

Nuclear Proliferation Dangers in the NIS: An Interim Assessment

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Introduction

The collapse of the Soviet Union could result in a variety of nuclear proliferation dangers. Some of the newly independent states (NIS) may retain former Soviet nuclear weapons or develop their own nuclear weapons capability. Others are capable of supplying nuclear weapons and missile equipment, technology, or materials to states outside the NIS. Ongoing conflicts in several regions of the former USSR could also lead contending political groups to seek to purchase or steal nuclear weapons or attempt to develop radiological weapons.

This article identifies the primary nuclear proliferation dangers in the former Soviet Union and examines incentives and disincentives for nuclear weapons acquisition or for weapons-related nuclear trade.¹ It evaluates military, political, and economic factors to identify those states and groups with the strongest proliferation motivations. Finally, it addresses technical constraints and compares motivations and constraints in order to assess the severity of proliferation threats.

This analysis leads to three conclusions. First, Ukraine is the only NIS state apart from Russia that has both the incentives and the capability to acquire control of nuclear weapons in the near term. Second, some leaders and opposition groups in Central Asia and the Caucasus have limited technical capabilities to acquire nuclear weapons, but strong incentives to do so, given ongoing conflicts and security concerns. Thus, efforts by these actors to buy or steal nuclear weapons cannot be ruled out. Third, the greatest proliferation threat is that weapons-related nuclear materials, technology, and knowledge will cross state boundaries and aid the nuclear weapons development efforts of outside states such as Iran, Pakistan, India, Iraq, Libya, or North Korea.

The final section of the article examines several possible events in the NIS that could cause sharp changes or “shocks” to the proliferation situation.

The Russian Federation

Two major proliferation dangers stand out regarding the Russian Federation. Control over nuclear forces could fracture through a split in the central political authority in Moscow or through a further breakup of Russia into additional independent states. Also possible is a loosening of Russia's adherence to global nonproliferation norms. This could lead to increased Russian sales of nuclear, missile, and chemical weapons-related technology, looser export controls, and closer relations with states

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seeking nuclear weapons.

The Russian political scene has been disrupted by violent struggles between the president and the Parliament and more generally between opponents and proponents of continued reforms. During any future political battle for central control of the government, fragmentation of nuclear command authority and efforts to seize nuclear weapons would be serious concerns. Although there are many technical and operational safeguards designed to prevent unauthorized use of former Soviet nuclear weapons, it is possible that, over time, these safeguards could be defeated by those

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with knowledge of nuclear weapons design.² This danger is greatest with older, non-strategic nuclear weapons. Therefore, an assumption that threats issued by groups that had gained possession of former Soviet nuclear weapons lacked credibility could lead to disaster. Opposing political and military factions might therefore use possession of nuclear weapons and the possibility of their use to deter hostile military action or influence ongoing negotiations. Possession of nuclear forces also might be used in an attempt to coerce support from weaker neighbors and political factions. The leaders of future separatist republics might follow the example of Ukraine and offer to give up seized nuclear weapons in exchange for political recognition, security guarantees, and financial assistance.

Even in a bitter struggle between political factions for control over the central government, however, both sides may have strong reasons to avoid threats to the unified command of Russian nuclear forces. First is the extreme danger that a conflict over nuclear control could create for the Russian people. Any political faction that hoped to enjoy popular support would have great difficulties justifying increasing the risk of nuclear accident, theft, or use. Second, any political turmoil in Russia that led to uncertainty concerning the stability of control over Russian nuclear forces would be certain to affect nuclear decision-making in Ukraine, Belarus, Kazakhstan, and perhaps even states outside the NIS that presently lack nuclear weapons.

The difficulty of successfully seizing control over nuclear weapons from a central authority is a disincentive to those who might attempt it. Winning control over only part of a nuclear force structure may provide separatist forces with a dangerous and costly liability rather than a credible deterrent. For example, physical or even operational control over nuclear weapons without control over delivery means, warning and control systems, or production and maintenance facilities may provide only a temporary and vulnerable nuclear capability. Over time such a capability would become less credible and increasingly unsafe.

Separatists seeking possession of nuclear weapons for blackmail or bargaining also would have to weigh the possible risks. Should Russian authorities lose control over nuclear weapons, they would all but certainly make immediate efforts to recover them. Moscow has specially trained and equipped teams supported by regular military units that could go into action quickly.³ Unless a separatist group

had powerful military forces of its own, attempts to seize nuclear weapons might provide the justification for aggressive use of force against them. It would also be very difficult for separatists to exchange seized nuclear weapons for political concessions or financial assistance from other nations.

A more likely danger is that Russia will agree to exports that are prohibited under various nonproliferation regimes, or fail to join multilateral efforts to apply economic or other sanctions against proliferation problem countries. Russia's political and economic situation makes this the most serious nonproliferation challenge posed by the Soviet Union's collapse. Russian defense industry managers who want to avoid unemployment and have a freer hand in export decisions are pressing for increasing the scope of nuclear exports and lifting proliferation-related sanctions. Enterprise directors who face privatization are searching for ways to preserve jobs for defense industry workers who total as many as 37 million. Some military officials have claimed that fewer domestic orders for weapons means that the health of Russia's defense industries is dependent upon exports. Russia's scientific community has also warned of a "brain drain" if research institutes and laboratories are allowed to close.

In addition, Russian nationalist and neocommunist groups have been critical of export restrictions which they see as part of a foreign policy that is too conciliatory to the West. They assert that the United States wants to dismantle the Russian defense industry, and that United Nations (U.N.) sanctions against Moscow's traditional arms purchasers are the result of U.S. pressure. According to these groups, Russia should not jeopardize good relations with China, Libya, Iran, India, and Iraq by joining multilateral sanctions aimed at blocking proliferation. The domestic political power of these groups may yet rise as Russia's economy worsens and conflicts on her borders intensify.

Russia could also exploit markets for nuclear and missile technology in countries of proliferation concern. Russia's agreement to sell rocket engines and missile technology to India in spite of the U.S. contention that the deal violates MTCR guidelines that Russia has pledged to observe is an example. The deal, first signed between India and the former Soviet Union, is worth between \$300 and \$400 million to Russia.⁴

Advocates of a less restrictive export policy highlight the desperate state of Russia's defense industrial base and scientific workforce. They claim that arms manufacturing and nuclear technology are two of the only industrial fields where Russia can compete with world standards. Military exports are also heralded as a means of raising hard currency for defense conversion. Former Vice-President Alexander Rutskoi and even the reformist St. Petersburg Mayor Anatoly Sobchak have claimed that Russia could earn over \$20 billion a year from arms sales. Russia's Minister of Foreign Economic Relations Sergei Glazyev, alleged that compliance with U.N. sanctions against Libya, Iraq, and Yugoslavia has cost Moscow billions of dollars in lost revenue.⁵ Given the substantial political power of such proponents, the push to step up Russian arms sales could well accelerate.

Although the official policy of the Russian Federation is to observe most international nonproliferation export controls, high economic incentives exist for smuggling and clandestine sales by corrupt officials. Russian and Western law-

enforcement agencies have uncovered several illegal attempts to sell nuclear materials. This threat shows no signs of abating. Enforcement of Russian export controls is hindered by poor policy coordination within the government and by weaknesses of human, material, and informational resources.

Weighed against the preceding, Russia has solid military, political, and economic reasons to continue its present policy of support for international nonproliferation efforts. First, Russia has a strong interest in preventing nuclear weapons development in countries that might emerge as military threats and has increasingly

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recognized the dangers of all types of proliferation to its security.⁶ Currently, this concern is focused on eliminating nuclear weapons from the territories of Ukraine, Kazakhstan, and Belarus.⁷ But other proliferation problem countries like Iran, Iraq, and North Korea could strike Russian soil with intermediate or even short-range missiles. In addition, selling nuclear technology to Russian allies like India will increase regional arms races and increase proliferation incentives for other states with whom Russia has more troubled relations, like Pakistan and China. Moreover, Russia's conventional military have weakened due to economic hardship and restructuring. A resurgent Iran backed by a nuclear deterrent could challenge Russia's position in Central Asia or the Caucasus. Russia also wants to lead in coordinating export control systems for all of the NIS, which requires that Moscow conform to the export controls it is encouraging for the other NIS.

As for political restraints, Russia is a member of the U.N. Security Council, the North Atlantic Cooperation Council (NACC), the Conference on Security and Cooperation in Europe (CSCE), and a party to the Nuclear Nonproliferation Treaty (NPT). It derives status, recognition, and security benefits from its participation in these organizations and has accepted obligations regarding nonproliferation. Russia's bargaining position on a range of international issues would be weakened in these and other forums if it began to ignore these obligations or break sanctions that have been imposed upon proliferation-problem nations such as Iraq. For example, in order to address security concerns in the Caucasus, Russia has requested adjustments in the regional distribution of forces it is permitted under the multilateral Conventional Forces in Europe (CFE) treaty.⁸ Several Western nations that are parties to CFE and have strong interest in upholding nonproliferation norms would be less likely to grant flexibility on this issue if Russia violates nonproliferation norms.

Russia would also run the risk of damaging relations with the neighbors or opponents of potential proliferators whose nuclear weapons development programs it assisted. In this regard Russia's plans to sell two nuclear reactors to Iran could lead to tension with the United States.⁹ Nuclear assistance to less threatening states such as Egypt, Algeria, or Syria would still provoke negative international reactions if it violated the guidelines of the Nuclear Suppliers Group or the Zangger Committee.

Domestic political opposition to nuclear assistance programs might also arise. The direct recipients of U.S. aid, as well as industry officials who are planning joint

ventures based on Western investments, might lobby against an easing of nuclear or missile export controls.¹⁰ A growing awareness of environmental damage caused by both civil and military nuclear programs in Russia and a continuing string of nuclear accidents is increasing popular discontent with all things nuclear. This sentiment is likely to fuel opposition to nuclear technology exports and build support for international nonproliferation norms.

Economically, Western willingness to extend aid is linked to Russian behavior. This was made clear by the explicit conditions set by the U.S. Congress on demilitarization aid to Russia. Because of the West's influence in the World Bank, the International Monetary Fund, and the G-7, aid from these organizations might also be jeopardized if Russia were to violate established nuclear supplier guidelines or other limits. Depending on the seriousness of Russia's actions, other economic penalties may be imposed, such as a pause in efforts to remove restrictions on high-tech Western exports to Russia, cancellation of joint ventures with Western firms, and a halt to U.S.-Russian space cooperation.

In sum, political instability in the Russian Federation continues as a potential source of nuclear proliferation. It would be technically difficult and politically risky, however, for contending political factions in Russia or its various regions to gain control of nuclear weapons.¹¹ A negative shift in Russia's overall behavior regarding global nonproliferation also does not appear likely at this time, as it would undercut President Yeltsin's national and international objectives and endanger Russia's long-term security. Still, because of the political strength of its defense industrial sector and its need for hard currency, Russia has strong incentives to sell nuclear and missile technology to countries of proliferation concern, as it already has in India. In doing so it may exploit ambiguity in restrictions contained in various international nonproliferation regimes.¹² In other words, Russia may chisel at the margins of international nonproliferation norms when economic gains are at stake. This is all the more likely if a more right-wing government comes to power in Moscow. For this reason it will serve U.S. interests to continue international efforts to clarify and strengthen various nonproliferation regimes and Russia's participation in them.

Ukraine

The debate over nuclear weapons in Ukraine appears to be solidly linked to the popular assertion of national independence, and thus carries an emotional mass appeal. Many Ukrainians continue believe that maintaining nuclear weapons will improve their country's chance of becoming a great power and prompt the industrialized states to offer increased economic assistance and support. Ukraine also fears that once it gives up its nuclear weapons the West will have no incentive to protect Ukrainian interests.

Recent events in Ukraine regarding the nuclear issue are part of a legacy of official actions and statements that have often worked at cross purposes. On 18 November 1993, with a vote of 254 in favor and nine against, the Ukrainian Parliament passed a resolution on the Strategic Arms Reductions Talks (START-I) Treaty ratification. This resolution, however, represented a potential reversal of pledges made by Ukraine in 1991 and 1992 to eliminate all nuclear weapons from its territory.¹³ Ukrainian lawmakers denied Ukraine's obligation under Article V of the

Lisbon Protocol to join the NPT as a non-nuclear-weapon state, and declared that only 36 percent of its launchers and 42 percent of the nuclear warheads are covered by START-I. This action undercut major U.S. foreign policy objectives by drawing closer the prospect of a nuclear-armed Ukraine and further weakening global nonproliferation efforts.

Then, on 14 January 1994, Ukraine seemed to reverse course again by signing a Trilateral Agreement with Russia and the United States that would eliminate all the nuclear weapons in Ukraine within seven years. This agreement has been endorsed by the Ukrainian Parliament and is a potential resolution to the nuclear problem in Ukraine.¹⁴ However, a similar agreement between Russia and Ukraine to eliminate the nuclear weapons collapsed only days after it was signed at Massandra in September, 1993.

One key source of uncertainty for implementation of the Trilateral Agreement is the possibility of economic collapse and political upheaval in Ukraine. Press reports claim that the U.S. intelligence community believes a breakup of Ukraine is possible.¹⁵ A second issue is that Ukraine's Parliament failed to approve signing the NPT as a non-nuclear weapon state. Some of the central provisions of the Trilateral Agreement, such as those providing Ukraine security guarantees, cannot be honored until Ukraine joins the NPT. Parliamentary elections to be held on 27 March 1994 could further delay or block NPT membership for Ukraine. In short, it is too soon to say that Ukraine has set itself firmly on the course of nuclear disarmament. The danger exists that Ukraine could switch directions yet again while it still retains hundreds of nuclear weapons.

The need to deter perceived security threats provides the principal incentive for retaining nuclear weapons in Ukraine. Without a strong alliance or security guarantees from another nuclear power, Ukraine worries that its new sovereignty is at risk from Russian aggression. The two states continue disputes over the status of Crimea, Sevastopol, and the division of the Black Sea Fleet. Indeed, Ukraine has repeatedly stated that formal security guarantees from Russia and the U.S. are needed before nuclear weapons can be eliminated from its territory.

Uncertainty over Crimea's future status stems from both external and internal developments. Following the strong showing in December 1993 of Vladimir Zhirinovsky's Liberal Democratic Party in the Russian parliamentary elections, calls for Crimea to rejoin the Russian Federation have increased. Moreover, Moscow has asserted its right to intervene to protect the interests of ethnic Russians living anywhere in the NIS. Making matters worse, Yuri Meshkov, Crimea's newly elected president supports independence and eventual unification with Russia. Ukrainian President Kravchuk has warned that any outcome that changes existing borders would lead to bloodshed. Kiev has banned a proposal by Meshkov to hold a referendum on Crimean independence.

In order to enforce such a ban, Ukraine may have to take special police action in Crimea, such as breaking up future demonstrations. If Ukrainian actions were seen by Moscow as violating the rights of Russians, Russia might intervene militarily. Many Ukrainians believe that possession of nuclear weapons would deter Russia from sending troops to Crimea. The recent events in Crimea might accelerate Ukrainian attempts to gain operational control over nuclear weapons, or at least to

maintain ambiguity regarding their nuclear intentions.

Political instability in Russia also creates security concerns in Kiev. The October 1993 clash between Yeltsin and the Supreme Soviet gave many Ukrainians a clear sense of how quickly they could be facing either a nuclear civil war on their border or a more aggressive Russian leadership. Similarly, ongoing conflicts within the Russian Federation lead Kiev to question the wisdom of concentrating all of the nuclear weapons of the former Soviet Union on Russian soil.¹⁶

Public opinion in Ukraine regarding nuclear weapons is difficult to gauge. After the April 1986 accident at Chernobyl, grass-roots opposition to anything nuclear was intense and widespread. This anti-nuclear sentiment was reflected in the October 1991 declaration by the Ukrainian Parliament that Ukraine intended to forsake nuclear weapons. Popular concerns about nuclear safety persist but appear to have been overshadowed by a fervent nationalism with strong anti-Russian overtones. In early July 1993, Ukraine claimed ownership of the nuclear arsenal on its territory. In addition, in October 1993 66 percent of respondents in a public opinion poll agreed that Ukraine should in one form or another maintain its nuclear arsenal.¹⁷

Ukraine also faces strong economic incentives to export nuclear technology and know-how. By the end of 1993 inflation in Ukraine was running at about 70 to 100 percent a month, gross national product had declined 26 percent, and the government had ordered a 50 percent cut in industrial energy use.¹⁸ Ukraine's energy debt to Russia is approximately \$2 billion. Under these conditions many Ukrainian officials could place economic considerations above proliferation concerns. The present environment of corruption, black markets, open borders, and underdeveloped export control systems might allow sales of Ukrainian nuclear materials or technology to any purchaser who has hard currency or energy supplies. In this regard, reports persist concerning the potential for Ukrainian weapons exports to Iran.¹⁹

The Dneprodzerzhinsk industrial complex in Ukraine hosts a number of facilities for the production of heavy water, zirconium, and hafnium. It also produces ion exchange resins used in uranium enrichment. Since Ukraine is not a member of the Nuclear Suppliers Group (NSG) its trade in these commodities could circumvent international export control guidelines.

These problems in Ukraine have been compounded by a "hands-off" governmental policy. Ukraine established an intergovernmental commission in 1992 to oversee exports in the nuclear sector. However, the commission came under the control of the Ukrainian Ministry of Conversion which has been a promoter of sales of defense products abroad. As a consequence, export decisions have been made without taking into account the prior proliferation behavior of recipient states and without end-use guarantees. They also have been taken without the input of the State Committee on Atomic Energy and Radiation Safety—Ukraine's most knowledgeable nuclear safeguards specialists.

Weighed against these incentives are the fear of a possible military reaction by Russia, or the chance that other states in the region might react to Ukrainian nuclear arms by seeking nuclear weapons themselves. If it retains nuclear forces, Ukraine will find itself a nuclear target in its own right and increasingly a source of suspicions for its non-nuclear neighbors. A strong reaction, possibly including a call for economic sanctions, would be likely from the five permanent members of the

U.N. Security Council. The nuclear “balance” between Russia and Ukraine would contain a high risk of inadvertent war due to Ukraine's lack of an early warning system or reliable means of nuclear command and control. The safety of Ukrainian nuclear forces would suffer without Russian assistance and they would probably be vulnerable to a Russian first strike.²⁰

Russia might resort to force to remove, destroy, or disable all nuclear weapons in Ukraine before Kiev gained control over them. Such action could raise the risk of radioactive and chemical contamination in Ukraine, and threaten escalation to general war. Even

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if force were not used, military responses would result. Russia, as well as Poland, Romania, and Turkey would likely initiate military buildups and could form alliances against Ukraine. Any Ukrainian aspirations to join NATO might vanish as the country became isolated. Turkey might even request the redeployment of U.S. tactical nuclear weapons to deter Ukraine. This could cause new tensions between NATO and Russia. In short, a Ukrainian decision to maintain an independent nuclear force could decrease, rather than increase, its security.²¹

Formidable technical obstacles are another disincentive to pursuing a nuclear weapons option. For example, to gain operational control of nuclear weapons on its territory, Ukraine would need to develop or acquire existing access and launch authorization codes. It would also need to retarget most of the weapons. Both of these tasks, while not insurmountable, serve as technical constraints which would impede the transformation in the immediate future of former Soviet nuclear weapons into an effective Ukrainian deterrent against aggression from neighboring states such as Russia.

Further, to support an independent nuclear force Ukraine would have to overcome multiple technical problems associated with nuclear weapons training, maintenance, safety, command and control, and survivability. Each of these activities demands a long-term commitment of high-value human and material resources. These resources are simply not available given Ukraine's current economic crisis. While possession of an advanced nuclear infrastructure and a developed technological base may lead many Ukrainians to believe they could sustain a nuclear deterrent force, their ability to do so without direct support from Russia is doubtful.

The political consequences of retaining nuclear weapons also would be a disincentive. Doing so would run counter to nonproliferation norms and violate previous political commitments made by Ukraine thus damaging its international standing. The United States, Germany, the United Kingdom, and France all support the goal of a non-nuclear Ukraine. These countries not only have leverage over Ukraine through security cooperation, dismantlement aid and assistance, but also through such broad areas as currency reform, economic restructuring, and investment. The European Union (EU) has already said that a cooperation agreement with Ukraine is unlikely to be signed unless Kiev ratifies START-1.²² Belgian Foreign Minister and EU President Willy Claes said that it would be “unthinkable” for Ukraine to participate in the “Partnership for Peace” program without first

eliminating its nuclear weapons.²³ During his visit to Ukraine in August of 1993, the German Defense Minister Volker Ruehe confirmed that Germany will offer financial assistance for dismantling the nuclear weapons located in Ukraine only after Ukraine has ratified START-1 and acceded to the NPT as a non-nuclear weapons state.²⁴ Similar restrictions apply to Japanese dismantlement aid.

Ukraine's economic crisis provides the clearest disincentives to retaining nuclear weapons. If the Trilateral Agreement is implemented, Ukraine will receive debt relief and fuel for its nuclear reactors from Russia. The United States has promised Ukraine \$350 million in weapons dismantlement aid and \$155 in economic aid. Other nations are ready to help Ukraine with weapons dismantlement, defense conversion, and nuclear reactor safety upgrades. None of these programs are likely to go forward if Ukraine retains nuclear weapons and fails to join the NPT.

Voices favoring denuclearization have also been gaining within the Ukrainian government. President Kravchuk has managed to build a consensus within the executive branch on eliminating the nuclear weapons and signing the NPT as a non-nuclear weapon state. Defense Minister Vitaly Radetsky's support for the Trilateral Agreement represent an about-face on the issue by Ukraine's military leadership. Lt. General Vladimir Mikhtyuk, the Ukrainian commander with responsibility over the nuclear weapons has expressed concern over the condition of the warheads, claiming that they have become increasingly unsafe due to improper storage.²⁵ Moreover, during the February 1994 parliamentary debate on the Trilateral Agreement several influential deputies such as Valentyn Lemish, chairman of the Committee on Defense and Security also switched their position on the agreement from opposition to support.

Despite the signing of the Trilateral Agreement, a combination of nationalism and security concerns could still outweigh disincentives and lead Ukraine to become a nuclear-armed state. The United States, its European allies and Russia, in particular, would need to make major changes in their foreign and defense policies in response to a nuclear-armed Ukraine. The possibility that Russia would attempt to use force to remove or disable nuclear weapons in Ukraine cannot be ruled out. In addition, the United States would need to assess the various ways in which a nuclear-armed Ukraine will damage global nonproliferation efforts and alter the regional military balance. Ultimately, the planned reductions to U.S. strategic nuclear forces and the relationship between Russia and the United States would be negatively affected by a Ukrainian decision to keep nuclear arms.

Belarus

Of the 81 nuclear-armed missiles Belarus inherited from the Soviet Union, 54 remain on its territory. Under an agreement signed in November 1992, these are to be removed by the end of 1994 and redeployed in Russia. Belarusian incentives for retaining a nuclear deterrent are weak, due to the absence of a perceived external threat. Moreover, Belarus enjoys the protection of the Russian nuclear security umbrella through its membership in the Commonwealth of Independent States (CIS) Collective Security Agreement.²⁶

However, now that Ukraine has gained greater concessions from the international community by threatening to retain its nuclear weapons, Belarus may slow its

denuclearization. Indeed, Belarus has been promised compensation for the uranium contained in the strategic missile warheads on its territory, and it recently informed Russia that it should be paid for tactical nuclear weapons that were removed in 1992 as well. This request could increase the amount that Belarus seeks from Russia by several fold.²⁷

Despite the dispute over compensation, it is unlikely that Belarus will rethink its nuclear weapons option in order to establish an independent nuclear security posture. The political and economic disincentives for doing so are simply too great. The Belarusian Parliament ratified the CIS charter on 18 January 1994, a move which signals greater economic and political integration with Russia. Belarus acceded to the NPT as a non-nuclear-weapon state in July 1993, and has signed agreements under which the United States could provide \$100 million for eliminating the nuclear weapons on its territory.²⁸ In January 1994 the then-chairman of the Belarusian Supreme Soviet Stanislaw Shushkevich told President Clinton that his country would like to participate in NATO's Partnership for Peace Program. None of these activities can go forward if Belarus retains nuclear weapons.

As is the case in much of the NIS, the real proliferation danger in Belarus is the possibility of unauthorized trade in nuclear materials, equipment, or know-how. Economic incentives similar to those in Ukraine may cause some Belarusians to subordinate nonproliferation objectives to those of economic gain. The government of Belarus has acknowledged a number of illicit nuclear transactions involving its territory, as well as the recent interdiction of Russian uranium destined for Poland.²⁹ While there is little evidence that proliferation-significant abuses have occurred, the failure to establish an effective nuclear export system, the presence of unsafeguarded nuclear facilities,³⁰ and a high demand for hard currency means that unregulated trade in nuclear-related materials remains a concern in Belarus.

Kazakhstan

Some 92 strategic nuclear missiles, 40 heavy bombers, and approximately 1,300 nuclear warheads remain in Kazakhstan. Kazakhstan has declared its intention to become nuclear-free and has ratified the START-1 Treaty and acceded to the NPT as a non-nuclear-weapon state. Because the elimination of all nuclear weapons from its territory will require several years, it is possible that in reaction to some future event, Kazakhstan could reverse course and seek to retain nuclear weapons. Another possibility is that Kazakhstan could commit itself to non-nuclear status, destroy the nuclear weapons on its territory or transfer them to Russia, but retain sufficient nuclear production, scientific, testing, and assembly capabilities to enable it to recreate a home-grown nuclear weapons capability at some future date. Lastly, it could sell nuclear weapons, components, or technology and expertise to potential proliferant states.

The most compelling incentive for Kazakhstan to retain nuclear weapons is to deter the territorial aspirations of its two nuclear-armed neighbors, Russia and China. President Nazarbayev has publicly stated that security guarantees will be sought from these two countries, as well as from the United States, before it will give up its nuclear weapons.³¹ India and Pakistan, Kazakhstan's southern neighbors, are thought to possess nuclear capabilities as well, but are establishing friendly relations

throughout Central Asia.

Kazakhstan's fear of territorial encroachment by Russia or China is not unfounded. Resurgent Russian nationalism provides cause for alarm. Northern Kazakhstan is mostly populated by ethnic Russians and other Slavs. It is also the site of plants vital to Russia's mineral and petroleum processing industries. Should tensions rise between Russia and Kazakhstan, Russian leaders may support moves to assert control over northern Kazakhstan. Similarly, China could attempt to absorb territory in eastern Kazakhstan, which it has long claimed as its own.³² This could create tensions in China as well due to the one million ethnic Kazakhs living in China's Xinjiang-Uygar autonomous region.

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uranium fuel fabrication facilities in Ust-Kamenogorsk, and extensive uranium mining operations.³³ Iran, Libya, Syria, and China have reportedly sought to recruit nuclear scientists throughout the former Soviet region. Unconfirmed reports claim that Iran has tried to purchase nuclear fuel and nuclear weapons from Kazakhstan.

The belief that nuclear weapons bring international prestige, status, and attention provide a political incentive for Kazakhstan to retain them. Currently, Kazakhstan vies with Uzbekistan, the traditionally dominant country within Central Asia, for the role of regional leader. Without a nuclear capability, Kazakhstan may fear a decline in both regional and international attention and concern.

Fortunately, Kazakhstan also has strong disincentives to becoming a nuclear-armed state or trafficking in nuclear goods. The appearance of a new nuclear power in Central Asia would increase the region's instability. A reversal of Kazakhstan's current nuclear stance would cause concern in China, India, and possibly Iran, and create sharp divisions among Kazakhstan's partners in the CIS Collective Security Agreement. Russia, in particular, would see an independent Kazakh nuclear deterrent as a threat and could respond by revoking its commitment to Kazakh security. Turkey, Afghanistan, and Pakistan might also feel a need to react politically or militarily. Kazakh nuclear forces would pose a direct threat to China. China could become hostile to such a situation, especially if nationalist groups in Kazakhstan agitated for reunification with ethnic Kazakhs in western China. If the international community became convinced that Kazakhstan was attempting to become a nuclear power, its standing in various international organizations would suffer. Kazakhstan has entered into a variety of bilateral economic agreements with Russia and China which could be undercut by a decision to retain nuclear weapons. The \$85 million in dismantlement aid and \$311 million in economic aid that the United States has recently pledged to Kazakhstan would also be jeopardized.³⁴

Damage to public health and the environment caused by forty years of nuclear testing in Kazakhstan has instilled strong anti-nuclear sentiments in large parts of the

Economic incentives could also contribute to Kazakhstan's decision to retain or sell nuclear weapons, technology, and expertise. Kazakhstan's extensive nuclear infrastructure includes a fast-breeder reactor at Aktau, a research reactor in Almati, three experimental reactors at Semipalatinsk,

country. Because of public outcry, the Semipalatinsk testing facility was officially closed by President Nazarbayev in 1991. Having initially positioned himself in opposition to nuclear weapons, a decision by Nazarbayev to continue Kazakhstan's nuclear program could incite a public outcry that would weaken the government.

Pursuit of a nuclear option would jeopardize Kazakhstan's economic development by reducing access to international funding and investment. Kazakhstan intends to expand and improve its nuclear energy sector, and has received promises of Western technical and financial assistance to do so. To this end Kazakhstan is negotiating with the International Atomic Energy Agency (IAEA) to conclude a safeguards agreement with the IAEA covering its civilian nuclear facilities. Other agreements to develop Kazakhstan's rich petroleum reserves have already been concluded with American, French, British, and Italian firms. Such foreign assistance will not be sustained if Kazakhstan retains nuclear weapons.

A decision to become a nuclear power would all but certainly damage Kazakhstan's relationship with its largest trading partner, Russia. Although it would be difficult for Russia to cut off all trade with Kazakhstan, it could stop purchasing Kazakh oil. This loss of revenue from Kazakhstan's most valuable export would certainly cause the state some short-term economic damage. There is also the possibility that Russia could withhold supplies of fuel for Kazakhstan's nuclear reactors.

The cost and risk of maintaining the physical safety of nuclear weapons and their surrounding environment would rise dramatically if Kazakhstan attempted to perform these tasks independently. The facilities that are used to maintain nuclear weapons are in Russia, as are the institutes for training specialists in nuclear safety and security. Over time, the lack of these facilities and expertise would greatly increase the risk of a nuclear accident in Kazakhstan. Indeed, Russia has recently alleged that the nuclear weapons in Kazakhstan are poorly maintained and becoming unsafe.³⁵

In summary, Kazakhstan currently has strong incentives for eliminating the nuclear weapons on its territory. This outlook could change if Kazakhstan began to perceive a direct military threat from Russia or China. However, it is likely that Kazakhstan will link the pace of its nuclear disarmament to increased levels of compensation and assistance from Russia and the West.³⁶ For example, in February 1994 Kazakhstan suspended the delivery of strategic missiles to Russia until the issue of compensation for nuclear warhead materials could be settled.³⁷ Given the large number of nuclear weapons on its territory, Kazakhstan, like Ukraine, could maintain this strategy for several years.

NIS States Without Nuclear Weapons

There are no former Soviet nuclear weapons in Moldova, Armenia, Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. All of these states are torn by ethnic divisions, political conflict, and economic crisis. Such circumstances make these nations fear aggression from their neighbors and intervention by outside powers. Under these conditions, any weapons of mass destruction could be viewed as desirable for deterrence or bargaining.

The limited stocks of low and highly enriched uranium at civilian nuclear

facilities in Armenia, Georgia, and Uzbekistan are a proliferation concern, especially given the lack of safeguards and questionable physical security at these sites. Uzbekistan, Kyrgyzstan, and Tajikistan could supply uranium processing and possibly uranium enrichment services. Reportedly, Kyrgyzstan has already offered to sell enriched uranium to India.³⁸ In addition, Tajikistan is a possible supplier of heavy water.

Neither Moldova, Georgia, Armenia, Azerbaijan, or Turkmenistan are commercial suppliers of any nuclear materials or technology. Therefore, economic incentives to violate international norms on nuclear-related exports present a low proliferation threat in these states. However, poorly enforced customs regulations and the lack of export controls means that these states could engage in a nuclear black market and become transshipment points for exports of nuclear materials or dual-use items from elsewhere in the NIS. Other types of nuclear cooperation, including exchanges of technical information and personnel are possible between these states and nations such as Iran, Iraq, and Syria who are willing to conduct nuclear trade clandestinely.

Due to their limited nuclear infrastructures and severe economic problems, the production of true nuclear weapons will be beyond the capabilities of the non-nuclear NIS states for years to come. The availability of nuclear materials in some of these states, however, does raise the possibility that radiological weapons could be produced and used within a short time.³⁹ The other major proliferation dangers in these states are that they may try to buy or steal nuclear weapons from elsewhere in the NIS, and they may participate in the smuggling of nuclear materials and information.

Over the long term, however, all of the NIS that do not possess nuclear weapons could see their future acquisition as a way to achieve regional prominence and international recognition. Learning from Ukraine, the countries may also come to view a nuclear or radiological weapons program or even questionable nuclear export behavior as a bargaining chip. Commitments to end a nuclear development program or export practices that had become of concern to the international community could be exchanged for political or economic concessions.⁴⁰ Finally, a nuclear weapons development program could be seen as a means to boost national morale and divert domestic attention from severe socio-economic problems.

Armenia, in particular, could present a future radiological weapons proliferation threat, despite its very limited nuclear infrastructure.⁴¹ Attempts to mediate the ongoing war between Armenia and Azerbaijan over the Nagorno-Karabakh autonomous region have failed, and Armenia has reportedly threatened Azerbaijan with a radiological weapon made of spent nuclear fuel from its closed nuclear reactors.⁴² Fears concerning Armenia's nuclear capability and intentions could lead Azerbaijan to develop its own radiological weapons. To do so, however, Azerbaijan would have to acquire material from an external source, because it has no known nuclear facilities.

Armenia, Azerbaijan, and other NIS states without nuclear weapons could view possession of radiological weapons as a means to prevent strategic defeat by "forcing" outside powers to intervene and restore the status quo should local conflicts escalate. Reportedly, this was the motivation for the South African nuclear

program.⁴³ This would be a high risk strategy, however, which could equally likely lead to decisions by outside powers to stand aside.

Luckily, these potential incentives for nuclear or radiological weapons acquisition by the non-nuclear NIS are likely to be overshadowed by a clear set of disincentives. For Armenia, Azerbaijan, Georgia, and Uzbekistan pursuit of nuclear or radiological prowess would clearly violate previous political commitments. Armenia acceded to the NPT as a non-nuclear-weapon state on 15 July 1993. Armenia has also solicited IAEA technical assistance to monitor reactor safety at Medzamor and Russia has recently agreed to help reopen this reactor.⁴⁴ Discovery of an Armenian weapons effort would bring general international condemnation and eliminate the chances of technical assistance from Russia and the IAEA.

Azerbaijan joined the NPT as a non-nuclear-weapon state in September 1992. Baku sees ties to the Western industrial powers as a way to increase its prospects for economic development, and relations with Turkey are viewed as a bridge to the West. An Azerbaijani nuclear weapons effort would damage relations with Turkey and the West. In short, efforts to develop nuclear or radiological weapons would undercut Azerbaijan's main political goals—a secular, Western-style democracy, a strong economy, and integration into Western political and economic institutions.

Uzbekistan, which joined the NPT in May 1992, also aspires to expand ties with the world community. In 1992, Uzbekistan joined the U.N. and a host of international financial institutions.⁴⁵ In order to develop its natural resources it will need foreign investment from Western states that attach conditions to aid. American, West European, and Japanese businesses will be constrained from such investment if Uzbekistan is suspected of nuclear ambitions.

The fears of aggression that could motivate a nuclear program in some of these states have been mitigated by security guarantees from Russia. Uzbekistan, Kyrgyzstan, Tajikistan, and Turkmenistan are members of the CIS Collective Security Agreement and enjoy the protection of the Russian nuclear umbrella. Georgia, too, has agreed to provide Russia with military bases in exchange for security guarantees and aid in suppressing separatist movements. Furthermore,

“Armenia, Georgia, and Uzbekistan could, however, build radiological weapons.”

Georgia and Azerbaijan have expressed interest in joining NATO's Partnership for Peace Program. If these nations, and others such as Moldova, Armenia, and the non-nuclear Central Asian republics were accepted into the Partnership their security concerns may be reduced. However, their

acceptance to the Partnership would be surely be denied if they were suspected proliferators.

Radiological or nuclear weapons do not present clear solutions to current security problems faced by the non-nuclear NIS states. Any nuclear weapons program among them would provoke a negative response from Russia and other neighboring powers which could include economic sanctions and military pressure. Greater political isolation from the West would also result. The possibility of a preclusive strike by a neighboring power would be a constant threat to a potential proliferator. Finally, a

nuclear or radiological weapons program in any of these states could intensify the nuclear ambitions of nearby outside powers such as Iraq and Iran.

It is difficult to see how nuclear or radiological weapons could support a rational military doctrine. Radiological weapons could only be manufactured in small quantities by Georgia, Armenia, or Uzbekistan. The effects of such weapons would be difficult to control and might have little immediate impact on military operations. It is doubtful that they could deter a military invasion by a superior conventional army. International economic sanctions might be applied to the country that used radiological weapons, even if it was the victim of conventional aggression. Also, in the conflicts where several outside powers are attempting mediation, any nation that used a radiological weapon would greatly weaken its bargaining position.

In summary, some of the non-nuclear NIS states have security-related incentives to develop nuclear weapons. None of these states, however, possess the economic resources and technical capability to develop nuclear weapons at this time. Armenia, Georgia, and Uzbekistan could, however, build radiological weapons. All of the non-nuclear NIS states have strong economic incentives to supply nuclear materials or technologies to foreign buyers and have yet to establish export control systems. As is true across much of the former Soviet Union it is these conditions that present proliferation dangers.

These incentives are offset by the dependency of these states on Russia for trade, economic assistance, and security, and by their desire to forge greater political and economic ties with the West. If the non-nuclear NIS states follow policies that increase the threat of nuclear proliferation they could face sanction from Russia and their chances for improved relationships with the West would be jeopardized. It is therefore unlikely that the governments of these states will provide any official support for nuclear or radiological weapons programs. Clandestine support, however, by corrupt officials and profiteers for trade in nuclear materials and equipment will probably continue. The manipulation of rumors and threats regarding nuclear and radiological weapons is also possible in these states.

Proliferation-Related Shocks

Unexpected, but possible, events could significantly change the balance of proliferation incentives and disincentives in the NIS. Some of these hypothetical events, or “proliferation shocks,”⁴⁶ could alter the conclusions reached above regarding the nature of proliferation threats in various parts of the NIS. They could also cause sharp changes in export control policies in states of proliferation concern. Proliferation shocks could occur within the NIS or in the external international arena.

Internal Shocks

Russia could threaten or use military force against one of the new states of the former Soviet Union. For example, a clash between Russian and Ukrainian troops could occur in Crimea, or during disputes over the Black Sea Fleet and the control of former Soviet nuclear weapons in Ukraine. Ukraine could respond by taking operational control of the nuclear weapons on its territory in order to deter Russian intervention.

“In the event of a new coup, cohesion in the Defense Ministry or the General Staff could again become fractured.”

During the next few years, continuing political turmoil in Russia could at some point lead to serious disorders if not a virtual civil war between competing factions. This proliferation shock could lead to “instant proliferation” if two sides in a civil war each emerged with control over some nuclear weapons. During the August 1991 coup attempt, several military commanders with responsibility for nuclear weapons took independent actions reflecting their opposition, support, or desire to remain neutral. In the event of a new coup, cohesion in the Defense Ministry or the General Staff could again become fractured. Separate governments might be established in different Russian cities, each claiming ownership of parts of the nuclear arsenal.

Russia might also go the way of the former Soviet Union and split into a number of new states or autonomous territories. At least 22 regions within the Russian Federation have already declared some degree of autonomy or outright independence. Nuclear weapons or facilities for their production are located in some of these areas. If the central authorities tried to put down independence movements and preserve Moscow's control by force, some pro-independence groups could attempt to seize nuclear weapons for deterrence, defense, or bargaining leverage. Even in the absence of Russian military action, control of a few nuclear weapons might still appear a valuable bargaining lever to separatist leaders during political or military crises, or to coerce non-nuclear rivals.

A final possible proliferation shock in the Russian Federation would be a leadership change that brought to power a Russian nationalist such as Vladimir Zhirinovskiy who favored Russian expansionism. This could result from public discontent with continued economic decline, Yeltsin's death, or a successful coup. A more right-wing Russian leadership might export materials and technology related to the development of nuclear, chemical, and biological weapons and ballistic missiles to states such as Iraq, Iran, Libya, Syria, North Korea, and Cuba.

Most of these developments could create powerful new incentives for other NIS countries to seek or retain nuclear weapons. In particular, should rebellious Russian military leaders support a “Greater Russia” policy at the expense of independence for other former Soviet republics, it would significantly affect nuclear decision-making in those republics that still held some nuclear weapons. In the event of a violent Russian breakup, those NIS countries without them might accept nuclear weapons from separatist areas that had seized them in exchange for military cooperation against Russia.

On the other hand, a dramatic and successful use of force by Russia might create clear disincentives throughout the NIS against retaining or seeking nuclear weapons. For example, during an operation to seize the nuclear weapons remaining in Ukraine, Russia could occupy key assets such as ports, military bases, and mining areas which would cripple Ukraine's sovereignty. In this case Kazakhstan, which is more vulnerable to Russian aggression than Ukraine, could agree to the rapid elimination of nuclear weapons on its territory before Russia took steps to remove them by force.

Other possible shocks include the breakup of Kazakhstan or Ukraine. This could result from ethnic and political conflict with the large Russian population in these states. Russian nationalists have asserted that northern Kazakhstan, with a significant Russian population, is an area of Russian territorial interest and have advocated incorporating this area into a Greater Russian state. A serious dispute between the

two countries could potentially develop over control of the Baikonur Cosmodrome and the Semipalatinsk nuclear test center.⁴⁷ Ukraine's economic crisis and dispute over former Soviet assets could cause Crimea and the eastern part of the nation to declare independence or join Russia. Ukrainian nationalists could take over nuclear bomber and missile bases in the west. A breakup of Ukraine or Kazakhstan could again threaten instant nuclear proliferation if a separatist political leadership took possession of nuclear arms. It could also provoke Russian military action to prevent the loss of nuclear weapons.

A major nuclear accident in the NIS at either a nuclear reactor or a nuclear weapons deployment site could be a shock that sharply reduces incentives to retain or acquire nuclear weapons. The Chernobyl disaster sensitized public opinion throughout the NIS to the dangers of radiological contamination inherent in both nuclear power and nuclear weapons. Grass-roots anti-nuclear sentiment remains high and has been reinforced by the growing awareness of the Soviet system's legacy of environmental damage. Another major nuclear accident could increase public activism in some states against all things nuclear. This reaction could shift the opinion of elected officials towards elimination of nuclear weapons or rejection of their acquisition.

External Shocks

The deployment of nuclear weapons by Iran or Turkey could create a proliferation shock within the NIS. Such a move by Iran could well lead Kazakhstan to reassess its commitment to become a non-nuclear-weapon state. The other Central Asian republics might seek an alliance with a nuclear Kazakhstan, attempt to purchase nuclear weapons, or initiate their own weapons development programs. A Turkish bomb, perhaps developed in response to nuclear weapons development in Iran, would have the greatest effect on political and military decisionmaking in Ukraine and the Caucasus.

Kiev could see Turkey's action as a bid to dominate a region that included the Balkans, Caucasus, and the Black Sea. Turkey would also be placing itself *de facto* among the smaller nuclear-weapon states such as Britain and France. Ukraine has often compared itself to France in terms of nuclear status and could use Turkey's move as a justification to join the ranks of the smaller declared nuclear-weapon states.

Armenia would probably be the state most threatened by Turkey's deployment of nuclear weapons. Armenia fears Turkish aid to Azerbaijan, its adversary in the war over Nagorno-Karabakh. A Turkish bomb could increase Armenia's incentives to develop radiological weapons as a last-resort deterrent.

A final example of an external proliferation shock in the NIS is the possibility that India and Pakistan would jointly announce possession of nuclear weapons and declare their intention to maintain a stable nuclear balance in South Asia. If the international community did not condemn this joint announcement and bring additional sanctions against India and Pakistan, the incentives of Ukraine and Kazakhstan to retain nuclear weapons could increase. Several Ukrainian officials such as former Prime Minister Leonid Kuchma have claimed that retaining nuclear weapons would help create a stable deterrent relationship between Russia and

Ukraine. For its part, Kazakhstan could react to the announcement by claiming it needed to retain nuclear weapons not only for deterring Russia, but to deter the two nuclear states to its south.

Conclusions

Analyzing proliferation risks within the former Soviet Union is a difficult task. Rapid change continues and evidence can be found that supports both optimistic and pessimistic assessments of various proliferation dangers. Major positive developments since the Soviet collapse include the ratification of the START-I Treaty by Russia, Ukraine, Belarus, and Kazakhstan, and NPT membership for Belarus and Kazakhstan. Troubling negative trends include ongoing economic collapse, ethnic warfare, and the rise of nationalism in Russia.

Given this background, the immediate proliferation threats are not severe. Threats to the unified control of former Soviet nuclear forces within the Russian Federation appear to be low at this time. Neither opponents of Yeltsin's presidency in Moscow nor the leaders of separatist groups in non-Russian areas of the country have strong political motivations to gain control of nuclear weapons. Extreme measures continue to be taken by the Russian General Staff to prevent unauthorized control or use of nuclear weapons.

With Yeltsin as president, Russia is unlikely to make any sharp changes in its overall support of global nonproliferation norms and export controls. However, economic factors could induce Russia to exploit markets for nuclear and missile technology in countries of proliferation concern. This tendency could be strengthened if a more right-wing government comes to power in Moscow.

Of the three non-Russian republics that inherited former Soviet nuclear weapons, only Ukraine has not joined the NPT as a non-nuclear-weapon state. Because the Trilateral Agreement that provides for the removal of nuclear weapons from Ukraine will be difficult to implement, there is a chance that it could fall apart as did the September, 1993 Massandra agreement. This chance increases as Ukraine's economy collapses and political tensions rise over the status of Crimea. These two trends could lead to a breakup of Ukraine—an outcome that clearly contains proliferation dangers.

All of the NIS countries have economic incentives to participate in weapons-related nuclear trade and all but Russia have yet to establish reliable export control systems. Many have poor border security. The quality of physical control and accounting of nuclear materials has declined as well, and official corruption raises the risks of “insider” crimes at formerly secure facilities. It is these conditions that currently pose the greatest proliferation risks in the former Soviet Union. Specifically, the immediate risk is not that new nuclear-armed states will appear within the NIS, but that materials, equipment and know-how will flow out and accelerate the weapons development efforts of rogue nations and terrorist organizations.

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.”*

These conditions show no sign of abating. Nonproliferation objectives would generally be strengthened by NPT membership as non-nuclear-weapon states for all states in the NIS except Russia, the conclusion of IAEA safeguards agreements covering all nuclear facilities, and the creation of effective export control systems. The achievement of these goals will require time, careful planning and resources. Sustained Western aid can play a key role but faces difficult political challenges, especially when recipient states follow policies that conflict with Western goals.

While these threats persist, future events or “shocks” could significantly change the balance of proliferation incentives and disincentives in the NIS. An aggressive use of force by Russia against one of the other NIS countries could increase either the incentives or the disincentives for other post-Soviet states to acquire or retain nuclear weapons. A major nuclear accident in the NIS at either a nuclear reactor or a nuclear weapons deployment site could provide a shock that sharply reduces incentives to retain or acquire nuclear weapons.

Within Russia itself continuing political turmoil could lead to disorder if not a virtual civil war between competing Russian factions. This proliferation shock could lead to “instant proliferation” if two sides emerged with control over some nuclear weapons. Russia might also split into a number of new states or autonomous territories. A third possible shock would be a leadership change that brought to power a Russian nationalist who favored Russian hegemony within the former Soviet Union. These events could create powerful incentives for other NIS countries to seek or retain nuclear weapons and cause an unraveling of Russian export controls on materials and technology related to the development of nuclear, chemical, and biological weapons, and ballistic missiles.

Breakup scenarios are also possible for Ukraine and Kazakhstan. Finally, external shocks, like the deployment of nuclear weapons by neighboring states such as Turkey, Iraq, or Iran, could increase proliferation incentives in the NIS. If any of these hypothetical shocks should occur, they could alter the conclusions reached above regarding the current nature of proliferation threats in various parts of the NIS. New assessments would be therefore be required to understand the implications of new events.

Notes

¹The Baltic states are not considered in this analysis because they present very limited proliferation threats.

²For a detailed assessment of Ukraine's ability to establish operational control over nuclear weapons, see Martin J. DeWing, “The Ukrainian Nuclear Arsenal: Problems of Command, Control, and Maintenance,” Working Paper No. 3, Program for Nonproliferation Studies, Monterey Institute of International Studies, October, 1993.

³Russian forces for this type of mission are receiving special attention and resources, including instruction from U.S. military officials in anticipation of threats to nuclear weapons security.

⁴A compromise has been reached on this issue, although Russia will deliver some rocket components to India and has already delivered some of the associated technology. See Jeffrey Smith and Daniel Williams, “U.S., Russia Settle Dispute on Selling Rocket Engines, Technology to India,” *The Washington Post*, 17 July 1993, p. A12. In a related case, Russia has tried to sell rocket-fuel ingredients to Libya. See Michael R. Gordon, “U.S. Warns Russia on Missile-Fuel Sales,” *The New York Times*, 23 June 1993, p. A8.

⁵Former Soviet arms sales were estimated by the U.S. Arms Control and Disarmament

Agency to total more than \$102 billion for the five-year period 1985-1989. The actual value of these sales may be lower due to the inability of several major recipients to make payment in cash. Russian estimates of the real value of its arms exports in 1992 are approximately \$1.3 billion. See Stephen Foye, "Russian Arms Exports After the Cold War," *RFE/RL Research Report*, vol. 2, no. 13, 26 March 1993, pp. 58-66, and *RFE/RL Military Notes*, 22 July 1993, p. 12.

⁶See *A New Challenge After the Cold War: The Proliferation of Weapons of Mass Destruction*, Report prepared by the Foreign Intelligence Service of the Russian Federation, February, 1993. Summary and excerpts were prepared by the Committee on Governmental Affairs, U.S. Senate, 24 February 1993.

⁷See Victor S. Slipchenko, "Proliferation—A Russian View," presented to the 1993 NATO Symposium, National Defense University, Washington, D.C., 26-27 April 1993, p. 2.

⁸See Michael R. Gordon, "Russians Seeking Arms Pact Change," *The New York Times*, 11 June 1993, p. A5.

⁹See *FBIS, Central Eurasia*, (FBIS-SOV-93-071), 15 April 1993, pp. 10-11.

¹⁰For example, officials from the Russian Space Agency have supported a compromise with the American position concerning Russia's sale of rocket engines and missile technology to India in order to avoid economic sanctions on two Russian firms involved with the Indian deal.

¹¹For an overview of safeguards protecting Russian nuclear weapons from unauthorized seizure or use see Bruce G. Blair, *The Logic of Accidental Nuclear War*, The Brookings Institution, 1993, pp. 59-114.

¹²The MTCR is a case in point. This regime is not a treaty, nor is Russia a formal member. Moreover, there has been debate among the formal members over whether or not technology can be transferred that is to be used in the civilian space-launch programs of proliferation problem countries.

¹³In the Alma-Ata agreement, signed by Russia, Belarus, Kazakhstan, and Ukraine on 21 December 1991, Ukraine pledged to become a non-nuclear-weapon state and to cooperate in the "liquidation" of nuclear weapons. In the Minsk agreement, signed by members of the CIS on 30 December 1991, Ukraine agreed to dismantle all strategic nuclear weapons on its territory by the end of 1994. The Lisbon Protocol, signed by the United States, Russia, Ukraine, Belarus, and Kazakhstan on 23 May 1992 commits Ukraine to become a non-nuclear-weapon state party to the NPT in the shortest possible time. A letter accompanying the Protocol from the Ukrainian President to President George Bush commits Ukraine to the elimination of all nuclear weapons located on its territory by seven years after the START-I treaty enters into force.

¹⁴For a complete review of this agreement see John W. R. Lepingwell, "The Trilateral Agreement on Nuclear Weapons," *RFE/RL Research Report*, vol. 3, no. 4, 28 January 1994.

¹⁵"U.S. Intelligence Sees Economic Plight Leading to Breakup of Ukraine," *The Washington Post*, 25 January 1994, p. A7.

¹⁶Sergei Kiselyov, "Ukraine: Stuck with the Goods," *The Bulletin of the Atomic Scientists*, March 1993, p. 32.

¹⁷Council of Advisors to the Parliament of Ukraine, *Update on Ukraine*, no. 10, 21 October 1993, p. 4.

¹⁸"Economic Collapse Leaves Ukraine With Little to Trade but Its Weapons," *The New York Times*, 13 January 1994, p. A6.

¹⁹See the *Economist Foreign Report*, 27 May 1993, pp. 2-3, and Taras Kuzio, "Ukraine's Arms Exports," *Jane's Intelligence Review*, February 1994, pp. 65-66.

²⁰See Steven E. Miller, "The Case Against A Ukrainian Nuclear Deterrent," *Foreign Affairs*, vol. 72, no. 3, (Summer 1993), pp. 73-74.

²¹For a comprehensive expression of this argument see William H. Kincade, "Nuclear Weapons in Ukraine: Hollow Threat, Wasting Asset," *Arms Control Today*, July/August 1993, pp. 13-18.

²²Roman Solchanyk, *RFE/RL Military Notes*, 11 June 1993, p. 6.

²³FBIS-WEU-93-231, 3 December 1993, p. 5.

²⁴John Lepingwell, *RFE/RL Military Notes*, 17 August 1993, p. 16.

²⁵*RFE/RL News Briefs*, 10-21 January 1994, p. 3.

²⁶Belarus signed this agreement on 3 January 1994. See *RFE/RL News Briefs*, vol. 3, no. 3, p. 9.

²⁷*RFE/RL News Briefs*, 10-21 January 1994, p. 2.

²⁸ "U.S. Security Assistance to the Former Soviet Union," *Arms Control Today*, January/February 1994.

²⁹ *Washington Post*, 29 November 1992, p. A1., p. 33, and *RFE/RL News Briefs*, 10-21 January, 1994, p. 2.

³⁰ Belarus has two research reactors and a spent fuel storage area.

³¹ Michael Dobbs, "Kazakh Sets Condition on A-Arms," *The Washington Post*, 6 May 1992, A20.

³² Rajan Menon and Henri J. Barkey, "The Transformation of Central Asia: Implications for Regional and International Security," *Survival* (Winter 1992-93), p. 81.

³³ William C. Potter, *Nuclear Profiles of the Soviet Successor States*, Monograph No. 1, Program for Nonproliferation Studies, Monterey Institute of International Studies, May 1993, pp. 16-32.

³⁴ "U.S. Will Triple Its Foreign Aid to Kazakhstan," *The New York Times*, 15 February 1994, p. A3.

³⁵ *RFE/RL Daily Report*, no. 30, 14 February 1994.

³⁶ "Kazakh Leader Warns the West Not to Concentrate Aid on Russia," *The Washington Post*, 8 February 1994, p. A11.

³⁷ *RFE/RL Daily Report*, no. 30, 14 February 1994.

³⁸ *Nuclear Fuel*, 30 March 1992, p. 16.

³⁹ A radiological weapon is defined here as a weapon that can cause lethal chemical or radiological contamination but does not produce a nuclear detonation.

⁴⁰ The fact that Ukraine is likely to be compensated by Russia for the tactical nuclear weapons that were removed from its territory in 1992 sets an interesting precedent. Nearly all of the NIS hosted former Soviet tactical nuclear weapons at one time. If Russia compensates Ukraine, it will likely face requests for compensation from several NIS countries that have no nuclear weapons. To create leverage against Russia, some of these states may threaten to develop nuclear or radiological weapons.

⁴¹ Armenia has a small nuclear infrastructure centered around the two VVER 440 MW Medzamor pressurized water reactors and a nuclear physics institute in the capital, Yerevan.

⁴² Such a radiological weapon would presumably use irradiated waste from the Medzamor 1 and 2 reactors, which were closed in early 1989 after a devastating earthquake. Methods of delivery were reported to include gravity bombs and artillery. Armenian officials later denied any plans or capabilities to manufacture "nuclear weapons of any kind." For reportage of the Armenian threat and Azerbaijan's response, see JPRS, *Proliferation Issues*, 11 December 1992, p. 19.

⁴³ The South African leadership are said to have believed that threats to use nuclear weapons would have forced the West to intervene in a crisis before their country suffered a military defeat by Angola or Mozambique backed by the Soviet Union.

⁴⁴ *RFE/RL Daily Report*, no. 33, 17 February 1994.

⁴⁵ "Uzbekistan: Tamerlane v. Marx," *The Bulletin of the Atomic Scientists*, January/February 1994, pp. 48-51.

⁴⁶ Proliferation shocks are defined as events that significantly alter the attitudes of governments, political leaders, and the public towards nuclear weapons or weapons-related nuclear trade. Thus defined, proliferation shocks can lead these groups to either embrace or reject nuclear weapons or related exports.

⁴⁷ Baikonur is the largest spaceport in the former Soviet Union. Its space launch facilities are critical to Russian military and civilian space programs. See Jeffrey M. Lenorovitz, "Control of Kazakh Launch Base Disputed," *Aviation Week and Space Technology*, 26 July 1993, p. 26.