



**Air Force Global Strike Command's bombers and missile forces are at an increasing level of readiness.**

# Sharpening the Nuclear Sword

*A B-52H takes off on a training flight from Barksdale AFB, La. B-52s can carry nuclear ALCMs. The bombers regularly test unarmed ALCMs over a test range.*

**T**hree years ago, USAF stood up Air Force Global Strike Command at Barksdale AFB, La., with the goal of revitalizing the service's nuclear enterprise, to ensure USAF's two legs of the nuclear triad are a safe, secure, and effective deterrent force, ready at all times.

Since then, the measurable readiness of USAF's intercontinental ballistic missile and nuclear bomber force has increased by 30 percent, according to AFGSC boss Lt. Gen. James M. Kowalski.

"A lot of what we've seen in improving our readiness has simply been the result of the Air Force reorganizing itself" and changing its cultural attitude, said Kowalski. "All of our airmen understand and embrace the special trust and responsibility of nuclear weapons." This is "foundational" to the ongoing renewal, he said in an interview.

Within Global Strike Command, two numbered air forces assure the day-to-day readiness of nuclear forces: 8th Air Force at Barksdale and 20th Air Force at F. E. Warren AFB, Wyo. They organize, train, and equip combat-ready nuclear forces for US Strategic Command. The ICBMs under the 20th are tasked to STRATCOM around the clock, while 8th Air Force's bombers serve both conventional and nuclear missions.

"To be clear, employment does not mean creating high-yield nuclear detonation," said Maj. Gen. Michael J. Carey, 20th Air Force commander. "It means

the operation, maintenance, sustainment, and assured readiness of those forces, 24/7/365" to convincingly dissuade potential enemies from attacking.

To determine the combat readiness of its nuclear force, AFGSC considers weapons, personnel, and command and control. The Minuteman III system, for example, "is made up of the hardware—the missile itself—the men and women conducting the mission, and then the command and control elements that enable its proper use," Carey explained.

STRATCOM's entire nuclear command and control network exercises three times each day, from the national command level at the Pentagon all the way down to fielded ICBM forces scattered across the western United States. Coded messages pass to each launch control center (LCC) controlling all 450 of the Air Force's deployed ICBMs, and the responses are evaluated back up the chain of command.

### Test, Test, and Test Again

In addition to the daily test of the "deployed" ICBMs, both bomber and missile forces take part in periodic strategic-level communications exercises to validate their deployment and strike protocols. In fact, evaluators have stitched together "no less than half-a-dozen types of tests, exercises, and readiness demonstrations" to make certain "our force is ready all the time," Carey said in an interview.

The sheer number of interdependent components, and the fact that ICBMs

By Aaron M. U. Church, Associate Editor



**A B-2 prepares to take off on a training mission during Red Flag-Alaska. USAF's B-2 bomber fleet can deliver nuclear gravity bombs.**

are on constant alert, makes missile force readiness by far the most complex mission.

In terms of physical components, the bomber weapon system comprises aircraft, air launched cruise missiles, or nuclear free-fall bombs, and the data links to relay and authenticate orders.

For ICBMs, in addition to the missile itself, there is the command and control network, the LCC, and the electrical interface joining the LCC to geographically separate launch sites.

On top of the terrestrial network, there's an airborne component. Alternately, Airborne Launch Control System E-4Bs or Navy E-6B aircraft can control ICBM launches, and this element

must be validated as well. As a result, AFGSC must "isolate elements of the test program," then piece them together to "gain confidence that each segment of the force is viable and ready" as a matter of pragmatism, said Carey.

### Yearly Tests

Three times a year, the Air Force selects a single operational Minuteman III for an operational test launch over the Pacific Ocean. Since launching ICBMs from their deployed locations across the High Plains would scatter "tankage" debris over Canada—and perhaps panic friends and adversaries alike—live shots take place only from Vandenberg AFB, Calif.

To conduct such a test, operational missiles are pulled directly from their silos near Malmstrom AFB, Mont., Minot AFB, N.D., or F. E. Warren and transported to Vandenberg.

"It's a random selection of missile so that we can get a realistic cross-cut of the deployed missile force," as opposed to cherry-picking a missile that may not reflect the fielded force, Carey said.

For several years, Air Force Space Command testers with the 576th Flight Test Squadron handled all the assembly, preparation, and launching from Vandenberg. Now, underscoring AFGSC's intense operational focus, missileers and maintainers from each missile wing conduct a test shot each year. The LCC capsule underground at Vandenberg has the same equipment the missileers have in their own system, again, to underscore continuity.

During the most recent shot from Vandenberg on Nov. 14, a 341st Missile Wing crew from Malmstrom conducted the "key turn"—turning four switches at essentially the same time to launch a missile—in this instance, from a Navy E-6B Mercury airborne command post aircraft. For purposes of the test, the ICBM was fitted with an inert re-entry vehicle, replicating the flight characteristics of a nuclear payload. The missile was then launched on a ballistic trajectory positioning the re-entry vehicle for splashdown at a predetermined point some 4,200 miles away, at the Kwajalein Atoll range in the Marshall Islands.

Processes are the same at Vandenberg, so everything is tested: the "fly-out" hardware, the re-entry system, how

**SrA. Wayne Watts (l) sets the torque on a connector joining a missile guidance set with the propulsion system rocket engine of a Minuteman III. This procedure will prolong the operational life of the missile. A1C Robert Cooper observes.**



the re-entry vehicle performs, plus the control interface.

Similar test activity happens in the bomber force during weapon evaluations, added 8th Air Force commander Maj. Gen. Stephen W. Wilson. Weapon testers regularly perform an “end-to-end test” of the B-52’s nuclear ALCMs, including live shots of unarmed missiles over the test range, he said. The tiny nuclear capable B-2 stealth bomber fleet can also deliver air-dropped bombs, but does not fire the ALCM.

Though most tests go off as planned, occasionally there are surprises. In July 2011, testers at Vandenberg terminated a shot in midflight over the Pacific due to an unexplained anomaly. For both the Minuteman III and the ALCM, “one of the key reasons we fly those weapons out is so that we can do what we call an aging and surveillance program,” said Carey. With Minuteman, the data gleaned from test shots allows the Air Force to “see how all the components in a weapon system that was deployed in the ’70s are performing” and make improvements and replacements as needed.

“What we observed as we did test launches was that certain components age out at different rates,” Carey said. “As technology evolves, we can find appropriate points to integrate new technology and upgrade our capabilities.”

### Keeping the Force Viable

A service life extension program now under way will extend the reliability of the 1980s-era ALCM until its replacement enters service, circa



USAF photo by SSgt. Chad Warren



USAF photo by R. J. Ortez

2030. The primary focus is on the guidance, control, propulsion, and arming systems.

With the test data, Minuteman too has had a makeover that should keep it viable until 2020. “That’s not to say that we don’t have our own issues with components and subcomponents that still need attention,” Carey confessed, but the missiles now have fresh propellant and upgraded guidance. The original warheads have also been swapped

**Above:** SrA. Matthew Wallace (l) and TSgt. Ryan Asaria attach a GBU-31 JDAM to a B-52. BUFF crews must be proficient in both nuclear and conventional roles. **Left:** Maj. Gen. Michael Carey (l), 20th Air Force commander, and Col. Christopher Coffelt (c), 90th Missile Wing commander, speak with A1C Andy Monticello (back to camera) outside a launch facility in northern Colorado.



**An overhead view of a Minuteman III launch facility shows the launcher door, access hatches, and some security features.**

for more modern ones recycled from retired Peacekeeper ICBMs.

Since fly-out launches from Vandenberg don't test the operational infrastructure, AFGSC's missile wings conduct full-up dry runs known as Simulated Electronic Launch-Minuteman at their home bases.

Under normal circumstances, LCCs are interlinked to assure continuous control of each ICBM, even if one LCC goes offline. During SELMs, "we electronically isolate a select number of missiles and then run both the crews and the support systems through all their paces," said Carey. SELMs prove that the actual fielded systems are ready and that "the entire weapon system would function reliably" should the President ever order a launch.

The final piece of the puzzle is personnel: the bomber and missile combat crews actually performing the mission.

"We train, evaluate, and assess the readiness of our personnel both with written tests and practical evaluations, and then in-field evaluations" on a daily basis, Carey stated. Missile combat

crews are constantly being quizzed on knowledge, protocol, and procedures. From an institutional perspective, though, the dual-tasked bomber force probably faces the most challenges with personnel readiness.

### Turning Things Around

"Training missions are nuclear-focused on one day, then the next day we may be turning around and going to a Red Flag exercise" in the conventional role, said Wilson. The B-52 wings at Barksdale and Minot—and previously the B-2s at Whiteman AFB, Mo.—also rotate on six-month deployments to the Pacific. During continuous bomber presence stints at Andersen AFB, Guam, the crews exercise with joint forces under US Pacific Command and allies from Australia to South Korea, but the "primary focus is on conventional," Wilson explained. The crews must still maintain proficiency in nuclear procedures, though, and are routinely tested during deployments as they would be at home base.

"We put into place a number of nuclear modules to make sure that they don't have a big spin-up time when they get back," Kowalski said, noting that the really tenuous balance actually concerns the flying hours.

Aircrews get just enough flight time to stay proficient and ready for both missions, said Kowalski. Since AFGSC stood up, the swing role bombers have focused more on the nuclear mission—so far, without blunting their conventional skill. With readiness demands from regional combatant commanders and STRATCOM holding constant and budget cuts looming, the command is keen to guard the bombers' hard-won readiness across the mission spectrum.

"I would be very uncomfortable to take any further cuts in flying hours," Kowalski cautioned.

From the command level down, "we really do get it, and we're strengthening the legs that we control ... to make them the most realistic and relevant deterrent out there," Wilson said. One of the biggest cultural changes AFGSC instituted has been to increase the accountability of squadron leaders for unit readiness. The command has also gone to great lengths to open communication and provide leaders with what they need to achieve requirements, according to Kowalski.

"We were very relentless in getting to the root cause of readiness reporting and making certain that the squadron commanders—that basic fighting level of the



Air Force—were personally involved,” he said. “If it was something in their control, they were certainly going to be held accountable for it,” and he credits this shift as probably the biggest reason for the marked improvement under AFGSC.

Under a single dedicated command, squadron level readiness has improved, thanks to the command’s ability to shift manpower, funds, and equipment between units as needed. “If we had a unit reporting less than fully ready, ... we can do some movement of things to bring everybody up to the same level,” Kowalski pointed out.

Emblematic of the command’s push to return to a combat-ready operational focus is the new consolidated unit inspection, or CUI. This initiative began in 2007 as part of the nuclear enterprise inspection system’s reinvention, and it took hold across the service.

Units had spent so much time preparing for and undergoing inspections that training and operations were disrupted and curtailed. Instead, leaders proposed bundling all the inspections into a single event every two years. The resulting inspection regime gives units more time to focus on the mission.

“By trying to put a little bit more time in the schedule, we’re hoping to

improve that training long-term and the maturity and experience of our folks going forward,” explained Kowalski. AFGSC conducted its first CUIs of a bomb wing in 2011 at Barksdale and a missile wing in 2012 at F. E. Warren, with positive initial reviews from both.

### No Falls or Slips

After three years of focused attention, most of the easily fixed readiness problems have been resolved through concerted effort. The remaining challenges present more-difficult issues, such as maturing personnel or stocking adequate spare parts to meet requirements.

Kowalski said AFGSC has identified a need for experienced personnel. It is “just going to take us some time to grow those people and get them in place, but we think we’re on the right track,” he said.

In terms of procuring “high dollar items that need to be on shelves, ... we’re just bumping up against fiscal realities” of a tightening defense budget, he admitted. “Pretty much all of the low-hanging fruit has been picked. ... The problems are a little bit tougher now in terms of why we wouldn’t be achieving the highest levels of readiness.”

With the New START agreement and presidential initiative to reduce the US

***Lt. Gen. James Kowalski, commander of Air Force Global Strike Command, operates a combat network system aboard a test B-52H at Edwards AFB, Calif. Kowalski says AFGSC has worked hard to institute accountability within the nuclear force.***

nuclear arsenal, AFGSC will almost certainly “take some reductions” in force structure in the next few years, Kowalski acknowledged. As a result, the readiness of each airman, bomber, and ICBM in the inventory will count that much more.

“However you imagine the force structure being reduced, one of the key things that has to be factored in is readiness and reliability. It’s our duty to make sure none of those fall or slip,” Carey said.

“We’re going to have to think hard about how we do some of our business,” said Kowalski. Regardless of the force size, “at the end of the day, this is an essential, foundational mission set, and I think our nation is going to choose to continue to execute it.” Even with reductions and shrinking budgets, nothing on the horizon jeopardizes Air Force Global Strike Command’s “special trust and responsibility” to mount a ready and effective nuclear deterrent US citizens can rely on, he asserted. ■