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Testimony

Before the Subcommittee on Military Procurement,  
Committee on National Security, House of Representatives

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NUCLEAR WEAPONS

Russia's Request for the  
Export of U.S. Computers  
for Stockpile Maintenance

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Mr. Chairman and Members of the Subcommittee:

This statement responds to your request that we obtain information on proposed exports of U.S. high performance computers to Russian nuclear weapons laboratories. Specifically, you requested information on the policies affecting cooperation between the United States and Russia on nuclear warhead safety and security under a Comprehensive Test Ban Treaty (CTBT) and Russian officials' requests for access to U.S. high performance computer exports to conduct work under a CTBT.

The executive branch, pursuant to U.S. policy on cooperation with Russia, has held discussions with Russian Ministry of Atomic Energy (MINATOM) and other officials on the possibility of undertaking cooperative projects under a CTBT. Although no specific project plans have been developed or approved, Department of Energy (DOE) officials said that the boundaries for potential cooperative projects are that (1) they would be unclassified, and (2) they would not enhance performance of Russian nuclear weapons or contribute to Russian nuclear weapons design. These officials stated that any access to computers provided to Russian scientists will be consistent with current export control laws. The regulations implementing the law provide the executive branch the authority to deny a license for any item intended for research, development, design, manufacture, construction, testing, or maintenance of any nuclear explosive device or other sensitive nuclear activities. The United States is now seriously considering Russia's request for the export of U.S. high performance computers that are more powerful than those previously exported to Russia. The proposed export raises issues about safeguards to ensure that U.S. policy is adhered to and that the computers are not being used for proscribed nuclear activities. In considering these issues, the United States must also consider whether or not Russia could develop or acquire high performance computers from other non-U.S. sources in the near future.

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## Policies Affecting U.S.-Russian Stockpile Safety and Security Cooperation

On September 24, 1996, the United States, Russia, and several other countries signed a CTBT that prohibits any nuclear explosions. The United States supports a CTBT to prevent the improvement of existing nuclear arsenals and to constrain nuclear weapons proliferation. Since nuclear explosions are not permitted under a CTBT, the United States has embarked on a science-based stockpile stewardship program that uses past nuclear weapons test data, nonnuclear laboratory tests, and computer simulations to maintain confidence in the existing U.S. nuclear stockpile. It is U.S. policy to continue to maintain a nuclear deterrent against other countries

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with access to nuclear forces; the United States considers such a nuclear deterrent to be a supreme national interest.

While negotiating the CTBT, representatives from the United States and Russia discussed the possibility of scientific and technical collaboration on topics related to the safety and security of each country's stockpile under a CTBT. However, according to DOE officials, the United States set boundaries for cooperation with Russia to ensure that the information exchange does not contribute to nuclear weapons design or enhance the military performance of Russian nuclear weapons. The United States restricted collaboration to unclassified subjects and materials and projects that would not enhance the performance of Russian nuclear weapons. Access to computers will be consistent with U.S. export control laws. In this context, it should be noted that the actual export of high performance computers is not required to conduct the collaborative efforts currently being discussed, according to a national laboratory official.

The executive branch announced a new export control policy on October 6, 1995, for high performance computers that is intended to focus controls on computers that have a significant impact on U.S. and allied security interests and eliminate controls that became unnecessary or ineffective due to rapid advances in computer technology. The policy allows the executive branch to deny export licenses for high performance computers to certain nuclear weapons states and other countries of proliferation concern, such as Russia, China, India, Pakistan, and Israel, when the computers (1) are intended for a military end user or an end user involved in proliferation activity and have a composite theoretical performance (CTP)<sup>1</sup> of over 2,000 million theoretical operations per second (MTOPS) or (2) are intended for a civilian end user and have a CTP of over 7,000 MTOPS. The policy retained the authority to deny export licenses for any item intended for the research, development, design, manufacture, construction, testing, or maintenance of any nuclear explosive device or other sensitive nuclear technologies.

The policy was announced after the executive branch concluded that computers capable of a composite theoretical performance of up to 7,000 MTOPS would become widely available in international markets within the next 2 years. The executive branch set a lower export control limit of 2,000 MTOPS for military end users and end users of proliferation concern because, while these computers may be less controllable, the United

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<sup>1</sup>Composite theoretical performance is used to estimate the maximum possible performance of a computer as measured in millions of theoretical operations per second.

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States does not want to support proliferation or certain military efforts in these countries.

The policy also outlines a number of steps that the U.S. government may require of the exporter or the end user to safeguard computer exports. Among other things, the exporter or end user may be required to limit access to the computer or inspect computer logs and output. In addition, the end user may also be required to agree to on-site inspections by U.S. government or exporting company officials, who would review programs and software used on the computer, or to remote electronic monitoring of the computer.

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## Russian Requests for High Performance Computer Exports

In the early summer of 1996, a MINATOM official expressed concern about U.S. export restrictions on high performance computers and requested that Russian and U.S. officials discuss the possible export of a Convex SPP 2000 computer. This computer is more capable than any computer known to be in use in Russia. This request is currently being considered by the United States, although the Commerce Department has not yet received an export license application for the computer. In considering this request, the United States asked MINATOM for additional information on how Russia planned to use the SPP 2000 computer and several other computers for which the executive branch was reviewing export license applications. The MINATOM official indicated that the SPP 2000 would be used to help maintain Russia's nuclear stockpile but that the other computers requested would be used for civilian purposes at Russian nuclear weapons laboratories. According to the manufacturer, the SPP 2000, now known as the Exemplar X-Class, can be configured with a maximum of 64 processors and has a maximum performance rating of 46,100 million floating point operations per second (or approximately 34,500 MTOPS).<sup>2</sup>

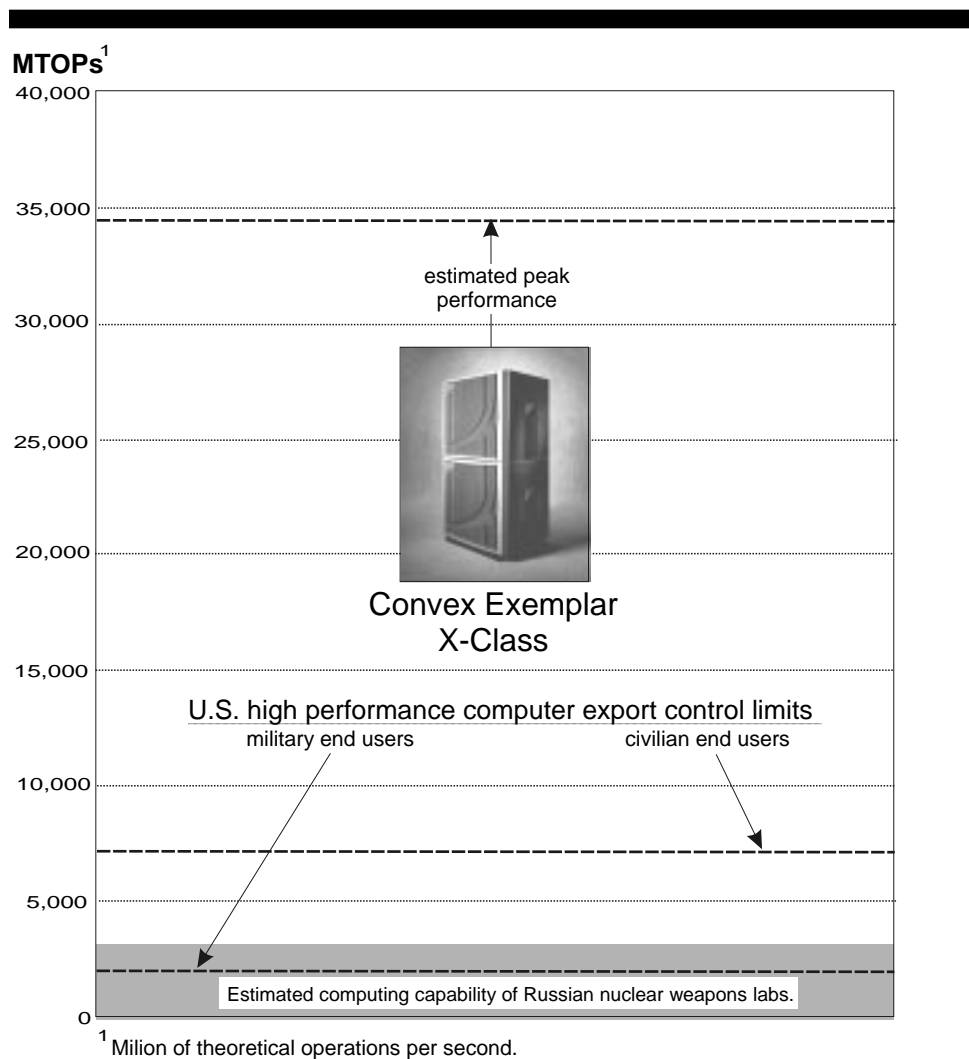
Our review of computer export data indicates that it is unlikely that Russian military and nuclear weapon laboratories have acquired computers capable of more than approximately 3,500 MTOPS, due to a lack of known sales of computers above that capability from the United States or Japan, the only countries currently producing computers above that level. Lawrence Livermore Laboratory officials told us that, the Russians currently have the capability to connect less powerful computers into a system with a capability greater than 3,500 MTOPS, but they did not know whether the Russians had done this. Figure 1 shows a comparison of

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<sup>2</sup>The computer industry measures computer performance in floating point operations per second. According to national laboratory officials, an MFLOP is roughly equal to .75 MTOP for multiprocessor computers.

Russia's computing capabilities with the Convex Exemplar X-Class computer.

Figure 1: Comparison of Russian Computing Capabilities With the Convex Exemplar X-Class Computer.



## Issues Regarding the Export of High Performance Computers to Russia

Under current export control regulations, the United States could choose to approve the export of high performance computers to Russia with a computer safeguard security plan. According to some national laboratory officials, implementing a rigorous safeguard plan would require personnel experienced in nuclear weapons work to identify the types of programs

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being run on the computer. These officials said that some civilian computer programs are similar to nuclear weapons programs.

Within this context, the proposed export of high performance computers to Russian nuclear weapons laboratories raises several questions the Congress and the executive branch may wish to consider.

- How will the executive branch determine whether the export of high performance computers to Russian nuclear weapons laboratories is in the U.S national security interest, taking into account (1) U.S. support for the CTBT and (2) the executive branch's boundaries on nuclear weapons safety and security collaborations with Russia to ensure that such efforts do not enhance the military performance or contribute to the design of Russian nuclear weapons?
- If the United States were to approve the export of any computers to Russian nuclear weapons laboratories for civilian end uses, how would the United States devise a computer safeguard plan that could detect the possible diversion of the computers from civilian end uses to proscribed nuclear weapons activities?
- Could Russia develop or acquire computers with similar capability to those they are requesting from non-U.S. sources in the near future?

This concludes our statement for the record.

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