

**RUSSIA'S
NUCLEAR AND
MISSILE COMPLEX**
The Human Factor
in Proliferation

Valentin Tikhonov



A Report by the Non-Proliferation Project
of the Carnegie Endowment for International Peace

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FOREWORD

This report on the Russian nuclear and missile complex presents the results of a study commissioned by the Carnegie Non-Proliferation Project, the Carnegie International Migration Program, and the Carnegie Moscow Center. The study was performed under the supervision of author Valentin Tikhonov, a well-known Russian sociologist specializing in migration problems. During the 1990s he conducted several studies of this nature on the closed nuclear cities (including one for the Rand Corporation), which made it possible to examine in greater detail the development of the situation there.

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INTRODUCTION

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This report examines the situation facing the inhabitants of the Russian nuclear weapons and missile complex. Russia inherited this sprawling network of cities and production facilities after the collapse of the Soviet Union. In its inherited form, this complex represents a serious burden for the troubled Russian economy, is vastly oversized given the current international situation, and is a potential source of nuclear and missile proliferation and instability. Across the entire Russian landmass, hundreds of thousands of previously pampered scientists and technicians face dire economic conditions. Their economic hardship dramatically increases the risk that they will be forced to sell their skills or materials at hand to the highest bidder, and also increases the difficulty Russia will have recruiting new scientists and technicians to join its military work force.

The potential threats of migrating experts and materials diverted to proliferators have been a major source of concern for the United States and other countries throughout the 1990s. The disturbing demographic trends discussed in this report, however, reveal another growing concern: that it will be increasingly difficult for Russia to train, recruit, and maintain the type of experts it needs to ensure a safe, secure, and reliable strategic nuclear deterrent. This less widely acknowledged problem raises long-term security questions for Russia, the United States, and their strategic partners.

BACKGROUND

After World War II, the Soviet Union applied enormous effort to the development of its nuclear and ballistic missile capabilities, which was viewed at the time—and even today—as a key component of its political and military status. Tens, if not hundreds, of enterprises were built, making it possible for Moscow to achieve nuclear parity with the United States by the early 1970s, but at the price of significant overtaxing of the nation's resources.

During the 1940s and 1950s, the “closed” nuclear cities were developed far away from major cities and were almost totally isolated from the surrounding areas. It was possible to visit or relocate there only with specially issued passes, and the residents of the cities had to get official permission to leave these sites. The cities were not shown on maps, had no names, and were referred to by the names of the nearest administrative centers plus a

postal code; for example: Chelyabinsk-45 or Krasnoyarsk-26. As a practical matter, however, they had nothing in common with these centers and often were located tens or even hundreds of kilometers from them.

As compensation for their remote location, the populations of the closed cities enjoyed significant privileges and advantages. A much better selection of foods and consumer goods was available than around the country as a whole, and at reasonable prices. Workers received higher pay and generally received free housing. This higher standard of living made it possible for the nuclear and missile enterprises to attract highly qualified specialists, including the top graduates from the country's most prestigious universities. As a result, the nuclear cities were islands of relative well-being located, as a rule, in the midst of poor, underdeveloped regions, where the standard of living in the last years of the USSR was steadily declining.

The situation was similar in the missile cities, although these developed in or near open cities and had fewer restrictions imposed on them. They were not so geographically isolated from the surrounding areas and, in most cases, could be found on a map.

CURRENT CIRCUMSTANCES

The end of the Cold War and the collapse of the Soviet Union put an end to the relatively comfortable existence of those in the nuclear-missile complex and raised the specter of nuclear and missile brain drain from the former Soviet Union. A sharp reduction in government funding substantially reduced the standard of living in the nuclear and missile cities. Nuclear experts went months or longer without receiving any pay. Work orders declined, decreasing job satisfaction, and the relative benefits that city residents once enjoyed all but vanished, without any real prospect for finding new jobs in their current locations.

These circumstances create two potential security concerns.

First, they give rise to fears that these highly trained and now disenfranchised workers might be tempted or even compelled to sell whatever was close at hand, or themselves, in order to make ends meet. Despite this potential, there has been only one known attempt at crossing the border by a large group of missile experts from the missile city of Miass in 1992. At the last minute, they were taken from an airplane setting out for Pyongyang, North Korea, from the Moscow international airport Sheremetievo-2. There is some information to indicate that representatives of the group had visited North Korea previously to look into the working and living conditions there. No concrete evidence of additional or individual emigration has come forward.

It is known, however, that nuclear physicists have been invited to work in a number of developing countries of proliferation concern. There were unconfirmed reports in mid-2000 that three experts from one of the countries of the former USSR had defected to the Taliban Movement. Moreover, the information revolution means that expertise can travel even if the expert stays put, with transfer of information taking place through computer, fax and phone networks—transfers that would be hard to identify and to stop.

The threat of the unauthorized use of nuclear materials attracted most of the attention during the nineties; there were several recorded cases of theft, which led to a significant but arguably underfunded effort to improve the security of and accounting for nuclear materials throughout the former Soviet Union.

Second, Russia's economic and strategic hard times have long-term implications for its ability to keep the human and technical capabilities necessary to maintain a modern nuclear arsenal. Just as the United States is facing potential problems as its nuclear work force ages—and fewer top experts are interested in entering the field—Russia is already facing a degradation in the skills of its nuclear experts. Without the needed investment

in facilities, education, and living standards, Russia might face serious problems with the safety and reliability of its nuclear arsenal in the years ahead. Any insecurity in this area has serious implications for Russia's perceived security and for international strategic stability.

Maintaining systems as complex as nuclear weapons and long-range missiles requires a skilled, experienced, and motivated cadre of experts and technicians. Russia expects to maintain thousands of nuclear weapons for the foreseeable future. To ensure that its weapons are safe and operate as expected, it will need to address the changes taking place within its weapons complex. The first step, to which this report contributes, is to help understand the nature and causes of those changes.

The risk that a brain drain could lead to additional global proliferation sparked early attention from the United States and its international partners, but was largely overshadowed by concerns over nuclear weapons and materials. In 1991 and 1992, Western countries moved to engage and employ the elite of the ex-Soviet nuclear, chemical, biological weapon and ballistic missile complex through the International Science and Technology Centers, which were described at this time as technical "dating services" between Western government grants and ex-Soviet experts. The expectation was that the Russian economy would, within a reasonable amount of time, develop to the point where it could provide alternative employment for these experts.

This expectation proved very wrong and, almost a decade later, the Russian economy is still unable to provide the necessary conditions for job creation to adequately employ this vast network of experts. Although the science centers and a variety of other unilateral and multilateral projects have made important progress toward employing ex-Soviet experts, the situation in the cities remains a serious concern and a threat to international peace and security. Without concerted and prolonged assistance to these locations, the situation is likely to get worse before it gets better. The sponsors of this report hope that this study will be the first step in a broader effort to better understand the changes going on in the Russian military complex and to develop effective responses to deal with the serious security challenges posed by those developments.