

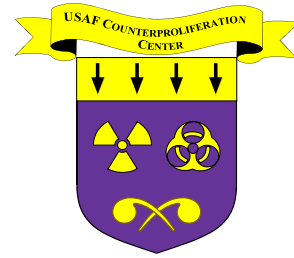
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*Air University
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Maxwell AFB, Alabama*



Welcome to the CPC Outreach Journal. As part of USAF Counterproliferation Center's mission to counter weapons of mass destruction through education and research, we're providing our government and civilian community a source for timely counterproliferation information. This information includes articles, papers and other documents addressing issues pertinent to US military response options for dealing with nuclear, biological and chemical threats and attacks. It's our hope this information resource will help enhance your counterproliferation issue awareness.

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Editors Note: Articles in this edition are before the terrorist attacks on New York and Washington. Subsequent CPC Outreach Journals will be post-attack articles. Thanks, Jo Ann

New York Times
September 11, 2001
Pg. 1

Nuclear Booty: More Smugglers Use Asia Route

By Douglas Frantz

ISTANBUL, Sept. 10 — The police in Batumi, a Black Sea port in Georgia, heard a rumor in July that someone wanted to sell several pounds of high-grade uranium for \$100,000. The most tantalizing aspect of the tip was that one of the sellers was reportedly a Georgia Army officer.

All sorts of scoundrels have tried nuclear smuggling in recent years. Many are amateurs; most of what they try to peddle proves useless for making bombs.

But the possible involvement of an army officer gave the Batumi case a measure of deadly seriousness, beyond its status as another example of how the smuggling of nuclear material has shifted to Central Asia.

On the morning of July 20, the local antiterrorist squad burst into a small hotel room near the port, just outside the Turkish border. They arrested four men, including an army captain named Shota Geladze.

On the floor of the room, in a glass jar wrapped in plastic, sat nearly four pounds of enriched uranium 235, according to Revaz Chantladze, one of the police officers. The quantity was less than is usually required for a small atomic bomb.

Subsequent analysis yielded differing opinions. A Western diplomat said the uranium probably had no value for bomb-making, but Georgian officials called it the third seizure in two years of uranium with potential weapons use. The appearance of a relatively large quantity of uranium on the black market in Georgia underscored American concerns that such trafficking has shifted from Europe to the Caucasus, Central Asia and Turkey.

Washington has responded by sending millions of dollars' worth of detection equipment to several countries in the region. The Americans are also providing training for border guards to learn to spot illegal shipments of nuclear material, and they helped to improve security at nuclear plants and airports.

The region is the gateway from Russia, which has huge stocks of nuclear material, to countries that are in the market for weapons material. Two of them, Iran and Iraq, are trying to develop nuclear weapons; a third, Pakistan, is expanding its nuclear arsenal.

Few smuggling incidents involve material that could be used to make bombs, and intelligence officials say they know of no successful attempt at smuggling weapons-grade material. But they concede that the scope of smuggling remains uncertain.

The rising number of incidents and the strong belief that only a fraction of shipments are intercepted have raised the level of anxiety here. The worries are heightened by the slackness of border controls and the economic instability that has left customs officers vulnerable to bribes.

"The nuclear material tends to come from Russia, but once it gets outside, the region is pretty wide open," Gary Milhollin, director of the Wisconsin Project on Nuclear Arms Control in Washington, said during a trip to the region to brief customs officials on suspected buyers.

The International Atomic Energy Agency provided new figures on Friday showing that the number of confirmed cases of nuclear smuggling had fallen in the rest of the world but had risen in Turkey, the Caucasus and Central Asia.

Only four of the 104 cases from 1993 to 1995 occurred in this region, the agency reported, but from 1996 to last month, 16 of the 72 cases worldwide occurred in the region. The data covered only three weapons-related elements — uranium, plutonium and thorium — and only incidents confirmed by the international agency.

Intelligence authorities said smugglers are seeking new routes out of Russia and find their paths easier across the southern flank. "There has, since the mid-1990's, been a shift of smuggling to the Middle East and Asia," Alex Schmid, head of antiterrorism for the United Nations, told a conference recently.

In the last eight years, there have been 104 attempts to smuggle nuclear material into Turkey, according to an internal report by the Turkish Atomic Energy Authority. Most cases, like those elsewhere, involved tiny amounts of radioactive material with no weapons uses. But officials at the authority said a handful were potentially more serious.

In September 1998, eight people were arrested for trying to smuggle nuclear material from Russia through Turkey to an unknown destination. The police seized about 10 pounds of uranium 235 and a tenth of an ounce of a plutonium mixture.

Yasar Ozal, director of Turkey's nuclear research center, said the plutonium and uranium were not weapons-grade material, but appeared to be fuel pellets. Nonetheless, he said, the appearance of plutonium on the black market was alarming.

In another case, a Turk was arrested at the Bulgarian border carrying a small amount of enriched uranium 235 in May 1999. Authorities said that the quality was high and that the material might have been a sample that he was trying to use to drum up a larger sale.

But Ismail Caliskan, director of Turkey's police unit fighting smuggling and organized crime, said the danger from nuclear smuggling had been exaggerated. Almost every incident, he said, involved amateur criminals trying to sell radioactive material with no weapons value. The only buyers, he said, are undercover policemen.

Turkey illustrates the difficulty of monitoring borders. The country is slightly larger than Texas and has 120 border posts, including crossings to Iraq and Syria in the south, Bulgaria in the northwest and Georgia, Armenia and Iran in the east.

A senior customs official said only two border posts have systems to detect radioactive material, both donated by the United States. He asked that the locations not be identified, but said neither is at Habur, a busy crossing between Turkey and Iraq.

Locations without detection devices rely on visual inspections, something that can be difficult. A kilo of plutonium (2.2 pounds) is so dense it can be concealed in a container the size of a soft-drink can.

Some American detection equipment went to Uzbekistan, which has hundreds of miles of border in remote deserts and mountainous terrain. Border guards at three locations received van-sized detection units and 30 hand-held detectors far more powerful than Geiger counters.

Early last month, guards at a remote Uzbek post on the border with Turkmenistan stopped a sealed truck en route to Iran when one of the American-supplied devices went off, according to American officials.

The officials said they did not know what type of material the truck carried. They said the truck had come from Kazakhstan and passed undetected through the checkpoint at Gisht Kuprik on the Kazak border before being stopped in Alat.

Another American device, on the border between Uzbekistan and Kazakhstan, about 20 miles from Tashkent, the Uzbek capital, detected radioactive material in March 2000 in a truckload of scrap metal. Uzbek authorities said the truck was coming from Kazakhstan, bound for Pakistan with 10 briefcase-sized containers of radioactive material. The Uzbeks sent it back to Kazakhstan for analysis of the material and a criminal investigation.

A Western diplomat said that when the Uzbeks stopped the vehicle, a second truck loaded with scrap turned and went back to Kazakhstan.

What followed remains a bit of a mystery and an illustration of how regional rivalries can make it tougher to stop trafficking: The Uzbeks complained that the radioactive material disappeared in Kazakhstan and that no arrests were made.

The Kazakhstan government has a good record on trying to curb nuclear-related smuggling. It worked closely with the United States to protect its Soviet-era nuclear facilities, and 1,300 pounds of weapons-grade uranium was removed from the country in 1994 by American officials.

But Western officials said they, too, were left in the dark about the outcome of the inquiry into the material on the scrap-metal truck.

In Kazakhstan's first official explanation, Altynbek Sarsenbayev, assistant to the president for national security, denied that there were any briefcase-size containers. He said the problem arose because the scrap metal was contaminated with low-level radioactivity

Washington Post
September 11, 2001
Pg. 4

Sen. Biden Attacks Missile Defense Plans As Costly, Risky

By Steven Mufson, Washington Post Staff Writer

In a spirited attack on President Bush's plans for national missile defense, Senate Foreign Relations Committee Chairman Joseph R. Biden Jr. (D-Del.) said yesterday the administration was risking a new arms race and draining money from other domestic and military programs for a porous system that would never add to U.S. security.

"Missile defense has to be weighed carefully against all other spending and all other military priorities," Biden said in a speech at the National Press Club. "And in truth, our real security needs are much more earthbound and far less costly than national missile defense."

Biden's speech was the latest effort by Democrats in Congress to undermine Bush's missile defense plans, as well as his image on foreign policy matters among American voters.

Moreover, congressional Democrats have been trying to use their legislative clout to scale back Bush's missile defense proposal, especially now that the budget surplus is decreasing. Democrats on the Senate Armed Services Committee succeeded Friday in cutting \$1.3 billion from the administration's \$8.3 billion request for missile defense for the fiscal year that begins next month, apportioning the money to other military needs.

"Particularly in a tough budget situation, the decision [to favor missile defense] is not free," a senior Democratic adviser said. "You have to decide: Do you want a pay raise for the troops or missile defense, close bases or missile defense?"

Democrats on the panel also fenced off missile defense funds for tests in the next fiscal year that would violate the 1972 Anti-Ballistic Missile Treaty. To spend the funds, such tests would need to be approved by the Senate and House. Defense Secretary Donald H. Rumsfeld said Sunday he would recommend that Bush veto the defense spending bill should the language remain as it makes its way through Congress.

By focusing on the possibility of the Bush administration withdrawing from the ABM Treaty, the vote of the committee's 13 Democrats united missile defense supporters, including Sens. Joseph I. Lieberman (D-Conn.) and Daniel K. Akaka (D-Hawaii), with missile defense skeptics. All 12 Republicans on the panel opposed the measures. Biden said yesterday that the United States should be a country "that doesn't abandon arms control treaties with the excuse that they are relics of the Cold War," paraphrasing a Bush speech that criticized the ABM Treaty. "I think many of those uttering that phrase are in fact themselves the relics of the Cold War," Biden said.

"Are we willing to end four decades of arms control agreements to go it alone, a kind of bully nation . . . and the hell with our treaties, our commitments in the world?" Biden said. "I don't believe our national interests can be furthered, let alone achieved, in splendid indifference to the rest of the world's views of our policies."

Biden also sharply criticized administration officials who suggested that China might be encouraged to resume nuclear testing so it could safely expand its small nuclear arsenal. "It seems to me it's absolute lunacy for us to invite China to expand its arsenal and resume nuclear testing," he said.

He said an expanded Chinese nuclear arsenal would prompt new nuclear weapons in rival India, then in India's rival Pakistan, and possibly in Taiwan and Japan, both concerned about China's expanding power in Asia. Biden added that U.S. plans for missile defense could also jeopardize Chinese cooperation with efforts to extend the freeze on North Korea's nuclear and missile programs through diplomacy.

"Let's not now raise the starting gun on a new arms race," Biden said. "It is sure, I promise you, to make my children and my grandchildren . . . feel less secure than we feel today."

He said Bush had shown "almost theological allegiance to missile defense," despite the possibility that systems under consideration would not be reliable. Biden noted that Rumsfeld said in May that if the system worked 70 percent of the time, that would be "plenty" to justify deployment. "Folks, 30 percent failure for any national defense system could be called plenty of things, but plenty successful is not one of them," Biden said.

Biden took issue with Bush's assertion in a May 1 speech that "Cold War deterrence is no longer enough." Biden said, "Name me a time in the last 500 years when the leader of a nation state has said, 'I know I face virtual annihilation if I take the following action, but I'm going ahead and I'm going to do it anyway.' "

Biden said U.S. deterrence during the Persian Gulf War a decade ago prevented Iraqi leader Saddam Hussein from using weapons of mass destruction when George H.W. Bush was president. "When George the first said to him, 'If you do, we will take you out,' what did he do with 500,000 forces marching on Baghdad?" Biden said. "He had those Scud missiles everybody talks about as a justification for building this system. He had chemical weapons. He had biological weapons. Why did he not use them if deterrence does not work?"

International Herald Tribune
September 11, 2001

New Russian Declaration On ABM Pact

Some Changes Possible, but Moscow Stands Firm Against Shield Plan

By The Associated Press

MOSCOW -- Defense Minister Sergei Ivanov said Monday that Russia might accept changes to the 1972 Anti-Ballistic Missile Treaty, but would not agree to dilute the accord's ban on the national missile defense system that the United States wants to build.

"Theoretically, I do not exclude the possibility" Mr. Ivanov said of modifications. However, in an interview with the Interfax news agency, he said the treaty's ban on establishing a nationwide missile defense must stand.

"When I say theoretically, I mean we must clearly understand what missile defense is being conceived by the United States and what technical possibilities in air, sea, ground and space fields are envisaged," Mr. Ivanov said. "Along with thresholds of nuclear weapons cuts," he said, "those are exactly the questions for which we still cannot receive answers from the American side."

Russia has pushed for deeper cuts in nuclear arsenals. Washington has said it should complete a review of how many nuclear weapons the United States needs before discussing specific figures.

Washington also has said that work on the proposed missile defense could be months away from violating the ABM Treaty, and that it must withdraw from the accord or amend it together with Russia before then.

Some U.S. officials have recently voiced hope that Moscow might soften its stance on missile defense by November, when George W. Bush and Vladimir Putin are scheduled to meet in Texas. They also will meet next month on the sidelines of an Asia-Pacific economic summit meeting in Shanghai. The two leaders discussed preparations for the meeting in a telephone conversation Monday, the Kremlin said.

"It was underlined that the meeting in Shanghai would become an important stage of preparation to the full-fledged Russian-American summit," the Kremlin said.

During a trip to Astrakhan in southern Russia, Mr. Ivanov said he expected the U.S. undersecretary of defense, Douglas Feith, to spell out American plans in talks with Russian military officials in Moscow on Tuesday.

Mr. Ivanov said the Russian-U.S. consultations would continue this month when he met with Defense Secretary Donald Rumsfeld, and in talks between Foreign Minister Igor Ivanov and Secretary of State Colin Powell.

Referring to a statement Sunday by Mr. Bush's national security adviser, Condoleezza Rice, that Washington would make an offer to Moscow and "we hope it's an offer they can't refuse," Mr. Ivanov said, tongue-in-cheek, that it reminded him of Al Capone's "You can go a long way with a smile. You can go a lot farther with a smile and a gun."

Sydney Morning Herald

September 11, 2001

Howard Moves Behind US Missile Defence Shield

By Australian Associated Press

Australia celebrated 50 years of the United States military alliance today by signalling it was willing to play a stronger role in the development of the new US missile defence shield.

Prime Minister John Howard gave the strongest indication yet that US bases in Australia could become a part of the National Missile Defence System.

Mr Howard and President George W Bush used a special ceremony marking the first 50 years of ANZUS to meet for the first time and to reflect on the benefits of the past half-century. Mr Bush said the alliance had helped prevent wars and encouraged democracy.

"Australia is a strong and peaceful presence in East Asia and the Pacific," Mr Bush said. "Your government and your good people are an example of democracy, individual liberty and the virtues of free trade."

He added: "By the way, we get along well because if there is any place that is like Texas, it's Australia. That's a high compliment, I want you to know."

Mr Howard's reception was in marked contrast to the last time he was in Washington to see former Democrat President Bill Clinton. Back then, he received only 20 minutes in the Oval Office and barely registered on the former president's agenda.

This time he was showered with the full diplomatic niceties of a Washington visit by a man he considers to be an ideological soul-mate. Mr Howard had the president's attention for more than three hours, starting the day with a ceremony to mark 50 years of the Australia-US Anzus military alliance.

Mr Bush then invited Mr Howard to return to the White House in his car - an honour rarely given to visiting dignitaries. The talks at the White House ran well over time, before Mr Howard went to a working lunch with the president and senior members of the US cabinet.

Mr Howard said Australians valued the defence alliance and they believed in many of the issues which were important in the US.

But he later indicated Australia was close to taking the next step towards backing up the US in the region by supporting the National Missile Defence System.

In a joint statement released after talks, which lasted more than an hour, Australia agreed on the need for a comprehensive approach to tackle the issue.

"They also agreed that missile defence could play a role in strengthening deterrence and stability," the communique said.

Mr Bush told reporters he could see a role for Australia in the development of the National Missile Defence.

"I do," he said.

"The close allies will have close consultation and I look forward to the prime minister's continuing advice.

"We've had great discussion about the Far East and his advice is very valuable for our foreign policy.

"There's nothing like a friend who will tell the truth."

Mr Howard, who also met US National Security Adviser Condoleezza Rice, later told reporters Australia was sympathetic to the need for the missile shield.

"And we talked about it at some length," he said.

Mr Howard said he was pleased the US had engaged the Russians and Chinese over the missile defence plans. But asked if Australian facilities, such as those at Pine Gap and Nurrungar, would be used if the program became operational, Mr Howard replied: "Well, I think facilities are there to be used."

Also today, US Defence Secretary Donald Rumsfeld signed a formal agreement for cooperation between Australian and US navies over submarine technology.

The deal means Australia will be able to access more up to date US technology in the upgrade of the Collins Class submarines.

Washington Post
September 11, 2001
Pg. 23

U.S.-Russia Nuclear Programs Questioned

By Walter Pincus, Washington Post Staff Writer

Nearly three dozen U.S.-Russian programs designed to prevent the spread of Russian nuclear weapons and materials have foundered because of disorganization and a loss of trust between the two countries, according to an official who was instrumental in creating them.

The programs, which have cost the United States more than \$5 billion to date, have "often lacked coordination not only with Russia but also within" the U.S. government, said Siegfried S. Hecker, former director of the Los Alamos National Laboratory. "Nothing really terrible has happened," Hecker said, but a decade after the collapse of the Soviet Union, Russia's nuclear complex "is largely intact, vastly oversized and overstaffed."

With the election last year of President Vladimir Putin, a former KGB official, and the resurgence of Moscow's security services, access to once-secret nuclear facilities has tightened, according to Hecker. "Today, the window of opportunity appears to be closing, both because Russia does not need our money as desperately and because the security services have begun to close up the complex," he said in a lengthy article published recently in *The Nonproliferation Review*, a journal of the Center for Nonproliferation Studies.

Hecker, currently a consultant at Los Alamos, established early contact with Russian nuclear scientists after the collapse of the Soviet Union and was among the architects of the U.S. effort to avert the spread of Russian nuclear weapons. His comments come as the National Security Council is nearing completion of a review of the U.S.-Russian nonproliferation programs ordered by President Bush in March.

The administration already has signaled doubts about the effectiveness of the effort by cutting the budget proposed by the Clinton administration by \$100 million. The programs, which will cost \$872 million this year, have also been criticized by some lawmakers on Capitol Hill and by the General Accounting Office, the investigative arm of Congress.

The nonproliferation effort began in the early 1990s to keep Russian nuclear materials from spreading, and to stop nuclear scientists from selling their knowledge to other countries. That was quickly complemented by the Nunn-Lugar program, which partially funded the destruction of Russian nuclear bombers, intercontinental ballistic missiles and nuclear submarines, as required by arms control treaties.

Overall, the effort gave rise to about 30 U.S.-Russian programs, managed by the Defense, Energy and State departments, aimed at tightening security at Russian nuclear facilities and providing money as an incentive to keep Russia's weapons scientists and engineers from moving abroad.

Speaking Friday at a meeting sponsored by the Monterey Institute of International Studies and the Carnegie Endowment for International Peace, Hecker said that although he remains a supporter of the programs' nonproliferation goals, a major overhaul is warranted. "What is needed is a coherent, comprehensive, integrated strategy," he said.

During the Cold War, the Soviet Union built nearly 20,000 nuclear warheads. Today, although the Russian strategic force is declining, many thousands of warheads remain deployed at dozens of locations and more than 60 storage sites. In addition, 1,000 metric tons of weapons-grade highly enriched uranium and between 125 and 200 metric tons

of plutonium are spread throughout the country at various facilities. Russia maintains a large network of production facilities for uranium enrichment and nuclear reactors that continues to produce weapons-grade plutonium, as well as a network of three dozen nuclear weapons labs and dozens of specialized defense institutes.

Hecker warned that the primary joint program for protection, control and accounting for nuclear materials and warheads at many of these facilities "has all but come to a standstill." He blamed not only increased Russian security, but also U.S. bureaucratic demands that have "lost sight that these are Russian nuclear materials in the Russian nuclear complex."

He said a multinational effort to provide Russian scientists and engineers with civilian job opportunities has been a success, but an Energy Department initiative that teamed Russian institutes with Western businesses has floundered, in part because of Russian security concerns.

The Energy Department's nuclear cities program, aimed at helping Russian scientists in regions once closed to the West, has also run into trouble. Newly aggressive Russian guards have made it difficult for American businessmen to gain access to scientists with whom they are attempting to arrange deals. In addition, funding limitations on the U.S. side -- including a sharp cut by the Bush administration in the Clinton-proposed \$30 million budget for next year -- have made it less attractive to the Russian government.

Two programs to reduce nuclear materials have had mixed success. One to turn highly enriched, weapons-grade uranium into fuel has been successful, and there is competition within the U.S. to get it expanded. The other, to burn plutonium or immobilize it so it cannot be used for weapons, has never gotten started, in part because the Russian plan for burning would cost \$2 billion or more. In addition, the Russians continue to produce plutonium from reactors they use for energy generation and see plutonium as part of their broader plan to encourage nuclear power.

New York Times on the Web
September 9, 2001

Missile Silos Proposed For Alaska

WASHINGTON (AP) -- It hardly seems the stuff of geopolitical significance: In forested flatlands about 100 miles from Fairbanks, Alaska, contractors are taking down 135 acres of fire-scorched spruce and birch trees on a closed military post.

When they are done, they also will improve a few roads near Fort Greely and dig wells.

Next spring, given congressional approval, the Bush administration intends to dig some deep holes there, then fill them with five interceptor missile silos.

At some point during the work -- precisely when is open to debate -- the United States likely will come into conflict with the 1972 Anti-Ballistic Missile Treaty with Russia. It is one of the fundamental arms control treaties of the Cold War.

The administration says it will either withdraw from the treaty to avoid violating it, or it will reach a modified accord with Russia allowing the work to go forward.

Even during the Clinton administration, Fort Greely was a flashpoint for ABM treaty issues. Clinton considered using the fort as the home for 100 interceptors that would serve as the nation's sole missile defense.

The Bush administration has changed that. It is opting to test several missile defense technologies, including the ground-based interceptor program backed by the Clinton administration.

To do so, the military envisions a missile range spanning most of the north Pacific Ocean. Sites at Fort Greely, Kodiak Island, and Shemya, Alaska, would augment the existing test range that runs between Kwajalein in the Marshall Islands and Vandenberg Air Force Base, Calif.

Ballistic target missiles would be launched from one part of the range, either from a ground-based site or from an airplane. New radars would track the missile as it arcs toward space, shedding boosters and possibly dropping decoys.

Around 200 miles above the Earth, the targets would tip over and fall back toward the surface. One or several experimental missile defenses -- ground-based or naval interceptors, airborne lasers, or possibly orbital weapons -- would try to shoot it down.

The ABM treaty has provisions against testing many of those defenses. Even using certain ship radars, or several radars in tandem, to track missiles during flight tests could create problems with compliance, Deputy Defense Secretary Paul Wolfowitz acknowledged in congressional testimony in July.

The giant range is necessary to give the programs adequate testing, said Lt. Col. Rick Lehner, a spokesman for the Ballistic Missile Defense Organization, the Pentagon agency running missile defense.

He said there is only one trajectory for missiles flying between Kwajalien and California; with the multiple launch sites, there would be several.

Building the range will cost \$800 million, much of that for a new, high-resolution radar in Hawaii, Lehner said. Fort Greely would be an interceptor missile base. Crews there would practice loading and unloading interceptor missiles from silos. Others would run an operations center and conduct launch drills, but no plans are in place for missiles to take off from Greely, Lehner said.

Those five silos, however, would be operational, and nothing would prevent the missiles inside from being used in an emergency, officials said.

Should the interceptor program go forward, Greely likely would be the site for the real thing. The 135 acres being cleared at Greely would provide enough space for 100 silos, Lehner said.

Greely was shut down in the 1995 base closure round. Its virtue as a base was its arctic conditions. The Army tested equipment performance in temperatures that regularly dip below minus 50 degrees Fahrenheit.

Now, much of its 750,000 acres serves as a bombing range for military aircraft.

When the base closed, nearby Delta Junction, a community of about 3,000, lost about half of its job base. The town's economic development director is happy to see the military return.

"They will have an awful lot of construction people, and they will have a lot of rocket scientists working out there and living in the community," Pete Hallgren said.

For all the activity planned for Greely, Delta residents do not expect to see missiles overhead anytime soon. During tests, interceptors ordered launched from Greely would take off from Kodiak Island, Alaska, hundreds of miles to the southwest.

On the island is the Kodiak Launch Complex, opened by the state in 1998 as a commercial space venture. Because Kodiak, unlike Fort Greely, is already cleared for rocket launches, the military would simply rent the launch facilities and build two interceptor silos, and fire between two and four interceptor shots a year, Lehner said.

Kodiak might later be used to launch target missiles for airborne laser and naval interceptor tests, but the site is not suited for deployment of any ABM systems, he said.

A number of island residents have protested the planned launches, saying they want the complex used solely for civilian purposes.

A coalition of environmental and arms control groups sued the Defense Department last week to force a fresh round of environmental studies for the test range.

The Pentagon argues that studies performed under the Clinton administration are adequate. An additional study for the Kodiak operations has been ordered.

Insight Magazine

October 1-8, 2001

ABM Now

Edward Teller, the father of the hydrogen bomb, says that President Bush is taking the right steps to back out of the 1972 ABM Treaty and deploy a strategic missile defense.

By James P. Lucier

As Congress begins debating the size and shape of the fiscal 2002 defense-authorization bill a familiar voice, still strong and steady, again is advocating a strategic missile defense for the United States. It is the voice of 93-year-old Edward Teller, by most accounts the world's most distinguished living physicist, a participant in the development of the atomic bomb beginning in 1939 and generally recognized as "the father of the hydrogen bomb."

An Hungarian-born specialist in the abstruse field of quantum mechanics, Teller's concepts and work in physics have had a decisive impact in shaping world peace during the last half-century. And even in his mistakes his instincts proved to be right. A man of wide-ranging interests and culture, Teller often is ranked as one of the most influential persons of the 20th century.

In an exclusive interview with Insight, Teller says that President George W. Bush is on the right track with his plan to back out of the 1972 Anti-Ballistic Missile (ABM) Treaty, which forbids testing or deployment of ABM systems, and to deploy a missile-defense shield.

Democratic Senate chairmen, such as the Armed Services Committee's Carl Levin of Michigan and the Foreign Relations Committee's Joseph Biden of Delaware, already are saying Bush's program for a "multilayered" missile-defense system — involving land, sea, air and space — is too expensive at \$8.3 billion (that is, 2.4 percent of the \$343.3 billion defense-budget request and .04 percent of the entire \$1.98 trillion budget). They also claim it is "too provocative" toward Russia and China. But Teller has heard all that before.

In 1949, the Soviet Union perfected and detonated an atomic bomb at the Semipalatinsk test site. The Soviet bomb was a carbon copy of the U.S. atomic bomb, thanks to actual parts and materials sent to the U.S.S.R. on the authority of White House aide Harry Hopkins, according to Lend-Lease bills of lading, and to plans and data supplied by Klaus Fuchs, a British scientist working at Los Alamos National Laboratory who later confessed to espionage.

Teller, a leader in the field of quantum mechanics, which explores the mysterious world of subatomic particles, realized any nation that successfully built such a fission device immediately would set to work on the difficult task of developing an immensely more powerful fusion weapon — the thermonuclear hydrogen bomb.

To put it simply, in an A-bomb the fission explosion takes place before the nuclear action is completed because it blows apart the critical mass before it reaches its full potential. In an H-bomb, a fission device triggers fusion in deuterium molecules (a form of hydrogen with one neutron in its nucleus), creating an explosion 1,000 times greater than an A-bomb.

When other scientific advisers told President Harry Truman that the H-bomb was not scientifically feasible or that not building it would demonstrate to the Soviets that the United States had peaceful intentions, Teller, who had been working on the idea since 1940, convinced the president that the H-bomb could and should be built. Truman gave the go-ahead in January 1950. But Teller's first design was inadequate because of the lack of calculating power to build a mathematical model, as mathematician Stanislaw Ulam demonstrated. The heat of the initial atomic explosion would not be enough to trigger fusion; the addition of the trace element tritium would be necessary. But tritium could not be produced in sufficient quantity.

In 1951, Teller and Ulam came up with a new design that focused the initial explosion so as to concentrate the deuterium with radiation so intense as to cause ignition. The design successfully was detonated at Eniwetok atoll in the Pacific in November 1952. The long-term result was that for 50 years U.S. hydrogen warheads provided a shield against Soviet nuclear and conventional forces — not only over North America but also over Europe.

Moreover, Teller's hunch about the likely intention of the U.S.S.R. was right. The Soviet nuclear program was under the direct supervision of Lavrenty Beria, who also was head of the secret police, the NKVD (predecessor of the KGB). A hydrogen-bomb research team already was in place in 1948 when Andrei Sakharov joined the laboratories known simply as "the installation." Fuchs had provided the Soviets with the early, unworkable U.S. designs of the H-bomb. What else they may have received from their agents among the U.S.-based nuclear scientists is not fully known, but Sakharov developed a solution that was remarkably similar to the Teller-Ulam concept. An early low-yield Soviet design was detonated in a 1953 test, but not perfected until a 1955 test. All subsequent Soviet designs were based on the 1955 test.

Sakharov in his memoirs wrote: "[Josef] Stalin, Beria and company already understood the potential of the new weapon, and nothing could have dissuaded them from going forward with its development. Any U.S. move toward abandoning or suspending work on a thermonuclear weapon would have been perceived as a cunning, deceitful maneuver or as evidence of stupidity or weakness."

Did the H-bomb contribute to world peace? "In my opinion, yes," Teller tells Insight. "Had the Soviet Union acquired the hydrogen bomb and nobody else did, it would have given so strong a push to the Soviet military advantage which already existed that the probability of the Soviets threatening to use it, or actually using it, would have resulted in those of us still alive talking Russian."

Since the 1970s the prescient Teller has been advocating construction of a defense shield against ballistic-missile attack. Although annual polling demonstrates that most U.S. citizens think the nation already has such a defense against missile threat, the fact is that such a defense is forbidden by the ABM Treaty. The treaty itself allows either side to withdraw by giving six months' notice, but the politics of arms control has blocked withdrawal. When Ronald Reagan advocated construction of an ABM system, critics ridiculed it as "Star Wars" stuff that couldn't possibly work, and would be a provocation against the Soviet Union.

But Teller's experience with politically motivated setbacks in development of the H-bomb program armed him with arguments against those who deny that ballistic-missile defense is possible. He shared them with Reagan. "I will agree with my opponents to the extent that, if we don't try, we won't succeed," Teller tells Insight today. "I cannot say that if we try we will; I will say that, if we try, there is a good chance that we will succeed. And I think the point

that there is a good chance of success should be taken very seriously. That is a basis of continuous strength in the hands of the United States. The world has become smaller, and in the absence of missile defense the situation will be in many respects uncertain. American influence, I think, will be greatly enhanced if a good missile defense should exist."

On May 1, President Bush laid out his program for missile defense at the National Defense University at Fort McNair in Washington: "We need a new framework that allows us to build missile defenses to counter the different threats of today's world. To do so, we must move beyond the constraints of the 30-year-old ABM Treaty. This treaty does not recognize the present or point us to the future. It enshrines the past. No treaty that prevents us from addressing today's threats, that prohibits us from pursuing promising technology to defend ourselves, our friends and our allies is in our interests or in the interests of world peace."

Bush went on to say that he had instructed Secretary of Defense Donald Rumsfeld to evaluate all available technologies. He noted that these included technologies that might be based on land, at sea, in the air and/or in space. The idea would be to defend the U.S. mainland, thus making nuclear attack far less likely to succeed. Each of these technologies has advocates within and outside the government. The recent test of the integrated land-based interceptor missile scored a remarkable success, effectively "hitting a bullet with a bullet," says Angelo Codevilla, a professor of international relations at Boston University and a nationally recognized intelligence expert. But, he adds, "This is a gimmick." He advocates the positioning of chemical-generated lasers in space with an entry-level technology that already exists — it was first demonstrated successfully in 1972 — and which could be deployed quickly to defend against missile attack while better technologies are being developed. Since 1992, the Air Force has been developing airborne chemical lasers, the ABL, carried on modified Boeing 747s to shoot down tactical nuclear weapons.

Similarly, the current shipborne Aegis system first deployed in 1973 was designed as an automatic detect-and-track, multifunction phased-array radar. It can track at least 100 objects at a time. But Frank Gaffney, director of the Center for Security Policy and an assistant secretary of defense in the Reagan administration, says the president could use this immediately to serve as the focus of policy. He says the AEGIS system has the potential to be a missile-killer. "I would make them missile-killers and, as aggressively as we can, build a dual capability to do a limited job immediately against missiles."

Another program already under development is SBIRS-Low, or space-based infrared system operating in low orbit. SBIRS would be a substitute for AWACS and ground-based radars. It would be a constellation of satellites capable of detecting missile launches anywhere in the world and is a key component of any missile-defense system. It would be complemented by SBIRS-High in high orbit. A new SBIRS task-force facility opened March 30 in Boulder, Colo. But SBIRS as currently planned has been "dumbed down" to fit under the ABM treaty restrictions.

Still another project is the SBL-IFX, or space-based laser-integrated flight experiment. SBL-IFX will carry a payload comprising a high-energy chemical laser, a beam director and related beam-control systems to detect and destroy a boost-phase missile target. The SBL-IFX successfully completed its system-requirements review in March, but launch is not expected until 2012, with testing of the laser against a target not scheduled until 2013. "Why not start these tests now?" Codevilla asks. "The mere intention to do so is what's important. It would take us another two years to get all these tests ready. We should get them moving now if we are serious."

But the president told the National Defense University: "We have more work to do to determine the final form the defenses might take. ... We will evaluate what works and what does not. We also know that we will be able to build on our successes. When ready, and working with Congress, we will deploy missile defenses to strengthen global security and stability." Critics, all on the left as it happens, went ballistic over the president's phrase, "we will deploy."

Leaving the U.S. mainland vulnerable to potential nuclear attack is an article of faith on the left, and the administration's opponents will be tenacious. In hearings in July, Levin told senators, "If you rip up an arms-control treaty, you could start a new kind of arms race of cold war with Russia and China." Biden recently noted, "I am deeply concerned that unilateral action on national missile defense, and walking away from a treaty that has helped keep the peace for 30 years, may unleash a dangerous new arms race."

In June, Bush startled his critics both in the United States and Europe by meeting with Russian President Vladimir Putin in the Slovenian capital of Ljubljana to discuss missile-defense issues. Instead of rejecting the proposals out of hand, Putin indicated there was room for discussion. Bush suggested, for example, that the United States might be able to reduce its nuclear stockpile if the present ABM treaty were set aside and ballistic-missile defense were deployed.

"I think Bush is on the right track, seeking cooperation with everybody who has even the slight inclination to cooperate," Teller tells Insight. "I believe that this [ABM Treaty] is a big mistake. As to the conversation of Bush

and Putin, those who were surprised apparently did not realize that Bush, among his other virtues, often has an open mind."

Insight asked Teller whether it would be worthwhile for the United States to reduce the nuclear stockpile as a trade-off to deploy missile defense. His reply: "Our stockpile is big. The [military] effect of nuclear weapons is so strong, so overwhelming, that a great number of them may not be necessary. I think the reduction of the stockpile is not a very essential fact; and I think it may be necessary, it may be a good idea. I am not opposed to it. I am not advocating it, but I believe that reduction might conceivably be something that would make people a little more relaxed. It is not something that is really important, because even a smaller stockpile would be very significant."

From Beethoven to Bombs

Edward Teller not only is a scientist, but a musician and a poet, writing poetry in his native Hungarian. In August the government of Hungary presented him with its highest award for distinguished accomplishment, the Corvin Chain. At the awards ceremony in his Stanford, Calif., home Teller was called upon to recite one of his most famous compositions in his native tongue, so moving that it brought tears to the eyes of the Hungarians present.

Teller was part of that generation of European intellectuals who fled their homelands as Adolf Hitler rose on the horizon. Born in Budapest in 1908, Teller first considered a music career and studied piano at the famous Liszt Academy, an interest he never abandoned. Insight interviewed him as he sat in an easy chair in front of his beloved Steinway grand with the bust of Beethoven hovering over him.

Teller lived under the first communist regime in Western Europe, the 1919 four-month reign of terror of Béla Kun. Unlike many American intellectuals, he already had his taste of communism. His gift for mathematics won out over music, and he first studied chemical engineering. Eventually he went to the University of Leipzig to study under Werner Heisenberg, one of the founders of the new theory of quantum mechanics — the study of uncertainty in the behavior of subatomic particles.

"Some very important people, including Albert Einstein, opposed it — Einstein never understood it," the great physicist says. "For me, as a young student, it was a wonderful idea, and I was convinced, perhaps more convinced than justified, that Heisenberg and his ideas about uncertainty are correct. Later it was justified and authenticated." After coming to the United States in 1935, Teller was part of an émigré circle of scientists who were aware of the advanced state of knowledge in Germany concerning atomic fission. Realizing that if Adolf Hitler was first to develop an atomic bomb it might be a decisive moment in history, they sought to get the attention of President Franklin Roosevelt to initiate a similar program in the United States. The physicist Leo Szilard, a fellow Hungarian, proposed that they get Einstein to sign a letter to the president. But Einstein was in Long Island, N.Y., and Szilard did not have a driver's license. Teller drove Szilard to Einstein's house where they edited the letter draft.

"The atomic-bomb project was extremely important, in my opinion, given the military situation. It came up in connection with the scientifically important discovery made in Germany at the time that neutrons in heavy elements like uranium can cause fission connected with a lot of energy release," Teller tells Insight.

Did he realize as he drove Szilard out to meet Einstein that he was beginning a journey that would change world history?

Says Teller, "I was a young man, Szilard was 10 years older and Einstein infinitely older. I was naturally very interested in what they thought. I had seen novel things, and I believed the novelty would continue. As for world history, I was full of worries on account of Hitler. ... It was relatively a short time before he started the Second World War, and I was painfully aware of the fact that historical events would take place. Anything connected with it had to be important." Thus was Teller an attendant at the birth of the atomic bomb, working at Los Alamos on the Manhattan Project, and midwife to the hydrogen bomb. He was cofounder of the Lawrence Livermore Laboratory in California. Since 1975, he has been a senior fellow at the Hoover Institution in Stanford.

As a musician and physicist, Teller reportedly would sit all night working over a problem — playing Mozart sonatas until the issue was resolved in his mind. To which composers is he drawn? "I am afraid I am very uneducated in modern composition," he says. "I am in a way ashamed as a Hungarian because Hungarian compositions are usually beyond my understanding. What I enjoy are ancients like Bach, Mozart and Beethoven. Then perhaps slightly more novel ones like Schumann, Schubert, Brahms, Debussy. From there on up my understanding quickly declines and so does my enjoyment."

Was there any parallel between music and physics? Teller points out that the burst of creativity in the development of Western music occurred during a very short time, between Bach and Beethoven, with a similar phenomenon later in theoretical physics. "I would make a very small parallel. Each of them [music and physics] is a little beyond common experience. The great musical revolution happened a few decades, perhaps a century, before the great revolutions in physics, such as relativity and quantum mechanics."

But should we expect further great advances in physics, such as we experienced first with relativity and then with quantum mechanics? Teller says, "I think relativity and quantum mechanics are not something that can be placed

side by side with [Sir Isaac] Newton. They are novel and they are right, and where they are right Newton was not quite right. It was an adjustment of old ideas that was surprising and necessary. Today we have the real novelty in biology. The latest single novelty in physics is now quite a few decades old. We have quite a few applications, we have details, but the great sudden progress is behind us."

And what of the next 100 years? Teller answers modestly as always: "I wish I could tell you more about the future, but I know more about the last 100 years. I was once asked if I would have liked to live in another time, and I said no, I have adapted to this period and I cannot imagine living in any other. But then I corrected myself: I was born too late. I would have liked to have been born a quarter of a century earlier because just after I was born and in my first few years science made incredible advances. What was impossible became reality. Relativity, a new understanding of space and time; even more importantly, quantum mechanics that Einstein himself never understood, and which I learned from one of its fathers, Werner Heisenberg. It had the very particular property that it found out that the future is truly unpredictable."

Teller continued: "I want to explain to you what quantum mechanics is. In the past century, if a physicist believed in God, he had to admit that God was unemployed. He had created a world with all the causality that determined everything in the future. So what else was to be done? Quantum mechanics discovered that the future was forever undetermined, that creation is forever incomplete. You can no longer think of anything like God as having finished the task.

"What we have discovered about the future is that the future is undetermined, that the next century — about which I am now talking — is unpredictable because it depends upon what you people and our children will want to make of this coming century. Will they find a way to use the incredibly increased knowledge, and further increase knowledge, in biology for everybody's benefit — all the while preserving the wonderful difference between nations in a peaceful manner? To realize that might be the highest aim of the next century. And all I can do is pray for your success."

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Ban The Bomb? Heck No, It's Too Useful

By James Kitfield

To his critics, C. Paul Robinson is Dr. Strangelove incarnate, a Cold Warrior who after nearly four decades working in the U.S. nuclear weapons complex learned to love the bomb. While even hard-liners in the Bush Administration are today trumpeting "deep cuts" in the U.S. nuclear arsenal, Robinson, director of Sandia National Laboratories, argues for new types of nuclear weapons to deter new kinds of threats. Although most of the globe embraces the dream inherent in the Nuclear Nonproliferation Treaty of a future world without nukes, Robinson—with unusual, to-the-point frankness—decries this "delegitimization" of nuclear weapons.

Not even his critics, however, question Robinson's credentials as an articulate advocate for the continued value of the United States' nuclear deterrent. A physicist by trade, Robinson spent nearly 20 years at Los Alamos National Laboratory, eventually heading its nuclear weapons programs. With the title of ambassador, he also served as Ronald Reagan's chief negotiator and head of the U.S. delegation to the Nuclear Testing Talks in Geneva in the 1980s. He is presently chairman of the policy subcommittee of the Strategic Advisory Group, a panel that advises the four-star commander of U.S. Strategic Command, which is in charge of U.S. nuclear weapons. Many of Robinson's ideas for reshaping America's nuclear arsenal—contained in his white paper "Pursuing a New Nuclear Weapons Policy for the 21st Century"—have been embraced by senior Bush Administration officials. National Journal correspondent James Kitfield recently interviewed Robinson in Washington.

NJ: In a post-Cold War era when most policy makers are focusing on reducing nuclear arsenals, you argue in your paper that nuclear weapons not only "have an abiding place on the international scene," but also that new ones should be tailored for new kinds of deterrence.

Robinson: As I wrote this paper, it felt like putting my head in a guillotine, because I knew that some people were going to try and chop it off for making these arguments. A lot has been done in recent years to delegitimize nuclear weapons to the point that I find people are lulled into a belief that nuclear weapons are going to go away soon, and thus we needn't worry about them anymore. But it's ridiculous to think that we can "uninvent" nuclear weapons.

I also happen to think that nuclear weapons have not only been vital to U.S. national security, but also that history has turned out better for our having nuclear weapons. U.S. nuclear weapons help maintain peace, and a lot of other nations depend on our nuclear umbrella. So, like it or not, for the foreseeable future we have no alternative but to continue to depend upon nuclear weapons and the deterrence they provide.

NJ: Are there no compelling strategic and moral arguments for, as you say, "delegitimizing" weapons of such horrific destructive potential? For instance, the United States signed the Nuclear Nonproliferation Treaty, which calls for non-nuclear states to forgo nuclear weapons, and for nuclear weapons states to work to reduce their arsenals eventually to zero.

Robinson: The NPT Treaty, the arguments surrounding the Comprehensive Test Ban Treaty, and a lot of the rhetoric we heard from the Clinton White House all suggested that sooner or later nuclear weapons are going to go away. I simply don't believe that is true. I think it's important that people wake up and realize that nuclear weapons have meant a lot to our security, and we'd better make sure that our arsenal doesn't erode if our future depends on it.

NJ: And you've taken on the mission of sounding the alarm?

Robinson: No one likes thinking the unthinkable, because it's a tough business. But someone's got to do it. I guess after spending my entire career in this field, I don't think anyone else knows more about the subject than me.

NJ: Arms control advocates would argue that the NPT is largely responsible for many nuclear have-nots doing without nuclear weapons.

Robinson: Yes and no. I believe the establishment of NATO did more to prevent proliferation than the NPT, because it extended our nuclear umbrella over the nations of Western Europe that could relatively easily have developed their own nuclear weapons. I think there's a lesson in that example which applies today to South Asia.

NJ: The Bush Administration has proposed deep reductions in our offensive nuclear arsenal as a sweetener in selling its proposed national missile defense shield. At some point, might such reductions erode the United States' ability to extend its nuclear umbrella?

Robinson: I support deep reductions, but at some point [those cuts] would call our umbrella into question. I worked on a report on that subject for the commander in chief of U.S. Strategic Command as a member of the Strategic Advisory Group. Essentially, our blueprint concluded that at some point between 2,000 and 1,000 nuclear weapons, we will run into speed bumps and probably a stop sign on reductions. It's not an exact science, and that level would still represent a dramatic reduction from today's massive U.S. and Russian nuclear arsenals.

At some point in reducing our arsenal, we also have to switch from bilateral to multilateral negotiations, because our nuclear arsenal has to deter a potential threat from unforeseen alliances that might develop in the future between other nuclear states. Stranger things have happened throughout history. Somewhat counterintuitively, a world in which there are just a few nuclear weapons would also be very dangerous, because the possibility that one side would "break out," and secretly construct a dominant nuclear force of a hundred or so weapons, would be quite high.

NJ: Do you think the Bush Administration's proposed missile defense system will lessen the need for some offensive nuclear weapons in the deterrence equation?

Robinson: I believe both offensive and defensive systems can coexist as part of an overall national security policy, though I have yet to hear that policy articulated. You'll never have a defense, however, that is dominant against offensive nuclear weapons. When I speak publicly on the subject, I also ask audiences to consider that the United States or one of its allies were attacked with nuclear weapons one day, and our proposed missile defense system worked as advertised. Say only 5 or 10 percent, or whatever number you pick, of the attacking nuclear missiles got through. Do you really think the war is then over?

NJ: The process of reducing the nuclear arsenals of the United States and Russia has been gridlocked for years by inertia over the START II treaty, which would bring each side down to roughly 3,500 weapons. The U.S. Senate has ratified the treaty, but the Russian Duma has not. Do you approve of the Bush Administration's suggestion to break the gridlock by abandoning the START process altogether and unilaterally reducing our arsenal?

Robinson: Well, the process has definitely become knotted up over the START II treaty. I considered START I a good piece of work and a worthy agreement. The START II treaty, on the other hand, was not the result of a formal negotiation in Geneva. It was more a ministerial statement agreed upon by both sides that they then decided to enshrine as a treaty. And quite frankly, from the Russian point of view, I can see how they find a lot of things wrong with START II. For the Russians, the whole process resembled a guy trying to negotiate with his loan officer.

NJ: Why is START II unfavorable for the Russians?

Robinson: The treaty certainly didn't win any applause from the Russian military or defense community. They felt it was an awful deal. At a time when Russia's [ballistic missile] submarines are falling apart and they can't keep them at sea, and they lack the money to build the mobile missile systems that they had planned on buying, START II would commit the Russians to going down to single warheads on all their land-based missiles.

NJ: Recently, Russia has threatened to rearm some of its ballistic missiles with multiple warheads if the United States unilaterally abrogates the Anti-Ballistic Missile Treaty in order to build a missile defense. Would that be a worrisome development?

Robinson: When I heard [Russian President Vladimir] Putin talking about doing that, I knew we needed some new talking points with the Russians, because I can't think of anything more stupid. Presumably, we would be the target, since MIRVs were built to attack missile fields. As the United States has gotten rid of most of our land-based missiles and decreased our reliance on that leg of the strategic triad, however, we no longer present those kinds of targets. Today we have roughly 800 ICBMs, and we've telegraphed our intention of going down to below 500 land-based missiles, all with single warheads. So if MIRVs didn't make much sense in the first place, they make even less sense today.

NJ: In your paper, you argue that the United States needs to tailor its nuclear arsenal to deter new types of threats, especially chemical and biological weapons. Do we really need to find new uses for nuclear weapons?

Robinson: Not necessarily new. We had a pretty good test case with Iraq during the Persian Gulf War. If you look at the volumes of chemical and biological weapons later reported by United Nations weapons inspectors, it was astounding what Iraq possessed. Why weren't those weapons of mass destruction used? Many military experts I've talked to are absolutely convinced it was because of a secret letter sent by President Bush threatening the gravest consequences if such weapons were released. President Clinton made a similar threat against North Korea during a crisis in 1994.

NJ: If our implicit threat of nuclear retaliation deterred rogue states such as Iraq and North Korea, why do we need new nuclear weapons?

Robinson: The problem is, the strategic nuclear policy we developed during the Cold War has been stretched about as far as possible to fit a changing post-Cold War era. Today, we are threatened not only by nuclear weapons in the arsenal of peer nuclear competitors like Russia, but increasingly by biological, chemical, and radiological weapons that could kill huge numbers of people in a flash. Yet it's pretty incredible to think that the United States would respond to such an attack by vaporizing 11 million people in a rogue state just because they were poorly led. Where the hell are we going to use missiles with four to eight warheads, or half-megaton yields? Even the few "tactical" nuclear weapons that we have left have high yields of above 100 kilotons. I would hope a U.S. President would think it was crazy to use such weapons in response to a rogue-state attack.

After a decade of trying to sort out what we learned from the Cold War and how we might tailor our nuclear deterrence and deterrent message to fit the future, I now argue that we need lower-yield nuclear weapons that could hold at risk only a rogue state's leadership and tools of aggression with some level of confidence.

NJ: Isn't the United States' vaunted conventional military superiority—based in large part on our increasingly accurate precision-guided weapons—enough of a deterrent?

Robinson: No. We've seen examples as recently as the [1999] air war with Serbia, when we attacked underground targets with conventional weapons with very little effect. It just takes far too many aircraft sorties and conventional weapons to give you any confidence that you can take out underground bunkers. By putting a nuclear warhead on one of those weapons instead of high explosives, you would multiply the explosive power by a factor of more than a million.

NJ: Wouldn't fielding new, low-yield nuclear weapons capable of penetrating underground bunkers require new designs and a return to nuclear testing?

Robinson: In my paper, I conclude that we would neither have to conduct testing nor redesign for such a weapon, because we have them already. Right now, all of our weapons have primary and secondary stages. Through a process known as "boosting," you get a thermonuclear reaction. The primary alone, however, has a yield of 10 kilotons or less, or basically what you would want for a bunker-buster or a weapon that would cause relatively low collateral damage. All we have to do is send these weapons back to the factory and replace the secondary stage with a dummy. The beauty of that approach is that we are already very good at building dummy secondary stages. For safety and costs reasons, most of the weapons we have flown and tested in the past have had dummy secondary stages. So we could develop these lower-yield weapons without forcing the nuclear testing issue back onto the table, with a richer database of past tests, and at relatively low cost.

NJ: On the issue of nuclear weapons tests, the Bush Administration caused a furor when it was reported that they instructed the nuclear labs to develop a streamlined plan for a return to testing.

Robinson: I read those stories that jumped to the conclusion that the Bush Administration was planning a return to nuclear testing, and that's wrong. There was a congressionally mandated commission, however, that recently looked at why it would take the nuclear labs roughly two years to return to testing. If we discovered a serious problem with the nuclear stockpile, the commission members suggested to me that a President would probably drop-kick me out of the Oval Office if I said it would take us two years to figure out what was wrong. You simply can't have people

who stay up at night worrying about the security of the nation kept in doubt for that long. So, the Bush Administration has asked that we go back and study the issue to figure out why it would take so long and how we might streamline a resumption of testing. We haven't come up with the answers yet.

NJ: During the 1999 debate over the Comprehensive Test Ban Treaty, you expressed considerable skepticism over the ability of the Department of Energy's Stockpile Stewardship program to ensure the long-term reliability and safety of the nuclear stockpile without testing. Has anything happened in the interim to change your thinking?

Robinson: You're the first person to ask me that. I would say that since 1999, the Stockpile Stewardship program has, if anything, surprised me by working a little bit better than I would have anticipated. I still have my reservations, however, about whether the program can substitute for testing over the long term. In my mind, the jury is still out on that question. As long as our reliance on a nuclear deterrent is crucial, we'll be taking a chance until we know for certain that Stockpile Stewardship is a reliable, long-term substitute for testing.

NJ: Are you seriously worried that aging will cause a catastrophic defect in our nuclear stockpile?

Robinson: The toughest single thing I've had to do in my entire life was phone the commander in chief of Strategic Command and inform him that we had identified a problem with a particular warhead that affected a significant portion of the stockpile. We had to retarget many of our weapons and work like hell to figure out a fix. Our system of confidentiality proved itself in that instance, because we kept it all very, very secret. But that is one phone call I hope no one ever has to make again, because it was very, very tough.

NJ: How do you respond to critics who believe that by tailoring new nuclear weapons for new types of deterrence, you would make their eventual use in a crisis more likely?

Robinson: My response is that for God's sake, then, let's think this through in advance rather than doing it on the fly. Say Iraq had instigated the first use of biological or chemical weapons during the Persian Gulf War, causing huge numbers of casualties. How would we have retaliated to make good on President Bush's threat? By vaporizing 11 million people? Because I can tell you, we haven't given a lot of thought to this issue. We need to carefully think through our posture of nuclear deterrence, because whatever decision is made during the next crisis will leave a message to all of history.

NJ: Why not send a message that the United States will not be the first to use nuclear weapons?

Robinson: The burden is on those who believe it is immoral to threaten nuclear retaliation for the use of chemical or biological weapons to propose an alternative. I subscribe to the advice of Winston Churchill: "Be careful above all things not to let go of the atomic weapon until you are sure, and more sure than sure, that other means of preserving the peace are in your hands." Those words reflect my thinking on the subject very well.

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Pg. 1

Nuclear Defense Strategy Waning

U.S. shifting toward high-tech weapons

By Scott Canon, The Kansas City Star

To reduce the number of nuclear weapons in the world, it would help first to count them.

Take Missouri's own B-2 stealth bombers. Each can stuff 16 nuclear bombs into its belly.

Under one arms-cutting deal, each bomber counted as just one bomb. Under terms of the next treaty, 16. Now, a third pact might return to counting each B-2 as one weapon.

Such is the curious calculus of nuclear disarmament more than a half-century after the blinding dawn of the atomic age.

Now President Bush has called for scrapping more warheads, even unilaterally, largely to calm Russian nerves jangled by his dreams of a missile shield.

He must win over the Pentagon and Capitol Hill first.

Still, even as it concedes the complications, America's small fraternity of nuclear strategists sees a real chance for a radical shift in the way the country arms itself.

The Bush administration, in fact, has voiced an attitude about nuclear weapons that would have been unthinkable not so long ago.

"Bush and (Vice President Dick) Cheney are essentially anti-nuclear people. They're pro-high-tech and pro-Star Wars people," said Ray Kidder, a retired physicist who designed nuclear weapons at Lawrence Livermore National Laboratory in Livermore, Calif.

"We're getting away from nuclear weapons and pretty much agreeing that they're not usable," he said. "Instead, we're going toward precision weapons and high-tech. The only unknown is how quickly the new will replace the old."

"A lot of people have reasons to make changes," said Andrew Krepinevich, executive director of the nonpartisan Center for Strategic and Budgetary Assessments, a research institute that focuses on defense planning and investment.

Start with the president.

Bush ran for office pledging to shrink U.S. nuclear forces. Once he was in office, over the protests of congressional Republicans, he quickly slated the silo-based MX missile for the junk pile.

Money saved could free dollars for the national missile defense, which carries a price tag estimated to be between \$35 billion and \$100 billion.

Think next of the Russians.

They loathe Bush's national missile defense. Even though it is sold as a backstop against lesser powers tossing missiles at the United States, Moscow sees it as a step toward a larger shield that could neutralize its weapons. The Kremlin also has bills it cannot pay, aircraft it cannot afford to build, submarines it no longer can safely keep at sea. The White House is banking that in the end, President Vladimir Putin will excuse Bush his missile shield - and its snubbing of the 1972 Anti-Ballistic Missile Treaty - in return for a deal to thin both countries' arsenals significantly.

Finally comes America's generals and politicians.

Already pained by cutbacks, the Air Force is reluctant to give up its nuclear bomber and missile crews, and the Navy treasures its strategic submarine forces. A nuclear assignment brings status to a military branch.

But if Bush orders the target list shaved, it would mean the military could carry on with fewer nuclear weapons.

That, in turn, could free money to update the military inventory with such items as new destroyers and fighter jets.

The savings are only a slight incentive, however. Experts say that even drastic warhead cuts might save only \$1 billion to \$2 billion out of a defense budget topping \$300 billion.

Congress only grudgingly gives up even the oldest Navy bases or defense assembly lines. And Capitol Hill remains a roost for defense hawks who say stability comes from convincing enemies that they can be wiped off the map.

"It's easier for a Republican president to make those deep cuts," said Jim Wurst, program director for the Lawyers' Committee on Nuclear Policy, which promotes peace and disarmament through the use of law. "He isn't going to get the criticism from other Republicans the way a Democrat would."

Wurst is fond of saying "the first President Bush did more for arms control in one year than (former President Bill) Clinton did in eight." Now, he said, it's up to the second President Bush to follow through on campaign promises to slash the nuclear arsenal and to take thousands of weapons off quick-launch alert.

Early analyses suggest Bush has taken vital steps toward moving in that direction.

The administration has sent key diplomatic signals to the Russians and the Chinese. Bush even suggested that he would not crab at Beijing for mustering more missiles that can reach U.S. soil - as long as Beijing stops carping about his missile defense.

In Donald Rumsfeld, he chose a defense secretary determined to reform the military and deploy a missile defense. And, in contrast to Clinton, Bush put the task of studying the country's nuclear war plan into the hands of a relatively small group of influential advisers.

The nuclear arms race peaked in 1986, when an estimated 70,000 nuclear warheads worldwide were loaded in submarines, silos or aircraft.

Their targets included not only enemies' nuclear weapons, army bases and the bunkers of political leaders, but also small machine shops that supplied steel plants that fed tank assembly plants. And so on.

Then the Soviet Union collapsed, and its corroding nuclear forces retreated into Russia. So scores of targets in the Ukraine, for instance, were targets no more.

Then-President George Bush, with Cheney as his defense secretary, made several moves. Bush halted the constant cruising of nuke-loaded bombers. He killed missile development programs and a plan to put the multiwarhead MX into a game of rail-based hide-and-seek. He ordered nuclear warheads off surface ships and out of artillery units.

In 1993 he inked a START II deal with then-Russian President Boris Yeltsin to bring both sides down to 3,500 warheads by 2007. Clinton followed by teaming with Yeltsin for START III talks, with a goal of lowering the stakes to 2,500 nuclear weapons per side.

Both nations remain on course to meet by Dec. 5 the final stages of the original Strategic Arms Reduction Treaty - first negotiated in the Reagan years, signed by then-President George Bush and taking effect in the Clinton administration. In the mid-1990s that same treaty yanked Minuteman missiles from the silos that pockmarked Missouri and South Dakota.

START II lacks full ratification from the U.S. Senate, however, and START III talks stalled.

So America's arsenal still holds upward of 6,500 warheads on missiles and airplanes capable of reaching Russia.

Russia has a corresponding batch of more than 5,500. Both must scale down to 6,000 by year's end.

Moscow has called for U.S. and Russian forces to drop to 1,500 or even 1,000 nuclear weapons each. Bush has pledged to "cut to the lowest possible number" without suggesting he yet knows what that number is.

Counting warheads always makes for tricky math.

For example, the 6,000-warhead limit applies only to nuclear explosives the United States has matched with a submarine or bomber or intercontinental ballistic missile. It does not cover the 10,000 other nuclear bombs in bunkers - there, in part, so that the United States would have something to deter another enemy after a shootout with Russia.

America's Minuteman and its Russian equivalent are loaded with one warhead but can easily be converted to carry two more.

How to count reusable bombers has always been a problem.

If the United States should decide to build more B-2s for non-nuclear work, as some have suggested, the Russians might wonder what's to keep them from loading nukes in an emergency.

The B-2 represents another wrinkle - high technology. Even if the Air Force eventually dedicates all of its B-2 force to conventional bombs, it still could enter the calculations.

Plans in the 1970s and '80s might have required a nuclear bomb to knock out a hardened bunker or counted on a hydrogen bomb blast to make up for a lack of precision. Today, satellite-guided cruise missiles or laser-steered bombs can achieve with relatively tame explosives what once demanded the splitting of atoms.

"The Russians I talk to are genuinely concerned about this," said nuclear policy analyst Steve Fetter.

Now teaching public policy at the University of Maryland, in 1993 and 1994 Fetter worked in the Clinton Defense Department on the nation's last Nuclear Posture Review.

The discussions can seem crazy, Fetter said, in the way they contemplate how many hydrogen bombs must be dropped on various parts of the Russian industrial complex to gut the country's military power. A recent analysis by the Natural Resources Defense Council, which advocates protection of the environment and wildlife, called the U.S. nuclear war plan overkill that could easily lead to the death and injury of 50 million Russians.

With the Clinton administration, Fetter said, the study grew to include large numbers of people scattered in several committees passing one consensus after another up the line.

"The result was very much status quo," he said. "It was a lost opportunity."

Now Bush is repeating that process of trying to weigh the nuclear needs. A key committee has an October deadline for suggesting to Bush how low he can go.

In contrast to Clinton, Bush set out a charter that repeatedly calls for a plan to find the deterrence "with the lowest nuclear force level compatible with security requirements." He has given that task to a small group, including former CIA chief R. James Woolsey, made up of people sympathetic to national missile defense and warhead reduction. America's problems with Russian nukes, Woolsey wrote in July, have "nothing to do with the number of their strategic warheads."

Rather, he and others worry about the rickety command and control system of the Russian forces. A 1995 launch of a scientific satellite from Norway, for instance, was mistaken for a few uneasy moments as Americans firing the opening salvo of World War III.

So hawks find common ground with doves such as Thomas B. Cochran, the director of nuclear programs for the Natural Resources Defense Council.

Cochran worries Bush will lead the country to a solo path of arms cutbacks. The cash-strapped Russians might follow, but neither side could count on the nuclear numbers to stay low if they abandon explicit deal-making, he said.

Putin has sworn to forget all arms deals if Bush walks away from the ABM pact.

Cochran and other doves want Bush to stick to existing deals and still go lower, even to an arsenal measured in hundreds instead of thousands. But that is so low, critics contend, that smaller countries might be tempted to jump into the nuclear game.

Yet in the new dynamic of American nuclear policy, Cochran and Woolsey agree that Cold War notions tying firepower to security have gone stale.

"What we worry about today are the accidents," Cochran said. "Us having more nuclear warheads is not going to reduce the chances of the Russians making a mistake."

The Defense Department is waiting for Bush to say that nuclear weapons mean less than they once did, said Owen Cote, associate director of the security studies program at the Massachusetts Institute of Technology.

"If Bush does, that will kick up a storm in Congress," Cote said. "The right wing won't like it. But if he says the world is different, that the mission has changed, then that opens things up for the (warhead) numbers to go way down."

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A Nuclear Nightmare

They look tough, but some plants are easy marks for terrorists

By Douglas Pasternak

He called it Project Worst Nightmare. And in the twisted mind of Donald Beauregard, commander of the 77th Regiment Militia in St. Petersburg, Fla., it surely was. Beauregard's plan was simple—disable the electric power grid feeding the nearby Crystal River nuclear power plant with explosives stolen from a National Guard armory. That would shut down the plant, blacking out St. Petersburg. This was no idle fantasy. When the cops finally caught up with him, Beauregard and his "strike team" had a 20-mm cannon, a .50-caliber machine gun, and a few pipe bombs primed to blow.

Beauregard might have succeeded if an informant hadn't tipped the police. He was prosecuted and clapped off to prison last year. But the FBI took Beauregard's plan seriously enough to incorporate it into a test it ran last May against the Palo Verde nuclear generating station in Arizona.

And here lies the rub. In the past decade, nearly half the nation's 103 power plants have failed mock terrorist attacks against them. The plants that failed, in other words, would not have stopped the Donald Beauregards of the world. In the parlance of counterterrorism, nuclear power plants are among the world's most "hardened" targets. Barbed wire, surveillance cameras, motion sensors, armed response teams—all are designed to make the plants impenetrable to even the most determined saboteur. But interviews with current and former Nuclear Regulatory Commission inspectors, security experts, and plant guards paint a very different picture. Often, security measures at nuclear plants don't work as they should or don't work at all. A review of recent incidents by U.S. News reveals numerous breakdowns in plant security, from criminals being granted access to sensitive areas to inadequate security that places vital equipment within easy reach of an attacker who never even enters the plant's perimeter.

Security experts say a terrorist is far more likely to attack a so-called soft target—such as a government building—than a nuclear power plant. Indeed, argues Lynnette Hendricks of the Nuclear Energy Institute, the nuclear power trade group: "We believe the plants are overly defended at a level that is not at all commensurate with the risk." But in light of attacks against fortified targets such as U.S. embassies, threats against nuclear plants are now considered very real. And concerns about security are likely to mount as the Bush administration calls for greater use of nuclear power. Last year, for instance, Japanese police arrested a man with seven pipe bombs who was planning to blow up a uranium processing plant. Last September, Ukrainian police arrested a group planning to sabotage the Chernobyl reactor. And in the United States, officials list at least 30 threats against nuclear plants since 1978. Most have been hoaxes, but in the mid-1980s, for instance, three of four power lines leading to the Palo Verde plant were sabotaged. And in 1989 four members of Earth First!, a radical environmental group, were charged with conspiring to disable three nuclear power plants in the Southwest.

Rating risks. Despite the threats and the documented security flaws, the nuclear industry has convinced the Nuclear Regulatory Commission—the federal agency that oversees nuclear power plants—that security at these sites would function better with less federal oversight. So starting this fall, the NRC will launch a pilot program allowing the power companies to design their own security exercises—a function formerly performed by federal terrorism experts. The industry says the new program will cost the plants less, yet allow for more frequent tests. But opponents, including many within the NRC, say the industry's track record has hardly earned it the right to looser regulation. In the past year alone, NRC inspectors have discovered alarms and video surveillance cameras that don't work, guards who can't operate their weapons, and guns that don't shoot. "I am very skeptical about the nuclear industry's ability to regulate itself," says Rep. Edward J. Markey, a vocal critic of nuclear security.

High on critics' lists of concerns is the failure rate in the NRC-run mock terrorist assaults—attacks that, if real, could have released radiation more lethal than the 1986 Chernobyl accident that resulted in an estimated 32,000 deaths. These exercises, called Operational Safeguards Response Evaluations, or OSREs, have been run by an outspoken former U.S. Navy SEAL captain named David Orrick. In a typical exercise, a team of three "terrorists" armed with small weapons and basic knowledge of how a plant works attempts to penetrate the facility. They evade or disable security equipment and destroy a set of targets in an effort to damage the plant's nuclear core, causing a radioactive release. In some cases, the mock terrorists make it all the way to the sensitive control room—even though they give plant operators ample advance notice of when they intend to strike.

Proponents of the NRC's mock attacks say they teach valuable lessons. In 1999, the Waterford 3 Nuclear Plant in Taft, La., failed a preliminary mock attack, but the plant's managers said that the exercise did not reflect the plant's true capability. So Orrick's team returned last year to conduct a more rigorous exercise against the plant. "We [the NRC team] just ate them alive," says one NRC inspector. The Waterford 3 site then hired more guards, improved training, and fortified physical barriers. They finally passed an NRC exercise last January. And in May, security guards easily apprehended a man with a history of mental illness who scaled a 10-foot, barbed-wire fence surrounding the site.

Still, critics charge that even the NRC's mock terrorist attacks do not reflect today's real-world scenarios. "There is nothing about protecting against a helicopter assault or a missile taking out one of our positions," says one plant security guard. Last September, for instance, an anti-nuclear demonstrator landed a motorized parafoil on the roof of a nuclear reactor in Bern, Switzerland, before being apprehended by security guards.

While nuclear plant operators design much of their security to prevent attacks from the outside, the record suggests that the greater danger lies within. "If somebody got a job as a janitor and got access to the plant, that's the real threat," says Erik Pakieser, former nuclear security officer at the Prairie Island nuclear generating plant in Minnesota. For instance, at the same time Donald Beauregard was cooking up his Project Worst Nightmare, a maintenance technician at the Crystal River site discovered that someone had intentionally disabled one of the plant's emergency diesel generators. Some nuclear security experts also believe that sabotage should not have been ruled out so quickly as a possible cause of the 1979 accident at the Three Mile Island nuclear plant. Scientists at the Los Alamos National Laboratory found striking similarities between the incident and a computer-generated sabotage scenario they had run several months earlier.

Two decades later, critics remain troubled by the sorts of individuals who can gain access to a nuclear plant. In the early 1990s, a carpenter named Carl Drega got jobs at three nuclear power plants in the Northeast despite an arrest record and a job reference that described him as "volatile." Two months after Drega left the third plant, in 1997, he shot four people to death, including two state troopers, a judge, and a newspaper editor. An NRC investigation of the incident found that none of the three plants had violated their regulations by hiring him.

Easy access. Another insider, a computer programmer who once worked in the control room at the Maine Yankee nuclear power plant, goes to trial next year for murdering seven of his coworkers at a small Massachusetts technology company. Plant coworkers said the programmer, Michael McDermott, slept in a coffin and told a colleague he was sometimes so angry he felt like killing someone. In 1998, a worker at the Turkey Point nuclear plant in Florida had free access to critical areas of the plant for more than a month before officials learned of his 14 arrests. And at the Calvert Cliffs plant in Maryland, officials took eight months to learn that a worker was an illegal Mexican immigrant with fake identification papers and an arrest record. "Charles Manson could get access to a nuclear power plant," says former nuclear security officer Richard Kester.

But some experts worry that attackers can succeed even without getting inside. Classified reports from Sandia National Laboratories show that a well-placed truck bomb would not even have to enter a site's property to destroy vital equipment, leading to a possible release of radiation. In addition, experts say, the water-intake systems at some plants are particularly vulnerable to sabotage by either cutting off the water supply by clogging the intake valve or introducing volatile chemicals into the reactor's cooling system.

An even more accessible target may be spent nuclear material piling up at these plants. Large cooling pools inside reactor containment buildings were designed to store this fuel, but several years ago the pools began to fill up. Now, at many plants, the highly radioactive fuel is stored in cooling pools outside the containment building. "A lot of the spent nuclear fuel casks can be hit with a shoulder-fired missile by someone standing outside the fence," says Dave Lochbaum, nuclear safety engineer at the Union of Concerned Scientists. Yet at plants that are being decommissioned, the nuclear fuel is even less closely guarded. The Maine Yankee plant, which has stored 700 tons of spent fuel in outside cooling pools, has removed all of its vehicle barriers and received the NRC's permission to eliminate its armed guard force once the fuel is placed into dry casks.

The chairman of the NRC, Richard Meserve, says that no matter who runs the security drills, the plants remain among the world's most heavily guarded sites. And he says that the NRC mock attacks are expensive for both the

commission to run and the plants to prepare for. "The reason we are making a big deal about this," says the Nuclear Energy Institute's Hendricks, is that the corrective actions resulting from these exercises "can have a tremendous impact" on a plant owner. "It can cost a million dollars to make these upgrades [of plant security]," she says. In any case, says Meserve, the new self-assessment program is only a trial: If it doesn't work, he says, it will be scrapped. But the chorus of nuclear industry critics continues to grow. "The overall focus [at these sites] is not to protect the public but to get the NRC's blessing and ensure profits," says one nuclear security officer. Starting next week, the Waterford 3 plant, which had boosted security to pass the NRC's terrorist exercise, will begin to reduce its training programs and its guard force. "As soon as the NRC leaves," says one guard, "they downgrade security."

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Deterrence And Arms Control Go Together

The debate about ballistic missile defense and the Anti-Ballistic Missile (ABM) Treaty boils down to this: conservatives put too much faith in deterrence (the threat of punishment) and liberals take too much comfort from arms control (restraint through verification).

Yet, neither deterrence nor arms control, by itself, prevents war.

Conservatives insist that weakness invites aggression, and that strength deters it. But strength can just as easily stimulate aggression, as the everlasting competition among sovereign states attests.

India and Pakistan, in strict military terms, are weakness personified--strategic runts. Yet the nuclear and conventional strength of the U.S. and its Western allies--the greatest assemblage of military might in all of recorded history--excites rather than deadens the subcontinent's drive to smash through the "nuclear apartheid" of the great powers.

Strength deters? Russia dwarfs Chechnya, but the rebels fight on.

The common liberal assumption is that arms races cause political conflicts, leading to belligerence. But usually it is politics that sparks arms races. Resolve a political clash, and the mainspring of arms rivalry breaks apart.

The end of the Cold War demonstrated this to a fare-thee-well. NATO and the now -extinct Warsaw Pact agreed under the Conventional Forces Europe (CFE) Treaty of 1990 to destroy literally tens of thousands of weapons. It was signed in double-quick time, completed in less than two years. Why? CFE was the outcome of prior political events: the dismantling of the Berlin Wall in 1989 and the democratic revolution in Eastern Europe.

Conservatives fear that arms control induces complacency about security threats. Yet, complacency is an ever-present risk in military affairs, absent arms control. Conservatives could just as well argue for the U.S. to give up its unparalleled wealth because prosperity invites softness and lack of vigilance.

Liberals, on the other hand, fear that waxing weapons inventories beget arms rivalry. But the risk of conflict stems largely from antecedent political warfare rather than the sheer number of arms that potential combatants can muster.

The missile defense/ABM debate ought to be resolved on the merits rather than on misconceptions about the effectiveness of deterrence and arms control. In fact, the two are mutually reinforcing, not mutually exclusive. The solution is to meld deterrence and arms control, maximizing the strengths, and minimizing the weaknesses, of both.

That approach arose informally at the Genoa summit this summer, where America and Russia agreed to realign strategic offense and defense in tandem, but outside of a formal negotiating framework, like the ABM Treaty or the two subsequent Strategic Arms Reduction Treaties (START I and START II).

Political conditions are promising for a new strategic relationship. President Bush points out that Moscow and Washington are no longer enemies.

If a new and durable relationship is to emerge, however, both sides must give a little. Moscow must accept that the ABM Treaty's missile defense ban cannot serve as the "cornerstone of strategic stability." Only two nations are party to it, and technological advances have outstripped key provisions.

Americans should remember that arms control is not just a numbers game. The ABM, CFE and START agreements, as well as the unratified Comprehensive Test Ban Treaty in support of them, institutionalized arms control as never before. Inspection and verification procedures were not perfect, but they considerably reduced the risks of cheating, codifying openness and enforcing it with on-site inspections, missile plant monitoring, freer satellite surveillance and greater joint access to missile test geometry.

This useful structure should be preserved, and augmented with a post-ABM Treaty that formally codifies a mixed, unitary strategic force of offensive and defensive missiles on each side, capped with a mutually agreeable ceiling. Offensive forces would be pared automatically as defensive forces are accumulated, an important guarantor of strategic stability and predictability.

The new pact could be bilateral to start with, and evolve into a multilateral mechanism that includes other nuclear missile powers, like China.

Missile defense and arms control are not the either/or proposition that the Bush Administration claims. Deterrence and arms control belong together, each serving as a backstop to the other to fortify international security.