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Nuclear Proliferation and Terrorism

Can "rogue" states and terrorists acquire nuclear weapons?

The recent discovery of a global black market in nuclear weapons and related technology has intensified concerns that so-called rogue nations and terrorist organizations like Osama bin Laden's al Qaeda network might acquire nuclear bombs. The network run by the "father" of Pakistan's atomic bomb, A.Q. Khan, sold nuclear-weapons materials to Iran and North Korea, which have refused to sign the Nuclear Non-Proliferation Treaty (NPT). Virtually all the other nations of the world are signatories. President Bush responded to the revelations about Khan's network with a plan to strengthen international anti-proliferation efforts, including calling on the U.N. Security Council to require all states to criminalize proliferation of components that could be used to make weapons of mass destruction. While arms experts commended the president for focusing on proliferation, some said his proposals did not go far enough.



The mushroom cloud from Romeo, an 11-megaton hydrogen bomb, rises over Bikini Atoll in the South Pacific on March 26, 1954.

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Cover: The mushroom cloud from Romeo, an 11-megaton hydrogen bomb, rises over Bikini Atoll in the South Pacific on March 26, 1954. Most modern nuclear weapons are much weaker; W88 warheads on U.S. submarine-launched ballistic missiles, for example, yield only 475-kilotons, or 32 times the power of the bomb dropped on Hiroshima, Japan, in 1945. A megaton is equivalent to 1 million tons of TNT, a kiloton to 1 thousand tons. (U.S. Department of Energy)

Nuclear Proliferation and Terrorism

BY MARY H. COOPER

THE ISSUES

Concern about nuclear terrorism rose to new levels when A.Q. Khan, the revered father of Pakistan's nuclear bomb, confessed recently to peddling nuclear weapons technology to Libya and other rogue states.

Khan's dramatic confession punctured any remaining illusions that 60 years of nonproliferation efforts had kept the world's most dangerous weapons out of the hands of countries hostile to the United States and its allies. Moreover, he enhanced fears that terrorist groups bent on destroying the United States — like Osama bin Laden's al Qaeda network — may be closer than anyone had realized to acquiring nuclear weapons.

"A nuclear 9/11 in Washington or New York would change American history in ways that [the original] 9/11 didn't," says Graham Allison, director of Harvard University's Belfer Center for Science and International Affairs. "It would be as big a leap beyond 9/11 as 9/11 itself was beyond the pre-attack illusion that we were invulnerable."

Khan's January confession followed the revelation that he had operated a busy black-market trade in centrifuges, blueprints for nuclear-weapons equipment to enrich uranium into weapons-grade fuel and missiles capable of delivering nuclear warheads. Khan's vast network involved manufacturers in Malaysia, middlemen in the United Arab Emirates and the governments of Libya, North Korea and Iran.¹

Several countries in Khan's network were known to have violated the 1968 Nuclear Non-Proliferation Treaty (NPT)



AFP Photo/Philippe Lopez

Terrorist leader Osama bin Laden, left, with his deputy, Ayman al-Zawahiri, has said he wants to use a nuclear bomb against the West. The recent sale of black-market nuclear-weapons technology to North Korea and Iran and the terrorist bombing of passenger trains in Madrid, killing more than 190 people, have intensified concerns about nuclear weapons falling into the hands of "rogue" states or terrorists.

and hidden their weapons programs from inspectors for the U.N.'s International Atomic Energy Agency (IAEA).² NPT signatories promise to forgo nuclear weapons in exchange for help from the world's five official nuclear powers — the United States, Russia, China, France and Britain — in building civilian nuclear power plants.

In fact, North Korea has bragged that it is developing nuclear weapons, Iraq tried for years to produce weapons-grade fuel, and Iran recently barred IAEA inspections from its nuclear facilities amid allegations that it was developing a bomb. Libya's admission in December that it, too, had tried to build the bomb blew the cover on Khan's network. (See sidebar, p. 308.)

But the extent of Khan's black-market activities stunned even the most seasoned observers. "I was surprised by the level of commerce in the supporting supply network," says Charles B. Curtis, president of the Nuclear Threat Initiative, an advocacy group that calls

for stronger measures to stop the spread of nuclear weapons. "While there had been suggestions that the Pakistanis were nefariously engaged in both Iran and North Korea, the extent of the engagement in Libya and indications that there was an attempt to market proliferation technology in Syria exceeded the darkest suspicions of the intelligence community."

Given the grim realities of the post-9/11 world, fear of nuclear terrorism has dominated the international response to Khan's revelations. President Bush has proposed several measures to strengthen international anti-proliferation efforts. "In the hands of terrorists, weapons of mass destruction would be a first resort," Bush said. "[T]hese terrible weapons are becoming

easier to acquire, build, hide and transport. . . . Our message to proliferators must be consistent and must be clear: We will find you, and we're not going to rest until you're stopped."³

But many experts say the president's proposals will not provide adequate safeguards against these lethal weapons. Wade Boese, research director of the Arms Control Association, a Washington think tank, commends the administration for emphasizing proliferation and pointing out that it is the most serious threat facing the United States today. However, he notes, since 9/11, the Bush administration has only "maintained the status quo" on funding for programs that deal with the threat of nuclear proliferation.

"The Khan network underscores the fact that we're in a race to tighten down security around [nuclear-weapons technology] so the terrorists can't get it," Boese says. "If this is such an urgent priority, which it is, why

Russia Has Most Nuclear Warheads

Russia and the United States have most of the more than 28,000 nuclear warheads stockpiled today. India, Israel and Pakistan — which have not signed the Nuclear Non-Proliferation Treaty (NPT) — have enough nuclear materials to produce more than 300 warheads. North Korea and Iran are both thought to be developing nuclear bombs. It is unknown whether terrorist groups have or are developing nuclear weapons.

Worldwide Nuclear Stockpiles

Country	Nuclear Weapons (estimated)
NPT Signatories	
China	410
France	350
Russia	18,000
United Kingdom	185
United States	9,000
Non-NPT Signatories *	
India	95 (max.)
Israel	200 (max.)
Pakistan	52 (max.)
Maximum total	28,292

** The number of warheads that could be produced with the amount of weapons-grade nuclear material these countries are thought to possess. The total number of assembled weapons is not known.*

Source: Carnegie Endowment for International Peace, 2004

not fund it like it is and recognize that we're in a race with the terrorists?"

During the Cold War, both the United States and the Soviet Union understood that using nuclear weapons would amount to mass suicide. The doctrine of mutual assured destruction — MAD — ensured that a nuclear attack by one superpower would unleash a full-scale response by the other, resulting in annihilation on a national, if not global, scale. Consequently, the theory went, rational leaders would avoid using nuclear weapons at all costs.

But al Qaeda and other radical Islamist organizations don't appear to operate under such constraints. Their suicide bombers embrace death as martyrdom in their quest to destroy the "Great Satan."⁴ And because they operate in a number of countries and have no permanent, identifiable headquarters, terrorist groups also have no "return address" to target for a counterattack.

As a result, keeping weapons-grade plutonium and highly enriched uranium out of the hands of terrorists is the only sure way to block terrorists

from building nuclear bombs, many experts say.

"The essential ingredients of nuclear weapons are very hard to make and don't occur in nature," notes Matthew Bunn, a nuclear-terrorism expert at the Belfer Center. "But once a well-organized terrorist group gets hold of them, it could make at least a crude nuclear explosive."

Instructions for making a nuclear bomb are not secret; they are even on the Internet. "The secret is in making the nuclear material," Bunn points out, "and that, unfortunately, is the secret that A.Q. Khan was peddling."

While the ability of terrorists to stage a full-scale nuclear attack is of paramount concern, experts say the use of a conventional explosive device containing radioactive waste — a so-called dirty bomb — is far more likely. A dirty bomb in an urban area could contaminate dozens of city blocks, fomenting panic and costing tens of billions of dollars in lost revenues and devalued real estate, even if it claimed no human lives.⁵

"A dirty bomb is pretty likely to happen," says Leonard S. Spector, director of the Center for Nonproliferation Studies' Washington office, a part of the Monterey Institute of International Studies. A dirty bomb can be made easily with radioactive materials, such as cesium, used in X-ray machines and other commonplace diagnostic equipment. Moreover, he points out, civilian nuclear-waste facilities are much easier to penetrate than weapons facilities.

"We have to do our best to control as much of the radioactive material as possible," he says, "but it's already the subject of criminal activities. So we're recommending that people get ready for this one."

As policymakers examine the impact of Khan's nuclear black marketeering on U.S. counterproliferation policy, these are some of the questions being considered:

Is the Non-Proliferation Treaty still an effective shield against the spread of nuclear weapons?

The United States launched the atomic age when it detonated the first atomic bomb in 1945. But After Britain, China, France and the Soviet Union developed their own nuclear weapons, the great powers sought to put the nuclear genie back in the bottle. The landmark 1968 Non-Proliferation Treaty embodied a "grand bargain," by which the five countries with nuclear arsenals agreed to help the rest of the world develop nuclear power for peaceful uses in exchange for the non-nuclear states' promise to forgo nuclear weapons. The IAEA was to oversee compliance with the treaty, which enjoyed near universal support.

However, India, Israel and Pakistan — all of which have since developed nuclear weapons — never signed the treaty. And North Korea, which signed but later renounced the treaty, recently boasted that it is on the threshold of developing nuclear weapons.

The absence of universal adherence to the NPT reveals the treaty's basic weakness. "The fact that a very small number of individuals — nobody believes that A.Q. Khan was acting alone — can create a network that provides some of the most worrisome states on the planet with the technology needed to produce nuclear weapons is very troubling," Bunn says. "It shows that the NPT regime is only as strong as its weakest links. We can secure 90 percent of the nuclear material to very high levels, but

if the other 10 percent is vulnerable to theft, we still won't have solved the problem because we're dealing with intelligent adversaries who will be able to find and exploit the weak points."

In fact, some experts say that weaknesses doom the NPT to failure. "Arms-control regimes are not capable of dealing with the hard cases," says John Pike, a defense policy expert and founding director of GlobalSecurity.org, a nonprofit organization that studies emerging security threats.



Protesters in Seoul, South Korea, burn a North Korean flag and an effigy of Kim Jong Il on Dec. 28, 2003, calling on North Korea's leader to end the country's efforts to build a nuclear bomb.

Getty Images

"The logic of the NPT just doesn't get you very far in Tehran [Iran] or Pyongyang [North Korea]," Pike says. "It's not going to matter to India or Pakistan, which have their own fish to fry. And the Israelis are not going to let go of their arsenal until there is a just and lasting peace in the Middle East," Pike says. "I'm afraid we're rapidly approaching a situation in which there are more nuclear-weapons states outside the NPT than inside, and the treaty itself provides no way whatsoever of addressing that problem."

The nonproliferation regime also lacks adequate verification and enforcement provisions, critics say. "The NPT was a confidence-building measure, not a true arms-control treaty," says C. Paul Robinson, director of Sandia National Laboratories, a division of the Energy Department's National Nuclear Security Administration. Robinson also was chief U.S. negotiator of the U.S.-Soviet Threshold Test Ban and Peaceful Nuclear Explosions Treaties, both ratified in 1990. None of the requirements normally found in arms-control treaties

to verify compliance were included in the NPT, he says. "So there's nothing in the original NPT designed to catch cheaters."

After the 1991 Persian Gulf War, the nuclear nonproliferation community was surprised to learn that Iraq had been secretly developing nuclear weapons. So an "Additional Protocol" was added to the NPT allowing for more thorough inspections of suspected weapons facilities, but only 38 countries have ratified it. In any case, Robinson dismisses the protocol as little more than a "Band-Aid."

Even IAEA Director Mohamed El-Baradei said the NPT regime does not prevent nuclear proliferation. "You need a complete overhaul of the export-control system," he said. "It is not working right now."⁶

But the Bush administration says if the NPT and the IAEA oversight powers are strengthened, nonproliferation can remain a credible goal. On Feb. 11, Bush outlined seven steps designed to make the regime more effective in

Continued on p. 303

A Chronology of Nuclear Close Calls

The superpowers came close to using nuclear weapons several times during the Cold War, sometimes due to tensions that might have escalated, and sometimes due to simple accidents or mistakes. The end of the Cold War in 1991, however, did not end the threat of nuclear conflict.

First year of Korean War, 1950-51 — President Harry S. Truman sends atomic weapons to Guam for possible use against North Korea; Strategic Air Command makes plans to coordinate an atomic strike. Gen. Douglas MacArthur pushes for attacks on China, possibly using atomic weapons.¹

The Offshore Islands Crises, 1954-55, 1958 — Testing America's resolve, China bombs Quemoy and Matzu, two Nationalist-held islands near the mainland. U.S. officials warn they will use atomic weapons to defend the islands.²

Mistake in Greenland, October 1960 — The American early-warning radar system in Thule, Greenland, mistakenly reports a "massive" Soviet missile launch against the United States. A reflection on the moon 250,000 miles away is thought to be a missile launch 2,500 miles away.³

Flashpoint Berlin, 1961 — Soviet threats regarding West Berlin prompt President John F. Kennedy to consider a nuclear first-strike against the U.S.S.R. if it attacks the city.⁴

Cuban Missile Crisis, October 1962 — President Kennedy considers invading Cuba to remove Soviet nuclear missiles, unaware the Soviets plan to respond with nuclear weapons. The Strategic Air Command goes to Defense Condition 2 (DEFCON 2), the second-highest state of readiness, for the only time in U.S. history. After an American naval quarantine of the island, Soviet Premier Nikita Khrushchev withdraws the missiles.⁵

B-52 Crash in Greenland, January 1968 — A B-52 carrying four thermonuclear bombs crashes near the U.S. early-warning base in Greenland. If the bombs' safety features had failed, the detonation could have been viewed as a surprise attack on America's early-warning system, prompting nuclear retaliation.⁶

Sino-Soviet Conflict, 1969 — Soviet Defense Minister Andrei Grechko advocates a nuclear strike against China to deal with what is perceived as an inevitable future war. Fearing the U.S. reaction, the Soviets refrain.⁷

Yom Kippur War, October 1973 — Egypt and Syria attack Israel, and after initial successes face military disaster. The Soviet Union indicates it might intervene to rescue its client states if Israel continues to refuse a cease-fire; Soviet airborne forces are put on alert, and U.S. military forces also go on alert. Israel agrees to a cease-fire and the superpower crisis ends.⁸

War Game Turns 'Real' at NORAD, 1979-80 — In November 1979, a technician at the North American Air Defense (NORAD) facility in Cheyenne Mountain, Colo., accidentally places a training tape simulating a nuclear attack on the United States into the base computer system. The mistake is corrected in six minutes — but after the president's airborne command post is launched. Twice in June 1980, false attack warnings

caused by faulty computer chips send bomber crews racing for their planes.⁹

Tension in Europe, Early 1980s — After the Soviet Union deploys new nuclear missiles in Europe, the United States follows suit. Soviet leader Yuri Andropov fears NATO is planning a nuclear first-strike and orders Soviet intelligence to find the non-existent evidence. Tension in Europe decreases when Mikhail Gorbachev replaces Andropov.¹⁰

Soviet Pacific Fleet, August 1984 — A rogue officer at the Soviet Pacific Fleet in Vladivostok broadcasts an unauthorized war alert to Soviet naval forces, which, like American vessels, are armed with nuclear weapons. Soviet, U.S. and Japanese forces all prepare for battle. After 30 minutes, the alert is determined to be false.¹¹

Norwegian Sea, January 1995 — Russian radar detects an inbound missile over the Norwegian Sea, and President Boris N. Yeltsin opens his nuclear command briefcase and confers with his military commanders. The missile turns out to be a Norwegian weather rocket.¹²

Kargil, Kashmir, May-July 1999 — A year after nuclear tests by India and Pakistan, Pakistan invades Kargil, in Indian-controlled Kashmir, and battles Indian forces from May until July. The crisis between the two rival nuclear powers is described as "warlike." Pakistan withdraws in July under heavy international pressure.¹³

Attack on the Indian Parliament, December 2001-January 2002 — Islamic militants probably connected to Pakistan's intelligence service attack India's Parliament. India demands that Pakistan cease supporting Islamic fighters. Hundreds of thousands of troops face off at the Indo-Pakistani border; both sides discuss a possible nuclear exchange. Tensions ease after Pakistan cracks down on Islamist groups.¹⁴

— **Kenneth Lukas**

¹ Burton Kaufman, *The Korean Conflict* (1999).

² John W. Garver, *Foreign Relations of the People's Republic of China* (1993), pp. 50-60.

³ Center for Defense Information (CDI), www.cdi.org/Issues/NukeAccidents/accidents.htm.

⁴ Fred Kaplan, "JFK's First Strike Plan," *The Atlantic Monthly*, October 2001, pp. 81-86.

⁵ Graham Allison and Philip Zelikow, *Essence of Decision* (1999).

⁶ Scott D. Sagan, *The Limits of Safety* (1993), pp. 180-193.

⁷ Garver, *op. cit.*, pp. 305-310.

⁸ P. R. Kumaraswamy (ed.), *Revisiting the Yom Kippur War* (2000).

⁹ Sagan, *op. cit.*, pp. 228-233.

¹⁰ Christopher Andrew and Vasili Mitrokhin, *The Sword and the Shield* (1999).

¹¹ CNN, www.cnn.com/SPECIALS/cold.war/episodes/12/spotlight/.

¹² CNN, *op. cit.*

¹³ Yossef Bodansky, "The Kargil Crisis in Kashmir Threatens to Move into a New Indo-Pak War, With PRC Involvement," *Defense & Foreign Affairs Strategic Policy*, May/June 1999, p. 20.

¹⁴ Seymour M. Hersh, "The Getaway," *The New Yorker*, Jan. 28, 2002, p. 36.

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dealing with the threat of what the State Department calls “rogue” states and nuclear terrorism, including U.S. Senate approval of the Additional Protocol (*see p. 312*).

Other analysts say world dynamics have changed so dramatically since the NPT took effect that the nonproliferation regime needs a revolutionary overhaul. “The treaty was about controlling states and governments, not rogue individuals or terrorists who get their hands on these weapons,” says Boese of the Arms Control Association. “The nonproliferation regime needs to be modified to better address this gap.”

“The system has been pretty remarkable and successful, but is now in sufficient need of radical repair that we need a big jump forward,” says Allison of the Belfer Center, who as assistant Defense secretary oversaw the Clinton administration’s efforts to reduce the former Soviet nuclear arsenal. “We should now build a global alliance against nuclear terrorism, and the core of its strategy should be the doctrine of what I call the three ‘Nos:’ ”⁷

- “No loose nukes” — Allison coined the phrase a decade ago to describe weapons and weapons-grade materials inadequately secured against theft. “These weapons and materials must be protected to a new security standard adequate to prevent nuclear terrorists from attacking us,” he says. Under Allison’s proposal, all nuclear states would have to be certified by another member of the nuclear club that all their nuclear materials had been adequately secured. The NPT has no such requirement.
- “No new nascent nukes” — New production of highly enriched uranium and plutonium would be barred. “If you don’t have either one of them, you don’t have a nuclear weapon,” Allison says.

- “No new nuclear weapons” — Noting North Korea’s nuclear ambitions, Allison acknowledges that this is the most difficult but potentially most important goal. “To accept North Korea as a new member of the nuclear club would be catastrophic,” Allison says, “because North Korea historically has been the most promiscuous proliferator on Earth.”

North Korea has sold nuclear-capable missiles to Iraq, Pakistan and other would-be nuclear powers. If Pyongyang develops a nuclear arsenal, most experts agree, other countries in the region, including South Korea, Japan and Taiwan, would be tempted to jettison the NPT and develop their own arsenals in defense, setting off a potentially disastrous regional arms race. “A nuclear North Korea,” Allison says, “would blow the lid off the previous arms control and nuclear proliferation regime.”

Is the United States doing enough to halt nuclear proliferation?

Since the fall of the Soviet Union in 1991, the United States has concentrated its nonproliferation efforts on preventing the theft or sale of nuclear weapons and materials left in Russia, Ukraine and other former Soviet republics. The 1991 Soviet Nuclear Threat Reduction Act — renamed the Cooperative Threat Reduction (CTR) program in 1993 — was designed to help former Soviet satellite countries destroy nuclear, chemical and biological weapons and associated infrastructure. Nicknamed Nunn-Lugar after the law’s original sponsors (Sens. Sam Nunn, D-Ga., and Richard G. Lugar, R-Ind.), it also established verifiable safeguards against the proliferation of such weapons.

Recent U.S. efforts to control the worldwide supply of nuclear weapons and materials have focused almost solely on the CTR program: More than 50 former Soviet nuclear-storage sites have been secured and new security sys-

tems installed. Besides locking up nuclear materials and establishing security perimeters around the storage sites, says Robinson of Sandia Labs, the CTR program installs detection equipment to warn of any movement of the guarded material. “This material is being locked up and safeguarded,” Robinson says. Sandia designs and installs the nuclear-security systems and trains foreign technicians on their use.

But critics say the agreement is woefully inadequate. “Very, very little progress has taken place,” says Curtis of the Nuclear Threat Initiative, which Nunn co-founded. “There is an inertia that simply must be overcome with presidential leadership in all the participant countries.”

The Bush administration recognizes the importance of securing Russia’s nuclear stockpiles. In 2002, the United States, along with Britain, France, Canada, Japan, Germany and Italy, agreed to spend \$20 billion over 10 years to support CTR programs — with half of it, or \$1 billion a year, to come from the United States.

But that amounts to only about a quarter of 1 percent of the current Defense Department budget of about \$401 billion, Bunn points out. “Amazingly,” he adds, despite the new terrorist threats throughout the world, U.S. funding for the CTR programs “hasn’t increased noticeably since Sept. 11.”

Bunn is not alone. A task force led by former Sen. Howard H. Baker Jr., R-Tenn., and former White House Counsel Lloyd Cutler in January 2001 called for a tripling in annual CTR spending — to \$3 billion a year.⁸

Inadequate funding has slowed the pace of securing Russia’s nuclear sites, critics say. “We’re not doing all that we know how to do and all that we must to keep these weapons and materials safe,” Curtis says. After more than a decade of Nunn-Lugar efforts, only half of Russia’s nuclear weapons have been adequately secured, Curtis points out.

Critics of the war against Iraq suggest that the campaign to topple Saddam Hussein expended precious resources that could have gone toward halting the spread of nuclear materials. The first order of business in combating nuclear terrorism, Allison says, is to list potential sources of nuclear weapons, in order of priority. "Saddam clearly had nuclear ambitions, and the CIA said that over the course of a decade he might realize them," Allison says. "So he deserved to be on the list somewhere down there, but he wasn't in the top dozen for me."

The nuclear weapons and materials that remain vulnerable to theft in Russia are at the top of Allison's list, primarily because of the magnitude of the problem. "We've still got 120 metric tons of highly enriched uranium and plutonium in Russia alone that we haven't even begun security upgrades on," Curtis points out.

Second on Allison's list is North Korea. By repudiating the Clinton administration's "Agreed Framework" with North Korea and refusing to engage in negotiations with the regime until it renounces its nuclear program, Allison says the Bush administration has allowed "North Korea to just about declare itself a nuclear-weapons state. For the past three years, they have been given a pass. And what have they been doing while they got a pass? They've been creating more plutonium every day, as they are today." Recent six-party talks in Beijing aimed at halting North Korea's nuclear-weapons program ended without significant progress.⁹

Third on Allison's priority list is Pakistan. Because it is not a party to the NPT, Pakistan's nuclear-weapons inventory is unknown. But according to a recent CIA analysis, Pakistan's Khan Research Laboratories has been providing North Korea with nuclear fuel, centrifuges and warhead designs since the early 1990s.¹⁰ No one knows how many other customers Khan supplied over the past decade.

"A coherent strategy has got to deal with the most urgent potential sources of supply to terrorists first," Allison says. "When all this other stuff has been happening, why was Iraq the focus of attention for two years?"

Although no evidence that Iraq had recently pursued nuclear weapons has been found since the United States invaded the country over a year ago, Bush continues to defend his decision to overthrow Hussein's regime in the name of counterproliferation.

"The former dictator of Iraq possessed and used weapons of mass destruction against his own people," Bush said on Feb. 11. "For 12 years, he defied the will of the international community. He refused to disarm or account for his illegal weapons and programs. He doubted our resolve to enforce our word — and now he sits in a prison cell, while his country moves toward a democratic future."

Although Russia and Pakistan are widely regarded as the biggest potential sources of nuclear proliferation, the United States has a mixed record on safeguarding its own nuclear materials. The United States exported highly enriched uranium to 43 countries for nearly four decades as part of the Atoms for Peace program, sanctioned by the NPT, to help other countries acquire nuclear technology for peaceful purposes. The uranium was supposed to be returned to the United States in its original form or as spent fuel. But according to a recent report by the Energy Department's inspector general, the United States has made little headway in recovering the uranium, which is enough to make about 1,000 nuclear weapons.¹¹

"While we should be locking up materials at risk wherever we can and recovering them when needed, the Department of Energy has been leisurely pursuing its program to recover highly enriched uranium at risk in research facilities around the world," Curtis says. "This is a leisure that we can ill afford."

Should nonproliferation policy aim to eliminate all nuclear weapons?

Article VI of the NPT requires countries with nuclear weapons to take "effective measures" to end the arms race and work toward nuclear disarmament. This was an essential component of the "grand bargain" used to lure the rest of the world to forgo nuclear arms.

As the sole remaining superpower, the United States plays a key role in leading the world toward disarmament. "Nonproliferation strategies have always been linked to U.S. efforts to reduce reliance on its nuclear forces, so there's always been an arms control link to the NPT as part of the essential bargain," says Curtis of NTI. "The world community also considers it a prerequisite for the United States to exercise its moral leadership on nonproliferation, that it be seen to be living up to its side of that bargain."

During the Cold War, the United States and the Soviet Union, which had amassed vast nuclear arsenals, signed a series of treaties that first limited, and then began to reduce, the number of nuclear weapons on each side.¹² On May 24, 2002, President Bush and Russian President Vladimir V. Putin signed the latest of these, the Strategic Offensive Reductions Treaty (SORT). It called on the two countries to reduce their current number of strategic nuclear warheads by nearly two-thirds by Dec. 31, 2012 — to 1,700-2,200 warheads.

"President Putin and I have signed a treaty that will substantially reduce our strategic nuclear warhead arsenals to . . . the lowest level in decades," Bush declared at the Moscow signing ceremony. "This treaty liquidates the Cold War legacy of nuclear hostility between our countries."

But critics say the so-called Moscow Treaty will be far less effective in ridding the world of nuclear weapons than the president's comments suggest. "The agreement doesn't require

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Defusing North Korea and Iran

The good news: Only two so-called rogue nations are suspected of trying to build nuclear weapons. (Libya recently promised to end its bomb-making efforts, and Iraq never was close to having a bomb, U.N. inspectors say.) The bad news: The two rogue nations are North Korea and Iran.

North Korea is considered the more immediate threat. The shaky truce that ended the bloody Korean War (1950-53) has not removed the threat of hostilities between the reclusive, authoritarian regime and U.S.-supported South Korea, which relies on a large U.S. military presence for much of its defense.

Under the 1994 Agreed Framework brokered by President Bill Clinton, North Korea agreed to freeze production of plutonium — needed in the production of some nuclear weapons — in exchange for U.S. energy assistance and improved diplomatic relations. That agreement fell apart in October 2002, when the Bush administration accused North Korean leader Kim Jong Il of trying to enrich uranium in violation of the Non-Proliferation Treaty (NPT).

In January 2003, North Korea withdrew from the NPT and kicked out U.N. International Atomic Energy Agency (IAEA) inspectors. North Korea has continued to deny it has a uranium-enrichment program but openly acknowledges its plutonium program, which may already have produced one or two nuclear weapons.

The most recent talks aimed at ending North Korea's nuclear-weapons ambitions, held in late February 2004 in Beijing, also involved China, Russia, Japan and South Korea. The talks failed to overcome the impasse between the Bush administration, which insists on the "complete, verifiable and irreversible dismantlement" of North Korea's nuclear programs before the United States will agree to improve bilateral relations, provide economic and energy assistance and offer "security guarantees" that it will not invade North Korea.

Prospects for the success of follow-up talks soured further

on March 20, when North Korea warned it would expand its nuclear-weapons program if the yearly U.S.-led military exercises in South Korea proceed as scheduled in late March.¹

Iran's nuclear ambitions raised concern two years ago with the discovery of a large uranium-enrichment plant south of Tehran, the capital. Iran, a signatory to the NPT, claims its nuclear program is used purely to generate electricity. In mid-March, after the IAEA censured Tehran for not fully disclosing its nuclear program, Iran temporarily barred the agency from the country. Inspections were set to resume on March 27.

Meanwhile, IAEA Director Mohamed ElBaradei has appealed to President Bush to launch talks with Iran aimed at improving bilateral relations, which have remained hostile since Islamic clerics wrested control of Iran from the U.S.-supported regime of Shah Mohammed Reza Pahlavi in 1979.

Ending Iran's and North Korea's nuclear ambitions will require convincing both countries that they don't need nuclear weapons to defend themselves, experts say. "To strengthen the international non-proliferation regime, we're going to have to provide security assurances as well as economic aid," says Matthew Bunn, a nuclear-weapons expert at Harvard University's Belfer Center for Science and International Affairs. "There's going to have to be some kind of security assurance that the United States isn't going to invade Iran and overthrow its government. That's the center of the discussion with North Korea as well."

Failure to do so may lead to regional arms races that could quickly get out of control. If North Korea produces a nuclear arsenal, predicts John Pike of GlobalSecurity.org, Japan may feel sufficiently threatened to transform some of its civilian power-plant nuclear materials to build nuclear weapons in self-defense. "Then South Korea is going to need them, and Taiwan's going to need them," he says. "That will make China want to have more, which will prompt India to need more, and then Pakistan will, too."

¹ United Press International, "N. Korea Warns U.S. over War Exercises," March 20, 2004.



AFP Photo

North Korean leader Kim Jong Il

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the destruction of a single warhead or a single delivery vehicle,” says Boese of the Arms Control Association. Warheads that are removed from deployment could be disassembled or stored rather than destroyed. “Also, the agreement’s limit is actually in effect for just one day — Dec. 31, 2012,” Boese says. “Because neither side has to destroy anything after that day, presumably they could then rebuild their arsenals.”

After the Sept. 11 terrorist attacks, the Bush administration toughened U.S. policy on nuclear weapons and other weapons of mass destruction (WMD). The new national strategy to combat nuclear, biological and chemical weapons, issued in December 2002, called for strengthening “traditional measures — diplomacy, arms control, multilateral agreements, threat-reduction assistance and export controls.” But for the first time, the United States openly warned that it would pre-emptively attack adversaries thought to be preparing to use weapons of mass destruction against the United States.

“U.S. military forces . . . must have the capability to defend against WMD-armed adversaries, including, in appropriate cases, through pre-emptive measures,” the administration declared. “This requires capabilities to detect and destroy an adversary’s WMD assets before these weapons are used.”¹³

Meanwhile, the administration’s latest Nuclear Posture Review, sent to Congress on Dec. 31, 2001, called for research into new types of nuclear weapons and outlined new uses for them.¹⁴ As part of that policy, the administration has initiated research into the “bunker buster,” a missile armed with a low-yield (less than five kilotons) nuclear warhead designed to penetrate and destroy enemy arsenals or other targets buried deep underground. To enable research to proceed, Congress last year overturned a Clinton-era ban on research and development of low-yield nuclear weapons.¹⁵

“The reason it was important to reduce or get rid of the prohibition on low-yield nuclear weapons was not because we’re trying to develop or are developing low-yield nuclear weapons,” said National Nuclear Security Administrator Linton Brooks. “That’s a misconception. . . . What we said was that the amendment was poorly drawn and it prohibited research that could lead to a low-yield nuclear weapon.”¹⁶ In fact, research on high-powered “bunker buster” bombs commenced in 2003, after Congress overturned the ban.¹⁷

Since taking office, the administration has rejected arms control as an essential tool for reducing the nuclear threat. Shortly after being sworn into office, Bush said he would not re-submit the 1996 Comprehensive Test Ban Treaty to the Senate for ratification. He also abrogated the 1972 U.S.-Soviet Anti-Ballistic Missile Treaty, which barred signatories from building national defense systems to protect against ballistic-missile attack — a move designed to discourage the superpowers from building more nuclear weapons to overcome such defenses.

Bush instead announced he would pursue earlier plans to build a National Missile Defense System while seeking a “new strategic framework” for dealing with Russia that would focus on reductions in nuclear weapons.¹⁸ The first U.S. anti-missile defense facility, scheduled for deployment in Alaska this summer, has faced criticism for its technical flaws and for undermining the United States’ credibility as a strong advocate of nuclear disarmament.¹⁹

“The current U.S. approach to proliferation emphasizes non-treaty methods and military means, including the effort to deploy a national missile defense system,” said John Cirincione, director for nonproliferation at the Carnegie Endowment for International Peace. “The system faces formidable technical challenges and is unlikely to be militarily effective anytime in this decade. Every system within the missile-defense pro-

gram is behind schedule, over budget and underperforming.”²⁰

While supporters of the administration’s nuclear policy say the changes were needed to protect the United States in a new era of uncertainty, critics say they undermine the administration’s credibility in its calls to strengthen global anti-proliferation measures.

“If you’re trying to build a consensus [on halting proliferation] while at the same time saying we need a few more different nuclear weapons, I would say those are inconsistent arguments,” Allison says. “I’ve negotiated on behalf of the U.S. government many times when I felt I had a weak hand, but I couldn’t imagine keeping a straight face in trying to argue these two goals at the same time.” ■

BACKGROUND

Manhattan Project

The nuclear age traces its origins to 1938, when scientists in Nazi Germany split the nucleus of a uranium atom, releasing heat and radiation. The potential of nuclear fission, as the process was called, to produce weapons of unparalleled power prompted a recent refugee from Germany — Albert Einstein — to alert President Franklin D. Roosevelt. “[T]he element uranium may be turned into a new and important source of energy in the immediate future,” the already-legendary physicist wrote. “[T]his new phenomenon,” he added, could lead “to the construction of bombs . . . , extremely powerful bombs of a new type.”²¹

In 1939, even before the United States entered World War II or realized the full implications of Einstein’s

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Chronology

1930s-1980s

Atomic Age begins and evolves into the Cold War.

1938

Scientists in Nazi Germany split the nucleus of a uranium atom. A year later, the U.S. Manhattan Project enters the race to create an atomic bomb.

Aug. 6, 1945

U.S. drops an atomic bomb on Hiroshima, Japan, followed on Aug. 9 by another on Nagasaki, killing a total of more than 250,000 people. Two days later, Japan surrenders, ending World War II.

1949

The Soviet Union tests its first atomic weapon.

Dec. 8, 1953

President Dwight D. Eisenhower's "Atoms for Peace" proposal calls for using fissionable material "to serve the peaceful pursuits of mankind."

1957

International Atomic Energy Agency (IAEA) is created to promote peaceful use of nuclear energy.

May 26, 1958

Eisenhower opens first U.S. nuclear power plant, at Shippingport, Pa.

1964

China joins the United States, Soviet Union, Britain and France in the "nuclear club" of officially recognized nuclear-weapons states.

July 1, 1968

Nuclear Non-Proliferation Treaty (NPT) is signed by 98 countries after a decade of talks.

1969

Treaty of Tlatelolco bars nuclear weapons from Latin America. Brazil and Argentina are the last nations to sign, in the 1990s.

1981

Israel destroys an Iraqi nuclear reactor, claiming it was being used to produce fuel for weapons.

1990s Cold War ends, posing new proliferation threats.

1991

Soviet Union collapses. . . . Persian Gulf War against Iraq, an NPT signatory, reveals that Saddam Hussein had been trying to develop nuclear weapons. . . . Soviet Nuclear Threat Reduction Act sponsored by Sens. Sam Nunn, D-Ga., and Richard G. Lugar, R-Ind., authorizes the United States to help former Soviet-bloc countries destroy nuclear, chemical and biological weapons and establishes verifiable safeguards against their proliferation.

1993

Nunn-Lugar program is broadened and renamed the Cooperative Threat Reduction (CTR) program. . . . South Africa becomes first country with nuclear weapons to renounce its nuclear program and join the NPT.

October 1994

North Korea agrees to freeze its plutonium production in exchange for U.S. assistance in producing energy.

1996

President Bill Clinton signs the Comprehensive Test Ban Treaty.

1998

India and Pakistan join Israel on the list of non-NPT signatories with nuclear weapons.

2000s Massive terrorist attacks raise the specter of nuclear terrorism.

Sept. 11, 2001

Suicide airline hijackers linked to Osama bin Laden's al Qaeda terrorist group kill nearly 3,000 people in the worst terrorist attacks in U.S. history.

2002

President Bush disavows the U.S. pact with North Korea and calls on Kim Jong Il to renounce his nuclear ambitions as a condition of the resumption of U.S. aid.

March 19, 2003

U.S. troops invade Iraq but find no weapons of mass destruction.

Dec. 19, 2003

Libya agrees to terminate its nuclear-weapons program, revealing evidence of a Pakistan-based black market in nuclear technology.

Feb. 6, 2004

Pakistani President Pervez Musharraf pardons Abdul Qadeer Khan, founder of Pakistan's nuclear-weapons program, for selling nuclear technology to Iran, North Korea, Libya and possibly others.

Feb. 11, 2004

President Bush responds to the revelations about Khan's network with a seven-point plan to strengthen the NPT and IAEA's enforcement powers.

Fall of a Nuclear Black Marketeer

As A.Q. Khan tells it, the horrors of religious intolerance he witnessed as a 10-year-old Muslim in India turned him into the world's leading black-market merchant of nuclear-bomb materials.¹

"I can remember trains coming into the station full of dead Muslims," Khan recalled recently, describing the sectarian violence that broke out in Bhopal following Indian independence from Britain. "The [Hindu] Indian authorities were treating the Muslims horribly."²

Six years later, Khan fled north to the newly independent Islamic nation of Pakistan. But the slaughter he had seen as a youngster left Khan with an enduring enmity toward India and shaped his life's work, spurring him to develop Pakistan's nuclear bomb.

In the 1960s, Khan pursued postgraduate studies in metallurgy in Western Europe and later worked in the Netherlands at a uranium-enrichment plant run by Urenco, a Dutch-British-German consortium. There he learned about uranium enrichment and the design of sophisticated centrifuges needed to produce weapons-grade nuclear fuel.

Khan reportedly smuggled Urenco's centrifuge designs into Pakistan in the mid-1970s after Prime Minister Zulfikar Ali Bhutto invited him to establish the country's nuclear-weapons program. A Dutch court in 1983 convicted him in absentia of attempted espionage for stealing the designs, but the conviction was overturned.

As the director of Pakistan's nuclear program, Khan became adept at procuring equipment and technology — both legally and on the black market — and did little to conceal his activities. He even published a brochure with a photo of himself and a list of nuclear materials available for sale or barter, including intermediate-range ballistic missiles. Investigators say Khan's network stretched from Europe to Turkey, Russia and Malaysia. Khan himself traveled to North Korea at least 13 times to swap his nuclear technology for Korean missile technology, and U.N. inspectors have discovered documents in Iraq suggesting that he offered to help Saddam Hussein build a nuclear weapon in 1990, just before the first Gulf War.³

By 1998, when India first tested nuclear devices, Khan was quick to follow suit. Now the bitter adversaries were both in the "nuclear club."

Khan became an instant hero to Pakistanis, whose hatred of India permeates the national culture. Schools, streets and children were named after him. Indeed, most Pakistanis appeared forgiving when Khan confessed in February following revelations he had illegally supplied nuclear technology to North Korea, Libya and Iran.

But Khan's admissions — and the fact that he was not punished for selling nuclear secrets to rogue states — infuriated many Americans and others in the West. "It sends a horrible signal," said David Albright, president of the Institute for Science and Interna-

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warning, Roosevelt established the first federal uranium-research program. Fission research led to further advances, including the 1940 discovery of the element plutonium by physicists at the University of California, Berkeley. After the United States entered the war against Japan, Germany and Italy in December, the race to beat Germany in developing an atomic bomb accelerated under a secret Army Corps of Engineers program known as the Manhattan Project.*

By September 1944, after less than

two years of work, Manhattan Project researchers had begun producing plutonium for weapons. On July 16, 1945, they detonated an experimental atomic bomb known as "the Gadget" from a tower in the New Mexico desert. Less than three weeks later, on Aug. 6, U.S. airmen dropped an atom bomb nicknamed "Little Boy" on Hiroshima, followed on Aug. 9 by the detonation of "Fat Man" over Nagasaki. Two days later, Japan surrendered. World War II was over and the "Atomic Age" had begun. Within weeks of the bombings, the death toll had climbed to more than 100,000 people — mainly civilians.

The enormous loss of civilian lives sparked intense debate over the future of atomic weapons. The Manhattan Project cost the U.S. government almost \$20 billion (in today's dollars), including the construction of reactors and lab facilities at more than

30 sites, such as Los Alamos, N.M., Oak Ridge, Tenn., and Hanford, Wash. In 1946, the American representative to the newly created United Nations Atomic Energy Commission, Bernard M. Baruch, proposed the elimination of atomic weapons, but the Soviet Union rejected the proposal. In 1947, Congress replaced the Manhattan Project with the civilian Atomic Energy Commission, which assumed control over atomic research and weapons facilities around the country.

The postwar deterioration of relations with the Soviet Union effectively ended the nuclear debate in the United States and prompted the administration of President Harry S. Truman to intensify production of nuclear weapons, especially the next generation of more powerful, thermonuclear weapons. The first Soviet atomic bomb test and the rise of communism in China in

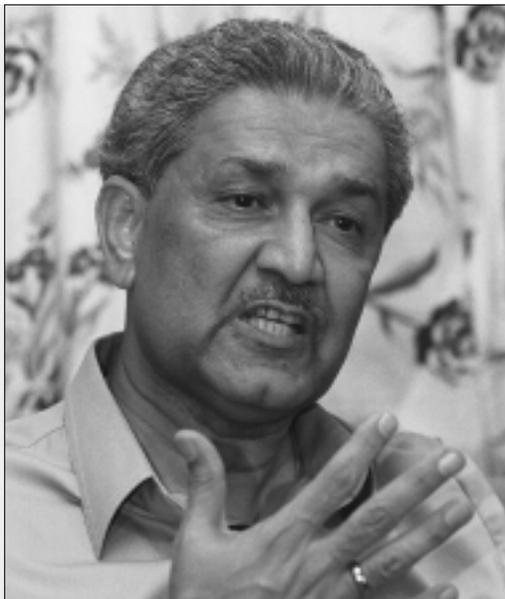
* Atomic weapons get their energy from the fission, or breaking apart, of the nucleus of an atom of uranium or plutonium. Hydrogen — or thermonuclear — weapons get their energy largely from fusion, the formation of a heavier nucleus from two lighter ones. Both types of weapons are known collectively as nuclear weapons.

tional Security, a nonpartisan think tank dedicated to educating the public on scientific issues affecting international security. "It basically says, 'Yeah, your wrists will be slapped, but, boy, you're going to make millions of dollars.'" ⁴

Khan professes bewilderment at the outrage his proliferation activities have engendered. "They dislike me and accuse me of all kinds of unsubstantiated and fabricated lies because I disturbed all their strategic plans, the balance of power and black-mailing potential in this part of the world," he said. "I am not a madman or a nut. . . . I consider myself a humble, patriotic Pakistani who gave his best for his country."

Indeed, while Islamic extremism is rising in Pakistan, the moderate Khan is married to a Dutch national, and neither she nor their daughters wear the veil typically worn by conservative Muslims.

Khan's enduring popularity helps explain why Pakistani President Pervez Musharraf pardoned him — and why the Bush administration accepted Musharraf's claim that he knew nothing of Khan's illicit activities. Others say the United States did not push Musharraf



Pakistani nuclear scientist Abdul Qadeer Khan

AFP Photo

to punish Khan because of a deal in which Pakistan would help U.S. troops find terrorist leader Osama bin Laden, thought to be hiding in Pakistan's north-west territories (see p. 312).

"They correctly judged that the United States would blow hot and cold on the question of nuclear proliferation, depending on the temper of the times," says defense-policy analyst John Pike, director of GlobalSecurity.org, a nonprofit organization studying emerging security threats. "Blaming the black market all on A.Q. Khan and letting Musharraf say he had no idea what was going on is just a way for everybody to have their cake and eat it, too."

¹ Unless otherwise noted, information in this section is based on Peter Grier, Faye Bowers and Owais Tohid, "Pakistan's Nuclear Hero, World's No. 1 Nuclear Suspect," *The Christian Science Monitor*, Feb. 2, 2004.

² Khan was interviewed by the Human Development Foundation, an expatriate Pakistani group in Shaumburg, Ill., www.yespakistan.com.

³ "The Black Marketeer," "Nightline," ABC News, March 8, 2004.

⁴ *Ibid.*

1949, followed the next year by the outbreak of the Korean War, fueled U.S. policymakers' support of the weapons program. By the early 1950s, both sides in the rapidly escalating Cold War had developed hydrogen bombs.

With momentum building for still more nuclear research, calls to abandon the new technology ran into resistance from those promoting nuclear power as a cheap, virtually inexhaustible source of energy. Fission releases large amounts of heat, which can be harnessed to power a steam turbine to generate electricity.

On Dec. 8, 1953, President Dwight D. Eisenhower presented his "Atoms for Peace" proposal to the United Nations, calling for creation of an international atomic energy agency "to devise methods whereby this fissionable material would be allocated to serve the peaceful pursuits of mankind."

The Soviet Union beat the United States in the race to introduce nuclear power, starting up the world's first plant in 1954. With federal support and AEC oversight, General Electric, Westinghouse Electric and other U.S. companies invested heavily in the new technology. On May 26, 1958, Eisenhower opened the first U.S. nuclear power plant, at Shippingport, Pa.

For the next 20 years — until the partial meltdown at Pennsylvania's Three Mile Island nuclear plant in 1979 and the catastrophic accident at the Soviet plant at Chernobyl in 1986 — nuclear power accounted for a growing percentage of the world's electricity.

Today nuclear power accounts for 16 percent of global electricity generated at some 440 plants in 30 countries. ²² A handful of countries depend on nuclear power for more than half of their electricity, but only about 20 percent of the

power generated in the United States comes from nuclear reactors.

Nonproliferation Efforts

Eisenhower's Atoms for Peace proposal bore fruit in 1957, when the IAEA was established as an independent U.N. body charged with promoting the peaceful use of nuclear energy. The agency was responsible for inspecting nuclear research facilities and power plants to ensure that they were not being used to build nuclear weapons. ²³

It already was becoming clear, however, that stronger measures were needed to prevent nuclear proliferation. Britain, which had participated in the U.S. nuclear development program, tested its first nuclear device in

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1952 and quickly built several hundred warheads. France developed its nuclear capability independently and began building a nuclear arsenal in 1960. In 1964, China tested its first nuclear weapon, becoming the fifth and last nuclear-weapon state recognized under the NPT.

Faced with the prospect of dozens more countries acquiring the bomb within a few decades, the United States and 17 other countries began talks in 1958 aimed at halting the further spread of nuclear weapons. A proposal by Ireland envisioned a commitment by all nuclear-weapon states not to provide the technology to other countries. In theory, non-nuclear countries would benefit from such an arrangement because it would ensure that their neighbors would also remain nuclear-free. But non-nuclear states called for more incentives to accept this permanent state of military inferiority.

In 1968, after a decade of negotiations, 98 countries signed the Nuclear Non-Proliferation Treaty (NPT). The agreement recognized the original five nuclear-weapon states — the United States, the Soviet Union, France, the United Kingdom and China — defined as countries that had “manufactured and exploded a nuclear weapon or other nuclear explosive device prior to 1 January 1967.” The IAEA was charged with monitoring compliance with the treaty. Countries that signed the treaty agreed to refrain from producing, obtaining or stockpiling nuclear weapons.

The treaty expanded on the Irish resolution by offering more incentives

to refrain from building nuclear weapons. The nuclear states agreed to help other countries develop civilian nuclear power plants and also, under Article X, to take “effective measures” to end the arms race and work toward nuclear disarmament.

But the treaty set no timetables for disarmament, enabling the nuclear powers to keep their arsenals virtually indefinitely. The NPT’s Article X contains another important loophole

heads. In 1998, India and Pakistan — engaged in a longstanding border dispute — acknowledged their nuclear status. Both India with (50-90 warheads) and Pakistan (30-50 warheads) are believed to store their nuclear weapons in the form of separate components that can be assembled at short notice.²⁴

Over the past decade, the international nonproliferation regime has scored some important successes. In the 1990s, Argentina and Brazil agreed to abandon their nuclear-weapon ambitions, signed the NPT and became the last two Latin American countries to sign the 1969 Treaty of Tlatelolco, which barred nuclear weapons from the 33-nation region. After the Soviet Union’s collapse, the former Soviet republics of Belarus, Kazakhstan and Ukraine voluntarily relinquished to Russia all the nuclear weapons Moscow had deployed on their territory during the Cold War. And, in 1993, after the fall of apartheid, South Africa became the first

nuclear-armed country to voluntarily dismantle its entire nuclear-weapon program.



Components from Libya's nuclear weapons program are displayed by Secretary of Energy Spencer Abraham at the Y-12 National Security Complex in Oak Ridge, Tenn., on March 15, 2004. Libyan leader Muammar el-Qaddafi ended the country's isolation by renouncing weapons of mass destruction and joining the world nonproliferation regime.

EPA/Wade Payne

— it allows signatories to withdraw from the treaty without penalty for unspecified “supreme interests.”

With 188 parties, the NPT has the broadest support of any arms control treaty. Only three countries — India, Israel and Pakistan — have not signed the pact and are believed to possess finished nuclear weapons or components that could be rapidly assembled. Israel began developing its nuclear capability in the 1950s with French assistance. The United States has refrained from pressing its chief Middle Eastern ally on its nuclear program, and Israel has never acknowledged its arsenal, thought to number 98-172 war-

Mushrooming Nukes

For all the NPT’s success in containing nuclear weapons, it has failed to keep non-signatories, and even some “renegade states” that signed the treaty, from pursuing nuclear capabilities. Almost as soon as it signed the NPT in 1968, Iraq began developing nuclear weapons with help from France and Italy, presumably to

counter Israel's arsenal. Israel destroyed an Iraqi reactor in 1981, claiming it was being used to produce fuel for weapons. Nevertheless, Iraq continued its clandestine program, as weapons inspectors discovered upon entering Iraq after its defeat in the 1991 Gulf War.

After the war, U.S.-led condemnation of Iraq's nuclear-weapons program resulted in U.N. sanctions that prohibited trade with Iraq. The sanctions were later eased to allow Iraq to sell a limited amount of oil to buy food and medical supplies, but by the end of the 1990s, Iraq was in the throes of an economic crisis.

Although the Bush administration cited evidence that Iraq had continued its nuclear-weapons program to justify last year's invasion and toppling of Hussein, recent inspections have turned up no signs Hussein was pursuing nuclear weapons. "It turns out we were all wrong," said former weapons inspector David Kay of U.S. suspicions that Iraq possessed weapons of mass destruction. "And that is most disturbing."²⁵

Another NPT "renegade," North Korea is considered to pose a far greater risk. A party to the NPT since 1985, North Korea launched a clandestine nuclear program centered on production of plutonium, which could be used to make nuclear weapons. Although North Korea insisted that its program was intended only to generate electricity, in 1993 it barred IAEA inspectors from viewing its facilities, precipitating a crisis in the nonproliferation regime. In October 1994, the Clinton administration brokered an "Agreed Framework," whereby North Korea agreed to freeze plutonium production in exchange for U.S. assistance to compensate for any energy lost due to the reactor shutdown. President Bush disavowed the pact in 2002 as bowing to nuclear blackmail and called on North Korea's Kim Jong Il to renounce

his nuclear ambitions as a condition of resuming aid to the impoverished country.

Concerned that nuclear weapons or weapons-grade materials might fall into the hands of renegade states or terrorist groups, the United States, the Soviet Union and 38 other countries with nuclear technology established the Nuclear Suppliers Group in 1985, agreeing to control exports of civilian nuclear material and related technology to non-nuclear-weapon states. And to restrict the proliferation of nuclear-capable missiles, the United States and six other countries in 1987 set up the Missile Technology Control Regime, a voluntary agreement that has since been expanded to more than 30 countries.

The collapse of the Soviet Union signaled the end of both the Cold War and the nuclear standoff dominated by the military doctrine of mutual assured destruction. But the post-Cold War peace, welcome as it was, ushered in a new era of uncertainty in which concern over nuclear proliferation took the place of superpower nuclear brinkmanship. The resulting economic and political upheavals left Russia — the Soviet successor state — poorly equipped to maintain security over the vast nuclear arsenal it inherited.

Recognizing the proliferation risk posed by Russia's arsenal, Congress passed the so-called Nunn-Lugar measure. Since it became law in 1991, the United States has helped Russia deactivate some 6,000 nuclear warheads, retrain 22,000 nuclear-weapons scientists and remove all the nuclear weapons deployed in the former Soviet republics of Belarus, Kazakhstan and Ukraine. Nunn-Lugar also has helped destroy hundreds of Soviet missiles, seal nuclear test facilities and dismantle submarine-based nuclear warheads. ■

CURRENT SITUATION

Black Market Revealed

A.Q. Khan's black market in nuclear weapons and materials began to unravel on Dec. 19, 2003, when Libya told the United States and Britain it would terminate its nuclear-weapons program. Although the North African country had not developed warheads, it was found to have imported numerous key components, including sophisticated centrifuges needed to enrich uranium into fuel for bombs.

The Bush administration claims much of the credit for this unexpected victory in the fight against nuclear proliferation. "The success of our mission in Libya underscores the success of this administration's broader nonproliferation efforts around the world," said Energy Secretary Spencer Abraham at a special press tour of seized Libyan nuclear materials and equipment on display at the department's Oak Ridge labs on March 15. "What you have witnessed represents a big, big victory in the administration's efforts to combat weapons of mass destruction."

Administration critics dispute this claim, citing reports that Libyan leader Muammar el-Qaddafi had been convinced by his son and presumptive heir, 31-year-old Saif al-Islam Qaddafi, to end the country's isolation by renouncing weapons of mass destruction and joining the world nonproliferation regime.²⁶ Libya has suffered severe economic privation since coming under U.N.-sponsored economic sanctions for its involvement in the 1988 bombing of a Pan-Am flight over Lockerbie, Scotland, which killed 270 people.

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U.N. sanctions, imposed in 1992, were lifted in September 2003, after Libya accepted responsibility for the bombing and agreed to pay \$2.7 billion in compensation to families of the Pan Am victims. Although the Bush administration lifted a ban on travel to Libya after it renounced its nuclear program, other U.S. economic sanctions remain in place.²⁷

“Muammar’s son thought his dad had run the country into a ditch,” says Pike of GlobalSecurity.Org. “But when the dynastic handoff of a country from father to son becomes the primary determinant of our disarmament success, then we’re running on a pretty thin reed.”

When they entered Libyan facilities in January, IAEA inspectors said they discovered crates of nuclear equipment that only could have come from sources with advanced nuclear programs of their own. Subsequent investigations uncovered a complex web of international transactions that led to a factory in Malaysia, transshipment facilities in Dubai, an intercepted cargo ship in Italy, shipments to Iran and ultimately to Khan himself. In January, after acknowledging his role in establishing the nuclear black market, Khan was pardoned by Pakistani President Pervez Musharraf, who claimed he knew nothing of Khan’s undercover business.

Nuclear experts dismiss Musharraf’s disavowal as ludicrous. Khan’s prominent role as the father of Pakistan’s nuclear arsenal made him a highly visible national hero who made no attempt to conceal his lavish lifestyle in his im-

poverished country and who actually had published brochures describing nuclear materials and equipment that were for sale from his lab for more than a decade.

“The pattern of activity was at such a large scale that it’s inconceivable that the Pakistani government didn’t know about this all along,” Pike says. “It’s like asking me to believe that [U.S.



AP Photo/Ted S. Warren

Vehicles entering the United States from Canada pass through radiation detectors at the Blaine, Wash., border crossing. Experts say terrorists are far more likely to deploy a small, easily transported conventional explosive device containing radioactive waste — a so-called dirty bomb — than to explode a nuclear bomb.

nuclear pioneer] Ed Teller was secretly selling hydrogen bombs out of the back of a pickup truck.”

But the Bush administration did not question Musharraf’s disavowal of knowledge about Khan’s activities. Since the Pakistani leader emerged as an outspoken ally of the United States in its war on terrorism after Sept. 11, the administration clearly has been loath to undermine his standing in an Islamic country where anti-American feelings and support for al Qaeda run high. Musharraf has narrowly escaped two assassination attempts, attributed to al Qaeda, in recent months.²⁸

Moreover, the Bush administration needs Musharraf’s cooperation in order to find al Qaeda leader Osama bin Laden — considered by some to be the mastermind of the 9/11 attacks — and his top lieutenants. Some observers suggest that the Bush administration decided to accept Musharraf’s denial of knowledge about Khan’s network in exchange for permission for U.S. forces to enter the rugged area on the Pakistani side of the border with Afghanistan, believed to be a key stronghold of al Qaeda militants and possibly bin Laden himself.²⁹ Up to now, U.S. forces have had to limit their searches to the Afghan side of the border.

Although administration spokesmen deny the existence of such a deal, American military officials have announced plans for a “spring initiative” on the Afghan side of the border.³⁰ Already, signs are emerging that an offensive is under way. On March 16, on the eve of a visit to Pakistan by

Secretary of State Colin L. Powell, Pakistani troops suffered numerous casualties in gun battles in the border region.³¹

Bush’s Response

President Bush responded to the revelations about Khan’s network with a seven-point plan to strengthen the NPT and IAEA’s enforcement powers. On Feb. 11, the president called for the expansion of his Proliferation Security Initiative, a year-old

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At Issue:

Will U.S. policies keep nuclear weapons away from terrorists?

PRESIDENT GEORGE W. BUSH

**FROM A SPEECH AT THE NATIONAL DEFENSE UNIVERSITY,
FEB. 11, 2004**

On Sept. 11, 2001, America and the world witnessed a new kind of war. We saw the great harm that a stateless network could inflict upon our country, killers armed with box cutters, mace and 19 airline tickets. Those attacks also raised the prospect of even worse dangers — of other weapons in the hands of other men. The greatest threat before humanity today is the possibility of secret and sudden attack with chemical or biological or radiological or nuclear weapons. . . .

America, and the entire civilized world, will face this threat for decades to come. We must confront the danger with open eyes, and unbending purpose. I have made clear to all the policy of this nation: America will not permit terrorists and dangerous regimes to threaten us with the world's most deadly weapons. . . .

We're determined to confront those threats at the source. We will stop these weapons from being acquired or built. We'll block them from being transferred. We'll prevent them from ever being used. One source of these weapons is dangerous and secretive regimes that build weapons of mass destruction to intimidate their neighbors and force their influence upon the world. These nations pose different challenges; they require different strategies. . . .

I propose to expand our efforts to keep weapons from the Cold War and other dangerous materials out of the wrong hands. In 1991, Congress passed the Nunn-Lugar legislation. Sen. [Richard] Lugar had a clear vision, along with Sen. [Sam] Nunn, about what to do with the old Soviet Union. Under this program, we're helping former Soviet states find productive employment for former weapons scientists. We're dismantling, destroying and securing weapons and materials left over from the Soviet . . . arsenal. . . .

Over the last two years, a great coalition has come together to defeat terrorism and to oppose the spread of weapons of mass destruction — the inseparable commitments of the war on terror. We've shown that proliferators can be discovered and can be stopped. We've shown that for regimes that choose defiance, there are serious consequences. The way ahead is not easy, but it is clear. We will proceed as if the lives of our citizens depend on our vigilance, because they do.

Terrorists and terror states are in a race for weapons of mass murder, a race they must lose. Terrorists are resourceful; we're more resourceful. They're determined; we must be more determined. We will never lose focus or resolve. We'll be unrelenting in the defense of free nations, and rise to the hard demands of dangerous times.

NATURAL RESOURCES DEFENSE COUNCIL

FROM A STATEMENT, FEB. 12, 2004, WWW.NRDC.ORG.

nunn-Lugar funds are not being used to "dismantle and destroy" Russian nuclear weapons (as opposed to missile silos and obsolete strategic bombers and submarines). In fact, the recently signed Moscow Treaty between the United States and Russia allows Russia to keep SS-18 "heavy" strategic ballistic missile systems that would otherwise have been destroyed under the START II and START III treaties.

Despite years of cooperation, the United States still has no firm idea of how many and which types of Russian nuclear warheads and bombs have been dismantled. As former Sen. Sam Nunn has indicated, the Nunn-Lugar program suffers from inadequate funding. President Bush cites the 2002 G-8 Summit agreement to provide \$20 billion over 10 years, but even here the participating countries used accounting tricks to avoid increasing previous commitments. Moreover, some of this money is earmarked to build a plutonium fuel-fabrication plant in Russia that many observers believe will increase the potential that plutonium will be diverted and used for illicit purposes.

President Bush so far has refused to commit to destroying more than a few hundred of the more than 10,000 nuclear weapons still in the United States' nuclear weapons stockpile. The Strategic Offensive Reduction Treaty (SORT) negotiated with Russia in 2002 — the Moscow Treaty — does not require the elimination of a single nuclear missile silo, submarine, missile warhead, bomber or bomb. . . .

President Bush failed to address the longer-term problem, and long-term proliferation pressures, arising from a world permanently and inequitably divided into declared nuclear weapons states under the Non-Proliferation Treaty (NPT), de-facto nuclear weapon states outside the treaty (India, Pakistan and Israel), non-weapon states that have abandoned the treaty (North Korea) and states with varying degrees of nuclear expertise (Iran) that are presently bound by their treaty commitment not to acquire nuclear weapons but could elect to withdraw from the NPT at any time.

Nor did President Bush discuss how and when the United States and other nuclear weapon states would take further steps to fulfill their Non-Proliferation Treaty commitments to eliminate their nuclear arsenals. On the contrary, the Bush administration is spending record amounts revitalizing the U.S. nuclear weapons complex. . . .

There are two distinct kinds of threats facing the United States, one having to do with the proliferation of [weapons of mass destruction] by nation states and the second with threats posed by terrorists. The president's proposals focused on threats posed by the spread of nuclear weapons, materials and technologies to nation states rather than those by terrorists.

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international effort to seize nuclear materials on the high seas while in transit to or from rogue states. In 1999 and 2000, years before Bush's initiative, Indian and British authorities seized two North Korean shipments of missile components and related equipment en route to Libya.³²

Bush also called on the U.N. Security Council to adopt a resolution requiring all states to criminalize proliferation of components that could be used to make weapons of mass destruction and to strengthen export controls on them. And he proposed expanding U.S. efforts to secure Russia's nuclear weapons and materials under the Nunn-Lugar program.

In addition, Bush called for closing the loophole in the NPT that allows aspirants to the nuclear club to enrich and reprocess fuel used in civilian nuclear reactors and proposed that only signatories of the Additional Protocol be allowed to import equipment for civilian reactors. To strengthen the IAEA, Bush proposed a new measure to beef up the agency's safeguards and verification powers. Finally, he recommended barring countries being investigated for alleged NPT violations from holding positions of influence in the IAEA.

"We've shown that proliferators can be discovered and can be stopped," Bush said. "Terrorists and terror states are in a race for weapons of mass murder, a race they must lose."

Weapons analysts praised Bush's recommendations. "It was a very important speech," says Curtis of the Nuclear Threat Initiative. "It addressed a number of areas that require U.S. leadership and international cooperation."

But Curtis also says the United States needs to do more to dispel the perception that it holds itself to a different standard than the rest of the world regarding proliferation. "Missing from the speech was some meaningful initiative on addressing the strategic nuclear

weapons that the United States and Russia still maintain in very large numbers and, under the Treaty of Moscow, may retain into the indefinite future," Curtis says.

To others, Bush's speech exemplified the administration's unilateral approach to pursuing U.S. interests. "President Bush's speech was a series of measures that would constrain everybody else," says Bunn of Harvard's Belfer Center. "There was no mention of anything that would constrain the United States."

In Pike's view, the Bush administration's nuclear policies have left the United States with few viable options. "Right now, our declaratory policy is one of attacks to disarm our enemies' weapons infrastructure, followed up by military invasion and regime change," he says. That's the policy that led to the war in Iraq, which did not yet possess nuclear weapons. But the same policy cannot be applied to a state like North Korea, which may harbor nuclear weapons, for fear of igniting a global holocaust. "So we have an extraordinarily alarming declaratory policy that's basically frightened the living daylight out of the rest of humanity, [but which] we're not prepared to implement. That puts us in the worst of all possible worlds." ■

OUTLOOK

Crumbling Coalition?

The March 11 bombing of commuter trains in Madrid has lent further urgency to the international war on terrorism. Ten separate explosions at the rush hour ripped through the trains, killing more than 190 commuters and wounding some 1,400.³³ After initially blaming Basque separatists for the attacks, the government

announced two days later that it had arrested five people with suspected links to al Qaeda.

The next day, March 14, Spaniards went to the polls and removed Prime Minister José Maria Aznar, a staunch U.S. ally in the war against terrorism, from office. Spain's new leader, Socialist José Luis Rodríguez Zapatero, renewed Spain's commitment to fight terrorism. But he promised to fulfill a campaign pledge to withdraw Spain's 1,300-man contingent of peacekeepers in Iraq by June 30. He is one of Europe's most outspoken critics of the war.

Calling the occupation of Iraq "a fiasco," Zapatero has outlined an approach to fighting terrorism that relies on international cooperation, which he says differs sharply from the administration's tactic. "Fighting terrorism with Tomahawk missiles isn't the way to defeat terrorism," he said. "I will listen to Mr. Bush, but my position is very clear and very firm. . . . Terrorism is combated by the [rule] of law."³⁴

Zapatero may be expressing the views of more than a demoralized Spanish electorate. According to a new international survey, opposition to the war in Iraq and U.S. international policies has intensified in Europe. A growing percentage of Europeans polled said they want to distance their fate from the United States by adopting independent foreign and security policies through the European Union. More than half support a European foreign policy independent from that of the United States. Even in Britain, the administration's strongest war on terrorism ally, support for an independent European foreign policy has risen from 47 percent in April 2002 to 56 percent in the current poll.³⁵

The Bush administration has downplayed any notion of a rift between the United States and its European allies. "We don't think countries face a

choice — being European or being trans-Atlantic,” said an administration official following Secretary of State Powell’s March 24 trip to Spain to attend a memorial service for victims of the Madrid bombing. “All of us, especially in the NATO alliance, are almost by definition both. . . . European nations don’t have to choose between good relations with Europe and good relations with the United States.”

Foiling Nuclear Terror

The Madrid bombing — the worst incident of terrorist violence in Europe since the Pan Am bombing — coming as it did on the heels of the exposure of Khan’s nuclear-smuggling network, will likely intensify debate over how to deal with the threat of nuclear terrorism. Bin Laden has made no secret of his desire to use a nuclear bomb as the ultimate weapon against the West, and weapons experts say events are fast outpacing policies deigned to avert such a catastrophe.

“The Bush administration and the president himself have rightly said that the ultimate specter is al Qaeda with a nuclear weapon,” says Harvard’s Allison. “But this administration has no coherent strategy for preventing nuclear terrorism. That’s a pretty serious charge, but I think it’s correct.”

Administration supporters reject that view. “President Bush has transported the fight the terrorists began back to their land,” wrote former Sen. Alfonse M. D’Amato, R-N.Y. “He refuses to allow them to contaminate our soil with their hatred. He has stood firm in the face of the terrorist threat, despite constant harping from critics who would second-guess his leadership.”³⁶

Still, IAEA Director General ElBaradei paints a grim picture of nuclear

proliferation’s future and calls for a revolutionary overhaul of international systems and policies to prevent nuclear terrorism. “Eventually, inevitably, terrorists will gain access to such materials and technology, if not actual weapons,” he wrote. “If the world does not change course, we risk self destruction.”

ElBaradei calls for globalization of worldwide security. “We must abandon the traditional approach of defining security in terms of boundaries — city walls, border patrols, racial and religious groupings,” he wrote recently in *The New York Times*. “The global community has become irreversibly interdependent, with the constant movement of people, ideas, goods and resources.

“In such a world, we must combat terrorism with an infectious security culture that crosses borders — an inclusive approach to security based on solidarity and the value of human life. In such a world, weapons of mass destruction will have no place.”³⁷ ■

Notes

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² For background, see Mary H. Cooper, “Non-Proliferation Treaty at 25,” *The CQ Researcher*, Jan. 27, 1995, pp. 73-96.

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¹⁴ “Findings of the Nuclear Posture Review,” U.S. Department of Defense, released Jan. 9, 2002; www.defenselink.mil.

¹⁵ The measure was included in the 1994 Defense Authorization Act.

¹⁶ From an interview with *Arms Control Today*,

About the Author

Mary H. Cooper specializes in defense, energy and environmental issues. Before joining *The CQ Researcher* as a staff writer in 1983, she was Washington correspondent for the Rome daily newspaper *l’Unità*. She is the author of *The Business of Drugs* (CQ Press, 1990) and holds a B.A. in English from Hollins College in Virginia. Her recent reports include “Exporting Jobs,” “Weapons of Mass Destruction” and “Bush and the Environment.”

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¹⁷ See Joseph C. Anselmo, "Opponents See New Arms Race in Push for Nuclear Research," *CQ Weekly*, Feb. 21, 2004, pp. 498-500.

¹⁸ For background, see Mary H. Cooper, "Bush's Defense Policy," *The CQ Researcher*, Sept. 7, 2001, pp. 689-712.

¹⁹ See Bradley Graham, "Missile Defense Still Uncertain," *The Washington Post*, March 12, 2004.

²⁰ Cirincione testified before a special meeting of the Danish Parliament, April 24, 2003.

²¹ For the text of Einstein's letter, see Robert C. Williams and Philip L. Cantelon, eds., *The American Atom* (1984), cited in Stephen I. Schwartz, ed., *Atomic Audit* (1998). Unless otherwise noted, information in this section is based on Schwartz.

²² Data from www.iaea.org and the Nuclear Energy Institute, www.nei.org.

²³ For background, see David Masci, "The United Nations and Global Security," *The CQ Researcher*, Feb. 27, 2004, pp. 173-196.

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²⁶ See Michael Evans, "Libya Knew Game Was Up Before Iraq War," *The Times* (London), March 23, 2004, p. 8.

²⁷ See "Top U.S. Official Visits Libyan Leader," *The Associated Press*, March 23, 2004.

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FOR MORE INFORMATION

Arms Control Association, 1726 M St., N.W., Washington, DC 20036; (202) 463-8270; www.armscontrol.org. A nonpartisan membership organization dedicated to promoting support for effective arms-control policies.

Belfer Center for Science and International Affairs, John F. Kennedy School of Government, Harvard University, 79 JFK St., Cambridge, MA 02138; (617) 495-1400; <http://bcsia.ksg.harvard.edu>. Provides information on technical and political aspects of nonproliferation policy.

Bureau of Nonproliferation, U.S. Department of State, 2201 C St., N.W., Washington, DC 20520; (202) 647-4000; www.state.gov. Administers policies to prevent the spread of weapons of mass destruction.

Center for Nonproliferation Studies, Monterey Institute of International Studies, 460 Pierce St., Monterey, CA 93940; (831) 647-4154; <http://cns.miis.edu>. A nongovernmental organization devoted to research and training on nonproliferation issues.

GlobalSecurity.org, 300 N. Washington St., Suite B-100, Alexandria, VA 22314; (703) 548-2700; www.globalsecurity.org. A Web site maintained by veteran defense-policy analyst John Pike containing exhaustive information on U.S. defense policies, including nonproliferation strategy.

Nonproliferation Policy Education Center, 1718 M St., N.W., Suite 244, Washington, DC 20036; (202) 466-4406; www.npec-web.org. A project of the Institute for International Studies that promotes understanding of proliferation issues.

Nuclear Threat Initiative, 1747 Pennsylvania Ave., N.W., 7th Floor, Washington DC 20006; (202) 296-4810; www.nti.org. Seeks to increase global security by reducing the risk from nuclear, biological and chemical weapons. The Web site contains a wealth of information.

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³³ See Aparisim Ghosh and James Graff, "Terror on the Tracks," *Time*, March 22, 2004, p. 32.

³⁴ From an interview on radio Onda Cero quoted in "New Spain PM Firm on Troop Withdrawal," *The Associated Press*, March 17, 2004.

³⁵ Pew Research Center for the People & the Press, "A Year After Iraq War, Mistrust of

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After decades of effort, North Korea almost certainly has enough enriched uranium to produce three to five nuclear bombs.

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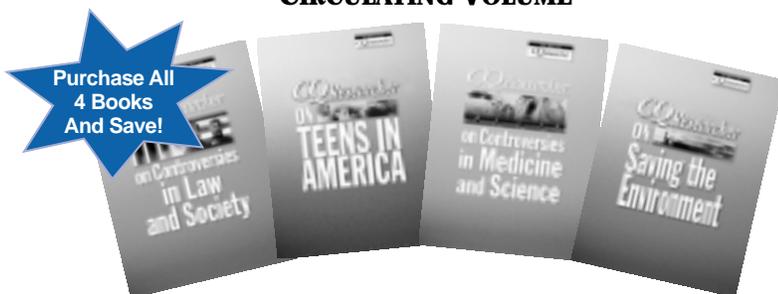
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