

STATEMENT OF  
IVAN SELIN  
CHAIRMAN  
UNITED STATES NUCLEAR REGULATORY COMMISSION  
  
BEFORE THE  
COMMITTEE ON ENERGY AND NATURAL RESOURCES  
UNITED STATES SENATE  
  
CONCERNING  
U.S. EFFORTS TO IMPROVE THE SAFETY OF  
SOVIET-DESIGNED NUCLEAR REACTORS

OCTOBER 28, 1993

Mr. Chairman, Members of the Committee, I am pleased to be given the opportunity to address the important issue of improving the safety of Soviet-designed nuclear reactors in Central and Eastern Europe and the former Soviet Union (FSU), particularly the Nuclear Regulatory Commission's role in this effort.

I have just returned from a trip to Central and Eastern Europe (CEE), during which I served as a member of the United States delegation at the General Conference of the International Atomic Energy Agency (IAEA) in Vienna. All eyes and ears seemed tuned to what had transpired only three weeks earlier in Washington when Russian Prime Minister Chernomyrdin met with Vice President Gore to discuss, among other things, improving nuclear reactor safety in Russia.

This was my third trip to this area, having visited a number of the same countries and sites both in 1991 and 1992, and I can report progress: on the ground, in the material condition of many of the plants that were so seriously flawed as late as just two years ago; in the sensitivity of the leaderships of these countries to the safety concerns of the West; and, most importantly from my point of view, the growth (however slow) of strong and independent regulatory bodies that will eventually be capable of exercising the same kind of authority over safe operations that the NRC does in the United States.

The NRC has developed into a unique nuclear regulatory body, one, I might add, after which a number of other similar bodies have patterned themselves in other countries. We have the authority to take action to close down plants we find to be operating in an unsafe manner in order to protect the public health and safety. NRC regulations are used as models for many of the safety codes and guides of international bodies such as the IAEA. NRC experts are called on to participate in working groups to develop international consensus on new safety principles. We operate an independent, confirmatory research capability that enables us to develop our own perspective on problems from severe accidents, to the quality of the nuts and bolts used in our reactors; from the relative risks involved in operating these plants, to the ultimate question of how long these plants should be allowed to operate. We do not need to depend on vendors or utility operators for these judgments.

The countries of Central and Eastern Europe, and particularly the former Soviet Union, do not have this tradition of regulation. In Russia, for example, the nuclear regulatory body does not operate under a national nuclear law such as that which set up the NRC, but has derived its authority as a part of the Ministry of Atomic Energy. One of the goals of the Gore/Chernomyrdin Commission (GCC) is to improve both the legal and political stature of the regulator in Russia, to give it a place at the table so to speak, so that it commands the respect of both the Ministry and the utilities operating the nuclear power plants. The shutdown of unsafe plants in these countries will ultimately depend upon the strength and independence of their regulators.

With the level of effort we in the U.S. Government have exerted over the last two years, the short-term phase of western assistance programs to the former Soviet Union and Central and Eastern Europe is beginning to show signs of real success. Even one of our usual critics, Viktor Mikhailov (head of Russia's

Ministry of Atomic Energy) recognizes this progress. He told the European Parliament on September 22 that bilateral nuclear relations with the U.S., while more recent than those with the European Community, had produced "better results."

As we settle the liability question in Russia and Ukraine and in the Baltic States, near term improvements will buy time to improve overall energy efficiency and should make possible the closure of the least safe plants. The NRC's role in this assistance effort is unique, since it is manpower-, rather than equipment-, intensive. NRC programs involve inspector training and institution building, rather than hardware backfits, and are thus quite economical to implement. Government and regulatory leaders from many of these countries personally expressed their appreciation to me for this assistance, and I was able to witness some of the effects in my visits to various sites.

Paradoxically, western success in securing near term improvements in safety, will require us to confront earlier the basic problem of closing down the least-safe reactors as soon as practicable. The program of western nuclear safety assistance developed at the 1992 G-7 Munich Summit was not intended to extend the life of these reactors indefinitely. However, it is admittedly difficult to draw a fine, bright line between near-term safety upgrades and improvements which could encourage an operator to think in terms of long-term life extension. The task of identifying and financing replacement power for these facilities is a very difficult one, potentially involving many billions of dollars of capital which neither we nor the affected countries have readily available. Relevant international financial institutions (the World Bank, European Bank for Reconstruction and Development (EBRD), and International Energy Agency (IEA)) have prepared useful studies of these long-term issues, but it will be difficult to engage the Russians (and other nations operating Soviet-era plants) to take the hard decisions needed to close the worst plants.

Measuring success in our assistance program will, therefore, be difficult, and, much as we would like to see the many unsafe reactors shut down immediately, it is not likely to happen any time soon. Accordingly, the U.S. has tried to direct attention to business-like ways of finding replacement sources of electric power, without which the Russians will not begin shutting down even their oldest and riskiest plants, and this is a key element of the Administration's follow up to the Gore/Chernomyrdin meetings. Russian energy price decontrol will be crucial to encourage conservation and to facilitate commercial funding and repayment of loans for safety enhancements and replacement power.

One sign that will indicate progress will be when the regulatory bodies in the NIS and CEE have the authority and the will to shut down nuclear power plants for safety violations. A significant portion of the NRC effort to implement the Gore/Chernomyrdin Commission mandates will be to strengthen the Russian nuclear regulator -- Gosatomnadzor (GAN).

During the September meetings, the Vice President was able to elicit a commitment from the Prime Minister to a much strengthened nuclear regulatory body, a goal towards which the NRC has been working since 1988. As one

possible outcome of our efforts, on October 16 President Yeltsin issued a decree significantly expanding the authority of GAN. It has now been officially declared the lead nuclear safety oversight organization in Russia and its sphere of influence has been expanded to cover all nuclear facilities. Its funding will derive from a separate line item in their Federal budget. While we see this as forward progress, we have yet to learn the size of the separate budget for GAN, but we expect to press the Russian Government at the highest levels to assure full and adequate funding for all GAN's responsibilities, including salaries for its inspectors. In addition, GAN will sit at the table with Minatom during all future Gore/Chernomyrdin negotiations on nuclear safety matters.

NRC is in a position to deal with Russian regulators thanks to a cooperative U.S./Soviet technological effort that has been underway since 1988. The recent meetings between Vice President Gore and Russian Prime Minister Chernomyrdin are a continuation of this relationship, and they have taken the relationship a giant step into the future. To illustrate this, perhaps a brief review of recent summit activity on nuclear safety would be useful.

#### The Lisbon Initiative

In May 1992, at the Lisbon Conference on Assistance to New Independent States, the U.S. announced several initiatives. Prominent among these was a nuclear safety initiative to spend \$25 million on:

- o Cooperative activities with Russia and Ukraine, building on prior work done by the Department of Energy and the Nuclear Regulatory Commission under a 1988 Memorandum of Understanding;
- o Establishment of two regional training centers, one in Russia and the other in Ukraine;
- o Immediate operational safety enhancements for VVER 1000s and VVER 440/213s;
- o Risk reduction measures for RBMKs and VVER 440/230s; and,
- o Regulatory assistance in developing consistent and effective safety standards and procedures, as well as training in their use.

This initiative, along with a broader nuclear safety initiative launched at the G-7 Summit Meeting in Munich in July 1992, marked a significant new departure in efforts to improve safety in Central and Eastern Europe by involving the U.S. Government at the level of head of state.

#### The 1992 and 1993 G-7 Summits

About a month after the Lisbon Conference, the Group of Seven (G-7) heads of state, meeting at Munich, recommended a Program of Action that had been prepared by a Nuclear Safety Working Group in May 1992. The Working Group

found a growing international consensus that the remaining 15 RBMKs in the former Soviet Union and the 10 VVER 440/230s in the former Soviet Union and Central and Eastern Europe should not be operated any longer than necessary, although short-term risk reduction measures would be justified, and that the better-designed plants (VVER 1000s and 440/213s) should be upgraded to achieve an acceptable level of safety. In addition, reactors of the newer design under construction could be completed if economic conditions warranted, and funded through commercial loans. (There are a total of 17 VVER 1000s in Russia and Ukraine, two each in Bulgaria and the Czech Republic; there are four of the smaller VVER 440/213s in the Czech Republic, two in Slovakia, and four in Hungary.)

While western countries had no authority or leverage to demand that the worst plants in Russia be shut down, the Summit recommendation was intended to promote agreement in principle with the republics of the former Soviet Union to limit the remaining lifetime of the less safe plants. In addition, the program was to create the basis for longer-term safety improvements by examining the scope for replacing less safe plants by the development of alternative energy sources and more efficient use of energy, and the potential for upgrading plants of more recent design. Further, the Summit members promised to pursue the early completion of a nuclear safety convention.

I should emphasize one key principle of our joint assistance efforts, namely, that improving the regulatory structure in the countries of concern is an essential element in achieving nuclear safety. But equally important, in seeking upgrades for nuclear plants and improving operational safety, is the achievement of a fundamentally new attitude towards energy economics on the part of officials in Russia and its neighbors. It will be necessary to assist them in developing the legislative, regulatory, and liability frameworks for an effective, independent regulatory infrastructure, and lead them to a market based energy economy to generate revenues adequate to maintain their nuclear power plants.

#### The Gore/Chernomyrdin Commission

At the Vancouver summit between Presidents Clinton and Yeltsin in May of this year, the U.S. pledged \$15 million to assist Russia in nuclear safety. There will be an additional \$15 million for Ukraine. Of perhaps even greater importance, however, the two Presidents asked the Vice President of the United States and the Prime Minister of the Russian Federation to establish and chair a Joint Commission on Energy and Space. The Commission was founded to establish a dialogue between the two governments at the political level for expanding cooperation in energy, nuclear safety, and space technology as well as in several other areas, and to serve as a forum for jointly resolving practical problems in this expanding relationship.

U.S. objectives in providing nuclear reactor safety assistance are to help Russia:

- o reduce the near-term risk of operating the less safe Russian reactors;
- and

- o reinforce the authority of an independent Russian regulatory regime; while,
- o rationalizing the Russian energy economy through market pricing, conservation, and use of alternative energy sources.

In support of these objectives, the Gore/Chernomyrdin Commission had as its goal the communication of Western safety concerns and policy perspectives to the highest levels of the Russian government. Although we would like to see the VVER 440/230 and RBMK plants closed down, it appears for various reasons that the Russians and others are going to operate them for a while, and we cannot ignore this fact. Therefore, the U.S. has made significant investments in short-term risk reduction which we hope will have the additional benefit of improving national confidence such that we will have laid a solid basis for discussions concerning their decision to continue operation of their less safe reactors in the future.

The two key messages the Vice President wished to give Prime Minister Chernomyrdin was to express U.S. and Western concern about the continued operation of the least-safe reactors, and to press for a strengthened nuclear regulatory authority. NRC helped with preparations for the meetings, which emphasized U.S. policies:

to encourage the Russians to introduce risk reduction measures in their least safe plants;

to give greater autonomy and authority to the regulatory body Gosatomnadzor (GAN);

to improve operational training through the use of simulators;

to develop emergency operating procedures;

to complete arrangements for liability protection to enable U.S. industry to provide safety assistance, and,

to gradually replace their obsolete Chernobyl-type RBMK reactors with modern PWR's equipped with containment and augmented safety systems on the model of most western reactors.

The NRC also took the lead in arranging a visit to the St. Lucie Nuclear Power Plant in Florida for Prime Minister Chernomyrdin. I was privileged to host the visit, and we held frank and productive discussions with Prime Minister Chernomyrdin and his top advisers, both in Washington and Florida. Prime Minister Chernomyrdin indicated that he was greatly impressed with his St. Lucie visit and said he believed U.S. cooperation could provide a valuable contribution to advancing nuclear safety in Russia. The Vice President raised the importance of an independent nuclear regulator. The Russians agree that the ultimate responsibility for nuclear safety resides with the operators of the power plants, not with the regulators. Nevertheless an independent, legally constituted, well funded safety regulator can assure that the operators achieve the proper degree of vigilance and devote proper attention

to safety. The Vice President and Prime Minister suggested that this issue should also be followed up in further Commission activities.

Prime Minister Chernomyrdin committed Russia to examine carefully ways to strengthen the independent regulatory body. The U.S. will work with Russia to improve its regulatory structure, based on commonly agreed criteria for such a body. NRC is the appropriate U.S. agency to take the lead in assisting Russia in regulatory enhancement. The insight gained by NRC through our Joint Coordinating Committee on Civilian Nuclear Reactor Safety (JCCCNRS) which has been in operation since 1988, as well as certain internationally agreed principles of regulation and reactor safety, provides a solid foundation for the conceptualization and development of a set of recommendations.

During the Gore/Chernomyrdin session the two sides agreed to form a subcommittee on nuclear safety. Secretary O'Leary and I are co-chairs for the U.S.; the Atomic Energy Minister and the Nuclear Regulator are the Russian co-chairs.

The key elements of nuclear regulation should include (but not be limited to):

- Development and acceptance of a legal basis for a strong and independent regulator;
- Provision of adequate resources, both material and personnel, to fund and staff an organization with the ability to monitor plant safety and operations;
- The authority to intervene in operations to insist on safety and, when and if necessary, to shut down a plant in the face of danger to the public;
- The adoption of internationally agreed safety principles; and,
- Public accountability through openness about reporting incidents and accidents at plants which have safety implications, and a public voice in reactor licensing.

In fact, many of NRC's assistance activities focus on these key points.

Prime Minister Chernomyrdin also expressed his willingness to sign agreements on both 1) Radiation Health Effects with the United States, and 2) Liability Protection for western companies doing business in Russia. The Departments of State and Energy have the lead in the development of the Health Effects Agreement; the State Department in its negotiation, and the Department of Energy in its implementation. The NRC will participate and assist in the negotiations, and was represented on the negotiating team in Moscow in mid-September, where such an agreement was initialed.

Russia has neither acceded to existing international liability regimes nor enacted domestic legislation related to nuclear liability. The U.S. began negotiating a bilateral agreement with Russia in early 1993 to provide adequate legal liability protection for U.S. companies providing nuclear

safety assistance to Russia. The proposed agreement is intended to ensure that the Russian Federation is held legally responsible for the operation of its nuclear power plants, including responsibility for the consequences of any incidents that may occur, as is the case in most western countries.

Prior to the Commission meeting, although Russia had expressed its intent to conclude arrangements, indications were that it could take several years to complete this process. During the Commission meetings in Washington, Prime Minister Chernomyrdin and Atomic Energy Minister Mikhailov indicated their determination to resolve the liability question as soon as possible. In addition to a bilateral agreement with the U.S. to resolve the near-term assistance problem, the Russians need to move forward with domestic legislation to deal with the liability issue in a more regular way.

Secretary O'Leary followed up the Washington discussions in meetings with the Russian leadership in Moscow late last month. (My own follow up meetings were preempted by the battle for the Russian White House on October 4.) The U.S. has effectively engaged the Russian political leadership in a fruitful dialogue on nuclear safety in the context of overall economic and energy development. This is a major achievement, and one without which it might have been impossible to have a significant impact on Russian nuclear safety plans for the future. While the details of an expanded joint U.S. - Russian nuclear safety program are only now under negotiation, and are expected to be finalized during a visit by the Vice President to Moscow in December, I believe we have turned a corner into a new, more productive path in which nuclear safety improvements will be taken in the context of an overall energy strategy that will emphasize market forces, market pricing of energy, and viable alternatives to Russia's least safe nuclear power plants.

#### Evaluation of Status Today

While the U.S. is placing high national priority on assistance, particularly to Russia, improvements are slower than we hoped. There has been significant progress in short-term risk reduction at the plant level. Nevertheless, while they praise the U.S. programs, Russian officials continue to complain that assistance is not getting through to the plant and operator level. We will be discussing this matter with our Russian counterparts under the new structures for cooperation set up by the Gore/Chernomyrdin Commission. Too much of the western funds continue to be spent in donor countries. Economic conditions and decisions in many of the recipient countries today do not favor improved nuclear safety.

In addition, because of their need for power, Russia and Ukraine have shown an interest in resuming construction on several nuclear power plants. Last week the Ukrainian parliament lifted a moratorium on nuclear plant construction, which will enable them to finish some needed new capacity in VVER 1000's, but at the same time they decided to continue operation of Chernobyl. Most worrisome is the attitude displayed in Russia that there are no fundamental problems with the RBMKs and therefore that their lifetime can be extended safely to a full 40 years.

Of particular urgency is the continuing need for regulatory authorities to be strengthened in Russia and Ukraine. Ukraine is slowly developing a government infrastructure for dealing with nuclear safety and is facing energy needs that they believe require keeping the Chernobyl plant open. We at NRC are responding to what the regulators in these countries have asked for, and we need to stay the course. We have also established project agreements with the Czechs, Slovaks, Hungary, Bulgaria, and Lithuania, to help them improve



regulation. But our task will require a long term effort and continued funding, both bilateral and multilateral, public and private.

With regard to Eastern European regulators, I am pleased to report that in a recent meeting in Vienna on September 30, all regulators from countries owning VVER 440 reactors agreed to collaborate and meet on a regular basis jointly to address problems in operating these Russian designed reactors. The NRC and the German regulators have been asked to participate in these meetings as associate members of the group. The NRC can work through this group when we are providing common assistance. Most importantly, this group can share experience in operations, training, maintenance, and other areas of regulatory interest for VVER 440 reactors.

Not only does the U.S. need to maintain current levels of funding for short term programs, we also must encourage market pricing of energy to increase financing, or the conditions for financing, of long-term energy options. Finally the U.S. needs to support multilateral funding efforts through international development institutions such as the World Bank and the EBRD.

Mr. Chairman, this completes my statement. I will be pleased to answer any questions that you and the Committee may have.