

New bomb, no mission

By Greg Mello

The government says it is no longer building new bombs. So why is it deploying a new version of the B61 nuclear bomb?

THE COLD WAR MAY BE OVER, BUT the nuclear arms race has not quite ended. The United States is fielding a new nuclear weapon—a bomb that was used to threaten Libya, a non-nuclear nation, even before it was deployed.

The B61 “mod-11” gravity bomb is the first new nuclear capability added to the U.S. arsenal since 1989. It was developed and deployed secretly, without public or congressional debate, and in apparent contradiction to official domestic and international assurances that no new nuclear weapons were being developed in the United States.

The B61-11’s unique earth-penetrating characteristics and wide range of yields allow it to threaten otherwise indestructible targets from the air—or, in Pentagonese, to hold such targets “at risk.” That makes the B61-11 a uniquely useful warfighting tool.

The 1,200-pound B61-11 replaces the B53, a 8,900-pound, nine-megaton bomb that was developed as a “city buster” and was later designated as a substitute for an earth-penetrating weapon. The B53 was deliverable only

by vulnerable B-52s; in contrast, the smaller and lighter B61-11 can be delivered by the stealthier B-2A bomber, or even by F-16 fighters.

The B53 was the highest-yield weapon in the arsenal. Although not a true earth-penetrating weapon, it was believed capable of taking out underground targets through brute force. When fuzed for a ground burst, a small percentage of its energy would be transmitted through ground and rock to buried installations. Even a small percentage of nine megatons is a lot of destructive power.

In contrast, the B61-11 offers a range of yields, the highest of which is only a fraction of the B53’s. But because it can pierce deeply into the earth, “ground coupling” its energy output to efficiently produce a shock wave, the B61-11 is more efficient at destroying underground structures, enabling it to threaten the same deep targets as the B53.

Meanwhile, the B61-11’s lower yields are said to enhance its credibility as a deterrent. The B53, goes the tortured logic, was too big and too dirty to use. Its use would have caused “massive

collateral damage” above ground. (As if the rest of a nuclear war would somehow not cause “massive collateral damage.”)

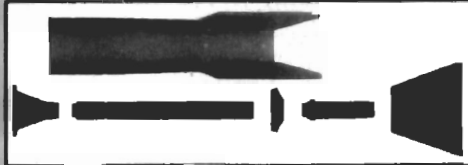
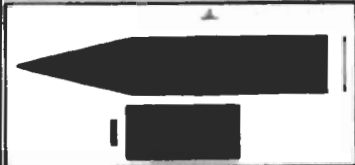
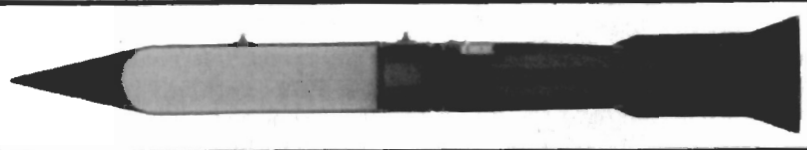
Deployment of the B61-11, however, raises two fundamental questions:

■ According to government officials, the United States is no longer developing new nuclear weapons. But what is a new weapon? Those connected with the B61-11 program say it is not new because its “physics package” remains unchanged from an earlier model of the B61, the B61-7.

Indeed, the physics package has apparently not been changed. But an undisclosed number of B61-7s have been transformed, adding greatly enhanced capabilities against underground targets. Does that make it a “new” weapon or an “old” weapon?

Greg Mello is director of the Los Alamos Study Group in Santa Fe, New Mexico. Important parts of the B61-11 puzzle were provided by Bruce Hall of Greenpeace, Christopher Paine and Robert S. Norris of the Natural Resources Defense Council, and by Bulletin sources.

B61-11 Program



Case Subassembly
All Components will be
preassembled into the case

Property	B61-7	B61-11
Weight - Lbs.	763-15	1912-15
Wing Area - Sq. Ft.	520	607
Wing Span - Ft.	30	30
Length - Ft.	178	185
CG - In. from nose	141.6	142
Wing - In. H.T.	60.25±0.5	60.25±0.5
Wing - In. H.T.	10000±100	23000±100
Wing - In. H.T.	870000±10000	1700000±10000

Tail Subassembly
All Components will be
preassembled into the tail

B61-11 Program

The new steel center-case gives the B61-11 the earth-penetrating punch policy-makers feel is lacking in the U.S. arsenal.

■ What is the mission of the B61-11? For years, and particularly in the 1980s, nuclear planners sought to develop an earth-penetrating weapon to hit deeply buried Soviet command-and-control centers.

But there are no Soviet targets today; only Russian targets. Russia and the United States are no longer engaged in a nuclear arms race, and they are no longer adversaries.

Increasingly, U.S. nuclear strategists speak of holding targets at risk in "rogue states." But since 1978, U.S. policy has expressly forbidden U.S. forces from using nuclear weapons against non-nuclear states that are signatories to the Nuclear Non-Proliferation Treaty, unless they are allied with a nuclear state engaged in an act of aggression. The events surrounding the B61-11 are difficult to explain in this context.

A long trajectory

Earth-penetrating nuclear weapons have a long history. A modified "Little Boy" gum-type gravity bomb called the Mk-8 or "Elsie" (which stood for "LC" or "light case") was deployed by the navy in 1953 as a hard-target penetra-

tor. By 1956, the weapon was adapted and deployed for the air force; it was called the Mk-11.

In subsequent years, other earth-penetrating designs were proposed but never reached deployment, each being eclipsed by the availability of greater explosive yields that seemed to make earth penetration irrelevant.

But in the late 1970s, earth-penetrator design resumed in earnest in the administration of Jimmy Carter. By 1980, Los Alamos had produced a prototype earth-penetrating warhead, the W86, for the mid-range Pershing II. But in September of that year, the W86 was cancelled in favor of a more versatile, non-penetrating design called the W85.

The W85 and W86 had been developed in parallel; the latter was a victim of budget-driven fratricide—and a change in the Pershing's targets from underground command-and-control bunkers to surface-based mobile missile launchers.

Like the new B61-11, the W86 (as well as the W85) was based on a modified B61. In 1984, interest in earth penetrators resurfaced again. The Reagan administration wanted "a weapon to counter deeply buried, superhard

time-urgent targets" in the Soviet Union.

The aim was to arm some intercontinental ballistic missiles with earth-penetrating warheads. But that was quickly seen as a daunting and hugely expensive task. The high reentry speed of an ICBM warhead would have insured its destruction when it hit the earth. To slow it, and to allow the proper entry angle into the ground, the warhead required a maneuverable reentry vehicle.

The search for an ICBM penetrator was eventually downgraded in October 1988, thus effectively killing the project. The technical uncertainties and costs were too great, and key strategists were having second thoughts. After all, if a small-scale nuclear exchange ever began, someone would have to be left alive to call it off. The destruction of Soviet command-and-control centers would almost surely insure that a limited exchange would automatically turn into an all-out nuclear holocaust, involving the use of thousands of warheads and bombs.

Concurrently with interest in an ICBM penetrator, nuclear strategists also pursued a different and more technically feasible course for an earth penetrator, a B61 bomb adapted to an air-launched cruise missile. That would give the air force a "stand-off" strategic weapon with earth-penetrating abilities.

In fiscal years 1988 and 1989 there were underground tests of two earth-penetrator designs, both having a yield far greater than needed. But the program expired with the Cold War. There was no further need perceived for such a weapon.

The B61-11 gathers momentum

Interest in a B61-based earth penetrator appears to have been revived in October 1993, with a request by Harold Smith, assistant to the secretary of defense for atomic energy, to explore alternatives to the B53. In a memo to air force strategic planners, he said:

"Should the Nuclear Posture Re-

view revalidate the mission for the B53 [as a substitute for an earth penetrator], then we should seek a replacement weapon, and the appropriate offices within OSD [Office of the Secretary of Defense] will work together toward that goal. In the interim, I request the air force work with DOE to identify, prioritize, and cost the available replacement options for the B53 that use existing warheads. This response should be based on existing data and keyed directly to the current B53 mission requirements. In case replacement is not possible, I have requested DOE define the options and costs for upgrading the B53 system.”

The B53 was first deployed in 1960. Retirement of early versions began in 1967, but later versions remained in the arsenal until 1987, when retirements were halted. At that time, retired B53s were brought back into the active stockpile. The turnaround on B53 retirement came when the Reagan administration was seeking a capability against deeply buried targets.

There are roughly 50 B53s in the current stockpile. The bomb is too bulky to fit into the more modern (and theoretically more survivable) B-2 bomber. But it has another problem, to which Harold Smith's memo, cited above, also refers. It is the only weapon now deployed that lacks full “Enhanced Detonation Safety.” That makes it, by current standards, an “unsafe” weapon.

As officials considered alternate strategies, they emphasized this “safety” theme rather than the improved utility, versatility, or credibility of the B61-11.

By August 1994, an earth-penetrating gravity bomb based on the B61 had become the preferred replacement for the B53. In November 1994, the Nuclear Posture Review officially recommended that the B53 be replaced. On November 29, 1994, the Nuclear Weapons Council Standing Safety Committee endorsed the B61. And on February 6, 1995, Deputy Defense Secretary John Deutch signed off on the plan.

On April 18, 1995, Energy submitted a request to Congress to repro-



LOS ALAMOS NATIONAL LABORATORY

Test drop of an earlier B61 family member.

gram \$3.3 million in current-year funds within the Atomic Energy Defense Weapons Activities account for the B61-11. That request was submitted to the House Energy and Water Development Appropriations Subcommittee (approval from Tom Bevill and John Myers, May 15, 1995); the House National Security Committee (approval from Floyd Spence and Ronald Dellums, June 29, 1995); the Senate Armed Services Committee (approval from Strom Thurmond, July 19, 1995); and the Senate Energy and Water Development Appropriations Subcommittee (approval from Pete Domenici, June 12, 1995).

The request was classified; committee proceedings, if any, were secret. Not long afterward, however, rumors about the new weapon began to filter out. In a July 18, 1995 debate with local disarmament activists that was broadcast live on radio station KSFR in Santa Fe, Don Wolkerstorfer, manager of the Above-Ground Experiments I Program at Los Alamos, seemed to confirm the rumors. He said:

“The services are looking at re-deploying an existing weapon in such an earth-penetrating warhead to address hardened targets, that's exactly right. The hope is to replace the high-yield B53, which has some safety problems.”

In early September 1995, Energy and its three nuclear weapons labs released a revised version of a report about the nuclear stockpile surveillance program, called “Stockpile Sur-

veillance: Past and Future.” A footnote on page 11 said:

“A modification of the B61 is expected to replace the B53 by the year 2000. Since this modification of the B61 is not currently in the stockpile, there is no Stockpile Evaluation data for it. The B61-7 data can be used to represent this weapon.”

As a result of these revelations, the new weapon—or an old weapon with a new capability—was the subject of newspaper articles in New Mexico and California in September 1995, and William M. Arkin wrote a column about it in the January/February 1996 issue of the *Bulletin*.

Meanwhile, on November 15, 1995, at a meeting of the Nuclear Weapons Council Standing Safety Committee, Smith requested that the B61-11 schedule be accelerated. He asked that the first unit be delivered “as soon as possible, with a goal of December 31, 1996.”

A bomb for all reasons

The B61-7, from which the B61-11 is made, has a selectable yield ranging from 0.3 to about 340 kilotons. It was first placed in service in 1985. (The original B61 entered the stockpile in 1968.)

According to Chuck Hansen, one of the nation's leading independent authorities on the U.S. nuclear stockpile, the B61-7 can be fuzed for air or surface bursts, and it has “a hardened ground-penetrator nose” with a retarded contact-burst fuzing option. It can be dropped with or without a parachute.

William M. Arkin and Robert S. Norris of the Natural Resources Defense Council (and authors of the *Bulletin's* regular feature, the “NRDC Nuclear Notebook”) estimate that there are about 750 B61-7s in the active stockpile, along with about 600 B61-3s, -4s, and -10s.

In recent years, some military strategists have advocated deployment and possible use of very small tactical nuclear weapons against Third World adversaries, especially in earth-penetrating roles. Some of this advocacy—per-

haps most of it—has come from the weapons labs. In the Fall 1991 issue of *Strategic Review*, for instance, Los Alamos strategists Thomas Dowler and Joseph Howard wrote:

“Would policymakers employ nuclear weapons to protect U.S. contingency forces if conventional weapons proved inadequate, or would the nature of our present nuclear arsenal ‘self-deter’ policymakers from using those weapons? . . . One possible answer to these questions might be the development of nuclear weapons of very low yields. . . . The existence of such weapons—weapons whose power is effective but not abhorrent—might very well serve to deter a tyrant who believes that American emphasis on proportionality would prevent the employment of the current U.S. arsenal against him.

“We doubt that any president would authorize the use of the nuclear weapons in our present arsenal against Third World nations. It is precisely this doubt that leads us to argue for the development of subkiloton weapons.”

And in July 1992, Los Alamos conducted a high-level briefing called “Potential Uses for Low-Yield Nuclear Weapons in the New World Order.” One theme of the briefing was that in future showdowns with Third World states, “we need options besides defeat or use of inappropriately large [nuclear] weapons.”

One option, suggested the briefing, was to develop and deploy “micronukes” with a yield of some 10 tons of high explosives; “mininukes” with a yield of 100 tons; and “tiny nukes” with a yield of 1,000 tons.

An earth-penetrator with a yield of just 10 tons could, according to a Los Alamos viewgraph, “hold buried leadership and C3 at risk.” And it could do that while keeping “collateral damage very localized.”

The rush to deploy

The response from the nuclear labs to Smith’s November 1995 request for more speed in the B61-11 program was positive. The April 1996 issue of *Weapons Insider*, the internal newslet-

ter of Los Alamos, put it this way:

“The B61-11 modification project was originally scheduled for completion by August 1997; however, DOD requested that we advance the completion date to December 1996. NWT [the Los Alamos Nuclear Weapons Technology program] is committed to meeting the aggressive schedule, and a significant reprogramming of resources has allowed us to accelerate our progress. . . . Full-scale testing, led by Manny Martinez, is in progress, and three successful test drops took place in Alaska on February 28.”

The August 1996 *Insider* provided an update, along with some additional details.

“The essence of the modification is a field changeout of the weapon’s case to provide an earth-penetration capability. The B61’s inherent ability to perform this mission was demonstrated in Nevada almost a decade ago. . . . The engineering and nuclear certification activities are in high gear. Hydrotest Shot 3574 in September will be the basis for assuring that the underground environment does not adversely affect nuclear performance. Full-scale penetration tests of real and high-fidelity mock hardware are being conducted at the Tonopah Test Range in Nevada. . . . We are committed to delivering the First Production Unit kits by the end of the calendar year.”

Two months later, Steven Younger, director of the NWT program, encouraged the troops with this message in the October 1996 *Insider*:

“As I see it, our highest priority over the next several months is the B61 Mod 11, and the Air Force is anxiously awaiting this system. . . . The project is proceeding at a very fast pace, and almost every division associated with our Program is contributing to this important work.”

The January/February 1997 *Insider* picks up the story again.

“The last in a series of B61-11 full-scale drop tests, prior to the Major Assembly Release (MAR), was conducted at the Tonopah Test Range on November 20, 1996. More than 60 people from throughout the complex were on hand to observe the early morning drops.

Three units were dropped from a B2-A aircraft, two units from about 6,900 feet above ground level (AGL) and a third from about 25,700 feet AGL. Prior to November’s tests, we had demonstrated compatibility with the F-16 and the B-1A aircraft. . . . All objectives with the exception of recording the strain measurements were met. . . . Another attempt to record strain measurements will be made in the upcoming test, now scheduled for early April in Alaska.”

Thus, dummy forms of the new weapon have been tested for delivery with a variety of aircraft, including the F-16, a tactical delivery system, marking a considerable shift in application from the B53, whose mission was to take out Soviet strategic targets.

The Energy Department confirms that deployment of the B61-11 is under way. The “front” components of the new weapon are being (or were) made at the Y-12 plant on the Oak Ridge Reservation, with the new “tail” components made at the Kansas City plant. The new nose and tail have added about 450 pounds to the bomb and have enhanced its resistance to deflection. Presumably the fuzing has also been changed. The location or locations where the B61-11 “field modifications” are being done is classified, as is the number of weapons being converted. A coda to the speeded up effort was provided by the March 1997 issue of *Weapons Insider*:

“The DOD’s operational base recently received delivery of the first shipment of B61-11s. The B61-11 is now part of the stockpile, and that means the B53 can soon be retired. This is an accomplishment of which the entire laboratory can be proud. We have succeeded in meeting an ongoing military requirement while simultaneously enhancing the safety of the stockpile.

“A heroic effort by many people at the Lab and throughout the complex was required to meet what were some of the most aggressive deadlines ever set for such a project.”

Shock waves

Why did Harold Smith insist in November 1995 on setting such “ag-

gressive deadlines" for the B61-11 project? Perhaps the answer was hinted at in a series of statements offered the following spring by senior administration spokespersons, including Defense Secretary William Perry and his nuclear deputy, Harold Smith.

On March 28, 1996, Perry testified in the Senate in support of the Chemical Weapons Convention. At one point, he said: "We have an effective range of alternative capabilities to deter or retaliate against use of the CW [chemical weapons]. The whole range would be considered. . . . We have conventional weapons, also advanced conventional weapons—precision guided munitions, Tomahawk land-attack missiles—and then we have nuclear weapons."

A few days later, Robert Bell of the National Security Council spoke about the United States having signed on to the African Nuclear-Weapon-Free-Zone (ANWFZ) Treaty, a treaty that Libya had signed. "Under Protocol I, which we signed, each party pledges not to use or threaten to use nuclear weapons against an ANWFZ party. However, Protocol I will not limit options available to the United States in response to an attack by an ANWFZ party using weapons of mass destruction."

And at a breakfast meeting with defense writers on April 23, Smith was more specific regarding the possible use of nuclear weapons. He spoke of the potential menace presented by a Libyan chemical weapons factory under construction underground at Tarhunah, 40 miles southeast of Tripoli.

At present, said Smith, the United States had no conventional weapon capable of destroying the plant from the air, and such a weapon would not be ready in less than two years. However, by the end of the year the United States would have a nuclear warhead based on the B61 that would be able to do the job.

None of the writers at the breakfast meeting seemed to note that since 1978, the United States had assured the world that it would never use nuclear weapons against non-nuclear countries that signed the Nuclear

Non-Proliferation Treaty (NPT), unless the nation were allied in aggression with a nuclear weapon state. In fact, President Clinton had reaffirmed this policy April 5, 1995, as he sought to shore up support for the treaty's indefinite extension.

But a year later, in the spring of 1996, administration officials were clearly devaluing that "no first use" pledge. The arms control community quickly took note of that.

At a press briefing on May 7, Defense Department spokesman Kenneth Bacon engaged in a little damage control, saying that there had been some "confusion" in the press regarding the nuclear issue. "Should military options be necessary [against the Libyan plant], we can accomplish this with conventional means. There is no consideration to using nuclear weapons and any implication that we would use nuclear weapons against this plant preemptively is just wrong."

"Preemptively" seems to have been the operative word at the May 7 briefing. Bacon also reiterated that the United States for years had reserved the right to respond with "devastating force" if weapons of mass destruction were ever actually used "against us or our forces."

Bacon went on to quote Defense Secretary Perry, who said on April 26 at Maxwell Air Force Base: "In every situation that I have seen so far, nuclear weapons would not be required for response. That is, we could have a devastating response without the use of nuclear weapons, but we would not forswear that possibility."

Despite the ambiguity, fudging, and backtracking engaged in by Pentagon spokesmen regarding the nuclear option, work on the B61-11 project continued on its previously-accelerated schedule.

Collateral damage

From an Energy Department perspective, the B61-11 is a "modification" to the B61-7 gravity bomb. And yet, these modifications provide significant new military capability. This new capability is clearly at odds with commit-

ments made by the United States in the context of the NPT and in the Comprehensive Test Ban (CTB) Treaty.

Consider, for example, a January 1996 statement made in Geneva by John Holum, director of the U.S. Arms Control and Disarmament Agency, as he pushed for completion of the CTB:

"Even the open literature points to a broad array of new weapons developments. . . . Many would involve directed energy weapons—ways to focus the release of energy with greater precision than is now possible, to enable military effects well beyond those available now. Without nuclear testing the nuclear weapon states will not be able to pursue confidently such technologies as the nuclear-explosion-pumped X-ray laser, the so-called nuclear shotgun, enhanced electromagnetic pulse weapons, microwave weapons, and enhanced radiation weapons. . . . And the true zero [yield] test ban will also place out of reach new 'mininuke' and 'micronuke' concepts—technologies designed to use nuclear explosive yields in small amounts. . . ."

"So let there be no mistake—the CTB will help impede the spread of nuclear weapons. But its great practical impact will also be for arms control—to end development of advanced new weapons and keep new military applications from emerging."

The B61-11 may be a mere modification, a new shell for an older physics package. It may not be the kind of exotic new weapon that Holum listed. But it is a weapon with a new capability. Should the need arise, it will allow U.S. military forces—to borrow Holum's words—to "focus the release of energy with greater precision." In this case, against underground targets.

When all this is said, the B61-11 remains something of a mystery weapon. It offers a new capability at a time when there is no strategic requirement for such a capability, and it can be delivered by tactical aircraft at a time when—according to national policy—there is no tactical justification for it. Why was it developed and deployed now? That's a question the Clinton administration needs to address. ■