

Enemies adapt. The Air Force must also.



Evolving the 21st Century Air Force

By John A. Tirpak, Executive Editor

Even though its departure from combat in Afghanistan is still a year away, the Air Force is rapidly evolving into the next version of itself: becoming smaller, but highly capable, and keeping at least one technological step ahead of potential adversaries, while living within its financial means. The end state of the reinvention, however, is not yet fully in view.

So said top USAF and defense leaders at AFA's Air & Space Conference, held in September just outside Washington, D.C. Newly installed Chief of Staff Gen. Mark A. Welsh III set the stage in his keynote speech, saying, "For the last 20 years the enemy's been changing. Now here we sit at another one of those turning points. Where are we going to be when we grow up? It's time to think seriously about that. ... It might not be who we were."

While the US military has been fighting in Iraq and Afghanistan, "our

friends and enemies elsewhere have not stood still, and technology has not stood still," said Deputy Defense Secretary Ashton B. Carter. It will be the job of all the services to "look out to what the world will need next" with regard to international security challenges, but to do so bearing in mind "the need to keep the United States' fiscal house in order."

To go with a new national military strategy that puts emphasis on the Asia-Pacific region and winning on battlefields teeming with anti-access, area-denial threats, Carter said the Pentagon is aiming to reshape the US military by 2020 to be "agile, ... lean, ... ready, ... technologically advanced, ... [and] able to "defeat any adversary, anywhere, anytime." This, he said, is "what we're building towards."

The Air Force, Carter said, is "well-suited" to the new national strategy, by virtue of its long reach and technological orientation.

"We need to continue to invest in future-focused capability," Carter asserted. "We must protect the seed corn of the future." Those investments will emphasize "cyber, space, electronic warfare, unmanned aerial vehicles, the long-range ... strike family of systems, all of which are so important to the Air Force and will be so important to our future operations."

One Force, Total Force

Carter warned, however, that "our newest investments have the shallowest roots," and it's "easier to tear them up when we need to make cuts." The US, he said, "can't afford to lose our future technological edge by cutting the seed corn." The Air Force "understands this better than almost anyone," he said.

Carter said the Air Force is to be "congratulated for innovative approaches" to the new long-range strike family of systems, for its fixed-price tanker development, and improvements in



F-22 Raptors fly a two-ship formation over New York.

acquiring spacecraft and launch vehicles. The service understands that in order to get new systems, “acquisition management matters.”

Service Secretary Michael B. Donley highlighted the rationale underlying force structure cuts in the Fiscal 2013 budget—and those beyond—by saying “the best course of action for the Air Force is to trade size for quality. Becoming smaller will allow us to protect a high-quality and ready force, one that will continue to modernize and grow more capable in the future.” Nevertheless, he insisted, “we intend to be a superb force at any size.”

Donley acknowledged challenges in getting the Active Duty, Guard, and Reserve to reach a full-throated consensus on how to shape both personnel levels and force structure in the coming years. However, he maintained: “We must consider our overall program and budget, as well as our strategy for the future, on a holistic basis. We can’t

manage the Total Force in 50 separate packets, and the success of our Total Force will remain dependent on the collective success of all three components. We must move forward together as one Air Force.”

Welsh, also commenting on the friction between the components, said it will be a temporary condition. “We’ll figure it out, I promise you.”

The coming years will have to be marked by innovation—an Air Force “tradition,” Welsh said—as the service struggles to balance spending on new technology with keeping enough force on hand to cope decisively with an immediate threat from any enemy.

In remotely piloted aircraft, for example, Welsh said the Air Force has invested more than \$55 billion on “the infrastructure, the communications architecture, the PED [processing, exploitation, dissemination], the people, the training, the entire complex.” But regional commanders have an insatiable

demand for the intelligence, surveillance, and reconnaissance products that RPAs provide, Welsh said. “The requirement is now 65” 24-hour RPA patrols, he said, “with a push to go to 85, although [Donley] is holding the line.”

Welsh said he understands “if you’re getting shot at, you want more” ISR. However, “we’re going to have to get engaged seriously in the mental process ... of how we define the ISR requirement for the future, because there isn’t enough money in the universe to fund the requirement that we have in the Department of Defense.”

Later, in a press conference, Welsh allowed, “we have a problem with so many [RPAs] right now that I don’t know what we’re going to do with them when they come back from Afghanistan. So buying more right now probably doesn’t make much sense” although “it probably does make sense down the road.”

Welsh said he finds the idea of the jet-powered Predator C “a pretty



Air Force Chief of Staff Gen. Mark Welsh III speaks on the state of the Air Force at the Air Force Association's Air & Space Conference. Welsh said USAF is at a historic turning point.

interesting system,” though he was noncommittal about whether USAF still plans a stealthy MQ-X to follow on to the MQ-9 Reaper. He also expressed interest in having RPAs controlled from manned aircraft.

The good news is that while the Air Force has been heavily focused on ISR for 20 years, the rest of the world hasn’t been, and “they’re lagging [behind] us,” Welsh noted. But what does that mean?

“Do we slow down?” Welsh asked rhetorically. “Do we create partnerships that will actually allow us to build capacity in other nations that we can

use as parts of coalitions? Or do we just keep running on this? This is a big debate” within the Pentagon, he said, observing that the regional commanders will “frame” the debate but it will be up to the Air Force to figure it out.

“It’s our job to do the thinking on this,” Welsh asserted. “How much we can afford has to be factored in. Do you need an orbit for every squad on the ground? Maybe for some missions; certainly not for all.”

Lt. Gen. Larry D. James, deputy chief of staff for ISR, said his organization is transforming largely through the

way it handles the vast amounts of data coming in. Rather than have all analysts in-theater, more and more of them will be at Distributed Common Ground System nodes in the US and elsewhere, thus minimizing their forward footprint. Additionally, the Air Force is investing in machines that will do the drudge work of watching RPA video feeds for hours at a time, alerting crews only when there’s something important to watch, James said.

Train to the Fight

Gen. G. Michael Hostage III, Air Combat Command chief, said the training of the combat air force is already evolving to a post-Afghanistan mindset. After years of fighting in a permissive environment, largely unchallenged by enemy air defenses, ACC is adjusting its training to reflect how it will fight in an A2/A3 environment.

When “working up” for a deployment to the fight in Afghanistan, CAF units still “prioritize their training” to how they’ll actually fight there, Hostage said. His instructions to units are to “focus on what is most important ... because we know in this era of constrained fiscal budgets, we’re not going to have the resources to do every possible thing we might need you to do.”

However, when preparing for an operational readiness inspection or in general training, “then they are focusing on that contested, degraded environment, dealing with anti-access, because

The Importance of the Nuclear Triad

Operating a fleet of nuclear-capable B-2A and B-52 bombers as well as hundreds of Minuteman III ICBMs remains the Air Force’s most important contribution to the nation’s security, said senior service officials at AFA’s Air & Space Conference outside Washington, D.C., in mid-September.

“The nuclear mission—continuing to strengthen the enterprise—is still our No. 1 priority in the United States Air Force and it will remain that way,” said Chief of Staff Gen. Mark A. Welsh III in his Sept. 18 conference address.

Welsh said it’s “a huge responsibility” to provide two-thirds of the nation’s strategic nuclear deterrent. (The triad’s third leg is the Navy’s force of submarine-launched ballistic missiles.)

“We have 36,000 airmen every day who worry about the nuclear mission,” said Welsh. “It’s a big deal for us. We can’t afford to ever get this wrong.”

In addition to the challenges of sustaining and enhancing the decades-old bombers and ICBMs, modernization looms on the horizon for these forces. This comes at a time when the Pentagon braces for an era of fiscal austerity.

“That will require not only innovative thinking in the short term, but an opportunity to develop a culture of innovation,” said Lt. Gen. James M. Kowalski, Air Force Global Strike Command commander, during the conference’s four-star forum on Sept. 19.

I have some resistance there,” said Kowalski. “Some people think that the word ‘innovation’ is the opposite of the word ‘nuclear.’ It’s not.” In fact, he added, “if you look at the early days of Strategic Air Command, it was an amazingly innovative command.”

As part of the modernization, the Air Force is developing a penetrating bomber for conventional roles, with initial field-

ing anticipated in the mid-2020s. Welsh called this future platform “a must-have capability.”

The Air Force is proposing adding nuclear certification to the bomber “in the late 2020s, early 2030s,” said Maj. Gen. William A. Chambers, assistant chief of staff for strategic deterrence and nuclear integration, in an interview with *Air Force Magazine* at the conference venue.

With tightening budgets, elements of the nuclear triad—in particular, the ICBM force—may come under scrutiny for reductions or elimination altogether, said Chambers during the conference’s Sept. 18 panel discussion on the role of the ICBM force in 21st century deterrence. Advocates of going to a nuclear dyad, for example, might argue that the money spent on ICBMs would be better invested in other weapon systems, such as in ensuring a robust F-35 Lightning II fleet.

our [inspector general] now tests to that standard," Hostage said. Such training now stresses units by jamming their access to Global Positioning System information, with reduced input from certain elements of the ISR network, a more vigorous and modern "enemy," and tougher air defenses.

"The IG will not let you fly a scenario during the ORI that doesn't have some type of challenge to those things that you normally would've expected to have in the old days," Hostage observed.

"The reality ... is that we have an adversary out there who is focused on all of those things that make us the world-class force that we are, and is systematically investing in capabilities to deny us that full capability," Hostage warned.

Though US forces have gotten used to having "maximum capability" and complete access to "connectivity, communications, data links, networks, ... [and] ISR anywhere and everywhere we need it," that's not how it will be in a fight with a near-peer, Hostage said.

Nevertheless, "there should never be a question that our airpower will be where it needs to be and will be effective," he said.

The F-22 is still rewriting the rules of air combat, he said, flying higher than anything besides the U-2 and maneuvering forcefully even in that thin air. The F-22 is a world-beater, and that will provide some cushion as USAF sorts out its future, he explained.

Chambers countered this argument during the interview, saying he wants the debate over the relative value of the deterrent's legs to be framed on some first principles.

"The nuclear deterrent force underpins and underwrites every other tool of statecraft, every other military capability," he said. "The reason we can keep small regional, low-intensity conflicts under control is because we have this underwriting of protection against major power conflict that is produced by deterrent forces. That has to be taken into consideration in the relative-value debate if it is a fiscal discussion."

Despite such outside pressures for triad alterations, Chambers said, within the Pentagon, "I don't think the fundamental change that would call for us to reconsider the three legs of the triad has taken place."

In fact, Chambers said in the past year he's sensed "a strengthening of the consensus" that "the triad is actually even



USAF photo by Scott Ash

Secretary of the Air Force Michael Donley said in his keynote address that USAF must trade size for quality.

"It does things I have never seen airplanes do before, ... and I still can't believe it," Hostage said. "It's amazing. The best thing about it is our adversaries watch it carefully, and it scares the hell out of them, which is a good thing."

Pacific Air Forces chief Gen. Herbert J. Carlisle, at a press conference during the AFA conference, echoed Hostage's point that the Air Force can no longer assume it will be vastly better than any potential adversary it may face. Asked about the recent appearance of a second Chinese stealth fighter prototype—this

one bearing strong resemblance to the F-22 and seemingly optimized for high maneuverability—Carlisle acknowledged that China's technology is improving rapidly.

"With respect to stealth capability, they are behind us, but they will develop and they will get better, and we certainly can't rest on our position," he said. The lag time between the introduction of an American military innovation such as stealth and the appearance of similar technology in other air forces will steadily shrink in the future, he said.

more important" as the size of US deterrent forces decreases to the levels laid out in the New START arms reduction agreement with Russia and, perhaps at some later point, goes beyond those thresholds.

"We've now argued well that the attributes, in particular of our two legs of the triad, actually are well-tailored for the new strategic environment," said Chambers.

For example, he said the bomber fleet will continue to provide the national leadership with "a tremendous amount of flexibility" and a visible tool to signal to potential adversaries and allies alike that "America has a long arm and is able to project power."

For its part, the ICBM force is stabilizing, lethal, responsive, and highly credible, said Chambers during the panel discussion. Further, operating the Minuteman III fleet cost the Air Force only one percent of its budget—some \$1.1 billion—in Fiscal 2011, he noted.

"That's not a lot of money" in the overall scheme of defense priorities, he said.

The Air Force spent about \$2.5 billion in Fiscal 2011, about two percent of its budget, to operate the nuclear-capable bomber fleet, he told the magazine.

The Air Force is involved in the preparations to reduce the bomber and ICBM forces to meet the caps established in New START by the deadline of February 2018. This will require converting some B-52 bombers to conventional-only roles and removing some Minuteman III missiles from operational status.

"It is a complex undertaking. There are a lot of moving parts to be programmed out basically [in] the next five years," said Chambers. "We want to be at the central treaty limit a little before February of 2018."

He noted that the final number of operational ICBMs "has not been decided."

—Michael C. Sirak



TSgt. Wyatt Bloom, a cyber transport technician, uses a spectrum analyzer to check television broadcast network routers. Top USAF leaders agree that the cyber mission is critical to the future of the Air Force.

"I think whatever advantages we have technologically ... won't last as long," he predicted.

In his press conference, Welsh broke with the Air Force's long-held position that the service has all the F-22s it needs and would turn down more if they were offered.

Asked if USAF would ever consider reopening F-22 production, Welsh said "I would never draw a line in the sand and say I would never consider buying the most capable aircraft in the world for the United States Air Force." He confessed, however, that he didn't know what restart costs would be or what other budget priorities additional F-22s would displace. Air Force and think tank studies of a few years ago pegged restart costs as running anywhere between \$7 billion and \$17 billion.

Welsh told reporters he doesn't anticipate a budgetary push "to downsize our air mobility fleet," observing that "people have agreed" that the proposed size of the lift inventory is appropriate, "and the requirement is clear."

He's less optimistic about fighter force structure, which has already been reduced by hundreds of aircraft in the last few years.

"I think our fighter fleet ... will be the first thing to come under pressure," Welsh asserted. "I think we've got to be careful about that." While 181 F-22s "sounds like a lot, it's not," especially if two demanding scenarios—Welsh

mentioned Syria as one—pop up at the same time.

If called to fight in Syria, the Air Force "would be using the F-22," Welsh said flatly. But to split the fleet with "a concern in the Pacific somewhere, there aren't many airplanes. In this business, quantity does have a quality all its own."

Cold, Hard Caution

Further reductions of the fighter inventory "would affect our ability to do the air superiority mission," he declared.

Welsh singled out the A-10 as a platform that "nobody wants to get rid of" but that doesn't make the cut in a force where the reduced numbers of aircraft demand that each be capable of multiple missions. The A-10, though excellent at ground attack, can't swing to a high-end dogfight mission. It will continue to serve but at reduced numbers.

The centerpiece of the Air Force's future fighter fleet will be the F-35, but attendees got a cold dose of caution from the newly nominated program manager for the strike fighter, Maj. Gen. Christopher C. Bogdan.

Bogdan, who came to the fighter program in August, described it as a misunderstood project that's far more complex than people realize.

"I thought ... it was a single program with three variants," Bogdan said in an exhibit hall presentation. "It's not. It's

three separate airplane programs that have common avionics and a common engine." With two major contractors, eight international partners, three services, and already two foreign military sales customers, Bogdan said, the F-35 couldn't be more complicated if it had been designed to be so.

He admitted that the 20 million-plus lines of software code to make the airplane and its support systems work "scares the heck out of me," and he said those depending on the program shouldn't be overly optimistic about its success.

Given the progress made so far in turning around flight test, concurrency, and production problems, Bogdan declared the F-35 "potentially achievable."

He noted that software development is only a few months behind, test points are being achieved ahead of schedule, and Lockheed is "right on the edge of getting really, really good" at production, though that has yet to result in significant cost savings.

The Autonomic Logistics Information System—which tracks flight hours and maintenance action on every F-35 aircraft and automatically orders parts or prescribes maintenance actions—is a monster of a program itself, Bogdan noted, saying it could well be a separate effort requiring top-level Pentagon oversight. The system has already had some security problems but "we went back and fixed those vulnerabilities," he reported. The ALIS will get tremendous attention because, without it, "we don't fly airplanes."

He noted that there is "a bunch of airplanes" at Lockheed's factory in Fort Worth, Tex., that are finished but can't be delivered or completely paid for because "they can't fly unless ALIS 1.03 works. So there's a lot riding" on the success of the support project.

Bogdan also hinted strongly that the Pentagon will seek competition on F-35 support, though he was cagey about whether that would be competition between organic and contractor logistics support, or competition between contractors. The program is too big not to have competition, he said, and that approach will save money.

The major overhaul of the F-35 program two years ago—which added 30 months and billions of dollars of wiggle room—was a one-time deal, Bogdan warned.

"There is no more money [and] no more time in the development of this

program," he asserted. "That is it. ... We will not go back and ask for any more. It's as simple as that." From now on, he said, the F-35 is "fundamentally a fixed-price development program." If problems come up, "we're going to have to make trades." He pledged that he won't allow optimism to substitute for realism in explaining to customers what to expect. Bogdan also promised accountability on the part of the program office.

Donley, asked in a press conference to respond to Bogdan's remarks, concurred, saying the Pentagon "is done ... with major restructures that involve transferring billions of dollars into the F-35 program from someplace else in the defense budget." If there are additional bills to pay, he said, "they need to be [paid] ... within the resources already provided." That means there could be "a reduction in tails"—meaning fewer aircraft—"or there could be ... slippage in schedule or changes in content."

There's been "intense" bargaining between the government and Lockheed Martin, Donley acknowledged, but "I think we'll eventually bridge our differences."

Speakers at the conference universally agreed on two things regarding the cyber mission: one, that it will be critical to the future of the Air Force, and two, that it is so specialized that few of the service's top leaders comprehend it enough to make intelligent decisions about it.

"My concern," Welsh said in his press conference, "is I don't know of a really clearly stated requirement from the joint world—from US Cyber Command, in particular—as to exactly what kind of expertise they need us to train [to], and in what numbers, to support ... their effort to support the combatant commanders in the cyber arena."

Welsh guessed that more than 90 percent of USAF's cyber warriors are actually cyber architecture and infrastructure specialists. That's "confusing to the rest of the Air Force," he said, and most of the service "doesn't really understand it. They don't really know what we're doing. And until we're all on board and we're all running [in] the same direction, I'm just a little hesitant to commit wholeheartedly to major resource expenditure" in the cyber domain.

In his speech to attendees, Welsh pleaded with cyber specialists and

industry vendors to banish jargon from their discussions and speak plainly so that nonexperts can understand the issues at stake. That's essential, Welsh said, because he's convinced that the Air Force's future lies with "air, space, and cyber."

AirSea Battle

One of the foundational concepts of the Air Force's evolution will be the AirSea Battle concept, which Donley described in a press conference as the two services seeking synergistic solutions to operating against A2/AD. Among the projects they will work on, Donley said, are joint integrated air and missile defense, ISR, command and control, and common weapons. He reiterated that the strategy is "not aimed at a particular threat"—read China—but rather at the A2/AD technologies that have proliferated in the last two decades and "have the ability to threaten US forces or threaten freedom of action in the global commons." Those conditions exist "in more than one theater around the world," he added.

Army Gen. Martin E. Dempsey, Chairman of the Joint Chiefs of Staff, also weighed in on AirSea Battle in his remarks to the conference. Though the idea originated with the Air Force and Navy as a way to cope with long-distance, well-defended threats, Dempsey said he sees all the services playing a role in it.

AirSea Battle, he said, is "a multi-service approach to ... operational access." In the arena of joint doctrine, the Army has been working to be a player in the concept, and Dempsey—who acknowledged his job is to agnostically get the services working together—said, "I think we've got work to do ... to make sure" we are thinking about it the right way.

Dempsey urged the Air Force to continue focusing on "the fundamentals" of air and space control, because its success has meant the other services never have to worry about attack from the air.

"If you're stopped, we're stopped," he said.

Dempsey said constraints on defense spending mean that the military services will probably have to hang onto about 80 percent of the equipment they already have for the foreseeable future.

"We've got an opportunity to change about 20 percent" of the hardware, Dempsey said, and that new gear will not only have to meet new threats but

make "the other 80 percent" better "right along with it."

Carlisle said Pacific Air Forces is working to translate AirSea Battle into operational use, and the first step is to ratchet up coordinating on efforts with allied air forces in the region. He promised an increased number of multinational exercises, mil-to-mil contacts, and the continued presence of USAF's best equipment in the theater. That said, Carlisle acknowledged that even though a larger proportion of USAF's combat air forces will be stationed in or rotate through PACAF, the number of troops and aircraft permanently posted there won't increase much.

Gen. William L. Shelton, head of Air Force Space Command, said his command is evolving by emphasizing an operational bent in every aspect of its activities. That has led to tremendous success in a string of space launches and declaring initial operational capability recently for the Space Based Space Surveillance system.

However, "business as usual will amount to an 'epic fail,'" Shelton said. Space Command is looking at better business models to reduce the cost of launch. Next year, including new-start rocket companies in competitions could lower launch costs by a quarter—or by half if the companies' optimistic estimates are to be believed.

"We'll look for cost trades" on all aspects of AFSPC's activities, he said, re-examine architecture to see if satellites can be built on more of an assembly-line basis and piggyback on commercial satellites—called hosted payloads—to a greater degree.

Along with the rest of the ISR enterprise, Space Command will work toward making ISR products "platform and domain agnostic," Shelton said, so operators will neither care nor really need to know where battle information is coming from—only that it's secure and reliable.

Welsh said the single most critical factor in the Air Force's evolution is that, while the service figures out what it is becoming, it must remain ready for any contingency.

He said he has worries that the Air Force is not as ready as it thinks it is. Augmenting real flying hours with simulator time, for example, is fine if you fund the simulators, but "if you don't, you're kidding yourself." Overall, he's worried that with readiness accounts, "I don't think we're where we think we are." ■