5 Kazakhstan

Kazakhstan is located south of central Russia on the northern tier of Central Asia. Its territory includes the eastern shore of the Caspian Sea and half the Aral Sea. Its population of about 15 million is nearly evenly divided between ethnic Slavs and central Asians. The breakdown is 40 percent Kazakh, 38 percent Russian, 6 percent ethnic German, and 5 percent Ukrainian, with the rest mostly Uzbeks, Tatars, Uighurs, and Belarusians.[1] Kazakhstan is a large country, with an area only slightly smaller than western Europe, but a far lower population density. Figure 3 shows relevant installations in Kazakhstan.

When the Soviet Union dissolved, some 1,400 strategic nuclear warheads were present in Kazakhstan, including 108 nuclear-armed SS-18 ICBMS having 10 warheads each.[2] Twelve of the missiles and some 40 Bear H bombers capable of carrying nuclear cruise missiles were withdrawn in early 1994, but the associated warheads are thought to remain in Kazakhstan, stored near the city of Semipalatinsk.[3]

Kazakhstan is also the location of the Semipalatinsk nuclear test site, one of only two nuclear test sites in the former Soviet Union (the other is on the remote Russian island of Novaya Zem-

[1] FBIS-USR-92-016L, Nov. 27, 1992.

[2] W. Potter, "Nuclear Profiles of the Soviet Successor States" (Monterey, CA: Program for Nonproliferation Studies, Monterey Institute of International Studies, May 1993), p. 16.

[3] "Last Strategic Bombers Leave Kazakhstan," Radio Moscow, Mar. 1, 1994, in FBIS-SOV-94-041, Mar. 2, 1994. Also, see "Nuclear Successor States of the Soviet Union: Weapon and Sensitive Export Status Report" (Washington, DC; Monterey, CA; and Moscow: Carnegie Endowment for International Peace and the Monterey Institute of International Studies, May 1994).

FIGURE 3: Selected Sites in Kazakhstan

SOURCES: Carnegie Endowment for International Peace, Monterey Institute of International Studies, Office of Technology Assessment, 1994

SEMIPALATINSK NUCLEAR TEST SITE

Nuclear explosion at the Semipalatinsk test site in Kazakhstan before 1963, when atmospheric testing ended,

lya, located in the Arctic Ocean). There is considerable concern in Kazakhstan over radiological pollution at and near the Semipalatinsk site, following over 100 atmospheric tests in the 1950s and early 1960s, and hundreds more underground tests. The situation is somewhat analogous to that near the U.S. Nevada Test Site, although contamination is probably much worse in Semipalatinsk. Aggravating the situation is that while the nuclear testing program was run by Russians, much of the surrounding population—which suffered the effects of the radiological releases—is Kazakh.

Kazakhstan President Nursultan Nazarbayev, a contemporary and long-time colleague of former Soviet President Mikhail Gorbachev, is a reformer in the Gorbachev mold (although the two had serious differences) who has permitted some opposition parties and movements to arise in the country. However, he has not yet designed a liberal democracy such as would be recognized in the West. President Nazarbayev has thus far managed to balance the various ethnic and political currents in Kazakhstan, resulting in a considerably greater degree of stability and political comity than exists in most of the other former Soviet republics. The political relations between the president and the opposition in parliament are relatively calm, certainly in comparison with Russia and Ukraine. In fact, unlike the case in those two countries, the president dominates the parliament.

ANTHONY FAINBERG

Cow roaming the Semipalatinsk nuclear test site in 1993.

Maintaining a relatively tranquil political order while permitting some opposition activity is particularly difficult in Kazakhstan because of the nearly even ethnic division between Slavs and central Asians. There is also the complication of strong environmental movements, many of which focus on the consequences of nuclear, chemical, and biological weapon testing or manufacture by the Soviet Union in what is now Kazakhstan. One such group-- 'Nevada-Semei," formerly "Nevada-Semipalatinsk''—is dedicated to achieving a universal nuclear test ban, and it succeeded in persuading President Nazarbayev to ban nuclear testing at Semipalatinsk on August 29, 1991, when

Kazakhstan was still part of the Soviet Union. Nazarbayev has called for a massive international aid program to cleanup the mess left from decades of activity by the Soviet military-industrial complex.

Kazakhstan ratified the START I arms control treaty in 1992, but Non-Proliferation Treaty (NPT) ratification came more than a year later despite various statements that it would follow soon behind START. It was not until December 13, 1993, during a visit by Vice President Gore, that the NPT was ratified, garnering a near-unanimous vote. During President Nazarbayev's visit to Washington in February 1994, when he deposited the instruments of ratification of the NPT with the U.S. government, President Clinton announced the provision of $311 million in aid to Kazakhstan. The money will be expended in programs including defense conversion, the dismantlement of the nuclear delivery systems eliminated by START I, and some other areas.

THE SEMIPALATINSK NUCLEAR TEST SITE

In addition to the strategic nuclear weapons located there, Kazakhstan has several facilities containing highly enriched uranium (HEU) and plutonium. On the Semipalatinsk nuclear testing site are three relatively small research reactors fueled with HEU. The reactors' fuel loadings vary from 2 kg to 9 kg. Including old loadings, which are not highly radioactive, up to 300 kg of HEU are located at the site.

Additionally, the test site contains a small nuclear explosive device, currently buried several hundred meters underground. It was apparently about to be detonated when the site was closed to nuclear weapon testing by the government of Kazakhstan in 1991. For reasons that are unclear (perhaps financial, safety-related, or both), it has not yet been removed. Although the device is said to be of very low yield, it still contains, by definition, enough nuclear material to make a nuclear explosion.[4]

In November 1993, during a period of particularly cold weather, public utilities (including heat and hot water) failed at Kurchatov City, the residential and administrative center of the test site. This problem was eventually repaired, but, **for a while, Russian press reports discussed the possibility of abandoning the site-a rather disturbing option, given the presence of a nuclear weapon there.**[5] Although the site has not been abandoned, the Russian military detachment that had provided security there was withdrawn in May 1994, leaving the security situation unsettled.

"BRAIN DRAIN"

Overshadowing the need to safeguard Kazakhstan reactors is the problem of what to do with Kurchatov City, located within the Semipalatinsk nuclear test site. Named for the first director of the Soviet nuclear weapon program, Kurchatov City

SEMIPALATINSK NUCLEAR TEST SITE

Kurchatov City a nuclear research city within the boundaries of the Semipalatinsk nuclear test site in Kazakhstan.

[4] For a report on the unexploded device, see, for exarnple, "Unexploded Nuclear Device Left Under Semipalatinsk Site," *Krasnaya Zvezda*, Jan. 14,1994, p. 3, in FBIS, JPRS-TND-94-004, Feb. 11,1994, p. 22. An earlier report may be found in W. Potter, "NuclearProfiles..." op. cit., footnote 2, p. 16.

5 For information on the utility failure at the Semipalatinsk site, see "Semipalatinsk Accident Makes Future Uncertain," *Nezavisimaya Gazeta, Nov. 24, 1993, FBIS-SOV-93-226, Nov. 26, 1993,* p. 58.

was part of the Soviet nuclear weapon complex. Reports currently indicate that the scientists and technicians there, nearly all of whom are ethnic Russians, are receiving minimal financial support (10 percent of their funding) from Moscow. The rest of their funding comes from Kazakhstan, which has very limited financial resources.

Scientists at Kurchatov City are trying hard to interest Western nations in joint research projects just to keep themselves employed. Although workers receive subsistence salaries, there is no funding at all for any new research projects, and current projects appear to be proceeding very slowly for lack of funds. Like the scientists at the Arzamas and Chelyabinsk laboratories and elsewhere in the Russian nuclear weapon complex, Kurchatov City residents spend a considerable amount of time raising crops in the summer to feed themselves in the winter.

In early 1993, President Nazarbayev announced the establishment of a Kazakhstan National Nuclear Center with one branch at Kurchatov City and the other at the Institute for Nuclear Physics in Almaty, the capital. This briefly raised hopes at Semipalatinsk. However, the government then could not find funds to pay for the enterprise. Following this, the scientific workers there threatened strikes. One recent press report states that only 20 percent of the original maintenance personnel remain on site, causing maintenance and security problems.[6]

One possible solution for dealing with the unsettled situation there would be to arrange joint research projects with Western scientists. However, it is not clear how appropriate most of the facilities at Semipalatinsk are for such joint work. One of three reactors there, built to produce high neutron intensities for material testing, can produce severe transients (rapid surges of activity, resulting in enormous bursts of neutrons and heat production). Such transients are useful for reactor safety studies. There is also a mothballed nuclear rocket propulsion facility which includes the other two reactors, now also used for material testing.

However, there is not much Western interest in pursuing nuclear rocket propulsion. A recent effort by two groups in the United States to revive such work at the Nevada Test Site was put on hold in 1992. Barring renewed interest in a joint U. S./Russia manned flight to Mars, nuclear rocket propulsion at present seems an unpromising area for collaboration. In addition, local environmentalists might oppose such a project in Kazakhstan, even if scientists promise to contain the radioactive effluent from the nuclear rockets.

Another suggestion, made by local scientists to visiting counterparts from the West, was to build an underground cavity at Mt. Degelen, an area of the test site where many underground nuclear explosions have taken place. Western clients would be invited to construct scale models of nuclear reactors in this cavity and force them to fail, creating catastrophic accidents for diagnosis. Understanding how the models failed could lead to improved techniques for preventing and mitigating nuclear accidents. However, even if interested clients from abroad could be found, this proposal is also likely to be regarded unfavorably by local environmentalists.

The Soviet nuclear testing program released a considerable amount of radioactivity in the region near Semipalatinsk. Apart from the atmospheric tests, many of the hundreds of underground explosions vented radiation (as has also occurred at the Nevada site, but, apparently, to a lesser extent than at Semipalatinsk). A possibly fertile field would be cooperative U.S.-Russian-Kazakh research aimed at devising effective methods for cleanup.[7] Such work could also have applications in dealing

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6 Moscow Television, Apr. 28, 1994, Vesti newscast. FBIS-SOV-94-090, May 10, 1994, p.25.

7 There is interest in Kazakhstan not only in cleaning up nuclear sites, but also sites that handled chemical or biological weapon work. For example, a biological agent test range was located on Vozrozhdenya Island in the Aral Sea in Uzbekistan, very close to Kazakhstan territory, and a facility existed in Aksu (Stepnogorsk) in northern Kazakhstan.

with high- and low-level waste disposal from civilian nuclear power industries.

An additional incentive for the United States to engage in joint work with experts at the Semipalatinsk site is that its own nuclear testing infrastructure and expertise (at the Nevada Test Site) is also likely to remain inactive given the current moratorium on nuclear testing, which may become permanent. Like their Kazakhstani counterparts, managers of the Nevada Test Site have been looking for alternate missions for their facility and its 8,000 employees.

OTHER SENSITIVE FACILITIES

Kazakhstan has several sensitive nuclear facilities outside the Semipalatinsk nuclear test site. One is the 350 MW civilian breeder reactor in Aqtau (formerly Shevchenko). By irradiating an unenriched uranium "blanket" around the core, a breeder reactor produces more nuclear fuel (plutonium) than it consumes. Some experimental core fuel loadings containing over 30 percent plutonium were produced and briefly irradiated in tests. There may be other experimental fuel at the site with similarly high plutonium content. The breeder blanket also contains plutonium, although its plutonium content is less than 1 percent.

The plutonium in these fuel loadings can, in principle, be relatively easily separated from the uranium that constitutes the rest of the material—particularly since, unlike usual spent reactor fuel, neither the blanket nor the test fuelings in the reactor have been irradiated enough to reach very high levels of radioactivity. Therefore, they are more vulnerable to unauthorized removal than they would be if they were highly radioactive. It is essential to maintain control over and keep precise accounting of such nuclear material, since it can be used to manufacture weapons. However, although the International Atomic Energy Agency (IAEA) and several countries, including the United States, are helping Kazakhstan establish its own system of material control and accountancy, no IAEA safeguards agreement was concluded with Kazakhstan until July 1994. Further, there is a lack of qualified nuclear safeguards experts there.[8]

Another unique site in Kazakhstan is the Ulba (formerly Ulbinsky) Metallurgy Plant in Ust-Kamenogorsk in the northeastern comer of the country. This large complex fabricates nearly all the fuel elements for the civilian nuclear reactors of the former Soviet Union (FSU). It is also the only major site in the FSU that produces beryllium, a light metal with unique neutron reflecting characteristics that make it a useful component in nuclear weapons as well as in nuclear reactors. Low-enriched uranium arrives from Russia in the form of UF_6 and is fabricated at the plant into pellets of $U0_2$, used in reactor fuel rods.

The NPT requires international safeguards to be placed on low-enriched uranium (LEU). Low-enriched uranium cannot be directly used to fabricate nuclear weapons. However, it can be used to fuel a plutonium-production reactor. Moreover, if a would-be proliferant already possessing some enrichment capability were to feed an enrichment process with low-enriched uranium, the amount of effort required to produce a given amount of weapon-grade HEU from it would be considerably reduced.

Since LEU would be of considerable use to a proliferant, press reports that Iranian representatives had purchased large quantities of both LEU and beryllium from the Ulba Plant in August 1992 would, if true, cause concern.[9] Had Kazakhstan been subject to IAEA safeguards at the time, any LEU sold from the Ulba plant would have to have been placed under safeguards as a condition of sale. Since no such safeguards were in place, the

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8 W. potter, "Nuclear Exports From the Former Soviet Union: What's New, What's True," *Arms Control Today,* Jan./Feb. 1993, pp. 3-10.

9 BBC-Panorama report on FRONTLINE, Public Broadcast Service Television, Apr. 13, 1993. Although, according to the BBC, government officials in Kazakhstan denied that the Iranians had even been present, factory officials conceded that Iranians had visited the facility but denied that they had been sold any LEU or beryllium. The difference in the two stories gives rise to some concern.

material (if indeed it was actually sold to Iran) could be used for purposes not known to or approved by the IAEA. Even if the reports of the sale of LEU are not accurate, the fact that the uncertainty exists (due to the absence of international safeguards) means that there may be real occurrences of this sort that have not been reported.

Further, Iran's presence and interest in Kazakhstan has been obvious and widely reported, both by journalists and by U.S. scientists visiting Kazakhstan. Iran has an understandable interest in cultivating relations with its neighbors, particularly states with Muslim populations, on all levels: commercial, cultural, and other. However, its interest in Kazakhstan may also have a nuclear component.

There are, as yet, no international safeguards on any nuclear facilities in Kazakhstan. There have, however, been many contacts between the IAEA and Kazakhstan, and IAEA officials have visited nuclear sites in Kazakhstan on several occasions with a view to preparing and concluding such agreements. In addition, a workshop was held in Kazakhstan during June 1993 with participants from the IAEA, Japan, the United States, the United Kingdom, and Sweden to help prepare Kazakhstan officials to apply safeguards to their nuclear facilities.

It would be wise, from the U.S. perspective and from the perspective of the international nuclear nonproliferation regime in general, to apply international safeguards to the Ulba Plant and to Kazakhstan's other nuclear facilities as soon as possible. **In addition to applying safeguards, international standards of physical security recommended by the IAEA should also be applied to these facilities as soon as possible.**[10] Any assistance that the United States can provide to the Kazakhstan government in these areas would be extremely useful.

U.S. POLICY OPTIONS REGARDING KAZAKHSTAN

It is not clear why Kazakhstan took so long to comply with its frequently stated intent to ratify the Lisbon Protocols and the NPT. Perhaps the Kazakhstan leadership decided to let Ukraine do

Findings Regarding Kazakhstan

- Kazakhstan has over 1,000 nuclear warheads on its territory, as well as considerable amounts of nuclear material that could be used in nuclear weapons
- After some delay, Kazakhstan ratified the NPT,
- Kazakhstan urgently needs to develop expertise in nuclear safeguards and physical security.
- None of Kazakhstan's nuclear facilities are yet under IAEA safeguards; this fact may be a threat to the international nuclear nonproliferation regime.
- Ethnic Russian scientists at the Semipalatinsk test site are in some economic distress, raising concerns about "brain drain" and about the security of the nuclear material at that site
- Kazakhstan is very interested in developing cooperative research aimed at cleaning up the environmental insults to its territory caused by years of various Soviet weapon programs,
- Due to its possession of a variety of nuclear materials under insufficient international controls, Kazakhstan poses significant proliferation risks There is at least the appearance of vulnerability to theft, diversion, or sale of nuclear material to foreign parties. However, Kazakhstani authorities appear eager to expand ties with industrialized states and are willing to improve their nuclear safeguards capacity
- **Of the four nuclear inheritor states to the FSU, Kazakhstan is probably the one in which U.S. efforts have the best chance of improving the situation significantly** Several of the most acute proliferation concerns seem amenable to outside assistance

[10] IAEA safeguards are intended to detect the diversion or misappropriation of nuclear materials; they do not deal with threats to capture such material through use of force. That possibility is addressed by physical security measures such as guards.

the fighting for it on the issue of whether to become a nuclear weapon-free state. More likely, Kazakhstan wanted to extract further economic benefits, rewards, and security guarantees before a final commitment was made to go non-nuclear. Kazakhstani officials have stated that the president's national security advisors debated at length the advisability of renouncing the nuclear option, given that the country borders directly on two declared nuclear powers: Russia and China.[11] Kazakhstan is also located near India and Pakistan, both widely thought to possess nuclear weapon capability.

Kazakhstani officials also made clear that they would like to see a universal norm of "no-first-use" established; that is, a commitment from each nuclear power never to be the first to use nuclear weapons.[12] In fact, the government may have held out on the NPT for this reason, among others. Current U.S. policy hedges this issue by offering its no-first-use pledge only to members of the Nonproliferation Treaty (or equivalent agreement) that are not nuclear powers or allies of nuclear powers. The Russian Federation recently changed its policy from the declared (although not necessarily believed) Soviet no-first-use pledge to one that mirrors the U.S. position.

On the one hand, since Kazakhstan-like Belarus—has now ratified the NPT, any further concessions, whether financial, policy, or aid-related, are unnecessary for persuasion on this issue. The policy approach of providing no further "carrots" to Kazakhstan has the attraction of not requiring any further action. It also would save money in a time of fiscal limitations. However, dealing in bad faith with Kazakhstan, after it had satisfied U.S. requests in the realm of nuclear nonproliferation, would make it more difficult to persuade other countries to comply with such requests in the future. The signal that such an act would send to Ukraine is obvious. Further, such behavior would increase world cynicism towards U.S. nonproliferation policy, seriously damaging the credibility of subsequent U.S. offers of assistance. Such a policy could also make it more difficult to achieve international consensus on related issues in the future (e.g., in dealing with North Korean intransigence on fulfilling its international obligations under the NPT). It could also poison the relationship between the United States and Kazakhstan, a nation where there are considerable U.S. commercial interests and which is located in a strategically important region.

It is useful to consider what other policy approaches towards Kazakhstan might address that state's legitimate concerns. For example, Kazakhstan would like financial help in dismantling the nuclear missile silos on its territory pursuant to U.S.-Soviet arms control agreements. It would like help in characterizing and dealing with the environmental insults due to former military programs on its territory and in monitoring health problems among populations exposed to effluents from the military programs. From the nonproliferation perspective, the United States would like Kazakhstan to exert improved control over nuclear material in the country.

Now that the Nunn-Lugar "umbrella" agreement with Kazakhstan has been completed, some of the promised money could be transferred as soon as possible, earmarked, for example, for aid in setting up an export control system, for cleaning up dismantled nuclear (or chemical or biological) weapon sites, or for monitoring the health of local populations. Nunn-Lugar assistance is being obligated, here and elsewhere, although imple-

11 E.g., O. Kasenov and K. Abuseitov, "The Future of Nuclear Weapons in the Kazakh Republic's National Security," (McLean, VA: The Potomac Foundation, February 1993). Kasenov is a senior advisor to President Nazarbayev on national security issues and director of Kazakhstan's International Institute of Strategic Studies.

12 O. Kasenov and K. Abuseitov, ibid.

mentation in general has been slow.[13] This assistance includes help in export control and nuclear material control and accountancy, but little is being done in terms of environmental cleanup or health monitoring beyond a quick initial survey of the Semipalatinsk site.

The establishment of an international research center, possibly at Kurchatov City, might be a viable option.[14] The political problems faced by similar projects in Moscow and Kiev would probably not impede such an agreement here. But the same arguments as in the Belarus case (see chapter 4) could be made against establishment of a new center—increased cost and less need to placate Kazakhstan, since it has already ratified the NPT. It might be easier either to set aside a certain fraction of funds from the Moscow-based International Science and Technology Center (ISTC) for use in Kazakhstan, or to establish a branch ISTC office in Almaty. Kazakhstan has become a member of the ISTC, along with Belarus, Armenia, and Georgia, and it may receive some funding for ISTC projects. However, it is not clear how much funding from such an arrangement would go to Kazakhstani scientists. In addition, Kazakhstani sensitivity to being treated by the United States as an appendage of Russia would argue for an independent center there. [15]

Also, the research perspective of a center in Kazakhstan would likely be quite different from one in Russia: Kazakhstani interests would probably be mostly focused on environmental cleanup of past military programs, and secondarily on energy research: the country, in spite of large fossil fuel resources, imports large amounts of electricity from its neighbors, Russia and Tadjikistan.

Another argument against working with the scientists at Kurchatov City is that the United States may be reluctant to spend resources to help preserve a former Soviet nuclear test site that could one day again be used for developing nuclear weapons to target the United States. However, this type of argument also applies to the Russian weapon design centers of Arzamas and Chelyabinsk, where it is generally thought that the greater danger would be of weapon scientists there contributing their expertise to states seeking weapons of mass destruction, thereby promoting proliferation.

The decision on whether to aid such facilities and personnel depends on several factors. It is not clear how valuable the facilities and resident expertise at the test site actually are. Once there is assurance that the nuclear material on the site is being properly protected, perhaps U.S. experts will decide that there are insufficient technical grounds to work on projects there. However, there is still the problem of potential "brain drain" from the personnel stranded at the site. Decisions on cooperation will depend, ultimately, on whether the United States feels that the risk of nuclear proliferation from these sites, where personnel are under severe economic and political stress, is greater than the risk that the laboratories—particularly Kazakhstani laboratories—will turn again to nuclear weapon development as part of a possibly resurgent imperialist power.

Joint research projects with Kazakhstani scientists, however structured, would address at least two concerns simultaneously: first, by involving scientists from all over Kazakhstan, such projects would assist the survival of science and technology in that nation and aid its transition to a market-based economy; second, they could bring much needed financial support to the nearly abandoned nuclear scientists at Kurchatov City. In addition, if it at least partially focused on environmental cleanup of military programs, it would address

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13 Theodor Galdi, Congressional Research Service (CRS), "The Nunn-Lugar Cooperative Threat Reduction Program for Soviet Weapons Dismantlement: Background and Implementation," CRS Report 93-1057F (Washington, DC: Congressional Research Service, Dec. 29, 1993).

14 This has been suggested by W. potter in *Arms Control Today*, op. cit., footnote 8, for both Belarus and Kazakhstan.

15 See Fred Hiatt, "Kazakh Leader Warns the West Not to Concentrate Aid on Russia," *The Washington Post*, Feb. 8, 1994, p. A11.

one of the major political issues in Kazakhstan, likely winning the support of both the president and the parliamentary opposition. [16]

Another option is for the United States to exercise its influence with the IAEA and Kazakhstan to hasten the establishment of safeguards agreements over that country's nuclear facilities. In addition, the U.S. could help Kazakhstan improve its nuclear safeguards and export control expertise by training Kazakhstani scientists, technicians, regulators, and customs agents, and by transferring nuclear detection equipment there. Moreover, the United States could transfer physical security technology and related systems analyses for use at sensitive Kazakhstani nuclear facilities.

The U.S. "no-first-use" pledge, with its reservations about non-nuclear-weapon states, is not likely to be the decisive factor in motivating major strategic decisions by Kazakhstan. However, the matter is an irritant, both for Kazakhstan and, for other reasons, for Ukraine. One option would be for the United States to consider strengthening its pledge not to use nuclear weapons first against any nonweapon state, even those aligned with a weapon state. At any rate, the rationale underlying the current version of the U.S. "no-first-use" pledge needs to be revisited, given the absence of the bipolar world that gave rise to it. A recent redefinition of Russian military doctrine took a "no-first-use" position that closely parallels U.S. policy. This will make it more difficult to implement a change in policy in the United States.

Finally, as in Belarus, aid could be used to house Russian forces maintaining custody of nuclear weapons on Kazakh territory, if it is determined that those personnel are in need of such help. The same issues apply as did to Belarus (see chapter 4): it would be difficult to help Russian forces who were aiming missiles at the United States. However, housing aid for those being retired because of arms control agreements may be more feasible.

POLICY OPTIONS SUMMARIZED

- **Accelerate transfer of Nunn-Lugar funds to Kazakhstan to aid compliance with arms control agreements and initiatives.**

Rationale For: Many urgent problems need addressing, especially the development of local expertise in safeguards and export control. This action would help reduce an immediate threat to the United States by aiding nuclear weapon dismantlement. It would also be a positive signal to Ukraine in trying to persuade it to accede to the NPT.

Arguments Against: In order to spend U.S. funds wisely, it is necessary to review programs carefully, which requires effort and time. Fraud may be of particular concern in a country undergoing major economic and political transitions and suffering economic difficulties.

- **Establish a formal program for science and technology cooperation with Kazakhstan by assisting in creation of a center for joint scientific and technical research, possibly at Kurchatov City. Focus could be on environmental cleanup of nuclear, chemical, and biological weapon facilities.**

Rationale For: This would satisfy various needs for Kazakhstan, including employment of scientists and technicians at Kurchatov City, aiding President Nazarbaev's initiative to create a research center there (as well as in Almaty), and bringing international help to the environmental problems of Kazakhstan. It would also aid in preserving the scientific and technological expertise of Kazakhstan during a difficult transition period, since a high level of technological capability and a good part of the technical expertise in Kazakhstan

16 Joint research on environmental cleanup of the Soviet nuclear weapon complex was suggested by G. Perkovich and W. Potter in "Cleaning Up Russia's Future: Scientists Could Deal With Its Nuclear Mess," *The Washington Post,* Jan. 5, *1992,* p. *C2.*

is there. The economic stresses on the scientists and the availability of nuclear material at the site may threaten the international nonproliferation regime. **In addition, programs focused on Kurchatov City might usefully employ U.S. counterparts from the Nevada Test Site.**

Arguments Against: There is now less need to placate Kazakhstan, since it has already acceded to NPT. Further, the United States may not want to help scientific staff at Kurchatov City, since it is connected with the old Soviet nuclear weapon program. Finally, resources might be more productively focused on aiding economic development, rather than on finding work for scientists.

Other possibilities:

1. Open a branch of the Moscow International Science and Technology Center in Almaty, which would be easier and cheaper than founding an independent center. However, this approach would probably be less pleasing to Kazakhstan leadership, who are annoyed at dealing with the United States through Russia. Pursuing this option implies support for the principle of working with Kurchatov City scientists.
2. Use the FREEDOM Support Act mechanism to establish a purely civilian R&D center (see chapter 3).
3. Rely on laboratory-to-laboratory interactions, together with the participation of U.S. industry, for cooperative science R&D with Kazakhstan.

The last two mechanisms could be used together. They would still be viable options, whether or not the United States decided to work with Kurchatov City scientists. A broad umbrella agreement between the U.S. and Kazakhstan has been reached for the general purpose of scientific collaboration.

- **Work with Kazakhstan and the IAEA to apply international safeguards to Kazakhstan nuclear facilities as soon as possible.**

Rationale For: The absence of nuclear safeguards and physical security measures at sensitive Kazakhstan sites constitutes a serious proliferation risk. The government of Kazakhstan appears to support the application of safeguards and is working with the IAEA to this end.

Arguments Against: None.

- **Offer U.S. aid insetting up and training personnel for application of nuclear safeguards, customs, and export control regimes.**

Rationale For: Kazakhstan urgently needs such aid to maintain proper control over nuclear material on its territory. Note that pending export control legislation creates the authority to help other states establish and implement their own export controls. [17] Since the IAEA is far more pressed financially than the U.S. government, it may not be feasible for the IAEA to fund these activities. Moreover, asking other countries, individually or though their IAEA assessments, to shoulder the responsibility for financing such efforts would be tantamount to abandoning U.S. leadership in nonproliferation.

Arguments Against: Because of fiscal limitations in the United States, the government should let the IAEA or other countries perform these tasks, notwithstanding the above arguments.

- **Apply U.S. Nunn-Lugar funds to housing and, possibly, other support for Russian personnel having custody of those nuclear weapons stationed in Kazakhstan.**

Rationale For: If such personnel are seriously stressed economically, they may become vulnerable to subornation by foreign or subnational groups attempting to gain access to nuclear materials or weapons.

Arguments Against: Assistance given to *active* nuclear officers would be difficult to justify, politically and otherwise.

[17] *Omnibus Export Administration Act of 1994,* H.R. 3937, sec. 114 (i); *Export Administration Act of 1994,* S. 2203, sec. 105 (b) (9).

- **Provide Defense Conversion Assistance**

Rationale For: Helps establish economic stability, resulting in less pressure to export weapon technologies; gives positive example of potential rewards for NPT accession to recalcitrant states; has potential to help hasten reform process. Kazakhstan provides a better climate than most other FSU states for foreign investment.

Arguments Against: Problem maybe too large to be addressed by any realistic amount of U.S. aid.