



ARSENAL ADJUSTMENT

The maintenance of a capable, credible nuclear deterrent seems to have consensus governmental support.

Despite heavy investment in the nuclear mission over the last few years, Air Force and senior defense officials say much work lies ahead for the nation's stockpile of nuclear warheads.

Not long ago, ambitious plans were on the books for a new nuclear earth-penetrating weapon and the first new-build warhead since the Cold War. Then, Administrations changed and the budget crunch hit.

In the aftermath of the New START agreement and the 2010 Nuclear Posture Review, the nuclear arsenal is in the midst of substantive changes, as the

size of the deployed strategic arsenal shrinks and the US reviews its nuclear requirements.

Defense and Energy Department leaders want to streamline and standardize the maintenance of the nation's warheads—a process that has long been unpredictable and irregular, according to a senior USAF official working in the Air Staff's nuclear deterrence shop.

Consolidation

"We are in a period of transition," said Billy W. Mullins, the associate assistant chief of staff for strategic deterrence and nuclear integration on the Air Staff.

Counting variants, the US currently maintains 12 warhead types in its stockpile, Mullins noted—five alone for the

B61 nuclear gravity bomb, carried by the B-52 and B-2 bomber fleets.

In the near future, officials want to consolidate the number of warheads to curb costs and accommodate an evolving concept of nuclear deterrence, which may be far different from the policies and assumptions that dominated the Cold War. The task is to bring the nuclear weapons complex—the nation's nuclear warheads and the laboratories and facilities charged with their care, testing, and maintenance—into the 21st century.

As a result, over the coming decade-plus, the National Nuclear Security Administration—the Department of Energy's organization responsible for stockpile maintenance—will shrink the number of warhead variants in the stock-



Photos by Ted Carlson

The US is preparing to sustain, and simplify, its nuclear warhead stockpile.

By Marc V. Schanz, Senior Editor

Here: AGM-86 Air Launched Cruise Missiles are packed into the bomb bay of a B-52 on the ramp at Minot AFB, N.D. Eventually, the venerable bombers will carry a new weapon called the long-range standoff vehicle. Above right: SSgt. Keith McClain (l) and SrA. Malcolm Salyards maintain a Minuteman III missile in a silo at Minot.

pile to five, as part of a plan dubbed “three plus two.”

The streamlining and standardizing effort must coordinate requirements across DOD and DOE agencies, the Air Force, and the Navy.

The Nuclear Weapons Council, the joint DOD-DOE body managing nuclear requirements, signed off on the “three plus two” strategy in December 2012, beginning the consolidation process. As

part of the 25-year plan, the first three warhead life extension programs (LEPs) are moving forward, for the B61, W78, and W88. The resulting inventory of between 78 and 88 warheads will be shared between USAF and the Navy, for use on the submarine launched ballistic missile (SLBM) fleet and the Air Force’s Minuteman III ICBMs.

The B61-12 would be the only variant used for the B-2 and the tactical nuclear mission in Europe, now performed by dual-capable F-16s but soon to transition to the F-35.

The W78 and W88 LEPs will utilize a “common physics package” (the term used for the uranium, plutonium, and explosive aspect of a nuclear weapon) for the ballistic missile fleet, Mullins noted—a strategy followed with bombs and cruise missiles.

With two backup warheads in addition to the three designs, the warhead stockpile will streamline to five types over the next two decades if all goes well. The first B61 delivery is anticipated for Fiscal 2019, while the first production unit of the 78-88 LEP is planned for Fiscal 2025. The strategy, having been blessed by the NWC, was briefed to Deputy Secretary of Defense Ashton B. Carter and passed to the budgeting process.

As part of its effort to win congressional support for its nuclear force reductions, the Obama Administration says it will invest upward of \$200 billion across the nuclear enterprise in the coming decade to keep the deterrent viable.

“As long as nuclear weapons remain in existence, the United States will maintain a safe, secure, and effective arsenal,” according to the January 2012 defense strategic guidance document. It identified nuclear deterrence as one of the US military’s core missions.

“What we’re trying to do is align the warhead modernization with platform modernization,” Mullins said.

A new long-range strike bomber is working its way through requirements, and the future of the ICBM fleet past 2030 is under study as well. Air Force nuclear officials are reviewing what warhead or family of warheads might equip a follow-on nuclear-capable air launched cruise missile, Mullins said.

The weapon is called the long-range standoff (LRSO) vehicle and is part of the “family of systems” for the long-range strike portfolio. Probably, a variant of the B61, the W80 warhead equipping the air launched cruise missile fleet, or the W84 that once armed ground launched cruise missiles will be incorporated into the LRSO, which will eventually fly with the B-52 and the B-2 fleets.

Mullins correlated the process to how the Air Force maintains its aircraft.

“We’re trying to standardize ... like depot maintenance,” he said. “We’re trying to go from an episodic [way of maintaining our stockpile] into a predictable process.” In the Cold War, costs were less of a concern; the emphasis for the science side of the nuclear mission was to generate yields per pound, he pointed out.

As a result, many warheads became “custom designs” with few interoperable electronics—those components or other elements that might help planners keep maintenance costs lower.

“There’s no more custom design. ... You [get] common components, you can test more often, and maybe you might fail a bit more—but you test them more and the confidence goes up,” Mullins said. He said that often, in older warheads, every firing set would be a custom match to each warhead, in order to maximize yield. “We spent a little extra back then. Now we’re into getting the right yield for the right capabilities,” he said. The days when accounts for the nation’s laboratories and nuclear scientists were flush are long gone.

We are taking this into a world that is no longer “bipolar,” Mullins said. This means the nuclear stockpile must be retooled for a nuclear deterrent far more scalable than during the Cold War.

The days of explosive testing are also over—the US last tested a live nuclear weapon in 1992—and the science of “stockpile stewardship” has improved greatly since then.

“We can have redundancies [in our deterrent], but we also realize this is a new age and a new time,” said Maj. Gen. Garrett Harencak, then commander of the Air Force Nuclear Weapons Center at Kirtland AFB, N.M., USAF’s nuclear-support nerve center.

Harencak has since moved to the Pentagon where he has taken over the Air Staff’s nuclear deterrence directorate, A10.

“It’s become more important that we get the science right,” Harencak said in a January interview. “The good news is, ... we have the answers to this ... in a lot of cases.” USAF officials and scientists and civilians working in the weapons complex have a “far greater understanding” of nuclear explosive packages than they did a generation ago, he said. As technology has advanced, so has the ability to do advanced simulations and modeling work in place of explosive testing.

“That is sometimes hard for some of the older scientists because that’s not how it worked back in the Cold War,” Harencak commented. He said as part of the plan to refurbish the stockpile, the AFNWC works with a wide range of stakeholders—from the Defense Threat Reduction Agency to the National Nuclear Security Administration, the Navy, and others.

“We have a lot of smart, young people who are motivated,” and USAF wants to address these systems. “We want to



Photo by Ted Carlsson

A B61 nuclear bomb in a hangar at Minot. As part of a 25-year plan, a life extension program is moving forward for the B61, W78, and W88 warheads.

open them and address as many aging components as we can one time and then prepare [these warheads] for the rest of their lives,” Harencak said.

Mullins and Harencak said the hard work ahead is in standardizing maintenance activities, along with investment and refurbishment across the enterprise in the coming years. Given the nation’s budget woes, however, choices must be made as far as investments in the complex. For example, the NNSA is now deferring for five years construction of the final phase of the Chemistry and Metallurgy Research Replacement (CMRR) project at Los Alamos National Laboratory in New Mexico and accelerating construction plans for the Uranium Processing Facility at Y-12 National Security Complex at Oak Ridge, Tenn.

Budget Woes, Of Course

Part of the new “three plus two” plan is scaling back the so-called “hedge”—the nondeployed portion of the nation’s nuclear stockpile—which will mean divesting some excess infrastructure as this occurs. Costs are already under scrutiny, as the B61-12 LEP has recently been scaled back by NNSA due to cost growth—with some cost projections showing the program effectively doubled in size, to about \$10 billion.

While the nuclear complex is receiving great attention, the budget crisis is forcing many in the nuclear weapons community to curb ambitious plans for modernizing the arsenal.

There is a danger “that stockpile stewardship may be compromised by a desire to do exciting but unnecessary engineering,” said Jeffrey Lewis, director of the East Asia Nonproliferation Program at the Monterey Institute’s James Martin Center for Nonproliferation Studies. The leadership of NNSA has done a good job under trying circumstances, he noted, as

there remains a great deal of resistance due to nostalgia for the salad days of live testing.

Due to funding priorities, however, and the arrival of a younger generation of scientists and engineers, this mindset is slowly shifting. “I doubt the lab directors, if given a little extra money, would put that toward a test instead of infrastructure spending,” Lewis surmised.

“What we are trying to do is get this science where we are measuring part of the explosive chain and connect that science to the next [life extension program],” Mullins said.

The US can’t afford the episodic, inconsistent work flows and shifts that marked stockpile maintenance in the past. The DOD, DOE, and others want to get to a point where work orders—from plutonium construction to maintenance on electronics—are cyclical.

The plan is ambitious and will take more than 20 years to reach fruition, and much remains to be decided as far as funding.

“This is a complex problem, as we consolidate and work with the Navy to make sure we have common adaptable components,” Harencak said. “A nuclear weapon is a complex thing,” and the NWC’s job is to “ensure everyone’s requirements are integrated and there is collaboration and nobody is moving forward without taking a look at the whole. ... ‘Three plus two’ is a simple sounding equation, but there are a lot of moving parts in that.”

The consolidation is long overdue, Mullins asserted.

“We kicked the can down the road. If you’re going to be a member of the nuclear club, there is a cover fee you have to pay and we’ve ignored it for a while. As some senior folks around here say, if it’s a real priority, we will have the money to fix it.” ■