Bomber

By John A. Tirpak, Senior Editor

Photo illustration by Erik Simonsen

In the era of long-range precision strike, we have only 112 operational bombers.

Questions

THE Pentagon's Quadrennial Defense Review, working toward a statutory deadline of Sept. 30, will place heavy emphasis on long-range precision strike systems to help gain quick control of a future military crisis and serve as a wedge for other forces to get into the fight. It will echo the Air Force's own proposals in this regard.

The QDR, however, is unlikely to provide a blueprint for expanding the manned bomber force. Plans called for the Defense Department to emphasize radically smaller, more-precise munitions plus greater reliability and availability of existing aircraft and not the procurement of new aircraft.

The new munitions will, in fact, multiply the capabilities of the bomber fleet. In the near future, a B-2 stealth bomber will be able to achieve on one mission the same effects that it took six missions to achieve during Operation Allied Force. And even better weapons already in development could increase each bomber's effectiveness 20-fold, enabling them to precisely strike hundreds of targets per sortie.

The enhancement of aircraft reliability, coupled with improved survival systems, will expand a bomber's maximum number of sorties, further increasing the effects bombers can achieve without the addition of new airplanes.

The Air Force, reflecting this direction, actually has proposed reducing the size of its bomber fleet, asserting that it prefers to invest the savings in munitions and improvements to the remaining bombers. This, it is said, will increase their readiness and the range of weapons they can employ.

The multiplication of capability should sharply increase the tempo of a future air campaign.

Missing Successor

However, the Air Force still has produced no plan for a successor to USAF's existing bombers, many of which are quite old and will need to be replaced sooner than previously expected. The service is sticking to its notion, voiced in the 1999 Bomber Roadmap, that it can defer work on a follow-on system until the mid–2010s—fielding replacements in the late 2030s. By then, however, the fleet will have undergone a steep decline, as airframes wear out or are lost to attrition.

Because of the impending problems facing the bomber force, some have suggested the existence of a classified program of some sort, one which could soon emerge to take over some of the long-range mission. However, there seem to be no budget placeholders for such a program.

USAF's proposed B-1B cut would shrink the fleet from 93 to only 60 aircraft. The plan hit immediate resistance. Senior members of Congress blasted the move as both militarily unsound and politically motivated. Spurred by the potential loss of jobs in their home districts, as well as concern that the Air Force would be getting rid of needed capability, the Congressmen insisted on further study before action is taken.

As a result, the B-1B drawdown is on hold, though the Air Force had intended to put it into effect on Oct. 1.

Some lawmakers focused on the argument that the Air Force should be increasing the size of the bomber force, not cutting it, and promised budgetary amendments that might oblige USAF to invest in a new global strike platform earlier than called for in service plans.

Since the Bush Administration came into office this year, long-range

airpower has been considered a rising priority in the Pentagon. The Administration's suggestion of a possible shift of military focus to Asia and the Pacific, coupled with its desire to reduce overseas deployments and act with greater speed in a military crisis, implied that the required bomber fleet, set at 190 airframes in the 1997 QDR, would be expanded.

In setting the new QDR's "Terms of Reference"—that is, ground rules and definitions for the exercise—Defense Secretary Donald Rumsfeld named 13 investment priorities. Prominent among them was precision strike.

Rumsfeld instructed the services to favor "long-range platforms that can strike rapidly ... carrying larger payloads of weapons," from the air, sea, and space. He specified that the military will increasingly demand stealthy "long-range aerial platforms capable of penetrating enemy air defenses" as adversaries develop the means to deny the US entry to overseas theaters of war.

Quickly defeating these anti-access systems—such as weapons of mass destruction, improved air defenses, and tactical ballistic missiles—may even be undertaken from "suborbital space vehicles" that may prove "valuable for conducting rapid global strikes," Rumsfeld wrote. He also directed an emphasis on developing more precise and smaller standoff weapons, able to attack in all weather and some able to loiter over the battlefield, striking mobile targets.

The Naturals

Bombers seemed to be a natural for these missions, given that the combination of their long range and heavy payload offered the exact capability needed to attack at globe-spanning distances. Also, they would require less aerial tanker support than would be the case with fighters, and they would also have the capability to function without forward operating bases.

The Terms of Reference guidance reflected President Bush's own pointed—though perfunctory—remarks on the shape of the future military. In a May commencement address at the US Naval Academy in Annapolis, Md., Bush said he was committed to building a force "defined less by size and more by mobility and swiftness, ... one that relies more heavily on stealth, precision weaponry, and information technologies." Such an approach, he said, would help redefine war "on our terms."

To inform his own decisions on both strategy and spending and to identify issues for the QDR to tackle, Rumsfeld launched a series of studies. He used them to examine current and future military threats, the condition and direction of the US military, and places where new funding would have the most dramatic results.

USAF photo by MSgt. Kenneth Fidler

B-1Bs on the Block? *USAF proposed cutting the B-1 fleet and investing the savings in munitions and improvements to remaining bombers. Here, a crew refuels a Kansas ANG B-1B at a French base.*

The first of these groups to publicly report its findings was the Transformation Panel chaired by retired Air Force Gen. James P. McCarthy. It pegged long-range precision attack as one of six capabilities necessary to quickly gain the upper hand in future crises. The transformation group suggested that the US military of the future should be able, within 24 hours, to "set the conditions" of a conflict anywhere in the world. After forces had accomplished this goal, follow-on forces would enter a theater of war, "establish control" of the situation within 96 hours, and achieve "decisive resolution" to the conflict within 30 days.

The discussion of gaining entry to a theater of war and defeating anti-access threats dovetailed with the Air Force's own strategic concept, Global Reconnaissance Strike, and its execution derivative, Global Strike Task Force. The two concepts call for stealthy bombers and fast stealthy fighters to quickly destroy enemy anti-access systems so that the rest of the military can flow into the theater to conduct warfare on any level deemed necessary to accomplish strategic objectives.

"Bomber-Centric" Force

Gen. Richard E. Hawley, retired former head of USAF's Air Combat Command and a principal author of the initial Global Reconnaissance Strike paper, followed up with another paper in the spring 2001 *Strategic Review*. In it, he said that the Air Force should swing "the airpower pendulum" away from fighters and back toward a more "bomber-centric" force. Bombers, he said, require fewer pilots and less investment than fighters to deliver the same number of munitions and can reduce the strain on airlift and tanker assets as well.

"A bomber-centric approach can deny an enemy his anti-access objectives, attack his key strategic infrastructure, slow or halt his forces, and beat down his defenses while the other elements of the joint force are safely built up in-theater," Hawley wrote.

The Transformation Panel did not focus on bombers to the exclusion of all other systems. Cruise missiles launched from standoff platforms were also deemed crucial in the early round of combat. With a bow to

jointness, the panelists called for more involvement of naval forces to help protect forces entering the theater and for insertions of a small number of ground forces.

Then came the report of the Conventional Forces Panel, headed by David C. Gompert, president of RAND Europe. This panel assessed the systems now in service or in development and attempted to determine which were most suited to the kinds of warfare anticipated in the early decades of the 21st century.

Like the McCarthy panel, Gompert's group emphasized the need for a "robust" long-range precision strike capability as a prerequisite for any future force. Upgrades to the B-2 and B-52 bombers, stealthy standoff missiles, and miniaturized munitions were among the few shooting capabilities that the panel deemed most "highly compatible" with future required capabilities. The panel suggested adding funds to the bomber upgrade and munitions programs and, where possible, accelerating them.

Photos by Ted Carlson

Leading Edge. *The Air Force would use the stealthy B-2 with the stealthy F-22 to quickly destroy enemy anti-access systems and clear the way for other US forces to enter the combat theater.*

BUFF Factor. *Though the B-52H is still frisky, the youngest model will turn 40 next year. Can upgrades and new munitions keep the B-52 bomber serviceable until 2037, as USAF contends?*

Underpinning the other panels was a study chaired by the Pentagon's longtime director of the Office of the Net Assessment, Andrew Marshall. The Marshall study on military strategy remains highly classified but is believed to concur with the other groups on the need for fast-striking systems to nip future military crises in the bud.

Leaving aside the proposed B-1B reduction, the Air Force's bomber fleet today comprises 208 airplanes—21 B-2s, 93 B-1s, and 94 B-52Hs. However, the figure of 208 overstates by far the service's true bomber capability. Of the 208 bombers in service, only 112 are deemed mission ready; the remainder are dedicated to either test and training functions or are considered part of the attrition reserve. This latter designation is conferred upon airplanes that receive no funding for spare parts, training hours, or crews and get only minimal maintenance attention.

The breakout is as follows:

- B-2 bombers, 21 total and 16 combat ready.
- B-1B bombers, 93 total and 52 combat ready (36 in the active force and 16 in the Air National Guard).
- B-52H bombers, 94 total and 44 combat ready (36 in the active force and eight in Air Force Reserve Command).

The proposed elimination of 33 B-1Bs would take the B-1B fleet down to just 60 airplanes, of which only 37 would be kept in combat-ready status. Thus, if USAF's reduction goes through, the overall bomber fleet will drop to 165 airplanes, of which only 89 would be ready for action.

In announcing the planned reduction, Rumsfeld said the Air Force requested it and that $130 million a year in savings could be retained by the Air Force and be plowed back into the bomber fleet to make the remaining aircraft more capable.

$2 Billion Gap

Air Force Secretary James G. Roche told the Senate Armed Services Committee in July that the bill to upgrade all 93 B-1Bs to a configuration deemed sufficient to keep the airplanes battleworthy would cost $2 billion more than the service had available for the task. He added that the new Administration wants to avoid asking for more money if there are ways to deliver the same capability within the existing Air Force means.

The annual $130 million in sav-

USAF photo by SSgt. Efrain Gonzalez

Higher IQs. *A weapons load crew member offloads a Mk 82 "dumb" bomb, which may become scarcer. Plans call for using smaller, "smarter," precision arms to increase each bomber's effectiveness 20-fold.*

ings, even extended over a decade, still will not entirely make up the shortfall in bomber modification funding, but, the Air Force deputy assistant secretary for budget, Maj. Gen. Larry W. Northington, said, "It's a pretty good down payment to pay down the backlog." Much of the money would have to go toward improving the B-1B's defensive avionics suite and adding the ALE-50 towed decoy to all aircraft in the fleet.

In a statement, the Air Force said it could pay for all planned modifications to the 60 remaining airframes through 2007 using only the savings generated by retiring the 33 bombers. A special team has been set up to determine which airframes would be retired, since the B-1Bs are all about the same age but have been used very differently.

In explaining the reduction, Northington noted, "We have been unable to put the necessary modifications in the aircraft to continue to keep it viable in a combat situation. Offensive avionics, defensive avionics, weapon systems integration, electronics in general are things that have caused substantial cost growth and in fact degrade the aircraft's ability to perform in a combat situation."

The retired airplanes would be stripped of useful parts and sent to the boneyard. Absent a massive transfusion of money, these aircraft would never be serviceable again, Northington added. "We do not want to maintain those airplanes. That's the whole idea," he said.

Cutting the fleet and winding up with a smaller but more capable inventory is a move the Air Force has been considering "for a couple of years," Northington said. From an operational and logistics standpoint, "this makes sense," he added.

Some of the savings will come from consolidating the bomber's five current operating locations into only two. The USAF Chief of Staff, Gen. Michael E. Ryan, told the Senate panel that, in the Cold War, wide dispersal of the bomber fleet made sense because the US needed to reduce its vulnerability to a surprise sea-launched ballistic missile attack. Now that the Cold War is but a memory, he said, it no longer makes sense to continue with the inefficiencies of a dispersed fleet.

Long-Range Strike Assets

The Air Force's long-range precision strike capability rests with bombers and a number of new munitions designed to be highly precise and/or stealthy for farther reach into enemy territory.

The B-2A, B-1B, and B-52H represent, respectively, USAF's ability to penetrate tough air defenses, to attack enemy forces when air defenses have been suppressed, and to strike the enemy with standoff munitions. Only the B-2 and the B-52 retain a nuclear mission; the B-1Bs are limited to conventional operations.

The Joint Direct Attack Munition is an all-weather, satellite-guided bomb. The 2,000-pound variant was employed by the B-2 in Operation Allied Force with great success. A 1,000-pound version is available and a 500-pound version is being readied for deployment. Both the B-1B and B-2 are configured for the 2,000-pound JDAM. The B-52 will receive the 500-pound version late this year and the B-2 will receive it in 2004.

The Joint Standoff Weapon is a stealthy, satellite-guided glide bomb that can be released 40 miles away from its target. Initial versions are submunitions dispensers; later versions have a unitary warhead. The B-2 will receive JSOW certification late this year, the B-52 in 2002, and the B-1B in 2004.

The Conventional Air Launched Cruise Missile is a satellite-guided missile converted from stocks of nuclear-armed cruise missiles. Range is given at 600 miles. A precision version is in development; only the B-52 can carry the conventional cruise missile.

The Joint Air-to-Surface Standoff Missile is a highly stealthy cruise missile with a range in excess of 150 miles. The B-52 will receive JASSM in 2003, and the B-1 and B-2 will receive it in 2004. The JASSM will also be carried on fighters and is the planned replacement for CALCM, which is only available in limited qualitites.

The Wind-Corrected Munitions Dispenser is a smart guidance kit that can be applied to existing dispenser weapons, such as the tank-killing Sensor Fuzed Weapon. It allows the bomber to veer away from the target area immediately after weapon release and corrects the munitions flight path for windage automatically. The B-52 will receive WCMD this year and the B-1B in 2003.

The Small Diameter Bomb will have the precision necessary to achieve the effects of a 2,000-pound bomb with a 250-pound bomb. In-service dates are still being developed, but SDB will likely begin entering the inventory in 2007.

USAF photos by TSgt. Lance Cheung

Balkan Star. *The B-2 was lauded as the star of Allied Force. USAF has only 21; Northrop Grumman offered to build 40 more for $29.4 billion. Here, maintainers at Whiteman AFB, Mo., prep a B-2 for Exercise Global Guardian.*

It was the prospect of some bases losing the bomber mission that galvanized Congressional opposition to the plan, even though Roche and Ryan said a mitigation plan will find other tasks for the Guardsmen affected by the B-1 reduction.

Fading B-2 Prospects?

The B-1B announcement also chilled speculation that the Pentagon would restart the B-2 production line, a prospect that had seemed to gain momentum with the nomination of Roche, a Northrop Grumman executive, as Air Force Secretary.

In May, Northrop Grumman made an unsolicited offer to the Pentagon to reopen the B-2 production line and deliver 40 new stealth bombers at a total cost of $29.4 billion. The airplanes, which would be called B-2C (the C is for conventional) would be cheaper than their elder brethren because much of the expensive equipment necessary only for the nuclear attack role—such as hardening against electromagnetic pulse—would be deleted.

In a letter to Rumsfeld, Northrop Grumman Chief Executive Officer Kent Kresa said he could reopen the B-2 line and get production under way in 2003. The B-2 would remain "essentially unchanged" aerodynamically—saving money by eliminating substantial test and development costs vs. a new-design aircraft—but would enjoy modern avionics and software and would be cheaper to operate because its stealthy systems and surfaces would be more modern and resilient. The 40 airplanes would be delivered through 2016, at a rate of three or four a year.

There was no money for renewed B-2 production in the Bush Administration's amendments to the Fiscal 2002 budget, however, and the move to reduce the B-1B inventory all but quashed any chance to add more stealth bombers.

"If we can't afford to keep the bombers we already have, I don't see how we could pay for ... new ones," a senior USAF official told reporters in Washington.

An advisor to Rumsfeld who participated in one of the panels said he has found no one in the Administration very high on the idea of restarting the B-2. "The money's not there," he said. "And even if it was ... if you were to start a new stealth bomber today, [the B-2] is not how you would do it. Stealth has evolved quite a bit over the last 20 years." The advisor said the Bush Administration is looking for "something new" that could serve as its "signature system."

A participant in one of the Rumsfeld panels said the members of his group nearly recommended retiring all B-1s, mostly because of their operational woes, chronic maintenance problems, and vulnerability in many phases of the mission. However, they did not want to send "the wrong message" about long-range airpower, which they felt was critical. Neither did they want to imply that the US should buy more B-2s.

In Defense of the B-1

Scott White, Boeing's program manager for the B-1 and B-2, on which the company is a subcontractor to Northrop Grumman, said the B-1 has acquired a bad reputation for technical problems, but he argued that these are not inherent faults of the airplane itself.

"The B-1 has, over the years, been unfairly characterized and limited

SIOP Bomber. *The B-2 retains a nuclear attack mission. In this photo, munitions specialists at Whiteman operate a rotary launcher erector, one of two that would contain nuclear weapons.*

Photo by Ted Carlson

How Many? How Capable? *The proposed scrapping of 33 B-1Bs would take the fleet down to just 60 airplanes, of which only 37 would be kept in combat-ready status.*

by what it is allowed to do," he said. Under terms of the START I treaty, White noted, B-1Bs are not permitted to carry cruise missiles or external stores—they could carry 50,000 pounds of munitions on external racks—which weighs against the B-1 when competing against the B-52 for the mission of employing stand-off weapons.

White acknowledged, however, that the B-1B "can't go over Baghdad with immunity" but was "never supposed to have the survivability in the high-threat region."

The B-1 can do missions beyond the way it is now employed, "but somebody negotiated that capability away," he said. "To characterize the B-1 as not being able to do certain things is not allowing the B-1 to compete on a level playing field."

White also noted that the Air Force has chronically shortchanged the B-1 when it comes to spare parts, maintenance, and staffing, and the result is mission capable rates hovering just above 50 percent. Gen. John Michael Loh, a retired former head of Air Combat Command, said in a July 5 letter to the *Los Angeles Times* that "the Air Force demonstrated in 1993 to the satisfaction of a critical Congress that the B-1 could exceed all bomber standards for readiness and reliability if, like any other weapon system, it had its full set of people and spare parts." The 1993 evaluation cleared the B-1B for a "$2.5 billion conventional mission upgrade" that is still under way.

Both the McCarthy and Gompert studies emphatically promoted the use of bombers in conjunction with the Small Diameter Bomb, a weapon that will be able to achieve the effects of a 2,000-pound warhead in a 250-pound munition, mainly due to sharp improvements in accuracy.

The B-2—which was lauded as the star of Operation Allied Force in the Balkans in 1999 and which typically hit 15 aim points or better on each mission with 2,000-pound Joint Direct Attack Munitions—will be able to carry more than 300 SDBs, according to the Air Force's program executive officer for weapons, Joseph G. Diamond.

Diamond reported that the SDB will go first on the F-15E and F-16 but will eventually be made available for most of the bomb-dropping aircraft in the Air Force. A "smart rack" will also be developed to carry the munitions, whose aim points can be updated after release to the point of impact.

The SDB comes into the inventory beginning in 2007, Diamond said, but a Phase 2 version of the weapon will come along just two years later, with a terminal seeker and the ability to hunt down mobile targets within a prescribed area. The unit will likely have a motor and wings for more range and employ either laser radar or millimeter-wave radar seeker technology, along with Global Positioning System and inertial navigation. The projected SDB buy is 12,000 munitions and 2,000 smart racks to hold them.

A major increase in bomber capability will already be long in service by then, Diamond noted. The B-2 is scheduled to receive in 2004 the first versions of the smaller 500-pound JDAM, which will give the stealth bomber the power to hit 84 aim points on a single mission, in all weather, and with accuracy to within 10 feet of the target.

McCarthy, in an interview with *Air Force* Magazine, said the SDB is a critical part of the overall bomber concept.

"You're talking about being able to do a decisive attack, meaning precision and a large number of weapons," he said, adding that its effects would be mass combined with speed and "mass in a different definition than we've used in the past."

"Awesome" Package

At a press conference explaining the Transformation Panel's findings, McCarthy noted, "You can put 324 of the Small Diameter Bombs on each B-2. If you launch 18 of the 21 B-2s, that's 5,824 individually targeted weapons on that small force." In conjunction with Conventional Air Launched Cruise Missiles and expanded B-52 launch capability, he added, "You're talking about 8,000 to 10,000 weapons in a single strike package, which is pretty awesome."

The Transformation Panel did not have time to weigh the issues surrounding what type of system might succeed the B-2 and the rest of the bomber force, McCarthy said in the *Air Force* Magazine interview. However, he added, "We felt that there is a need for further study in this particular area, which would involve a variety of different possibilities, ranging from more B-2s to manned or unmanned new aircraft to space-based capabilities."

McCarthy said flatly that the Air Force should begin work on a follow-on system much sooner than 2017, as now called for in Air Force plans. "We think you ought to start this process right now," he asserted. "That doesn't mean you start bending metal" immediately, however. He added that the platform itself is only part of the picture and that "it's the entire infrastructure and support mechanism."

McCarthy suggested that the Air

Force should have bombers sitting on conventional alert much as they sat on nuclear alert in the Cold War years. In a crisis, they could take off and fly to a preset launch area and receive targeting information en route. Such a capability would be "a very rapid, credible response force that can go anyplace in the world, and that has a deterrent capability in itself," McCarthy said.

The Transformation Panel also urged the Pentagon to begin work right away on long-range conventional cruise missiles, possibly a common type that could be used by bombers as well as ships and submarines.

USAF photo by SSgt. Mary L. Smith

Standoff Survivor. *The B-52 will survive by staying away from lethal air defenses. In 2003, BUFFs will receive the Joint Air-to-Surface Standoff Missile, a highly stealthy cruise missile with a range of more than 150 miles.*

The Big Leap

Ryan, in an interview with *Air Force* Magazine, said the service isn't interested in buying more B-2s because it lacks the funding to buy them or support them. Even so, USAF wants to make a big leap in capability with its next strategic system, Ryan said, and the technology has not yet arrived to do that.

"We need to go to the next level of strike capability, beyond the B-2," he asserted. "And I'm not sure what that is, but it's long range, it's fast, and it's precision and survivable. Whether that's manned, unmanned, orbital, suborbital, or hypersonic, I don't know, but I think that it is not in the current fleet that's out there right now."

Asked what field of basic research seems to hold the most promise for a bomber follow-on, Ryan said, "I'm not sure it's hypersonics yet, because we haven't yet been able to mitigate the effects of drag at hypersonic velocities." Work continues on ablative surfaces "that allow us to operate at those frictional temperatures," he added, "but we haven't got solutions to those yet." However, the Chief of Staff did say that a suborbital system "may be closer." Such a system would "transit" the hypersonic realm but not persist there.

"Orbital is another area we continue to look into," Ryan added. "There are huge policy issues about being on orbit with weapons," but USAF will continue to examine the technology to determine its promise, he said.

Ryan acknowledged the existence of a little-known program called the common aerospace vehicle, which he described as "more a concept than an actual article." The system would be carried aboard a space maneuver vehicle, itself carried to orbit by a rocket or reusable launch vehicle. Once on orbit, it would remain there until called on to act, but how it might attack ground targets is not yet clear, Ryan said.

No one seriously questions that a new bomber—or something—eventually will be necessary. The youngest B-52H in the fleet will be 40 years old next year, and while the Air Force has said the venerable bomber could continue for another 40 years, service officials privately say such a plan is unrealistic. Corrosion and other unexpected problems are already playing havoc with the KC-135, which is of a similar vintage.

The B-1B was designed for about a 30-year service life and so will have to be replaced entirely beginning around 2015. Even the B-2, which is the newest bomber in the inventory, is seen as needing to retire starting around 2024. The B-52s are projected to give out around 2037. To have a replacement strike platform ready by then, USAF expects to start work on a program circa 2017.

McCarthy, at his press briefing, said the next bomber-type system could be an unmanned aircraft, a jetliner loaded with cruise missiles, or something "from space." However, he said, work should begin right away, and the new system should be in hand "absolutely sooner than 2017." ■

It Takes One To B-1

In the Senate, anger was running high over USAF's decision to shut down B-1B operations in Georgia, Kansas, and Idaho. James G. Roche, Secretary of the Air Force, stepped before the Senate Armed Services Committee on July 10, where he encountered Sen. Pat Roberts of Kansas, who spoke on behalf of fellow Sens. Max Cleland and Zell Miller of Georgia, Larry Craig and Mike Crapo of Idaho, and Sam Brownback of Kansas.

Roberts: Now it's time to move to the B-1. Secretary Roche, remember the old days when [former California Republican Rep.] Bob Dornan was known as "B-1 Bob"?

(Laughter in audience)

Roche: Yes, I've met the gentleman.

Roberts: Well, now you've got B-1 Max, B-1 Larry, B-1 Mike, B-1 Zell, B-1 Sam, and B-1 Pat.