

Group Says Labs Eying New Nukes

Official: Work Theoretical

BY JENNIFER MCKEE
Journal Staff Writer

2/5/02

Scientists at the nation's nuclear weapons labs, including the two in New Mexico, are being formed into teams to conceive new nuclear weapons designs, according to a report by a national environmental group that says it obtained parts of a secret government nuclear weapons policy report.

The Natural Resources Defense Council, headquartered in New York City, released the report Thursday which says scientists at Los Alamos and Sandia national labs have been called upon to consider new nuclear weapons designs.

The report is based on information the council says it gleaned from the secret Nuclear Posture Review, a road map of the nation's nuclear policy the Bush administration completed earlier this year but has not fully released to the public.

The head of the National Nuclear Security Administration, a branch of the federal Energy Department which runs the weapons labs, testified about the Nuclear Posture Review at a Senate hearing Thursday in Washington.

John Gordon, administrator of the NNSA, said his agency has formed "small groups" of designers to "explore what might be possible" with new nuclear weapons designs.

"We do this with an appreciation on the restrictions on pursuing new weapons," said Gordon. He added that the work is not looking at any specific military needs and is more theoretical.

Sen. Jeff Bingaman, D-N.M., serves on the Senate Armed Services Committee and was at Thursday's hearing. Bingaman said he asked Gordon specifically whether the nation was engaged in designing new nuclear warheads.

"I was told we are not," Bingaman said. "We are not designing or developing new warheads."

The Natural Resources Defense Council report said the NNSA "is re-establishing advanced warhead concept design teams at each of the three design laboratories — Los Alamos, Sandia and Lawrence Livermore."

The teams will focus on designing new nuclear weapons to penetrate "hardened and deeply buried targets," and for attacking chemical or biological warfare sites. The teams will also



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Group: Labs Designing New Nukes

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focus on new nuclear weapons designed to be more precise and with "reduced yields," or lesser powerful nuclear weapons than the hydrogen bombs currently in the U.S. nuclear stockpile.

The nation has not formally pursued new nuclear weapons since the early 1990s, when President George Bush Sr. issued a presidential directive against it, according to Chris Paine of the Defense Council.

The design teams are part of a larger U.S. nuclear policy that re-examines the existing nuclear arsenal developed during the Cold War and identifies different potential targets for nuclear weapons. Those new targets could demand new kinds of nuclear weapons, according to the report. But because designing and building new weapons is a long and complicated process, the Bush administration wants to start early with design, the report said.

According to excerpts from

Gordon's testimony Thursday, Gordon said he also sees three main areas of change in the nation's existing nuclear capabilities and infrastructure.

Along with the design teams, Gordon said the nation must be able to perform an actual nuclear test, something that has not been done in 10 years. Gordon said he doesn't think the nation actually needs to perform a nuclear test but should be able to if the need ever arises.

He also said the nation needs to "think seriously about a modern pit production facility." Pits are the plutonium-sphered engines of every nuclear weapon. The nation has not manufactured a new pit in more than a decade.

Bingaman said he has read neither the National Resources Defense Council report nor the Nuclear Posture Review. "I think our national policy of not developing nuclear weapons has served us well," he said.

Gordon stressed in his comments that the design team that NNSA has assembled is formed

to "help ensure long-term design competence," and is not a pursuit of a specific new nuclear weapon or warhead. He further said that his agency is "focused almost exclusively on maintaining today's stockpile."

Still, the report and Gordon's testimony, alarmed some activists.

"We're very familiar with this agenda," said Paine. "We thought we left it behind 17 years ago."

Paine said the information his group obtained doesn't paint a complete picture and leaves room for questions.

Greg Mello, of the Los Alamos Study Group in Santa Fe, said including new weapons designs in the Nuclear Posture Review "provides legitimacy" to the effort and may confound U.S. efforts to contain the spread of nuclear weapons elsewhere in the world.

"It will be very difficult to go into an international gathering and say we are ending the arms race when we are planning on making new weapons," he said.

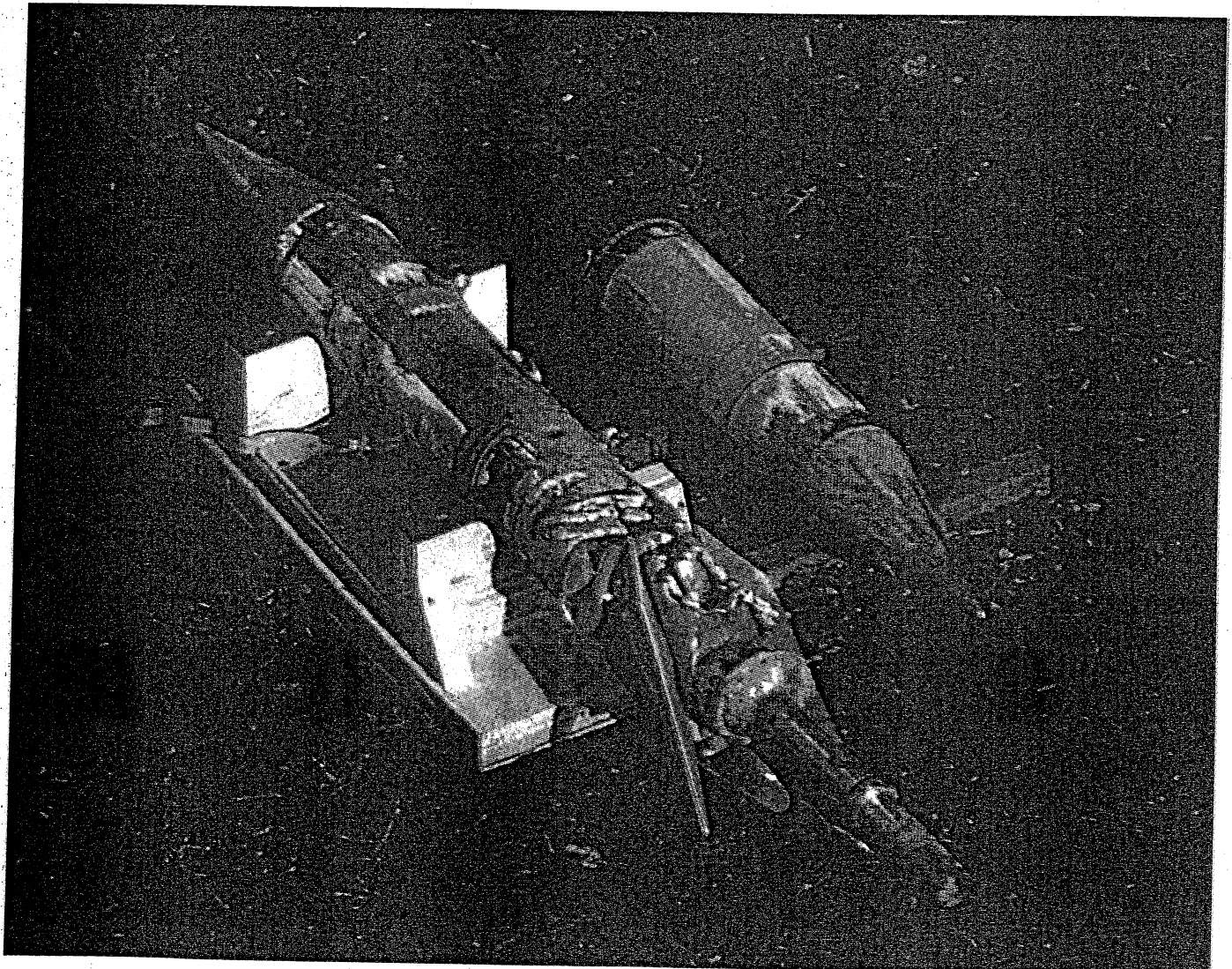


INSIGHT & OPINION

Analysis, commentary and ideas

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BACK TO THE NUCLEAR FUTURE



President Bush's recently completed "Nuclear Posture Review" strategy seeks the capability for new, earth-penetrating, bunker-busting warheads, capable of far deeper penetrations than these two test U.S. B61-11 penetrating warheads. Loaded with depleted uranium, they were readied for return to Sandia National Laboratories in Albuquerque for analysis after a March 1998 test at the Fort Wainright bombing range near Fairbanks, Alaska. They were dropped from a B-2A Stealth bomber and penetrated the permafrost to depths of 6 to 10 feet.

Mark Farmer/Associated Press

The more things change in the post-Cold War world, today's author warns, the more the nation's nuclear arsenal and two of its creators, New Mexico's nuclear weapons laboratories, stay the same — bucking the global trend toward denuclearization

By Greg Mello

On Dec. 31, the Bush administration delivered to Congress its nuclear weapons strategy, "Nuclear Posture Review."

On Jan. 9, the press was briefed.

In keeping with nuclear tradition, few details were provided; the briefing was confined to broad ideas and opaque terminology.

Fortunately, by mid-February, the first details of the actual plan began to leak, first to the Natural Resources Defense Council and later to major newspapers.

The devil, as it turned out, is in the details for U.S. nuclear policy and for nuclear weapons facilities such as New Mexico's Sandia and Los Alamos national laboratories.

What an active fellow that devil turns out to be!

The Bush nuclear strategy was pitched — and largely reported — as "new thinking" that would allow the United States to reduce its nuclear stockpile from about 10,650 warheads and bombs today to between 1,700 and 2,200 in 10 years.

But the Bush plan doesn't actually involve real stockpile reductions. Despite the headlines, total U.S. warheads are to be reduced by 6 percent over 10 years, or fewer than 1 percent per year.

This is because only one warhead type would be actually dismantled — the decades-old W62 warhead currently mounted on Minuteman III intercontinental ballistic missiles. Previously slated for elimination, they were temporarily reprieved when congressional Republicans scuttled ratification of the START II treaty.

Other than the W62, all the "reductions" in the plan are like Enron debts, simply moved to subsidiaries with different names.

Warheads taken from the category of "operational deployment" will be either redesignated the "responsive force," or placed in the "strategic inactive stockpile." There they will mostly remain intact and available for active redeployment at any time, in some cases within weeks, depending on the weapon in question. All these weapons could be redeployed when desired, which is the precise reason they are being kept.

The Enron-style accounting, however, doesn't stop there.

Aside from assembled nuclear weapons, the United States also has in reserve thousands of

TODAY'S BYLINE

Mello is director of the Los Alamos Study Group, a Santa Fe-based nuclear watchdog group that concentrates on Los Alamos National Laboratory.

TAP IN

Leaked portions of the Bush nuclear plan can be seen at: <http://www.globalsecurity.org/wmd/library/policy/dod/npr.htm>

To comment, write to us at Letters to the editor, The Albuquerque Tribune, P.O. Drawer 1, Albuquerque, N.M. 87103. Our fax number is 823-3689. Our e-mail address is letters@abqtrib.com.

components, including plutonium "pits," the nuclear cores of weapons. Some 5,000 "strategic reserve" pits, and possibly thousands more, are now stored near Amarillo, Texas, where they are available for ready remanufacture into a number of pretested weapon designs.

The number of nuclear warheads and bombs potentially available under the Bush plan is closer to 15,000 than the "1,700 to 2,200" figure that was pitched to gullible journalists.

The gravest dangers of the Bush nuclear strategy, however, do not lie just in its numerical sleight-of-hand. Rather, they lie in its pursuit of new nuclear capabilities — both weapons and the infrastructure to quickly make them — and in a newly serious, bloody-minded policy that would justify their use in battles around the world.

The Bush team calls its strategy the "New Triad." It integrates nuclear strike forces with missile defenses — both with conventional power projection forces — and supports these with a "revitalized (nuclear) infrastructure that will provide new capabilities in a timely fashion to meet emerging threats."

Put simply, this nuclear strategy aims to integrate nuclear weapons more tightly into the military with a variety of new roles, including and especially nuclear war-fighting. The plan gives specific examples of situations in which nuclear weapons might be used, and sets a new, very low, threshold for considering a nuclear strike.

The plan calls for the development of new kinds of nuclear weapons, such as better penetrating weapons and "agent defeat"

weapons designed to incinerate biological and chemical warfare agents. Advanced concept teams to design these and other weapons are to be started at the nuclear weapons laboratories such as Los Alamos and Sandia.

Because some of these new designs will require nuclear testing, "Posture Review" requires the Nevada test site be readied to conduct new nuclear tests (which would violate the 1996 Comprehensive Test Ban Treaty) with only a few months' lead time, certainly faster than Congress' response time.

It will not be inconvenient, for those who wish to resume nuclear testing, if other countries, for example China, are provoked to follow our lead. Projecting a need for nuclear weapons and their delivery systems at least 50 years hence, this plan calls for new, expanded and upgraded nuclear weapon production plants to make and maintain nuclear weapons, as one senior Department of Energy official put it, "forever."

All of this in the face of sweeping global efforts to denuclearize the world through nonproliferation, test bans and disarmament treaties.

In the Clinton administration, a cloud of deception lay over the varied purposes of what the DOE calls its "stockpile stewardship" program that allegedly was supposed to only monitor and maintain the existing arsenal.

Most Democrats, eager to placate the labs, couldn't — or wouldn't — see that the expanded capabilities that make that program so expensive were *not* actually needed to maintain existing U.S. nuclear weapons.

In fact, many of those capabilities, quite possibly including nuclear testing, *are* needed to make existing nuclear weapons different or to develop new ones. It is this strategy the Bush team has brought out of the closet for the world to see.

The plan's premise is that to achieve the specificity and speed required for credible nuclear tactical warfare in a Third World setting, an array of ambitious new military capabilities with global reach is needed. Not only must new weapons be tailored and certified for new kinds of targets; better — much better — targeting intelligence will also be required on the ground and in the skies; and very rapid strike planning capability will also be needed to support an evolving nuclear battlefield.

— Please see **FUTURE/C3**

FUTURE from C1

But with this level of detailed, on-the-ground intelligence (and hence "presence"), what would be the military "value added" of a nuclear strike — even if you do not consider the catastrophic consequences for global nuclear nonproliferation, U.S. stature at home and abroad, or homeland security?

There are many such hard military questions, all unanswered in this plan.

In fact, the plan appears to reflect more the budgetary needs of the nuclear weapons complex and the political needs of civilian ideologues than any coherent military strategy *per se*.

Indeed, the plan reads, in many places, as if the senior military officers — who blessed it — have been sold a bill of goods by enthusiastic weapons scientists and colonels who seek to maintain or expand nuclear capabilities, or by political actors who seek a posture of nuclear threat as essential to buttressing their aspirations of empire.

Does the military, and do members of Congress, know that so-called "low-yield" nuclear weapons cannot penetrate the earth more than a certain, relatively small amount, for fundamental physical reasons? Because they depend on physical law, they cannot transcend research, however lucrative the goal?

Do they know that the capability to destroy an enemy underground leadership bunker with a small nuclear weapon, let alone an underground storehouse of biological or chemical weapons,

is actually rather limited — whereas the damage to any surrounding population from even a very small nuclear weapon would be extensive, unpredictable, long-lasting and devastating?

This is a security plan that needs a serious reality check, one that Democratic leaders of Congress such as New Mexico's Sen. Jeff Bingaman could and must provide.

In the late 1940s, our political and military leaders thought their monopoly on nuclear weapons gave them the "winning weapon," in historian Gregg Herken's memorable phrase.

This ambition was frustrated by the Soviet Union's success at building its own nuclear weapons and, at terrible cost to its people, catching up — and keeping up — with the United States.

The superpower contest threatened the whole world but might have helped prevent nuclear use by both nations.

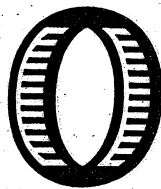
The end of the Cold War and

the collapse of the Soviet Union were a "near-death experience" for many nuclear weapons managers, ideologues and war planners. The devilish details of the Bush strategy, however, offer them salvation, with all the passion of a second chance.

Now lacking another superpower to help restrain them, this time we had all better get prepared to do it ourselves.

A Terrifying Tour of the Lab in Los Alamos

by Shannyn Sollitt



On December 15, 2001, Greg Mello and associates of the Los Alamos Study Group took citizens on a tour of Los Alamos National Laboratory. Most know that the Lab, a part of the University of California, is the site for the manufacturing of plutonium pits, the trigger for nuclear weapons. Although 20,000 perfectly good back up nuclear weapons are stored in a bunker in Amarillo, our government feels the need to constantly renew the stockpile of weapons, mainly to be able to recruit scientists. They need some way to test scientific skills — real design, real prototyping, real manufacturing and testing.

\$700 million has been spent so far on developing the pit manufacturing facility which currently employs about 1000 people. There will be a lot of nuclear waste as a result — enough, they anticipate, to fill up an entire mesa, Mesita del Buey. Already 11 million cubic feet of chemical and nuclear waste are buried there, along with nuclear reactor cores, in shallow unlined pits and shafts. On top, mildly fire resistant tents house 50,000 drums of transuranic radioactive waste intended for WIPP over the next 30 years. This waste dump has been operating illegally since 1985, with no external oversight. The illegal dump will continue to grow under the Stockpile Stewardship Program — around 9000 cubic meters per year. The trees there have elevated levels of radio-nuclides. Burrowing animals are radioactive. It is ranked as a low priority site for clean up, primarily because there is not enough citizen outrage.

VULNERABLE TO ATTACK

First on the tour, Tech Area 18 is where they test burst reactors for criticality experiments and test the effects of radiation on electronic equipment. About \$3 million dollars worth of research is done there. This area is so vulnerable to attack that it costs \$32 million to protect it against theft or the radiological sabotage of special nuclear materials, i.e. weapons grade plutonium and enriched uranium. Around 200 tons of these special materials are spread across LANL. All facilities across the entire complex that house special nuclear materials have been tested against a potential terrorist attack (a kind of laser gun tag). Fifty percent of the time, the bad guys win.

Tech Area 55, the Plutonium Processing Plant, is decorated with an orange windsock so that, when the alarm sounds, people know which way to run. The fire of 2000 came to within 100 feet of a light steel building, #185, which contained at that time around 20 kilograms of concentrated plutonium waste — considered a Category One Nuclear Waste Facility. The Department of Energy didn't know it was there. When plutonium burns, it disperses in the smoke and can travel for many miles, depending on the wind, making an eternal wasteland of its path. There are huge safety problems with storage of plutonium, a very unstable material, extremely difficult to store. There are 3 metric tons of weapons grade plutonium stored at TA 55. \$19 million was spent on a storage facility there that had such egregious faults, it was turned into an office building. Terrible accidents have happened inside the facility, dosing numbers of workers with plutonium.

QUESTIONS ABOUT BIO-DEFENSE WORK

Next stop, the site of the CMR (Chemistry and Metallurgy Research Building) is the largest building at the Lab, sitting atop a modern earthquake fault. Two Bio-Safety Level 3 labs, (BSL3), will be built on the adjacent parking lot. Level 3 labs handle pathogens contracted through inhalation — classical bio-weapons agents. Proposals to construct these two labs are at the vanguard of a huge bio-defense research funding, anticipated nationally to be in the tens of billions of dollars. It is not clear what research will be done in these two proposed facilities, and there is no way to tell if this type of research is offensive or defensive — until it is in a warhead. Particularly worrisome is the tinkering with the genetic engineering of pathogens.

Edward Hammond (the Sunshine Project) enlightened the citizens about the six years of negotiation at the UN Biological Weapons Convention. The US completely shut down the United Nations Organization for the Prohibition of Biological Warfare and nixed the Verification Agreement which would allow UN oversight and regular inspections. The US refusal to participate rendered the Verification Agreement null and void. The Labs were the main opponents of the Agreement. DOE facilities are not transparent.

When the US backed out of the Anti Ballistic Missile Treaty, the international community became even more suspicious of the US. For the past years it has become apparent to them that the US has been blatantly lying about its bio-defense work. Every other country would open their facilities. It is known that bio-bombs have

been tested "out west" in a secret aerosol facility. In Sverdlovsk, Russia, less than 2 grams of anthrax escaped through the filters at an aerosol testing facility and killed 1000 people. A small mistake can be very serious to adjacent populations, not to mention what bio-warfare might look like. A Bill awaiting consideration in the Senate, H.R. 3160, eliminates from the Freedom of Information Act the right for research organizations, citizen's groups, and others, to know what is happening in these facilities.

BUT WHO CAN MAKE IT WORK?

Just around the corner, the "Cathedral of Computing," the world's largest computer, will be able to compute 1000 trillion numerical operations per second. It has six cooling towers and consumes, at peak capacity, power which equals 1/3 the power of Los Alamos County — including the entire Lab. Primarily, its purpose is to simulate nuclear explosions. The weapons designers, however, doubt that the calculations of the computer programmers could be even remotely reliable. Among the other work they expect to use it for is bio organism modification, synthesis of new life forms, as well as other jobs like keeping track of all the bank accounts in the world. Based on the past track record with other super computers at LANL, when the final installation is complete, it is likely that no one will be able to figure out how to make the thing work — with a \$200 million price tag.

Last, but far from least, on top of a mesa amid ancient pueblo dwellings is Tech Area 53. Los Alamos Neutron Science Center is where the high current proton accelerator can be used to make isotopes. It is poised for the largest project proposal in the history of the Lab: the development of the Advanced Hydrotest Facility, (AHF), with an initial capital cost of \$1.6 billion. This is the weapon designer's dream. They expect to be able to simulate the closest approximation of a real nuclear explosion, save actual testing of the weapon. It will send a beam of protons across the mesas from an underground explosion chamber 350 feet below the top of the mesa. It has a high-speed x-ray machine for plutonium pit implosion photography. The program is so large it could consume 3/4 of the

An Eerie Voice From the Past

In the film archives of the Library of Congress there exists what might be the only remaining copy of a film entitled *When Will You Hide?* released by Encyclopedia Britannica Films in 1948. The script is like a voice from behind the curtain, tently delivering the unfolding scenario of the Nuclear Age.

It opens:

"The long Shadow of World War III, the first war of the atomic age, creeps steadily forward. Civilization stands in mortal danger! The cool methodical searching by scientists has given us an ever-growing control of the physical world, has provided each of us with a thousand mechanical slaves. Yet through all the years of opportunity we have not learned how to get along with our neighbors, man with man, or nation with nation. . . [and still] seek justice through slaughter and expect good to emerge from the reeking evil of war."

The film accurately lays out the advancements of weapons technologies which have since been developed — the self guiding rockets, the bacteria and germ warfare, the biological poisons which could kill every human on the North American Continent, the atomic bombs one thousand times more destructive than the ones used against Japan. It even predicts the effort to stop saboteurs.

"We could search all planes and trains and boats and automobiles crossing our borders. We could open every single package. . . We could remain on a constant, twenty-four hour, day-in day-out alert under some kind of dictatorship."

"We could devote all of our scientific effort to the constant improvement of weapons at the sacrifice of most constructive scientific programs. We could restrict ourselves to a standard of living under which everything but the barest essentials of existence would be sacrificed to a futile defense against the inevitable. Such a defense means a totalitarian America! A regimented population! A militarized industry!" — SS.

existing plutonium processing capabilities of the Lab. They can't manufacture a pit if it can't be tested. This is a very high priority project. This huge program can go forward, Greg Mello believes, because the citizens aren't informed by the press. The Energy and Water Appropriations Committee, headed up by New Mexico Senator Domenici, appropriates the funding. There is no Congressional oversight. According to Washington insiders, the appropriation committee members are dazzled by technology without a real idea what the bomb complex is about.

A DOZEN PEOPLE DECIDE

Seventy-nine percent of the Laboratory activity is nuclear weapons and associated waste. Only a dozen people make the decisions as to the directives of the Lab. It is difficult to begin to know what to do about this situation which has been progressively worsening for decades.

Are the appropriations really in the name of National Security or something altogether different? Greg Mello queries whether it is in our best security interests to create more reasons for the international community to fear the actions of the United States. Wouldn't it be better to remove the desire of others to inflict casualties on US citizens by working to correct the massive social injustice at the root of this desire — stemming from the imbalance of the utilization of world resources? Can the small group of thoughtful, committed citizens *really* change the world, (as Margaret Mead has said), or does the group need to be a whole lot bigger?

CALL TO ACTION

If this article disturbs you, contact the Los Alamos Study Group at 982-7747 for more information about how you can help.

6-16-02

Plutonium pits and LANL's Nuclear future

The lab expects to certify its first trigger for the W-88 warhead in 2007 at a cost of \$1.7 billion. But in an era of nonproliferation, critics question the need for a Cold War-era manufacturing capacity.

Story by Jeff Tollefson ♦ The New Mexican

Inside Technical Area 55 at Los Alamos National Laboratory, workers machine heavy, hollow orbs of plutonium that trigger thermonuclear bombs. Glove boxes and other equipment allow them to handle this man-made metal safely.

One day, one of these triggers, called pits, is likely to be certified for use in a W-88 warhead carried by the Trident submarine. A 475-kiloton bomb, the Los Alamos-designed warhead is 30 times more powerful than the one dropped on Hiroshima.

This activity is not entirely new. Pit manufacturing began at Los Alamos in the early nuclear years, and the lab has always built a small number of test pits. But in 1996, seven years after the closure of the old pit-manufacturing site at Rocky Flats in Colorado, the U.S. Department of Energy designated Los Alamos as a temporary site to build the W-88 pit.

"The next pit we do will not be \$1.7 billion."

DON McCOY
*deputy associate director
for weapons physics at Los Alamos*

The lab reports it has completed about a dozen test pits since the effort began in 1996. The first certified pit — ready for installation in a nuclear warhead — is scheduled for release in 2007, although the DOE inspector general has questioned whether the lab would be able to meet that goal. Los Alamos has 700 to 800 people working directly or indirectly on the pro-

Inside

■ President Bush's Nuclear Posture Review considers nuclear weapons to attack underground enemies, an idea that raises questions in political as well as scientific arenas.

■ Los Alamos National Laboratory aims to consolidate nuclear facilities at Technical Area 55.

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Plutonium pits and LANL's future

Pits: Critics question need for more production

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ject. Total cost from 2001 to 2007: \$1.7 billion.

"The next pit we do will not be \$1.7 billion," said Don McCoy, deputy associate director for weapons physics at Los Alamos. Although working on a single pit at present, McCoy said the lab is developing a process that can be used to build and certify pits for different nuclear weapons without nuclear testing. Once the W-88 project is up and running, he explained, Los Alamos could move on to other pits.

Local nuclear activists feared such an outcome more than a decade ago. With pit manufacturing come safety issues and the inevitable increase in nuclear waste. Rocky Flats carries a notorious environmental legacy, but most agree the process is much cleaner today.

"Making pits has never been safe, and it won't be safe. It can be made safer, and I'm sure Los Alamos is working on that, but it's not a nice process," said Greg Mello of the Los Alamos Study Group. "But the deeper problems have to do with a commitment which could have a lot of unintended consequences for nonproliferation and U.S. security."

From Mello's perspective, Los Alamos, as a nuclear weapons research facility, as a vested interest in new designs. If these were approved, it would increase the possibility that the DOE might one day say it cannot move beyond a doubt — without a nuclear test — that given weapon is reliable.

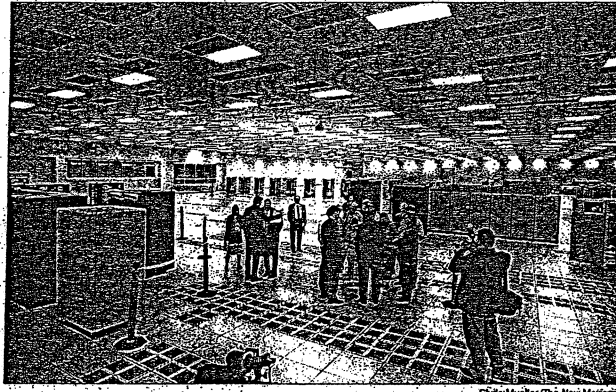
The Bush administration talks about both new designs and the potential return to testing in its nuclear-posture review. The administration announced May 30 it will pursue plans for a full-scale pit-manufacturing facility that would begin operating in 2020, parking further criticism from the disarmament crowd.

Until then, however, pit production belongs to Los Alamos. In the case of the W-88, Los Alamos officials say that job came about because Rocky Flats simply didn't make enough spare pits for the bomb, before closing; a certain number of pits are cut open and destroyed to check for flaws during routine maintenance. But the mission runs much deeper than that.

Anatomy of a pit

So how, exactly, does a pit — or thermonuclear bomb trigger — work?

Conventional explosives compress the plutonium pit, a hollow orb often compared to a grapefruit in size, until it reaches a critical density. Energy from the fission reaction in the plutonium, boosted by fusion in a deuterium-tritium mixture, triggers the secondary hydrogen bomb, which provides the bulk of the device's military might.



Chick Mueller/The New Mexican

Journalists tour the computer room in the Nicholas C. Metropolis Center for Modeling and Simulation at Los Alamos National Laboratory as the first phase of Q computer is installed. Q will run weapons codes as part of the lab's effort to certify pits and nuclear weapons.

Of course, this is a gross oversimplification. It also occurs unimaginably fast. And just as a tiny amount of material holds an enormous amount of nuclear energy, small changes in shape, design, materials and timing can have large consequences on bomb performance.

Weapon designers say it used to be easy to measure these effects: Blow up a test bomb. Most recently, this took place underground at the Nevada Test Site. The United States halted such activities in 1992, however, after its 1,054th nuclear test.

Los Alamos now uses other methods, including standard tests on explosives; computer modeling — the lab has a new computer facility; radiography, or imaging of simulated explosions conducted at the as-yet-incomplete Dual-Axis Radiographic Hydrodynamic Test Facility; and a host of other analyses. It's pretty much the full suite of science behind the current weapons research program, since certifying a new pit is akin to certifying a new weapon.

Skeptics note that Rocky Flats didn't shut down all that long ago, while LANL has been manufacturing five to 10 test pits annually for years. Why is it so difficult now? LANL's McCoy said the lab started out in a similar mind-set in 1995: "But what happened was people came in and said, 'Well, prove to me that it will work, without a test.' And we've never been asked that question before."

McCoy said the lab has hired a lot of people from Rocky Flats — some say it picked up their expertise to assure the lab would get the pit-manufacturing job. Even so, LANL cannot exactly replicate many of the processes used at Rocky Flats. McCoy notes that in many cases chemicals and lubricants once commonplace at Rocky Flats are not allowed under current environmental rules.

Either way, from McCoy's perspective, the entire pluto-

onium culture has changed. Designers never really had to understand plutonium before. They knew it would blow up, and that was good enough. All the weapons were replaced every 10 to 15 years anyway, he said. "We didn't have a reason to build a lot of experimental data on materials and properties."

Understanding plutonium

Now, laboratories want to understand exactly what plutonium is and how it behaves, he said, since predicting with confidence exactly how a bomb will behave is much more difficult than measuring the results of a test.

Ultimately, the questions Los Alamos is asking about its new pits must also be answered for the old ones. Much as the fenders on an old truck gradually give way to rust, radioactive decay gradually changes the make-up of plutonium in pits. It isn't clear, however, exactly what happens as pits age. To date, no pits have been pulled from the stockpile due to aging problems, according to McCoy, but how can the labs be sure about the future?

The Energy Department has set out on what is by any account an increasingly expensive project, dubbed Stockpile Stewardship, in search of proof the nuclear arsenal is up to snuff. The oldest weapons date back perhaps 25 years, since the stockpile used to be entirely replaced every decade or two, according to the lab. Critics point out that the DOE is spending much more on nuclear weapons now than it did during the Cold War, but McCoy said the program was not designed to save money. The alternative to testing, he said, is much more difficult.

"The country made a policy to stop testing, based on nonproliferation. ... The goal wasn't to be cheaper," he said. "It was to make sure that weapons didn't spread to other countries and to send a

message."

It used to be that computer codes only had to be good enough to indicate when a design was ready for testing. "Now," he said, "we're still in a situation where we know our codes are wrong, but we're being asked if everything is OK."

Nonetheless, just as the lab cites proof as the overriding concern in certifying a pit, critics say the DOE has no proof it needs any new pits, let alone the full-scale production facility proposed last week by the National Nuclear Security Administration, which is charged with Stockpile Stewardship. NNSA officials say the facility could be capable of producing around 250 pits annually, although watchdogs cite the administration's over-arching Nuclear Posture Review in saying the facility design might allow for 500 to 600 pits annually.

NNSA officials say such questions are premature since the proposal is only in the initial planning stages. Estimated at \$2 billion to \$4 billion, the plant would open in 2020, according to the agency.

Coupled with what many see as an overall effort by the Bush administration to boost the nation's nuclear capabilities, this project has raised the ire of critics who say the United States is planning an expensive and unnecessary return to the Cold War era. Why create a massive manufacturing capacity when, according to the treaty recently signed by Presidents Bush and Vladimir Putin of Russia, both nations' active arsenals would be reduced to 1,700 to 2,200 active nuclear weapons by 2012?

"When the country has

"But the deeper problems have to do with a commitment which could have a lot of unintended consequences for nonproliferation and U.S. security."

GREG MELLO
Los Alamos Study Group

almost 15,000 plutonium pits, why we would need a facility to manufacture new ones is quite extraordinary. How much security do you need?" asked Chris Paine, senior analyst at the national non-profit Natural Resources Defense Council. "After all, one Trident submarine can kill 60 million Russians, as a sample calculation. There just is no justification for a capacity that large other than some oddball nuclear planner's version of what nuclear superiority is."

Paine said the United States would lose all credibility for its nonproliferation policies if it moves forward with such a facility. Like many, he often notes the Cold War is over: "Russians are our friends." Furthermore, Paine is one of many who argue there is no evidence to suggest that pits go bad with age.

"No one has been able to say what the life-limiting factors of the pit are, and they haven't been able to observe any," he said.

Improving with age?

In a 2-year-old paper published in *Physics Today*, University of California-Berkeley Professor Raymond Jeanloz cited various studies, including work by Los Alamos researchers, indicating the interior crystal structure of plutonium might actually "get closer to the ideal crystal structure with increasing age." He cited consensus among specialists that plutonium pits "are stable over periods of at least 50 to 60 years, with the most recent studies suggesting a far longer period."

He underscored these conclusions in a recent interview. "There have been some remarkable discoveries ... and they all tend to reinforce the idea that this very complicated material ages relatively benignly," said Jeanloz, who is a member of JASON, a group of scientists who offer technical advice to federal policy-makers on national defense.

Nonetheless, Jeanloz is hesitant to come down on either side of the pit-production debate. The issue, he said, is not so much whether we need one now, but whether we should begin

preparing for a future date when we might: It could take a long time to go from design to production. At the same time, he recognizes that building a major pit-production facility sends a message to the international community.

For these reasons, Jeanloz advocates for the United States to take the time to gather all the technical expertise before making a final decision.

NNSA spokeswoman Lisa Cutler said the ongoing uncertainty about how plutonium ages is real, but that is only one part of the puzzle.

"The department has determined that we need to have the capacity to manufacture all of the pits in the current stockpile and to be able to respond to any future requirements," Cutler said. "Regardless of the size of the stockpile, it doesn't change the need to have the capacity to produce them (pits)."

McCoy said Los Alamos is not on the list of possible locations for the pit-production facility, while many observers have cited the DOE's Savannah River site in South Carolina as the most likely choice. Nonetheless, Cutler said, all DOE sites are on the table.

From the Natural Resources Defense Council's perspective, the fact that Los Alamos should be able to produce up to 50 pits annually is more than enough security. If more capacity is needed for some reason, the lab could double its capacity, according to Paine. The DOE could also focus on methods of refurbishing the current pit stockpile — as opposed to making hundreds of new ones.

In the end, Paine and others say the only use for a pit facility like that proposed would be for mass replacement of the entire nuclear arsenal — or perhaps to build an entirely new warhead. Rather than pour money into a new pit facility, Paine suggests that NNSA build a modest pit-resurfacing facility at the DOE's Pantex Plant near Amarillo, Texas, where most of the pits are stored.

"The sensible alternative to building all this capacity to build new pits is to have a facility to recycle the pits that we have got," Paine said.