USAF COUNTERPROLIFERATION CENTER

CPC OUTREACH JOURNAL

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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.

Established here at the Air War College in 1998, the USAF/CPC provides education and research to present and future leaders of the Air Force, as well as to members of other branches of the armed services and Department of Defense. Our purpose is to help those agencies better prepare to counter the threat from weapons of mass destruction. Please feel free to visit our web site at www.au.af.mil/au/awc/awcgate/awc-cps.htm *for in-depth information and specific points of contact. Please direct any questions or comments on CPC Outreach Journal to Lt. Col. Michael W. Ritz, CPC Intelligence/Public Affairs or JoAnn Eddy, CPC Executive Assistant at (334) 953-7538 or DSN 493-7538.*

Lansing State Journal
August 25, 2000

Documents Hold Anthrax Secrets

BioPort asks state to help it retrieve recipe from scientists

By A.J. Evenson, Lansing State Journal

Legal transcripts show the recipe for making the U.S. military's anthrax vaccine is among the documents missing from BioPort Corp.

The Lansing-based company on Tuesday requested the state's help in retrieving those documents, whose existence surfaced during a dispute with three former state scientists who want royalties for their work on the anthrax vaccine and two other vaccines.

The employees worked for the vaccine labs before the state of Michigan sold the operation to BioPort in 1998.

Transcripts from a state hearing involving the royalty issue indicate the missing documents include master manuals for making the rabies and anthrax vaccines and an updated version of the anthrax manual written on loose-leaf paper.

The saga is the latest roadblock in the Pentagon's beleaguered efforts to vaccinate 2.4 million U.S. troops against the deadly bio-warfare agent developed by North Korea, Iraq and others. The Defense Department has virtually suspended the $100 million program as supplies of the vaccine dwindle.

BioPort officials say the missing documents could help solve production problems that have kept the company from getting U.S. Food and Drug Administration approval of its renovated labs. Without that, the company can't sell its vaccine to the military or anyone else.

"We are deeply troubled by the entire situation and look forward to recovering every one of the documents - sooner rather than later," BioPort spokeswoman Kelly Rossman McKinney said Thursday.

The documents surfaced during a state hearing to determine whether the former state workers should get a portion of the vaccines' profits. Dr. George Burgoyne, Richard Hoort and Judith Boice filed a grievance with the state's Civil Service Hearings Division in 1998. A hearing on the matter is scheduled to resume Tuesday.

A lawyer representing the three workers called the missing documents a "non-issue."

Attorney Brandon Zuk said Thursday that the documents don't belong to the state but rather to the employees, who are using them to help "prove they invented the formulas for these products."

Zuk said he questioned state officials after allegations of possible "criminality" involving the documents were made during the first hearing. But the state didn't respond, he said.

The three workers say they developed the technology now used to make the anthrax and rabies vaccines and an experimental product. The former Michigan Biologic Products Institute, which became BioPort, is the only licensed producer of the anthrax vaccine in the United States.

The anthrax vaccine was developed before the three employees joined the state operation. But the workers say they made extensive changes to the production process when the U.S. military needed the vaccine to protect troops against an anthrax threat posed by Iraq in the 1991 Gulf War.

"It was not until '88-'89 when the . . . military showed interest in the vaccine that changes had to be made . . . so that larger quantities quicker could be made. This was just before the Gulf War," Burgoyne, who headed the production, testified in a March 3 Civil Service hearing.

Burgoyne also testified that the changes - including the use of additional filters and a new type of container to grow the vaccine - improved the vaccine's safety by ensuring sterility. The changes also made it cheaper to produce.

Some of the changes, Burgoyne said, may have been prompted by FDA concerns. "We needed to find a new method and continue producing it that way."

Assistant Attorney General Ron Styka, who received BioPort's request for help in retrieving the missing documents, would only say Thursday that his office continues to "look at the issue."

BioPort failed a November 1999 FDA investigation of its vaccine labs in 30 areas, including inadequate control or documentation for its manufacturing process. The federal agency was concerned that there was no guarantee BioPort could make each batch of anthrax vaccine to the same standards.

BioPort officials say the missing documents could help fill in some of the gaps as they work toward FDA approval. They would not comment on whether lab workers had identified documents were missing or their absence had gone unnoticed.

Pentagon officials said BioPort remains contractually obligated to making the vaccine and the military continues to work with them to reach that goal.

Pentagon spokesman James Turner wouldn't comment on the missing documents, saying: "That is a legal matter between BioPort and its former employees."

The military began soliciting a second source for the vaccine in June. Meanwhile, the Pentagon has temporarily suspended the vaccination program, saving the few doses it has left for troops headed to high-risk areas, such as the Persian Gulf.

Military.com
August 25, 2000

Bioport: Anthrax Vaccine Recipe Is Not Lost

Company denies newspaper claim that researchers took recipe

By Stephen Trimble, Military.com Staff Writer

WASHINGTON -- A senior official for the Pentagon's troubled anthrax vaccine supplier denied news reports that the company has lost the recipe for the preventative serum.

Citing legal documents, an Aug. 25 report by the Lansing (Mich.) State Journal claims that three researchers walked off with vaccine's production blueprint before 1998. That's when BioPort Corp. bought the state-owned firm.
The state scientists are seeking a share of the royalties for creating the vaccine, the newspaper reported.
"I read that report. I'm a little bit confused by that one," BioPort's director of government affairs Michael Tucker told Military.com. Asked if the company still holds the vaccine's recipe, Tucker replied, "Of course."
But BioPort officials still want the researchers to return any missing documents, which were part of the company's purchase two years ago, Tucker said.
In 1997, the Pentagon hired the Michigan-based firm to supply enough vaccine to inoculate the 2.4 active duty and reserve component troops. But the Pentagon has had to dramatically curtail the program after BioPort flunked two FDA inspections. The company last year also received a financial bail-out from the Pentagon to avoid bankruptcy.
Pentagon officials now hope to attract other vaccine suppliers. A notice in the Federal Register this morning hawked the availability of a license for using the military's pending patent for making the vaccine.
The prospect of competition doesn't faze BioPort. Said Tucker: "We've always said that we are going to cooperate with the military's efforts to find another source."

Saturday 26 August 12:58 PM

Olympic terrorist plot confirms worst fears

SYDNEY, Aug 26
A terrorist plot targeting Australia's nuclear reactor during the Olympic Games today led to angered new demands for its immediate closure.
New Zealand detectives reportedly foiled the plot, hatched by Afghan sympathisers of wanted terrorist Osama Bin Laden, to attack the reactor in Sydney's south.
New South Wales police today said they had been made aware of the plot and had been briefed by their New Zealand counterparts.
http://au.dailynews.yahoo.com/headlines/20000826/aapnews/967258722-2752012324.html

Published Sunday, August 27, 2000, in the San Jose Mercury News
will not be shut down for the Olympics, Australian officials say.

Sydney is safe, Australians say

Olympics: Scare over security of nuclear reactor prompts assurances that there's been no evidence of terrorism. By Rohan Sullivan Associated Press
SYDNEY, Australia -- Australian officials sought to reassure the world Saturday that the Sydney Olympics were safe from terrorist attack after a possible plot against the country's only nuclear reactor was exposed.
http://www7.mercurycenter.com:80/premium/world/docs/olympics27.htm

Report: Iran has world's most active chem-war program

SPECIAL TO WORLD TRIBUNE
Wednesday, August 30, 2000

TEL AVIV - Iran has been hampered in its nuclear weapons programs but appears ready to use its growing arsenal chemical bombs, a new study says.

The study quotes experts as saying that Iran has most active chemical warfare program in the developing world. This includes the development of VX nerve agent and Novichok agent, said to be five to eight times more lethal than VX and the focus of a Russian program, Middle East Newsline reports.

But the study by Bar-Ilan University's Begin-Sadat Center for Strategic Studies says Iran is hampered by the failure to develop a ballistic missile warhead that will deliver either a chemical, biological or nuclear weapon. The study says warheads developed for the Scud B are not suitable for an intermediate or long-range missile.

"To deliver effective biological and chemical weapons, Iran must develop warheads capable of delivering cluster munitions," says the study, authored by Seth Carus, a professor at the National Defense University in Washington. "The United States and Soviet Union are known to have developed such munitions and thus could be a source for such arms, if Moscow ignores U.S. pleas not to do so. Although Iran has made considerable progress in developing ballistic missiles, it is less clear that it has developed missile delivery systems for its existing chemical or biological agents."

Iran is also believed to have developed biological weapons. The study raises the prospect that Iran might have adopted agents developed by the former Soviet biological weapons program, such as Marburg, smallpox, plague, and tularemia.

The study says Iran appears ready to employ chemical weapons in future wars despite the struggle between reformers and the ruling conservative clergy. Carus cites the storage of chemical weapons on Abu Mussa, an island in the Gulf off the coast of Dubai.

"By merely possessing these weapons or by threatening to use them, Iran could also use them to gain leverage over neighboring states," the study says. "Even if the radicals lose influence in Teheran, there is no reason to believe that the Islamic Republic will constrain development of NBC [nuclear, biological, chemical] weapons."

Carus says Iran's chemical weapons program is the most advanced of its nonconventional arms projects. The biological weapons program has been constrained by budgetary woes.

The Iranian effort to acquire nuclear weapons has been hampered by an inadequate technical base, the report says. The result is that Iran has made little progress since 1996 in developing a nuclear warhead and could require up to 15 years to produce a weapon.

The report cites Iran's approval of inspections of the Bushehr nuclear facility by the International Atomic Energy Agency. "Although some experts discount the IAEA conclusions," the study says, "most believe that Iran is so early in the process of developing nuclear weapons that it has little need to hide its activities.

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Contact: Chris Burroughs
coburro@sandia.gov
505-844-0948
Sandia National Laboratories

Tiny sampling device promises big results for detection and analysis of chemicals

ALBUQUERQUE, N.M. -- A sampling device smaller than the tip of a fingernail promises big results for detecting and analyzing trace chemicals.

The tool, developed by the Department of Energy's Sandia National Laboratories, is a super miniaturized version of a traditional preconcentrator used to collect sample gases for analysis. The active area of the device is only two millimeters by two millimeters.

http://www.eurekalert.org/releases/snl-tsd082900.html

Published Sunday, August 27, 2000, in the San Jose Mercury News

Silicon Valley on front lines of expanding research field

BY NICOLE C. WONG
Mercury News

At a scientific conference two years ago, a Department of Defense investigator asked Geoff Davis whether his biopharmaceutical company would help the U.S. Army produce human antibodies to help counteract the deadly Ebola and Marburg viruses. The Pentagon suspected potentially hostile countries and terrorists were developing the two pathogens into weapons for germ warfare and wanted to find ways to protect against an attack.
http://www7.mercurycenter.com/premium/nation/docs/biowar27.htm

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Firms hope to generate commercial products

New technology could find way to store shelves

BY NICOLE C. WONG
Mercury News

On a translucent plastic slab slightly larger than a credit card, a drop of water suspected of containing anthrax races through a maze of tiny channels the width of two human hairs. Antibodies lining the channels cling to passing biological pathogens and, in a matter of seconds, signal whether the hazard is present.
http://www7.mercurycenter.com/premium/nation/docs/nubiocomp27.htm

Boston Globe
August 29, 2000
Pg. 10

Olympics Nuclear Threat Dismissed

By Reuters

WASHINGTON - The head of security for the Sydney Olympics said yesterday that a reported plot to blow up Australia's only nuclear reactor during the Games had been exaggerated, and that he did not think there was any threat.

In an interview with NBC's "Today" show, the police commissioner of New South Wales, Peter Ryan, who is in charge of security for the Olympics, said as far as he was aware there was no threat to the nuclear power station or the Sydney Games.

New Zealand police were probing an immigration racket involving Afghan refugees when they found plans that appeared to point to an attack on the Lucas Heights research nuclear reactor on the outskirts of Sydney during next month's games.

"They had in their possession a street plan of Sydney, and unfortunately because a line drawn on the map between Botany Bay and Sydney was near to the nuclear power station people drew the inference that they were, in fact, planning to attack the power station, which is completely untrue as far as we can tell," Ryan told NBC.

He described the Afghan refugee group as an Islamic group allegedly involved in the illegal immigration of people, money laundering and other activities, but "certainly not terrorism."

Asked if there was any need to shut down the reactor, which is used for medical and other research, Ryan said it was up to the Australian government to make that decision.

"All I can say is that the story about these people in New Zealand has certainly been exaggerated and as far as we are aware ... there is no threat to the nuclear power station or the Sydney Games," he said.
Ryan said 72 countries had contributed intelligence services for the games. While security will be tight, visitors will not see troops walking around with machine guns.

Washington Post
August 31, 2000
Pg. 25

U.N. Arms Inspectors Back Down

By Colum Lynch, Special to The Washington Post

UNITED NATIONS, Aug. 30 — To avoid a confrontation with Baghdad at an inopportune time, the United States and other permanent members of the Security Council have persuaded the chairman of a new U.N. arms agency to cancel his planned announcement that weapons inspectors are ready to return to Iraq.

The move follows repeated statements by the Iraqi government that it will never submit to inspections by the U.N. Monitoring, Verification and Inspection Commission (UNMOVIC).

Diplomats said U.S., Russian, Chinese and French members of a panel that oversees UNMOVIC advised its chairman, Hans Blix of Sweden, to drop a conclusion from a draft report that 44 inspectors have completed training and are "now in a position to start activities in Iraq," including "baseline" inspections of facilities that might be involved in building prohibited weapons.

The final version of the report, released to the council today, says the arms experts "could plan and commence" preliminary tasks to prepare for future inspections.

Given the uncertainty, more than half of the newly trained weapons specialists have been sent back to their home countries. Their names will go on a roster and they may be called up for service in the future.

"The U.S. and Russia agreed that it was not appropriate to give the impression that Mr. Blix and the commission was ready to go back into Iraq," said a Security Council diplomat. "They cautioned that this might create a climate of confrontation at an inappropriate time."

The Security Council's five permanent members--the United States, Russia, China, France and Britain--want to avoid a clash over Iraq policy when their heads of state meet at the United Nations next week during the so-called Millennium Summit of World Leaders, according to diplomats.

A U.S. official also contended that it would be premature to re-launch weapons inspections in Iraq. "They have more work to do," the official said. "While UNMOVIC has finished its first stage of preparation, it's a plain fact that they are not yet ready to launch a full-scale program in Iraq."

Despite the reversal, Blix reported that he would continue preparing for a resumption of on-site inspections. He said a new team of inspectors would be trained in France from Nov. 7 to Dec. 8, and U.N. officials said he was talking with various countries about technical assistance, such as communications equipment and surveillance aircraft.

Under the terms of the 1991 cease-fire that ended the Persian Gulf War, Iraq is prohibited from possessing medium- and long-range missiles or nuclear, chemical and biological weapons.

A former inspection agency, known as the U.N. Special Commission, or UNSCOM, pulled its inspectors out of Iraq on the eve of a U.S.-British air campaign in December 1998.

UNMOVIC may face a renewed challenge from Iraq's allies when the council debates the future of inspections during the week of Sept. 11. Russia has told Blix that the participation of some former members of UNSCOM on the new team--particularly two Russian arms experts, Nikita Smidovich and Igor Mitrokhin--would make it difficult for Moscow to press Baghdad to cooperate.

"We warned [Blix] that he should take into account that Iraq might not be satisfied with this decision" allowing former UNSCOM members to serve in UNMOVIC, said Gennadi Gatilov, Russia's deputy representative to the United Nations. He noted that the two inspectors were associated with some of the U.N.'s most aggressive inspections. "We will see how this situation develops in the future, but I personally envisage difficulties," he said.

In an unusual twist, the United States and Britain have defended the Russian inspectors while their own government has pressed Blix to get rid of them or push them into the background. U.S. officials praised the Russians as experienced and professional inspectors with unparalleled knowledge of the Iraqi weapons program.

New York Times
September 1, 2000

Israel, Iraq: Nuclear Row

In a sharp exchange at the United Nations disarmament conference in Geneva, Israel and Iraq accused each other of having weapons that threaten the Middle East. Israel's delegate said Iraq "devoted a major part of its vast income" from oil to develop weapons of mass destruction, including nuclear weapons. Iraq's representative said Israel "possesses hundreds of nuclear bombs, which threaten not just our region but the entire world."
Elizabeth Olson (NYT)

Washington Post
September 1, 2000
Pg. 13

Cipro Picked As Anthrax Treatment

If bioterrorists ever attack the United States with anthrax, the antibiotic Cipro will be the first line of defense for civilians who breathe the deadly bacteria, the government decided yesterday.
The Food and Drug Administration said Bayer Corp.'s popular antibiotic will help protect people exposed to inhaled anthrax from becoming infected and dying -- if they take it quickly enough.
Cipro, or ciprofloxacin, has been sold for 13 years to treat infections, and many experts have long believed it would fight anthrax too. But the FDA's formal approval of Cipro makes it the nation's first medication specifically designated for use after bioterrorism.
Eighty percent of people who inhale anthrax die within days if they go untreated. To be most effective, Cipro should be taken within hours of anthrax exposure, said FDA antibiotics chief Gary Chikami. Once symptoms -- fever, chills, rash and respiratory congestion -- appear, little can be done.
The Department of Health and Human Services is spending $278 million this year on bioterrorism preparedness. That includes stockpiling enough Cipro for 5 million treatments.

Defense News
September 4, 2000
Pg. 1

Greeks Acquire Cruise Missile

Turkey Raps Scalp Sale by France

By Douglas Barrie and Colin Clark, Defense News Staff Writers
LONDON — Turkish officials say an Anglo-French sale of stealthy cruise missiles to Greece has sharpened their concern about strategic parity between the two NATO allies and that Ankara reserves the right to redress any imbalance.
"If the current balance of power between Greece and Turkey is altered in Greece’s favor, we will have the right to correct the situation," a Turkish Foreign Ministry official told Defense News Aug. 24.
The Greek Air Force is getting the Anglo-French air-launched cruise missile, known as Scalp, as part of a $1.78-billion acquisition of combat aircraft and weapons systems. Contracts with the companies involved were signed Aug. 21 in Athens, Greek military sources confirmed. The service also is buying an additional Mirage 2000-5 combat aircraft.
Scalp is being developed by the Anglo-French missile house Matra-BAe Dynamics, London.
A U.S. State Department official told Defense News Aug. 25 the sale should not spark much objection.
"France is closely aligned with NATO, and Greece is a NATO ally, and that’s where these types of concerns are vetted," the official said. "If there was a problem with this it would have been addressed within that forum. These things aren’t going to be pointed at Turkey. And there are many people watching that situation very closely and I’m certain nothing will fall through the cracks."

A Greek Air Force official told Defense News Aug. 25 that "we have a need for a long-range air-to-surface weapon."
Under the Missile Technology Control Regime (MTCR) protocols, to which France and Britain are signatories, however, there is a presumption that cruise missiles with a range in excess of 300 kilometers, or a payload of more than 500 kilograms, will not be exported.
The MTCR is a voluntary pact aimed at preventing the spread of unmanned delivery systems such as ballistic and cruise missiles. The regime, which now has 32 participating countries, is intended to control the proliferation of ballistic and cruise missile technology.
Discussing the issue of MTCR, the Greek Air Force official pointed out that stand-off weaponry in the class of Scalp was either in development, or on the procurement agenda, for numerous air forces.
Scalp is intended to provide the ability to attack high-value fixed targets, such as command and control centers and airfields, at long range. This capability would thus allow the launching aircraft to remain outside the engagement footprint of even long-range surface-to-air missile systems.
The Turkish Air Force is working to acquire the Popeye air-launched stand-off weapon from Israel, but the range of this weapon is no greater than 100 kilometers. The Scalp missile design has a range capability in excess of 600 kilometers.
That worries the Turks.
"Our measures could include the acquisition of similar equipment," the Turkish Foreign Ministry official said. "Once the balance is altered, we don’t think the United States would oppose a Turkish move to restore the balance."
A U.S. State Department spokeswoman refused Aug. 25 to say whether the Scalp sale would violate MTCR protocols or contribute to proliferation in the region.
But a British Foreign and Commonwealth Office spokesman told Defense News Aug. 25 that the government considers the Scalp missile to be compliant with the MTCR.
Matra-BAe Dynamics officials previously have told Defense News that the variant of Scalp on offer to Greece was MTCR-compliant. Senior Matra-BAe Dynamics officials had anticipated that the sale of Scalp to Greece might raise political concerns, particularly in the United States. So far, however, according to one senior Matra-BAe official, Aug. 24, there has been little sign of this.
The sale in December 1998 of a Scalp derivative to the United Arab Emirates was strongly opposed by the U.S. State Department. The missile has not yet been delivered to the customer, though.
Pentagon and State Department officials have told Defense News that sales to a NATO ally are much less problematic than a missile sale to the Middle east.
Staff Writer Amy Svitak and Correspondent Umit Enginsoy contributed to this report from Washington.

American Spectator
July/August 2000
Pg. 36

Will Terrorists Go Nuclear?

Given all the nuclear waste scattered about the U.S. and elsewhere in the world, their task is becoming easier.

By John B. Roberts II
One year after the 1993 World Trade Center bombing, a Dodge B-300 series passenger van was parked on the sandy flats of the White Sands Missile Range test site in New Mexico. Alone against the backdrop of low-lying hills, the Dodge van looked strangely out of place. Concealed inside were hundreds of pounds of C-4 military-style plastic explosives, rigged to detonate by remote control.
With precision timing, the car bomb exploded in a blast that blew outward in a broad circular pattern at the base and rose upward in a smaller, oval- shaped, intensely violent flash. High speed film and video surveillance captured the spread of explosive debris. Sensitive monitoring devices measured the dispersal and trajectory of bomb fragments from the blast's epicenter, which the bombers called "ground zero."
The disintegrating Dodge van was among the first of many car and truck explosions ordered by Clinton's National Security Council at White Sands between 1994 and 1997 for a high-priority government research project called Dipole Might.

The project was part of an effort by the Defense Special Weapons Agency (formerly the Defense Nuclear Agency) to create a sophisticated computer program for field use by counterterrorism forces. Test bombs ranged in size from 50 to 1,000 pounds of explosives, inside vehicles varying from a Chevrolet Caprice four-door sedan to a 60,000-pound tractor-trailer truck. Armed with data from the tests, contingency planners could simulate the effects of large-scale vehicle bombs, chart evacuation zones, and anticipate the spread of lethal chemicals or radioactive material.
The NSC's urgent interest in dispersal bombs begins at the World Trade Center. Horrific as the bombing was--six people were killed and more than 1, 000 injured--it could have been far worse. At the 1994 sentencing of four of the six bombers indicted in the plot, U.S. District Judge Kevin T. Duffy revealed that the bomb which exploded in the Trade Center's parking garage was packed with sodium cyanide. The plan was for the deadly chemical agent to disperse when the truck exploded. Fortunately, the bomb explosion vaporized the chemical, preventing it from contaminating a wide area and probably killing hundreds of people.
Sodium cyanide was not the bombers' first choice. Ramzi Yousef, says one intelligence source, intended the World Trade Center bomb to be a " radiological dispersal device." A senior FBI source confirms that the bombers' initial plan was to irradiate the World Trade Center.
In 1992, a series of still-classified National Intelligence Estimates from the Central Intelligence Agency concluded that such nuclear terrorism is now highly likely.
The CIA reports galvanized Washington into efforts to prevent any of some 25,000 nuclear weapons from the arsenals of the former Soviet Union from falling into the wrong hands.
What really worries the experts is the lethal combination of radioactive waste and conventional explosives. According to policy makers, security analysts, and nuclear industry officials interviewed for this article, terrorist use of radioactive waste is a much more likely threat than terrorist use of actual nuclear weapons.
In the eight years since the CIA warnings, there has yet to be a single documented case of an attempt to steal or smuggle a nuclear warhead. The same claim cannot be made for the simpler, yet deadly, radiological dispersal device.Nuclear waste has already been used in terrorist bombs. In 1996, Chechen rebels placed a small bomb containing dynamite and the deadly radioactive element Cesium-137, a waste by-product of nuclear fuel, in a Moscow park. Cesium-137 has a half-life of thirty years on the ground and emits lethal radiation in the form of hard gamma rays. The Chechens did not detonate their bomb, but they did manage to highlight Moscow's vulnerability--not to mention the limitations of Russia's crack Alpha Force, the paramilitary emergency response team charged with locating and recovering lost or stolen nuclear materials.
A radiological dispersal bomb, like a nuclear weapon, spreads deadly radiation. But unlike a nuclear warhead, it does not split atoms to produce an explosion. Instead, it combines conventional explosives (such as the C-4 and ammonium nitrate used in the Dipole Might test bombs) with radioactive materials such as spent nuclear fuel. A conventional explosion spreads the radioactive debris, causing widespread destruction, contamination, and death.
The World Trade Center bombing is not the only time terrorists have targeted the U.S. for radiological dispersal bomb attacks. In 1996, FBI Director Louis Freeh testified before the Senate Appropriations Subcommittee on Foreign Operations that U.S. intelligence had foiled two conspiracies to import radioactive material into the country. In one of the plots, 45 tons of radioactive zirconium metal were seized in Cyprus as they were being prepared for smuggling into the United States. Zirconium is a key part of nuclear fuel assemblies. Nuclear fuel rods remain highly radioactive long after their useful life. The left-over materials and metal in a spent fuel assembly contain deadly levels of uranium, plutonium, cesium, and other radioactive elements. The "radioactive inventory" of a typical fuel-rod assembly roughly equals the Hiroshima bomb.

A NEST of Angels

In his long career, MIT nuclear engineer Shelby Brewer has overseen the construction and management of nuclear reactor plants worldwide. During the Reagan years, he ran America's nuclear power program at the Energy Department. In 1982, he put together a long-term plan for the safe storage of spent nuclear fuel. Signed into law in 1983, it became the nation's blueprint for disposal of radioactive waste. Brewer now estimates that a radiological dispersal bomb made from fuel assemblies of the kind intercepted in Cyprus would kill thousands if detonated in an urban area.
In 1980, the Nuclear Regulatory Comission, which oversees the security requirements for the storage and transportation of civilian nuclear reactor fuel, drafted an environmental assessment entitled "The Transportation of Radionuclides in Urban Environs." Using a worst-case scenario involving an explosion of a cask of spent nuclear fuel at noontime in Manhattan, the NRC estimated 2,492 deaths caused by immediate and latent radiation exposure, and up to $3 billion in property damage.
If there were such a threat involving nuclear materials, the U.S. Energy Department's Nuclear Emergency Search Team, known as NEST, would have to find and defuse the bomb.

Since its creation in the seventies, NEST teams have been scrambled for dozens of operations involving nuclear threats. John Weidner, NEST's program manager, confirms that at least nine of those instances have involved serious threats, including a 1979 theft of uranium from a plant in Wilmington, North Carolina.

NEST's ability to detect radioactive material is legendary. Radiation sources can be detected because they emit sub-atomic particles. NEST's radiation sensors are far more sophisticated than the rudimentary Geiger counters of the early atomic era. Its detection gear can be carried in search helicopters, or by hand in small units. When a crashing Soviet satellite spread radioactive debris over Canada during its descent, NEST teams searched an area 600 miles wide and 600 miles long and successfully detected radioactive material as small as a grain of salt.

Weidner maintains that NEST can also deploy surreptitiously, to gain an element of surprise that would be crucial in a counter-terrorist operation. As he put it, "It's possible for us to go in discreetly. Depending on the event, we may want to stay very low-visibility."

NEST's search equipment is on standby at Nellis AFB, just outside Las Vegas, ready to be loaded onto a commercial or military aircraft for rapid deployment. For clandestine operations, NEST members carry sensors concealed in ordinary attachG cases, enabling them to walk undetected in crowds and wait for a signal to wireless earpieces to alert them to the presence of a radiation source. Vans disguised to look like ordinary passenger or commercial vehicles stand ready for search use in larger zones, and NEST has its own search aircraft and helicopters to cover large areas of territory.

NEST is not a large standing organization. Standby teams are based in Nevada, but its human assets are spread around the country. There are hundreds of individuals trained and designated to assist NEST. Most have other full-time jobs. NEST duty rosters include some of the country's top scientists, bomb experts, and nuclear weapons designers. Weidner says up to 800 people can be mobilized to meet multiple threats at any given time.

But even NEST faces limits. Weidner acknowledges that some nuclear threats are difficult to neutralize. "It depends on how much ground we can cover in the amount of time," Weidner says. "Based on the kind of object we're looking for, some might be very easy to detect. Others may be very hard to find."

Ironically, the most dangerous devices--nuclear warheads and spent nuclear fuel in a dispersal bomb--would be virtually undetectable. In order to make both safe to handle and transport, the nuclear material is shielded. The better the shielding, the fewer sub-atomic particles can be detected.

"There are variables," Weidner says in describing NEST's limitations. "How much time you can spend in the area, how close you can get to the source, and whether there's any intervening shielding material." Needless to say, he adds, "our chances for success are much improved if we have good intelligence."

Once NEST finds a warhead or a radiological dispersal bomb, the next challenge is to successfully neutralize it before it explodes.

One famous incident where NEST's teams did not succeed occurred in 1980. Harvey's Casino at Lake Tahoe, Nevada, was threatened with nuclear extortion. The bomb exploded when experts tried to defuse it. Fortunately, the nuclear threat was a hoax.

Nonetheless, the design of the Harvey's Casino bomb was so sophisticated that seventeen years later it was invoked by the director of the Energy Department's office that oversees NEST in her testimony to Congress about nuclear terrorism. "While this particular device was not nuclear," Lisa Gordon-Hagerty said, "it offered many of the problems that our scientists and analysts feared could be encountered in a nuclear device."

"We now know," she added, "that terrorists are willing to use large explosive devices, and devices that disperse chemical agents, without warning. We must therefore assume that nuclear terrorist devices could be placed and detonated without warning."

While conventional bombs designed to disperse nuclear material may sound easier to dispose of than nuclear warheads, recent experience shows otherwise. In recent cases in Peru, U.S. experts found large-scale vehicle bombs with sophisticated improvised devices unlike any ever seen before. When and if NEST needs to dispose of a conventional bomb containing nuclear materials, it may encounter a highly sophisticated device.

The Lugar Project

Over the past decade, Senator Richard Lugar (R-Ind.) has been the driving force in U.S. efforts to prevent the spread of nuclear weapons, scientific expertise, and atomic materials beyond the crumbling Soviet military complex. In the fall of 1991, shortly after the collapse of the Soviet Union, Lugar met with Red Army officers who convinced him of the urgent need to secure the Soviet nuclear arsenal.

"They said security was so loose," Lugar says, "that you could put a tactical nuclear weapon on a flatbed truck and just drive it off to Iran."

Over the years Lugar's thinking has evolved from preventing nuclear terrorism to preparing state and local governments for a nuclear terrorist emergency. Lugar, who sits on the Senate Select Committee on Intelligence, says U.S. experts think terrorists are more likely to use bombs containing nuclear waste than atomic warheads.

Most efforts to contain nuclear smuggling focus on the former Soviet Union. A Center for Strategic and International Studies research project on the nuclear black market chaired by former CIA Director William Webster reports that Russian Interior Ministry officials acknowledge 54 cases of nuclear materials thefts in just two years. Most involve insider access at MINATOM, Russia's nuclear facilities. At least two cases, including the theft of nuclear fuel rods from a Russian naval base, involved military installations.

"In an era when the military and top scientists go unpaid," Lugar says about Russia's nuclear materials, "this is the coin of the realm."

Joint intelligence and police sting operations have caught nuclear smugglers in the act. Weapons-grade plutonium and uranium have been seized in Germany, cesium has made its way to Lithuania, and there is an unconfirmed report of plutonium seized in Verona, Italy. In 1994, six pounds of highly enriched uranium were recovered in Prague.

In Germany alone, police sting operations netted 404 credible nuclear smuggling cases between 1992 and 1994. After Russian officials complained these operations were entrapping desperate Russian citizens lured by false talk of a thriving nuclear black market, Germany in 1995 officially abandoned the sting tactics.

National security experts theorize that a comparable number of nuclear smuggling attempts to those detected in Germany should have been detected across the frontiers of southern Europe and Turkey. The fact that no similar surge in smuggling attempts has been reported in these regions is cause for alarm--a sign nuclear smuggling attempts have succeeded. In these experts' view, it is already too late to prevent the leakage of nuclear material from Russia.

Is there missing Russian inventory? "Our own people tell us they don't know, " Lugar says.

Another nuclear insider with extensive experience in Russia is less circumspect. "There are lost inventories and lost finished weapons in the former Soviet Union," he says. "But don't quote me."

Nuclear Waste, Nuclear Shutdown

MIT's Shelby Brewer says the former Soviet Union is not alone in poor accounting for nuclear materials. In the sixties and seventies, he notes, the U.S. also had inventory losses. The worst offenders are the national laboratories, where there are significant quantities of unaccounted-for nuclear materials.

"I've seen more lack of good management and safety at the national laboratories," Brewer says. "The military weapons labs are well-managed. The civilian labs are the problem."

Although he is bearish about the long-term prospects for nuclear power in the United States, Brewer sees the industry as undergoing a mid-life crisis that makes it vulnerable to security breaches. Brewer cites several worrisome trends.

"The nuclear industry is dormant, downsizing, similar to the Soviet Union," Brewer says. "Many employees in the U.S. nuclear industry are middle-aged, their careers are in ruins and going nowhere. What happens if some insiders become anti-government?"

Worry about the security of U.S. nuclear materials is compounded by delays in implementing a long-term storage plan for the nation's atomic waste. Legislation passed in 1983 required the federal government to take over nuclear waste storage and management by February 1, 1998. But that deadline has come and gone, and individual nuclear power plants are still responsible for storing their own wastes.

Nuclear power plants are running out of room to store radioactive waste. The U.S. has 105 operating nuclear plants at 74 different locations spread across every region. These plants generate enough electricity to power 65 million homes. The average plant also generates 28 tons of nuclear waste a year. Ten plants have already run out of room to store wastes inside the reactor complex and now use dry storage warehouses. By 2010, 78 plants will have run out of storage space.

Security experts and industry spokesmen are quick to point out that there has never been a theft of spent nuclear fuel in the U.S. But until 1993, there was never a World Trade Center bombing either.

During 30 of operations, including some 2,400 shipments of nuclear fuel since the 1960's, the material has been handled safely. But insiders acknowledge that it is more complex to secure scores of sites, and that overflow waste storage facilities outside the main reactor complex compound security risks.

"It's been stored safely for thirty years," says Nuclear Energy Institute spokesman Steve Ungelsby. "But at one location it's more efficient."

The radioactive contents of spent nuclear fuel rods typically contain about 25 pounds of uranium 235, a ton of uranium 238, and about 15 pounds of plutonium 239. Cesium 137 and Strontium 90 are also present. The dry casks that contain this nuclear inventory are designed to withstand severe stresses. The cask used for rail transportation of nuclear waste is made of 12 inches of steel covering 8 inches of lead, and weighs 100 tons unloaded! Casks can withstand fires up to 1,475 degrees Fahrenheit. To test its durability, one cask type was dropped 2,000 feet from an airplane traveling at 135 mph. It bent, but it didn't break.

But the casks are not tamper-proof. One expert says a cask can be structurally weakened by drilling or removal of lugs fastening the cask's lid. Conventional explosives like those tested in Dipole Might would then rupture the casks, dispersing their deadly contents over a wide area.

To counter this vulnerability, the Energy Department recently issued a request for bids specifying even more stringent standards for the next generation of dry casks. New specifications call for casks that can withstand armor-piercing ammunition and small artillery rounds as well as high- explosives. Their location will be monitored by devices welded to them that transmit signals to a satellite, which are then retransmitted to a centralized monitoring facility so that the precise coordinates of each cask are known at one-minute intervals.

But this state-of-the-art security system doesn't yet exist.

To rectify the storage problem, Senator Frank Murkowski (R-Alaska) recently sponsored the Nuclear Policy Waste Amendments Act. His bill directed the Energy Department to begin shipping nuclear waste to Yucca Mountain, Nevada, the site proposed for permanent nuclear waste storage. The bill also prevented the Environmental Protection Agency from writing the regulations for nuclear waste shipments, a move the Clinton White House opposes.

The EPA agenda is simple. Anti-nuclear activists have been appointed to top levels in the Energy Department and EPA under Clinton. By imposing standards so stringent that they cannot be met, the extremists plan to make shipment of nuclear waste impossible. As the wastes pile up at nuclear power plants, the industry will have to choose between shutting down power plants or expanding external storage facilities--provided state legislatures will authorize the new waste sites. Over time, the industry will literally become buried in its own waste.

In April, Clinton vetoed the Murkowski legislation. Senate attempts to override the veto fell short by three votes.

"The '82 plan was doable," Dr. Brewer says. "It called for banking the money until the early nineties and then starting construction. What has happened is one of the most egregious cases of mismanagement of a national program I have seen."

Former Energy Secretary John Herrington agrees. "I believe the people working in the nuclear waste program are doing a fine job," Herrington notes. "They have solved the technical problem."

"What you see now are the political impediments. It is one of the most politicized programs of the entire U.S. government," Herrington says. "In Nevada you can't get elected to office if you have any sort of reasonable policy with regard to nuclear power or waste shipment."

When asked what it will take before nuclear waste is permanently secured, Herrington replies: "There will be a triggering event...."

Senator Lugar isn't waiting. He and New Mexico colleague Pete Domenici joined forces to pass legislation for the training of emergency medical teams in cities across the U.S. The legislation provides funding for training exercises in 120 cities in order to create coordination among federal and local officials in the event of a chemical, biological, or nuclear attack.

"People are not defenseless," Lugar says.

"Wild Atom" may indicate otherwise. That is the name of a simulation conducted by the Center for Strategic and International Studies. The realistic game scenario involved former heads of the CIA, FBI, and Energy Department, and top Pentagon officials in a joint response to a nuclear terrorist threat. The simulation featured an improvised nuclear weapon made by Moslem radical terrorists being smuggled by ship. Wild Atom became the basis for the hit movie The Peacemaker, in which George Clooney and Nicole Kidman forge an unlikely collaboration and prevent a stolen Russian warhead from exploding in Manhattan.

The Peacemaker has a happy ending, but the high-level Wild Atom exercise on which it was based was characterized by internal turf battles between competing agencies and confusion over how to respond to these new threats.

"In the end," the Wild Atom report notes, "nothing was decided or even suggested that would have prevented a nondescript freighter with a crude nuclear device in its hold from arriving in Baltimore harbor in two days time. "

John B. Roberts II is a television producer and free- lance journalist.