VIEWPOINT: U.S. MISSILE NONPROLIFERATION STRATEGY TOWARD THE NIS AND CHINA: HOW EFFECTIVE?

by Victor Zaborsky[1]

Russia, Ukraine, and China present special challenges for American missile nonproliferation policy. Despite the relative backwardness of their economies, the missile and space industries in these countries are among the most advanced in the world. Facing economic hardship and lacking comprehensive export control systems, these countries may contribute to missile proliferation. Russia joined the Missile Technology Control Regime (MTCR) in August 1995, and Ukraine and China pledged in 1994 to follow the regime's guidelines. However, there is a risk that if they are unable to profit from their missile and space industries within the framework of the MTCR, Russia, Ukraine, and China may seek contracts with rogue states.

To manage the missile proliferation threat from these three states, the Clinton administration has constructed an incentive-based strategy of providing them a guaranteed share of the space or satellite launch market and inviting them to participate in international space projects. The policy aims to make the Russian, Ukrainian, and Chinese missile industries more controlled and predictable, while discouraging deals of proliferation concern. Among the "carrots," or positive incentives, provided by the United States are bilateral launch pacts with all three countries, and attempts to involve them in the MTCR. Since September 1995, Washington has also permitted American-made satellites to be launched into orbit by surplus foreign ballistic missiles.

So far, the results of this policy are rather modest. Current joint space projects, as a source of revenue for these nations, cannot provide a sufficient nonproliferation incentive for at least three reasons. First, the Clinton administration is not in a position to offer a large share of the space market to these countries because of vocal opposition from the American aerospace sector and strong international competition. Second, joint space projects are not a reliable source of income due to the potential for launch mishaps. Third, space cooperation does not alter the desire of these countries' military-industrial enterprises to sell excess missiles. Also, membership in the MTCR can hardly be considered an effective nonproliferation guarantee, since the three governments have mixed feelings about the regime, and membership is unlikely to bring them substantial financial benefits. Moreover, for economic and/or political reasons, these governments could cheat on their MTCR obligations.

To make its missile nonproliferation strategy more effective, the Clinton administration should balance incentives and disincentives more carefully, demonstrating both a readiness to encourage cooperative behavior and a willingness to punish those who violate MTCR guidelines. Thus far, the "carrots" have been too weak, and so have the "sticks." A closer look at recent developments between the United States and the three countries proves this point.

JOINT SPACE PROJECTS AS NONPROLIFERATION INCENTIVES

In an effort to give Russian, Chinese, and Ukrainian space and missile industries an alternative to missile exports, the United States has concluded bilateral accords with all three countries, permitting them to launch U.S.-built payloads. Under a six-year U.S.-China pact signed in 1988, China was allowed to launch nine American-built geostationary payloads. A more recent agreement signed on January 27, 1995, permits Beijing to launch 15 American geostationary satellites through 2001 at prices within 15 percent of those offered by Western firms. A 1993 U.S.-Russian agreement limits Moscow to launching nine American geostationary satellites through the year 2000 at prices within 7.5 percent of what Western companies charge.[2] In late January 1996, the United States and Russia concluded a deal that allows Russia to orbit from 16 to 20 commercial payloads through the end

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of 2000, depending on launch market conditions.[3] An agreement signed by Ukrainian President Leonid Kuchma and U.S. Vice President Al Gore on February 21, 1996, allows Ukraine to sell up to five geostationary launches on its Zenith and Cyclone boosters through the end of 2001 and would add one launch if market demand grows. The agreement also allots 11 launches to the Sea Launch venture, a joint project involving Ukrainian, Russian, American, and Norwegian companies, which will use Ukrainian and Russian booster technology to orbit payloads from a floating platform in the Pacific Ocean. Depending on market conditions, the agreement could allow Sea Launch to orbit three additional payloads.[4] Like the agreements with China and Russia, the U.S.-Ukrainian accord requires that Ukraine price commercial launches on a par with the prices charged by Western companies for comparable services.

While these deals look impressive on paper, in practice space cooperation between the three nations and the United States is not proceeding smoothly. Unexpected legal and technical problems are jeopardizing the revenue that these projects were expected to generate as a nonproliferation incentive. The projected Chinese-American projects have suffered the most mishaps. Under a contract between the International Telecommunications Satellite Organization (Intelsat) in Washington and Great Wall Industry Corporation of Beijing, Chinese Long March rockets were scheduled to orbit three Intelsat satellites in February 1996, July 1997, and March 1998. But in the first launch of the series, on February 15, 1996, a Long March-3B booster crashed seconds after lift-off, destroying the Intelsat 708 satellite on board. Insurance concerns and commercial pressure to add new satellite capacity quickly led Intelsat's Board of Governors to cancel all contracts with China in late March 1996. Intelsat then began talks with Lockheed Martin Corporation about using its Atlas rocket to replace Chinese launch vehicles.[5] Two other Long March customers—EchoStar Communications and AsiaSat—followed Intelsat's example and canceled contracts with China. U.S.-based Hughes Space and Communications Company has likewise been victimized three times by Long March failures since 1992. Hughes currently has only one satellite scheduled to fly on a Chinese rocket in 1998.[6] Of course, failures of Chinese booster rockets are not the fault of U.S. policy. However, these difficulties demonstrate that selling space services is a rather shaky and uncertain business. As a result, Chinese space/missile industries may be encouraged to export their other products in search of more stable revenue sources.

In the case of Russia, the launch agreement has been implemented smoothly, but is currently experiencing unexpected legal problems. These stem from American insistence on the legal protection of intellectual property rights when mounting American satellites on Russian launchers. The U.S. participants insist that their Russian partners should have no access to the satellite at any stage of a joint launch, while Russian experts argue that the projects cannot succeed without more openness and cooperation.[7]

The satellite launch pact was not the only American-Russian incentive project. Involving Russia in the construction of the international space station is an important part of the Clinton administration's Russia policy, which is especially targeted at missile nonproliferation. The original U.S.-Russian agreement provided Russia with $400 million for space hardware and launching services, including three modules for the station. Two of these are being built on schedule. However, the third one, a service module vital to the station's success, is in trouble. The cash-strapped Russian government is withholding payments to the Khrunichev company building the module, and its construction has now fallen nearly a year behind schedule. At a February 1997 meeting with U.S. Vice President Gore, Russian Prime Minister Viktor Chernomyrdin pledged that $100 million would be released for the project. Chernomyrdin made a similar promise in July 1996, but less than 10 percent of the necessary funds were released to the Russian companies involved.[8] Consequently, the other partners in the project are thinking about asking Russia to withdraw as a full partner, letting it serve only as a subcontractor for specific jobs.[9] In that case, the Russian government and Russian space firms would lose expected revenue and acquire a poor reputation in the space market.

Ukraine hoped to use its Zenith launchers for some six to 12 of the 70 to 80 launches Western countries carry out annually, giving Kyiv about one-tenth of the international space launch market.[10] In this context, the international venture Sea Launch, formally established in May 1995, appeared promising. Under the agreement creating the venture, the Ukrainian Yuzhnoye Design Bureau will supply Zenith-2CL rockets, while the Russian Energia Design Bureau will provide an upper-stage engine for the Zenith. A Norwegian firm, Kvaerner Maritime a.s., will modify a 30,000-ton oil rig to serve as the launch platform, and it will also build a command ship to tow the

platform to an equatorial launch site south of Hawaii. An American firm, Boeing Commercial Space Company, is the lead investment partner and overall system coordinator. Yuzhnoye will get 15 percent of the profits from the venture.[11]

However, under the U.S.-Ukrainian launch pact, through 2001 Ukraine can only launch three to four rockets with American payloads annually, far below earlier expectations. Under the agreement, if the market averages 24 launches from 1996 to 1999, Ukraine can fly up to five U.S.-built satellites itself, and Sea Launch can launch up to 11 geostationary satellites. This composition of launches is unfavorable for Ukraine, since three-fourths of them would involve a great number of foreign components that have never been used with the Zenith booster. This increases the risk of failure and makes earning even 60 percent of the expected revenue uncertain. (Insurance underwriters have not been enthusiastic about the project so far, and the first Sea Launch rocket and satellite, scheduled to launch in February 1998, will be self-insured.) In addition, market conditions may not allow Sea Launch to orbit as many satellites as it has planned. Some Russian experts, for example, do not share the Sea Launch partners' hope for quick economic gains from the venture. "On the technical side it [Sea Launch] is brilliant. But in all my calculations of Sea Launch, the rate of return drops to zero," said Alexander Lebedev, Deputy Director General of the Khrunichev State Research and Production Space Center. "To make their business plan attractive, they must do a lot of launches in a short period. This would mean they would have to win half of the available market, but this is impossible given the competition," Lebedev said.[12]

Ukraine is also planning to launch American low-earth-orbit (LEO) satellites that were not included in the U.S.-Ukrainian pact and will be handled separately. However, these launches are unlikely to change the situation drastically, as the geostationary market still dominates the launch business, and competition with U.S. firms launching LEO satellites will be very tough. Ukrainian government and industry officials have made it clear that they are eager to have more extensive space cooperation with the United States. But they made it clear that without such cooperation, they will be marketing their space services to other countries irrespective of those countries' proliferation records.[13]

MTCR MEMBERSHIP AS A NONPROLIFERATION INCENTIVE

For the seven original MTCR partners, membership in the regime meant a voluntary decision to restrict exports and economic benefits in exchange for political and security benefits.[14] Since these countries have similar political and economic structures, and share common interests and objectives, they did not require side-payments to join the MTCR, and their membership was not the result of intensive bargaining. In many cases, new regime members admitted since 1989 have had different motivations for joining the MTCR. Of course, such frequently mentioned membership benefits as demonstrating political good will, gaining access to technologies and information, participating in decisionmaking about the regime, and receiving immunity from most U.S. sanctions have served as positive incentives. However, more and more often new (and potential) MTCR members are requesting side-payments that are only loosely linked to missile nonproliferation as a condition for joining the regime.

U.S. attempts to persuade Russia, China, and Ukraine to abide by the guidelines of the MTCR thus far have had limited success. Russia was admitted to the regime in August 1995 in exchange for revising its plans to export cryogenic rocket engines to India.[15] The Russian government wanted MTCR membership primarily to ensure that the regime is not targeted against Russia. However, some of Russia's activities, namely deals with Iran and Iraq, continue to generate proliferation concerns. Ukraine and China are still outside the regime, although both have made commitments to respect the MTCR guidelines.

In a 1994 U.S.-Ukrainian memorandum of understanding, Ukraine agreed to conduct its missile exports according to the criteria and standards of the regime. However, it opposes American demands that it abandon its ballistic missile program as a precondition for formally joining the MTCR. Ukrainian President Kuchma clearly stated during his visit to Washington in May 1997 that Ukraine would preserve the right to produce and test missiles with a range up to 500 kilometers.[16] Ukrainian officials do not expect substantial technological benefits from MTCR membership, saying that Ukraine possesses advanced space technologies and needs only very specific technologies in limited areas. They do not expect any significant financial benefits either, arguing that the

other MTCR members will not make any concessions in the competitive space market, and that current Ukrainian deals were concluded without MTCR membership.

For China, MTCR membership has so far not proven attractive. In 1984, while Western nations were negotiating the future regime, China was designing an export program for its short-range M-9 missile. By 1987, when the MTCR was established, the program was in place and functioning. Since then, Chinese officials have claimed that China did not participate in the creation of the MTCR and "should not be called upon to assume corresponding obligations."[17] Beijing also argues that the MTCR is a discriminatory arrangement that does not cover other delivery systems of greater concern to China, such as jet fighters purchased by Taiwan. The Bush and Clinton administrations imposed trade sanctions against China in 1991 and 1993 for selling Pakistan finished components and launchers for its M-11 missile (a shorter-range version of M-9). Under a 1994 agreement with China, Washington lifted sanctions in exchange for Beijing's promise to stop missile deals with Pakistan and abide by the MTCR guidelines.[18] However, Chinese export control credentials have not improved significantly since then.

PROLIFERATION RECORDS

Among the three nations, China has the poorest missile nonproliferation record and is of major concern. In 1996, at least three alleged Chinese missile transfers were criticized in the U.S. Congress and media: 1) the export of M-11 missiles and guidance equipment to Syria;[19] 2) the sale of C-802 cruise missiles to Iran;[20] and 3) the supply of blueprints and equipment to Pakistan for a missile factory in Rawalpindi, near Islamabad.[21]

In December 1995, allegations surfaced in the American media that Russia had transferred guidance components from Intercontinental Ballistic Missiles (ICBMs)—accelerometers and gyroscopes—to Iraq. These reports were discussed in congressional subcommittees in the summer of 1996, and the Clinton administration issued a demarche to the Russian government. Senior Russian officials said they did not know about the transfer.[22] During the February 1997 visit of Russian Prime Minister Chernomyrdin to Washington, the U.S. delegation issued a diplomatic warning to Russia because it had allegedly transferred SS-4 technology to Iran that could threaten U.S. troops in the Persian Gulf. The SS-4 has a range of 1,250 miles, three times more than the missiles Iran currently possesses.[23] Russian arms traders consider Iran one of their best customers after India and China; reportedly, Russia's military contracts with Iran reached $1 billion in 1996.[24]

Iran is not the only recent customer for Russian missile technology. Since early 1997, Russian and Western media have reported that arms worth about $1 billion were illegally exported from Russia to Armenia in May-June 1996, including eight Scud launchers and 24 Scud missiles.[25] These deliveries took place nearly a year after Russia joined the MTCR. Reportedly, the arms shipments were sanctioned by Prime Minister Viktor Chernomyrdin, and the cash received in exchange was channeled into the Russian presidential election campaign.[26]

The Ukrainian government is interested in exporting missile technologies to nations with advanced missile capabilities, as well as in exporting finished missiles and missile components to countries with less developed missile industries. Recent reports that Ukraine has agreed to sell SS-21 or Scud B missiles to Libya for $510 million have contributed to doubts about Ukraine's export control credentials.[27] Also, alleged Ukrainian deals with China,[28] Iran,[29] Iraq,[30] Pakistan,[31] and India[32] lead one to believe that Kyiv's declared intention to profit from exports of its missile technology is serious.

So far, neither space cooperation with the United States nor MTCR membership has provided the ultimate "carrots" that would convince China, Russia, and Ukraine to halt their missile-related exports. Both Russia and Ukraine have clearly indicated that they will gradually expand arms exports. Russia increased its conventional arms exports from $1.7 billion in 1994 to $3.4 billion in 1996.[33] Reportedly, the state-owned arms export company Rosvooruzheniye has also developed a "strategic plan" to overtake the world's largest arms exporter, the United States, by 1998.[34] Russia, Ukraine, and China have more experience selling weapons and weapon technology to Third World countries than engaging in highly competitive space projects with the West. Many in the military-industrial complex are seduced by the idea of making a "quick buck" from arms exports. Exports of missiles and related technologies are in line with this drive for cash. China may produce missiles specifically for export, while Russia and Ukraine are willing to sell excess missiles, but all three may sell sensitive technology, which is of greater proliferation concern in the long run. Deals with Iran and Pakistan are good cases in point. Obviously, the U.S. "carrots" are too small to stop these developments

since they are not specifically targeted at military-industrial enterprises.

Not only are the "carrots" failing to offer sufficient nonproliferation incentives, but the "sticks" of negative sanctions are inadequate as well. Henry Sokolski, who served as a senior aide to former U.S. Vice President Dan Quayle and is currently director of the Nonproliferation Policy Education Center in Washington, D.C., argues:

> Russian officials make promises and then turn around and do whatever it takes to earn the hard currency. And whether we are talking about ballistic missiles or nuclear reactors, these sales are going to continue unless the White House gets serious and threatens sanctions.[35]

As an MTCR member, Russia is exempt from most sanctions that U.S. law requires be applied against foreign entities trading in controlled items, but not from all of them. The U.S. Congress has made much American assistance to Russia conditional on Moscow's compliance with a number of guidelines, including cooperation in promoting nonproliferation. Both the Freedom for Russia and Emerging Eurasian Democracies and Open Markets Support Act, and the Cooperative Threat Reduction Program (also known as the Nunn-Lugar Act), require annual presidential certifications that Russia is meeting these conditions before American governmental assistance can be disbursed. Despite questions about Russian dealings with Iran and Armenia discussed above, the Clinton administration issued its most recent certification for Russia in March 1997.

Many observers believe that the Clinton administration also does not adequately use the threat of sanctions against China. The United States has imposed sanctions on China twice for its missile exports to Pakistan, and in May 1997, it imposed one-year sanctions against two Chinese companies for exporting chemical warfare components to Iran.[36] Nevertheless some contend that the United States has not responded adequately to many reported Chinese exports of sensitive items. As one expert has argued:

> President Clinton's China policy—trade over everything—has so trapped Washington that it can neither deal honestly with the American public and Congress nor act effectively about China in support of other American interests. Knowing Washington would not endanger trade with China, Beijing increased... its sales of missiles, nuclear material and chemical weaponry.[37]

It is obvious that because of the economic and political significance of Russia and China, the Clinton administration has been reluctant to consider the imposition of broad sanctions against them in retaliation for exporting technologies related to weapons of mass destruction. In theory, alleged Ukrainian military cooperation with Libya could endanger more than $1 billion in U.S. aid to Ukraine,[38] but the Ukrainian government views such American sanctions as unlikely, given the Russian and Chinese experience.

CONCLUSION

Obviously, the "carrots" that the United States provides to contain nuclear proliferation are stronger and more effective than those used to manage missile proliferation. In order to convince various countries not to develop nuclear weapons, Washington has offered incentives ranging from augmenting Pakistan's conventional arms capability,[39] to cooperating in North Korea's civilian nuclear program,[40] and providing security and financial assistance to Ukraine.[41] In the case of Kazakstan the United States went even further, setting a precedent that demonstrates that potential proliferants can be convinced to give up valuable assets of proliferation concern. In 1993, the United States removed several hundred kilograms of highly enriched uranium from Kazakstan in exchange for cash and technical assistance.[42] Missile proliferation concerns should be given higher standing in current American policy, and potential proliferants should be treated appropriately. One should always bear in mind that missiles are potential delivery systems for weapons of mass destruction, and the list of countries seeking nuclear capabilities is almost identical to the list of nations shopping for longer-range missiles.

In order to strengthen its missile nonproliferation strategy toward Russia, Ukraine, and China, the Clinton administration should adjust the balance of incentives and disincentives. Broader cooperation through joint space projects could provide incentives to managers at design centers and production facilities not to export missile components and technology to rogue states. Assistance in creating communities of nongovernmental "whistle-blowers" and in establishing effective nonproliferation export control systems could provide other incentive elements in U.S. policy. In general, any kind of cooperative alternative to clandestine exports that would generate rev-

enue for missile/space firms and governments in these countries, while increasing their domestic and international standing, would serve nonproliferation purposes.

On the other hand, the U.S. government should make it clear that cheating on export control obligations is not acceptable and will result in a cut-off of economic assistance and the imposition of sanctions. Obviously, it is extremely hard for the Clinton administration to give priority to nonproliferation issues over other important areas of bilateral relations with these countries. However, it would be unwise to discard sanctions as a key disincentive missile nonproliferation policy toward Russia, Ukraine, and China, although their application should vary from case to case. The history of the U.S. nonproliferation efforts demonstrates that "sticks" may be as effective as "carrots."

Privatization and the increasing economic freedom of government entities and state-run companies in Russia and Ukraine (and to some extent in China) have resulted in a growing number of exporters dealing with items of proliferation concern, but not linked by a single hierarchy. The "state" is not the only producer and exporter any more, which makes a single incentive and/or disincentive policy irrelevant and ineffective. For example, a rogue nation may approach both the Russian or Ukrainian Defense Ministry asking for surplus missiles, and also space/missile firms asking for technology. While participation in joint space projects would provide an incentive for a space firm not to sell sensitive technology, it would not affect the Defense Ministry's willingness to sell surplus missiles. As a result, the Clinton administration should have a better understanding of the interplay between internal factors and external influences in these countries' nonproliferation policies, and more accurately define targets for its nonproliferation strategy.

Finally, many new and potential MTCR members do not share the original members' motivations for joining the regime and ask for financial or other benefits in return for observing its standards. To enhance the effectiveness of its missile nonproliferation strategy, the Clinton administration might consider such incentives as broadening economic cooperation with Russia, seeking a compromise with Kyiv on the Ukrainian ballistic missile program, and accommodating Chinese concerns by adjusting its arms sales policy toward Taiwan.

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[2] Warren Ferster, "China Wins Big In Launch Deal," *Space News*, February 6-12, 1995, p. 1.

[3] Joseph Anselmo, "U.S., Russia Reaching Launch Pact; Station Deal Pending," *Aviation Week & Space Technology*, February 5, 1996, p. 84.

[4] Joseph Anselmo, "Israel Pushes Shavit for U.S. Launches," *Aviation Week and Space Technology*, December 18-25, 1995, p. 97.

[5] Peter de Selding, "Intelsat Drops Long March," *Space News*, March 25-31, 1996, pp. 1, 26.

[6] Warren Ferster, "China Pledges Openness," *Space News*, August 26-September 1, 1996, p. 18.

[7] Russian Foreign Ministry official, interview with author, Athens, Georgia, March 1997.

[8] "Chernomyrdin Promises Release of Station Funds," *Space News*, February 10-16, 1997, p. 2.

[9] For details, see William Broad, "Russia Is Fumbling Its Contribution to Space Station," *The New York Times*, January 27, 1997, pp. A1, A9.

[10] Interview with Stanislav Konyukhov, Designer General, Yuzhnoye Design Bureau, in Oles Buzina, "Our 'Zenit' Wiil Be Launched From the Equator?" *Kievskie Vedomosti*, April 20, 1995, p. 7.

[11] Joseph Anselmo, "Boeing Moves Ahead With Sea Launch Venture," *Aviation Week and Space Technology*, January 1, 1996, p. 26.

[12] See interview with Alexander Lebedev in *Space News*, November 13-26, 1995, p. 38.

[13] Interviews with Ukrainian government officials and Parliament deputies conducted by the author in September 1996 in Kyiv.

[14] The original members of the MTCR are the United States, France, Germany, Italy, the United Kingdom, Japan, and Canada, who formally announced the formation of the regime on April 16, 1987.

[15] U.S. Congress, Senate, *Statement by Richard Speier on Russia and Missile Proliferation before the Subcommittee on International Security, Proliferation, and Federal Services of the Committee on Governmental Affairs*, 105th Cong., 1st Sess., June 5, 1997, cited in *The Monitor: Nonproliferation, Demilitarization and Arms Control* (Summer 1997), pp. 32-33.

[16] Itar-Tass, May 17, 1997; in FBIS-SOV-97-137, (17 May 1997).

[17] Deborah Ozga, "A Chronology of the Missile Technology Control Regime," *The Nonproliferation Review* 1 (Winter 1994), p. 79.

[18] For details see: Douglas Walter, "The Secret Missile Deal," *Time*, June 30, 1997, p. 58; and Ozga, "A Chronology of the Missile Technology Control Regime," pp. 79, 81, 87, 89.

[19] Deutsche Presse-Agentur, July 25, 1995.

[20] "U.S. Penalizes Chinese, Hong Kong Firms Suspected in Iran Arms Deals," *Chicago Tribune*, May 23, 1997, p. 9.

[21] Jeffrey Smith, "China Linked To Pakistani Missile Plant," *The Washington Post*, August 25, 1996, p. A1.

[22] Federal News Service, June 20, 1996.

[23] *OMRI Daily Digest*, No. 31, Part 1, February 13, 1997.

[24] Barbara Opall, "Israelis Say Russia Aids Iran's Quest For Missiles," *Defense News*, February 10-16, 1997, p. 40.

[25] For details see: "Summary of Presentation by Lev Rokhlin, Chairman of State Duma Defense Committee, at State Duma Session on Violations in Arms Deliveries to Republic of Armenia," *Sovetskaya Rossiya*, April 3, 1997, p. 3; in FBIS-SOV-97-067 (3 April 1997).

[26] *Radio Free Europe/Radio Liberty Newsline*, No. 64, Part I, July 1, 1997; "Summary of Presentation by Lev Rokhlin," *Sovetskaya Rossiya*, April 3, 1997, p. 3; in FBIS-SOV-97-067 (3 April 1997).

[27] Bill Gertz, "Kiev Imperils U.S. Aid With Libya Arms Deal," *The Washington Times*, December 9, 1996, pp. A1, A12.

[28] Yuri Smetanin, Deputy General Designer at Yuzhnoye, stated in late 1993 that "the Chinese have made many approaches to our company,

but not for purchasing rockets. They wanted answers to questions about how we test for strength, aerodynamics, vibration and so on. But we prefer to sell them hardware." Cited in *Space News*, November 29, 1993, pp. 1, 20. According to Ukrainian officials, license applications from Yuzhnoye to export sensitive technologies to China have been declined by the Ukrainian export control authorities. However, in late January, 1996, three Chinese nationals were caught in Dnipropetrovsk as they obtained a series of papers on the design of engines for intercontinental ballistic missiles with the intention of smuggling them out to China later. For details see: *OMRI Daily Digest*, No. 22, Part 2, January 31, 1996; *OMRI Daily Digest*, No. 32, Part 2, February 14, 1996.

[29] In late 1993, Iran reportedly purchased eight SS-N-22 Sunburn supersonic anti-ship missiles from Ukraine for $600,000 each. See James Kraska, *Defense News*, October 4, 1993, pp. 25-26, cited in "Ballistic, Cruise Missile, and Missile Defense Systems: Trade and Significant Developments, September 1994-January 1994," *The Nonproliferation Review* 2 (Spring-Summer 1994), p. 195.

[30] U.S. and U.N. officials have said that the Iraqi government has used a covert network of purchasing agents and dummy companies to buy millions of dollars worth of sensitive missile parts from foreign firms, in direct violation of the UN embargo. Iraq has sought to conceal them from U.N. inspectors and stockpile them for later use. The gyroscopes, as well as missile guidance system components made in Ukraine, were uncovered by U.N. inspectors. See: Jeffrey Smith, "Iraq Buying Missile Parts Covertly," *The Washington Post*, October 14, 1995, pp. A1, A20.

[31] Ukraine reportedly offered *Tochka* tactical missiles to Pakistan. See Aleksandr Sychev, "Weapon Producers From The CIS Are Taking Over Russia's Business," *Izvestiya*, April 16, 1996, cited in "Ballistic, Cruise Missile, and Missile Defense Systems: Trade and Significant Developments, February-June 1996," *The Nonproliferation Review* 4 (Fall 1996), p. 169.

[32] In mid-September 1994, Ukraine and India signed an agreement to cooperate in the areas of space technology and satellite monitoring of the Earth. The United States expressed concern that rocket technologies restricted by the MTCR could be transferred to India. Following pressure from Washington, the deal has been reportedly been suspended. According to Russian press reports, Ukraine also offered unspecified missiles to India. See: Sychev, "Weapon Producers From The CIS Are Taking Over Russia's Business," fn. 26.

[33] Igor Khripunov, "Have Guns, Will Travel," *The Bulletin of the Atomic Scientists 53* (May/June 1997), pp. 47-48.

[34] *OMRI Daily Digest*, No. 24, Part 1, February 4, 1997.

[35] Opall, "Israelis Say Russia Aids Iran's Quest," p. 40.

[36] For details, see: A. Rosenthal, "China's Poisonous Lie," *The New York Times*, May 27, 1997, p. A15.

[37] *Ibid.*

[38] Gertz, "Kiev Imperils U.S. Aid," pp. A1, A12.

[39] For details, see Ross Masood Husain, "Threat Perception, and Military Plannning in Pakistan: The Impact of Technology, Doctrine and Arms Control," and Rervaiz Iqbal Cheema, "Arms Procurement in Pakistan: Balancing the Needs for Quality, Self-Reliance, and Diversity of Supply," in Eric Arnett, ed., *Military Capacity and the Risk of War*, (Oxford: SIPRI and Oxford University Press, 1997), pp. 130-160.

[40] Northeast Asia Peace and Security Network Daily Report, July 24, 1997.

[41] General Accounting Office, *Nuclear Nonproliferation: Status of U.S. Efforts To Improve Nuclear Material Control in Newly Independent States: Hearings before the Permanent Subcommittee on Investigations of the Committee on Governmental Affairs, United States Senate*, 104th Congress, 2nd Session, March 13, 20 and 22, 1996 (Washington, D.C.: U.S. Government Printing Office, 1996), pp. 540-543.

[42] *Ibid.*, p. 543.