



Peacekeeper is gone, but USAF plans to revamp its long-range missile force for the long haul.

# The ICBM Makeover

By Adam J. Hebert, Senior Editor



*Pictured is the re-entry of eight test warheads carried by one Peacekeeper missile, such as the one pictured above (inset).*

**I**N September, the Air Force deactivated its last remaining Peacekeeper ICBM, pulling the mammoth multiwarhead missile out of its Wyoming silo and sending it off to be dismantled. USAF once had maintained an awesome force of 50 LG-118A Peacekeepers; now there are none.

This step marked the end of what many viewed as the most powerful weapon system ever built. Many may have been tempted to conclude that it also signified a steep decline in deterrence. However,

unlike that iconic Cold War missile, the Air Force's strategic nuclear mission has not faded away. Far from it.

The United States still needs to have "a continuum of capabilities across the force," maintains Gen. Lance W. Lord, the chief of Air Force Space Command, which oversees the long-range missile force. And the ICBM—ready, accurate, able to blast any target on Earth in 35 minutes—will continue to occupy an important place on that continuum.

Today, Space Command and US

Strategic Command, the joint service missile operator, are looking to move beyond systems that served the nation so well in the Cold War and bring on new and better ones. They are drawing up plans to build a next generation deterrent force more responsive to the needs of the modern era.

The effort has been under way for several years. The Bush Administration, after wrapping up a top-to-bottom Nuclear Posture Review in 2002, proposed a big cut in the number of



Boeing photo



US Army photo

IIIs in service until 2020. Plans call for USAF to give the venerable Minuteman a host of life-extending upgrades.

### No Let Down

The nation's only Peacekeeper unit, the 400th Missile Squadron at F.E. Warren AFB, Wyo., never wavered in discharging its duties. It kept up its full deterrence mission even as the force was drawing down over the past three years. Missile operators remained on full alert and kept regular schedules until the final launch vehicle was deactivated last month.

F.E. Warren missileers point out that, though the number of Peacekeepers steadily dwindled, they had no difficulty keeping up a professional approach to the missile.

Whether one is operating a Peacekeeper or Minuteman, the destructive power of an ICBM engenders an "environment of extreme seriousness," said 2nd Lt. Lyle Hedgecock, who was a member of the final Peacekeeper missile training class. On your first day of alert, "you're afraid of the phone ringing," he added.

Capt. Tim Hawthorn, on duty in late July, said the alert intensity was still high even though only three Peacekeepers were still in service. Missile combat crew members at their control sites still monitored the safety and security of the entire network.

Capt. Lara Wilson, a 400th flight commander, said a combat crew member typically arrives at F.E. Warren at 7 a.m. on the day of an alert, receives the day's briefings, drives to the control site, and changes over with the departing crew—all before beginning the 24-hour alert.

Sometimes the "work day" is not complete until 5:30 p.m. on the second day—more than 34 hours after check-in.

As the decommissioning of the final LG-118A approached, plans called for Hedgecock and others to retrain and stay at F.E. Warren to take up new posts operating Minuteman IIIs. Other missileers of the 400th moved on to other bases, often for Air Force Space Command satellite operations assignments.

The technical expertise and attention to detail the missile operators develop in their first four years are highly valuable, said Lord. "Air Force Space Command's operators have benefited significantly from our ICBM experience," he has maintained. Missileers

bring a combat mind-set to the rest of the command.

Lt. Col. Dave Bliesner, commander of the 400th Missile Squadron in its final days, noted that the Peacekeeper had been a mature operational system, requiring great focus from the missileers. These qualities are "very sought after" in the less-mature satellite and space operations realm, said Bliesner.

All 50 Peacekeeper silos may be empty, but complete deactivation requires quite a bit more work from the maintenance teams at F.E. Warren's 90th Space Wing. According to Bliesner, missileers have "a full year of work to do."

That work entails stripping the launch and control sites and pulling all classified materials so that they can be declared "nuclear decertified," said Col. Michael J. Carey, commander of the 90th Space Wing.

### Components Live On

Some of the Peacekeeper equipment will be reused. The relatively new and highly complex re-entry vehicles are set to be transferred to the Minuteman III program, where they will replace some older deployed warheads. Peacekeeper booster components are to be used in space launch vehicles. Much of the infrastructure—batteries, access doors, and the like—can also be recycled.

In a break with past practice, the Peacekeeper launch silos will be kept intact. Maj. Gen. (sel.) Mark D. Shackelford, director of requirements for Space Command, said the Air Force has decided that launch control centers and silos are "not to be destroyed." Instead, this infrastructure will go into indefinite "mothball status" to ensure that the facilities will be available in case the need for them arises.

Previous deactivations of ICBMs typically resulted in their infrastructure being imploded, but Shackelford said that action was driven by the strictures of Soviet-American strategic arms control agreements—not military requirements.

That's not the only new wrinkle in the US approach to strategic arms. According to Lord, the nation has accepted that it must now move to "deter adversaries in the future." This, he said, will require a strategic force with both nuclear deterrent capability and "the flexibility to provide conventional strike capabilities."

Already, the Air Force has embarked on several critical upgrade programs,

deployed nuclear warheads and called for increased reliance on a wider range of strategic capabilities, which for the first time would include antimissile defenses and secretive information operations.

The Air Force, as a result, began in October 2002 to decommission all of its 50 Peacekeepers, each of which could sport 10 high-performance, highly accurate re-entry vehicles. At the same time, the Air Force embarked on a program aimed at keeping its 500 Minuteman



*The 1970s-era Minuteman III (shown in test flight) will be the backbone of the US deterrent. USAF plans to keep 500 updated versions on station for years to come. Some will have one warhead, some three.*

tests, and studies. According to Maj. Gen. Frank G. Klotz, the commander of 20th Air Force and US Strategic Command's Task Force 214, the upgrades so far have proved to be unqualified successes.

Carey echoes that view. Minuteman III modernization plans, he said, will "ensure that the [deterrent] success we've enjoyed over the past decades will continue to be solid and secure in the future."

USAF's 500 Minuteman IIIs are being rebuilt from top to bottom to ensure their power and reliability. The buried launch control centers are getting upgraded command and control consoles. The missile's propulsion systems are being modernized. The outcome of a still-ongoing guidance system replacement program has been significant improvement in the average mean-time-between-failure of component parts.

### From Three to One

The Air Force has radically reshaped the fleet of 150 Minuteman IIIs currently deployed at F.E. Warren. Missile engineers have "downloaded" each of the Minuteman systems from a triple-warhead to a single-warhead configuration, thereby eliminating 300 nuclear re-entry vehicles.

However, Klotz said the Minuteman III fleet will keep a mixture of warhead configurations. Some or all of the ICBMs based at Malmstrom AFB, Mont., and

Minot AFB, N.D., will retain up to three warheads, he said, noting that the single-warhead weapon is not good for each and every threat.

Later, the Safety Enhanced Re-entry Vehicle (SERV) program will replace Minuteman III warheads with re-entry vehicles removed from the decommissioned Peacekeepers, a step that will also improve targeting accuracy.

The first SERV test flight took place in July, reported Shackelford. The Air Force plans to carry out four test launches before it makes a decision on whether to proceed with the full program. That decision is expected in 2006.

With all this work in progress, the Minuteman III remains a "very effective and reliable weapons system," said Klotz.

He points out that maintenance is manpower-intensive but "relatively modest cost," and the missile posts a "phenomenal" rate of sortie readiness. At any given time, 99.4 percent of Minuteman IIIs not undergoing planned maintenance are ready for launch.

During the Cold War, the difficulty of lifting multiple warheads with a single booster made it imperative to develop high "yield-to-weight" ratios, according to retired USAF Gen. Larry D. Welch, formerly the Chief of Staff and now head of the Institute for Defense Analyses in the Washington, D.C., area. This need, Welch went on, resulted in "exquisite" warhead designs containing "all kinds of esoteric, hard to handle materials." Now, the Air Force has under consideration a "reliable replacement warhead" that could free the Air Force of some maintenance headaches and safety concerns associated with the older warheads.

At present, Space Command officials are nearing the completion of an analysis of alternatives (AOA) evaluating options for a next generation land-based strategic deterrent. Space Command leaders are



*Refurbished Minuteman III engines await shipment from Hill AFB, Utah, where the reconditioning takes place. The fleet will be rebuilt from top to bottom to increase safety and reliability.*

AP photo by Douglas C. Pizac

## In Arms Control, It's START, START, START, and SORT

Peacekeeper deactivation, like the other nuclear reduction programs, came in the context of arms control agreements.

START I, signed in 1991 and ratified by the US and Russia, limited each nation to 6,000 total warheads. According to the Arms Control Association, a think tank in Washington, D.C., the US reached this target in December 2001.

START II negotiations lowered the warhead limit to some 3,500 weapons. The treaty was signed in 1993 but never entered into force because it was soon overtaken by events. The US should be at roughly 3,800 weapons in 2007.

START III, agreed to in principle in 1997, would cut each inventory to some 2,250 warheads. (This total mirrors that set in the Strategic Offensive Reductions Treaty—SORT—talks between President Bush and Russian President Vladimir Putin in 2002.)

SORT called for the US and Russia to have 1,700 to 2,200 operationally deployed warheads by the end of 2012. Warheads and delivery systems do not have to be destroyed, merely kept at distinct, separate locations.

Maj. Gen. (sel.) Richard Y. Newton III, director of plans and policy for US Strategic Command, said US forces will adhere to all applicable arms control agreements.

This fact is made easier by SORT's more lenient counting rules, which do not force the United States to dismember or implode systems and display them for verification purposes.

The newly relaxed situation reflects a steep lessening of tensions between Washington and Moscow. In fact, said Newton, the coming reductions are "not a particular issue to me."

not calling the next generation system a "Minuteman IV," but the command has determined that it needs a follow-on long-range missile.

The AOA is looking at options in three areas: delivery vehicles, command and control systems, and security.

Col. Richard Patenaude, who is leading the AOA, said last year that there is considerable room for improvement in all three areas. For example, in delivery vehicles, the Minuteman III has four thrust nozzles. There is "no way we'd do that today," he said—a modern ICBM would be designed with one thrust nozzle.

Accuracy improvements are also possible. Re-entry vehicles currently designed with inertial guidance systems could be made better. The RVs could be supplemented with Global Positioning System guidance or incorporate the stellar positioning system the Navy uses for its submarine-launched ballistic missiles.

The AOA has already turned down a proposal to convert a portion of the Minuteman III force to "Minuteman Elite" status by adding GPS for greater accuracy. This idea is now on hold until the AOA is completed and a long-range nuclear plan can be formulated.

On the command and control front, there is a "significant potential for manpower savings," said Patenaude, if the Air Force can break free of its paradigm of 50 isolated, hardwired capsules used to control the missile fleet.

The ultimate command and control solution could entail use of all, some, or none of the capsules. Technology

has advanced to the point where USAF is essentially free to create any sort of command architecture it desires, Patenaude said. The challenge is to avoid introducing "new vulnerabilities."

### The "Standing Army"

Physical security is another long-standing concern. Current defenses are manpower-intensive; Klotz noted that 20th Air Force has a "large standing army" of security forces—in fact, it comprises roughly a third of its total airmen.

Technological improvements could bolster defenses while simultaneously reducing security forces' high operations tempo. The missile silos are currently

monitored by motion detectors. Klotz would like to upgrade to a visual detection system, which would increase situational awareness and cut down on the number of false alarms security teams must respond to.

Technology cannot totally replace humans, said MSgt. Michael Parker, superintendent of the 790th Security Squadron, but it can be a force multiplier. There is "no room even for one error" in nuclear security, Parker said. The consequences would be grave if terrorists ever got possession of a warhead and "started running."

Officials expect the AOA to determine which nuclear options are the most promising. When it does, Space Command and Strategic Command will quickly turn their attention to the issue of prompt global strike. This is where the merits of conventional ICBMs, hypersonic missiles, and other options for providing a new level of accuracy and responsiveness will be weighed.

In a 2004 study, the Defense Science Board looked at what it called "imaginative candidates for prompt response." Among these candidates were large, stealthy, unmanned, long-endurance, air refuelable airplanes; hypersonic missiles or unmanned airplanes; and ballistic missiles with different kinds of payloads.

DSB concluded at the time that "no single alternative emerges as a clear winner," though it did recommend that the Air Force keep the deactivated Peacekeeper missiles for potential reuse as conventional platforms.

The DSB and Patenaude both said it



*On Oct. 3, 2002, Air Force TSgt. Bryan Stewart (l) and SrA. Theodore Fife look at the third stage of a Peacekeeper that had been located near Hawk Springs, Wyo. It was the first of 50 to be dismantled.*

AP photo by Dan Cepeda



**An artist's graphic depicts ejection of a Minuteman III nosecone shroud, revealing three re-entry vehicles. This action comes in the final seconds of the ICBM's stage 2 burn.**

would make sense to base conventional ICBMs on the US coasts and not in the "holes" left by Peacekeeper. Patenaude noted that spent boosters of missiles launched from Wyoming would fall back onto US soil. Better to base conventional ICBMs, if approved, at Vandenberg AFB, Calif., Cape Canaveral AFS, Fla., or both, he said.

### High Anxiety

Geographical separation of nuclear and conventional missile launchers also would help simplify the task of providing "assurance" to important powers. Russian leaders in Moscow, for example, surely would become highly nervous on being notified that the US had launched an ICBM. Should the launch come from coastal areas, however, they would know almost instantly that it was a conventional weapon and not aimed at Russia. That kind of knowledge would have a calming effect.

The Pentagon must answer many questions before it reaches a final decision about proceeding with a conventional ICBM.

Would a conventional system be cost-effective? Probably, conclude Air Force officers. Would it be responsive enough? Yes, because targets could be destroyed in minutes. Would it be sufficiently accurate to strike the kind of target set it likely would be sent to hit? Perhaps. Would it be politically viable? Hard to say. Overflight issues and international notifications and inspections also would have to be worked out.

Klotz said these decisions will come from a "much higher level" than 20th Air Force, but he offered an analogy. Strategic Air Command leaders designed the B-52 bomber to fly at high altitudes and strike the Soviet Union with nuclear weapons. Not long afterward, the B-52s

switched to low-altitude approaches so as to foil improved Soviet air defenses. With the end of the Cold War, the BUFFs again switched course and now perform a range of conventional and nuclear missions.

In light of the B-52's history, one must say that it is "certainly feasible" to take a delivery system such as a nuclear ICBM and modify it to create new effects, said Klotz.

The US lacks good options for prompt, assured, non-nuclear attack, said USAF Lt. Gen. C. Robert Kehler, Strategic Command deputy commander at Offutt AFB, Neb. "If a geographic combatant commander needs to deliver highly precise, conventional kinetic effects on a

target, can they do it?" Kehler asked. It can be done, but not always promptly.

The 2002 Nuclear Posture Review and subsequent guidance issued by President Bush called for the US to reduce its deployed strategic warheads to "the lowest number ... consistent with the security requirements of the US and its allies," while also developing a "new triad" of nuclear and conventional strike capabilities, improved defenses, and a responsive strategic arms infrastructure.

Kehler said "everything" on Strategic Command's plate today is done to reach the goals of the Nuclear Posture Review. The US is now nearing the completion of a first round of nuclear reductions.

In addition to reshaping the Minuteman fleet by taking off active status 300 warheads, the Air Force has now taken out of service the 500 warheads that once sat atop its 50 Peacekeepers. The Navy also has contributed to the reduction of warheads; by 2007, it will have completed the conversion of four Ohio-class ballistic-missile-carrying submarines into conventional cruise-missile subs.

As of January, the United States still deployed 5,966 strategic warheads, as calculated under counting rules that were put in place by the Strategic Arms Reduction Treaty talks of the 1980s. The real number is less than that; the arcane START rules still count all 500 Peacekeeper warheads and attribute 81

**An Oct. 28, 1995, controlled explosion destroys an underground Minuteman II silo near Holden, Mo. This was done as a part of Soviet-American arms control agreements. Standing in the Missouri cornfield and jointly pushing the button are American Secretary of Defense William Perry (left) and Russian Defense Minister Pavel Grachev.**



AP photo by Cliff Schiappa

warheads to the B-1B bomber, which has been a pure conventional system for some time now.

### From START to SORT

Under terms of the Strategic Offensive Reductions Treaty (SORT) forged by Bush and Russian President Vladimir Putin three years ago, Washington and Moscow agree to operationally deploy fewer than 2,200 warheads by the end of 2012. However, SORT rules do not require the actual destruction of delivery systems, as was true of earlier superpower agreements. SORT says only that they must be stored separately from their warheads.

These nondeployed warheads will become part of what the Bush Administration calls the “responsive force.” It is important to have such a force, said one Strategic Command official, because the US is the only nuclear power that lacks any current ability to manufacture new weapons.

Advances in precision and intelligence fusion will make conventional weapons more versatile and help bring the NPR vision to reality, officials believe. This has “implications” for the stockpile, Kehler said, because rapid, precise, conventional weapons could perform some current nuclear missions.

USAF Maj. Gen. (sel.) Richard Y. Newton III, Strategic Command plans and policy director, said greater precision should allow “some targets to be serviced by fewer weapons.” The ongoing strategic studies will help determine whether and how the US can further reduce its deployed-warhead count. There is no firm timeline for beginning additional cuts.

Improved targeting has permitted the US to safely cut nuclear forces in the past. Kehler was working on the Joint Staff when “tough discussions” occurred regarding START I requirements. Pentagon planners took a “hard look at the philosophical underpinnings of nuclear targeting,” he said, and determined that the US could reduce its nuclear inventories and “still preserve the essence of deterrence.”

Similar discussions are taking place today in centers of US nuclear policy and strategy formulation.

“It looks to us like there are some targets we hold at risk today with nuclear weapons that would be good candidates to be held at risk with a conventional weapon,” Kehler said.

The answer “may be” conventional



AP photo by Brett K. Snow

*The contrail of an unarmed Minuteman in flight is vivid against the evening sky over Victorville, Calif., in a 1999 test. Though many have predicted the demise of the ICBM, all signs are that it will be around for quite a while longer.*

ballistic missiles, but precision, promptness, and intelligence capabilities all have to be developed together, Kehler said.

### “The Toughest Targets”

Lack of production capability does not mean the US cannot add new capabilities, however. Strategic Command is interested in developing new ways—nuclear or conventional—to solve the long-vexing problem posed by an enemy’s hardened and deeply buried targets (HDBTs), principally command and control nodes.

Newton said this is a real “and growing” problem, one that is not likely to be solved by a single weapon.

HDBTs are “probably the toughest targets” for a variety of reasons, added Kehler. They are difficult to find and physically resistant to attack. Adversaries have studied US operations over the years and learned the American style of attack. They have come to regard the use of hardened and deeply buried centers as a way to defeat “what we strike [and] how we strike.”

Planners say it is unacceptable for potential enemies to have any category of targets that the US cannot hold at risk. The Administration, in turn, has been pushing for development of a so-called Robust Nuclear Earth Penetrator.

Kehler said Strategic Command supports creation of new earth-penetrating capabilities, whether they are nuclear or conventional, but the biggest “bang for the buck” in the future is likely to come in intelligence and weapon fusion,

he said, not through acquisition of any single system.

Some recall that in 2004, the Defense Science Board called on the Air Force to develop a “contingency arsenal” of specialized conventional weapons for niche purposes. The DSB highlighted the success DOD had had developing very effective specialized warheads such as the thermobaric bomb (used in Afghanistan). Such special-purpose weapons could serve strategic purposes as well and would increase flexibility.

Strategic Command already has targeting flexibility. Its senior officials are loath to discuss any aspect of this part of STRATCOM’s business, but Newton allowed that nuclear planning reflects a wide range of options that are “more suited for today and tomorrow” than for the threats factored into the Cold War model, with its Single Integrated Operational Plan.

Another official noted that ICBM targets must be changed more frequently than was true in the past. This, he said, stemmed in part from greater US reliance on single-warhead ICBMs.

For the Air Force’s missileers, life hasn’t changed much, and it won’t for the foreseeable future. Two-man missile combat crews still sit in buried, blast-resistant capsules under the Great Plains, each team directly responsible for overseeing and controlling 10 missiles while providing support for 10 more.

As they work their 24-hour shifts, they are constantly prepared to turn their keys in unison but hope they never have to. ■