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Los Alamos National Laboratory is working on a US$10-billion project to modify a set of nuclear bombs.

NUCLEAR WEAPONS

US warheads to get a facelift

Obama boosts 'stockpile stewardship' funds at energy labs.

BY JEFF TOLLEFSON

When he took office in 2009, US President Barack Obama bolstered efforts to secure nuclear materials around the globe. That spring, speaking in Prague, he said that he would push Congress to ratify a long-pending treaty to ban nuclear testing. By 2010, he had reached an agreement with Russia to reduce the number of nuclear weapons in both countries' arsenals to historic lows.

Yet the weapons laboratories of the US Department of Energy continue to be lavished with money. The administration's 2014 budget proposal would boost funding for the weapons programme to US$7.9 billion, nearly 30% more than when Obama took office. This rising flow of cash contrasts strikingly with a shrinking stockpile (see 'Small stockpile, big expense'). Life-extension programmes for weapons would receive more than $1 billion of this 'stockpile-stewardship' budget, including $537 million for a showcase initiative to modify and modernize the B61 line of nuclear gravity bombs.

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By keeping weapons scientists busy at top-of-the-line facilities, Obama says that he is maintaining a nuclear deterrent, one based as much on retaining brains as on projecting brawn. "We're going to keep investing in these programmes," he said, during a non-proliferation event in Washington DC in December 2012, "because our national security depends on it."

But the economic toll of doing so has grown increasingly — and, many argue, unnecessarily — steep. "It's been far more expensive than it needs to be," says Richard Garwin, a physicist and one of the designers of the first hydrogen bomb in the 1950s. "There's a real lack of control over budgets and programmes." The most vociferous critics go a step further, arguing that stockpile stewardship is about keeping people employed, and that Obama has used the programme to placate the sprawling nuclear-weapons complex and the politicians that support it while pursuing weapons reductions and non-proliferation goals.

NUCLEAR REMIX

Expensive science facilities and maintenance projects have become commonplace at US weapons labs since the end of the cold war in 1991 and the last US underground weapons test in 1992. Two costly stockpile-stewardship facilities, for example, are housed at Lawrence Livermore National Laboratory in California: the National Ignition Facility, a giant laser that is intended to replicate fusion explosions; and Sequoia, the world's second most powerful supercomputer, which is used to model nuclear explosions. Los Alamos National Laboratory in New Mexico also has a supercomputer and was planning, until recently, to build a major plutonium-research facility.

The latest major stockpile-stewardship initiative is the B61 life-extension programme at Los Alamos. This will merge components from several different versions of the weapon within a new bombshell, which would include updated safety and security features and a new tail.

The consolidation — as well as the improved accuracy that a new tail would provide — would allow the United States to deploy fewer bombs, with lower explosive energy, in places such as Europe, says ▶

Donald Cook, who heads the weapons programme at the National Nuclear Security Administration (NNSA), a semi-autonomous agency within the energy department. He adds that it would not necessarily be cheaper to simply maintain existing weapons indefinitely.

But observers say the B61 programme is much more expensive than it needs to be. An early analysis by the NNSA showed that a relatively simple refurbishment would have cost around $1 billion, whereas the current programme is expected to cost about $10 billion over the length of the project. "Rather than doing the minimum required, they are going for the best possible warheads," says Stephen Young, who tracks nuclear-weapons issues for the Union of Concerned Scientists, a group based in Washington DC that is pushing for nuclear disarmament.

Few doubt the administration's commitment to non-proliferation programmes, which received a boost of more than $1.1 billion, or 73%, between 2008 and 2012. Much of that extra money was used to secure nuclear materials and reactors in other countries. But Obama's latest budget request would cut non-proliferation programmes by more than $400 million dollars to pay for weapons activities.

A NEW START

Some of the spending helped to nail down the 2010 agreement with Russia to limit the number of strategic weapons deployed by each country to 1,550 — a reduction of 30% from levels agreed in a 2002 treaty. To get the latest agreement ratified by the Senate, the administration laid out a plan to spend more than $50 billion on weapons programmes between 2012 and 2017. Many Republican lawmakers now contend that, even with the recent budget boosts for the labs, the president is not keeping his promise.

"This will challenge the core promise that the United States will not build a new warhead."

Senator Bob Corker, a Republican from Tennessee, which is home to the Oak Ridge National Laboratory and the nearby Y-12 National Security Complex, says that Obama's budget requests have come in hundreds of millions of dollars below the amount promised in 2010 and have delayed the new multi-billion-dollar plutonium-research facility at Los Alamos. "If the Senate believed we would be in this position today, it is unlikely to have approved the treaty in 2010," Corker and Senator James Inhofe (Republican, Oklahoma) wrote last month in *Foreign Policy* magazine.

Other lawmakers think that the requests are excessive. During a budget hearing on 24 April, Senator Diane Feinstein (Democrat, California) pointed out that the amount requested for weapons activities in 2014 would be the same, in real terms, as what was spent in 1985 — when the United States kept 25,000 nuclear weapons and was conducting underground tests and designing new weapons. "None of that is happening today," she said, calling the scope of the NNSA's weapons activities "unsustainable and unrealistic".

Worries about initiatives such as the new B61 bomb extend beyond costs. Nuclear watchdogs say that these projects transgress the spirit, if not the letter, of US commitments to disarmament under the 1968 Treaty on the Non-proliferation of Nuclear Weapons, as well as Obama's promise not to develop new nuclear warheads. A more accurate, lower-yield B61 would constitute a new capability for small nuclear strikes and could be tempting for a president to use, says Hans Kristensen, director of the Nuclear Information Project at the Federation of American Scientists, a nuclear watchdog group in Washington DC.

A follow-up programme to modify W78 and W88 warheads would edge even closer to creating 'new' weapons than would the B61 project. One option for the programme, which is currently funded only at the conceptual stage, would combine the primary fission starter bomb from one warhead with the secondary fusion device from another. This ensemble would then be encapsulated in a new shell to create a system that would work in ballistic missiles fired from land or sea. "We are moving into completely new territory," Kristensen says. "This will challenge the core promise by the Obama administration that the United States will not build a new warhead." The US Navy has objected to the proposal, saying that it does not want a new warhead, but that has not dissuaded the nuclear labs.

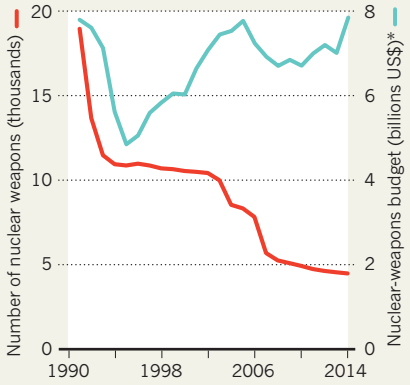
Cook says that trying to merge parts from several weapons into one is a legitimate effort to simplify the arsenal while maintaining robust capabilities. "I wouldn't consider that new," he says of the effort to modify the W78 and W88 warheads. Most importantly, he says, that programme, like the B61 effort, would allow the consolidation of weapons and open the way to further reductions in the arsenal.

The programme would almost surely be more expensive than the B61 project. And cost is the main issue for Garwin. He says that Obama ought to demand that the NNSA lay out a plan for cutting the cost of the stewardship programme by two-thirds, just to get a sense of how effective such a programme might be. That exercise would help the administration and Congress to better understand their options, he says.

The value of expensive stockpile-stewardship programmes is dubious, says Garwin. US weapons will remain credible, he adds, regardless of the results that come back from high-profile experiments such as the National Ignition Facility. And he points out that the W88, the most advanced weapon in the US arsenal, was designed on a computer that had less processing power than a personal desktop computer has today. He sees no need to capture the interests of an army of bomb designers with powerful lasers and supercomputers. "The training of weapons designers is important, but we only have a couple of dozen of them," he says. "It's not a big deal." ■

SMALL STOCKPILE, BIG EXPENSE

The US Department of Energy is spending as much to maintain its nuclear weapons now as it did at the end of the cold war, when it had thousands more warheads.



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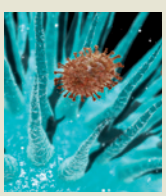

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