international efforts to end the civilian use of HEU and to minimize the proliferation dangers posed by this material.

Conversion of the Russian Plutonium Cities (POINT 9)

The Summit countries should issue a statement reaffirming the commitment to the interim conversion and/or replacement of the Russian plutonium production reactors at Seversk and Zheleznogorsk, as soon as possible, but no later than the year 2000. The G-7 nations and Russia should commit to the prompt evaluation of all viable replacement power alternatives for these cities, including energy efficiency potential, in order to develop the best assistance package to achieve shutdown of these reactors. (See Recommendations of the Working Group on Sustainable Energy Development.) This commitment should include a goal of prompt completion of the joint U.S.-Russian Fossil-Fuel Replacement Options Study.

Because of their potential for proliferation of weapon-usable fissile materials, sensitive technologies, and expertise, the plutonium cities must become a

focus of international nonproliferation efforts. Economic stabilization and defense conversion would be important elements of such an effort. The U.S. should make full use of the conversion potential of the ongoing cooperative activities in the areas of (i) construction of a fissile material storage facility in Ozersk, (ii) HEU blend-down in Seversk, and (iii) fissile material security and accounting efforts.

To achieve the conversion of these military cities to production of goods and services exclusively for peaceful purposes, the G-7 nations and Russia should commit to (i) completion of a joint assessment of possibilities for non-military activities for the plutonium cities, (ii) training of managers and establishing commercially viable enterprises, and (iii) creating incentives for Western investors and businesses to cooperate with the plutonium cities. The G-7 and Russia should also establish a working group to evaluate contamination at the nuclear facilities, and to research and develop clean-up and spent fuel management options. The U.S. and Russia should commit to facilitation of International Scientific Technical Center (ISTC) and Industrial Partnering Program projects in these cities.

Options for Long-Term Weapon-Usable Materials Disposition (POINT 10)

The G-7 countries and Russia should announce a decision to establish a working group, including representatives of nongovernmental, independent organizations, to set up a timeline and specific implementation programs for IAEA-monitored long-term disposition of weapon-usable fissile materials in order to accelerate the disposition process. The group should undertake joint studies to fully evaluate the environmental, health, safety, and nonproliferation implications of politically and economically plausible options for long-term management and disposition of weapon-usable material. Such options include the mixture of weapons plutonium with reprocessing wastes and glass ("vitrification") for direct disposal in permanent underground repositories, or with uranium to make "mixed-oxide" (MOX) fuel for existing reactors. In our view, a credible comparison would conclude that vitrification is the preferred disposal option. Additionally, the Summit nations should commit to developing vitrification programs to clean-up non-weapon-usable residues already produced in countries reprocessing spent nuclear fuel.