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House Armed Services Committee
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Thank you for the opportunity to testify on "The Future of Air Force Long-Range Strike." The Air Force's new Long-Range Strike Bomber is program is vital to our national security. America's power projection forces must be ready to back up our diplomacy and lead our military operations. My remarks address capabilities and employment concepts for the Long-Range Strike Bomber, and conclude with a note on risk reduction and cost.

Capabilities

Today approximately 16 combat-ready B-2 bombers have the reach and survivability to carry out missions deep into heavily defended airspace. The shortage of advanced stealth bombers is a potential weak point in crisis response, conventional deterrence and the nuclear Triad.

Access. The key attribute for the long-range strike bomber is the ability to penetrate close enough to employ a variety of direct-attack precision strike munitions against many types of targets in an adversary's most heavily-defended airspace. The bomber must be prepared to fight through surface-to-air missiles, electronic and information attack, defending aircraft and unmanned vehicles to access this airspace. Targets will include mobile targets and hardened and deeply buried targets

Stealth and Survivability. Stealth remains a fundamental design requirement because it creates a tactical advantage as it degrades radar tracking. Advanced stealth diverts enough of the radar energy to produce a poor return until the attacking aircraft is very close to the observer radar. Techniques for stealth in aircraft design have advanced beyond the B-2 and should be able to address more sectors of the electromagnetic spectrum. The state of the art should allow stealth and electronic warfare to complement each other and enhance bomber survivability. Modern aircraft survivability includes mechanisms to thwart infrared tracking. Information superiority through low probability of intercept battlespace communications also augments survivability.

Range and Payload. Range and payload define a bomber, yet they represent intricate trade-offs. Every bomber from the B-17 to the B-2 had to balance range, payload, altitude ceiling and other factors for maximum tactical advantage. We do not know what parameters the USAF selected this time. However, we can see that the set of choices may have been different from the 1970s decisions on the B-2. The new bomber must have sufficient unrefueled range to carry out its mission after leaving a tanker track. However, this range requirement does not mean it has to fly on its last drop of gasoline. It can be met by a bomber that looks different or even slightly smaller than the current fleet, for example. Current operational concepts have blurred distinctions between global and theater strikes.

Open Software Architecture. The bomber should have an open software architecture to put it at the forefront of battlespace communications from the beginning. This bomber must be able to join the IP-enabled networks which are integral to warfighting concepts. At the same time, the bomber must, like other aircraft, retain capability for redundant command and control if aerial layer or satellite networks are compromised.

Nuclear Capability. The new bomber will become part of the Triad. Aircraft early in low-rate production should have hardware and an appropriate software configuration for the nuclear mission. The USAF should use EMD and initial low-rate production aircraft for flight test and then begin the process of nuclear certification with a small number of bombers in identical configurations.

Upgrade Capacity. The Long-Range Strike Bomber reaching initial capability circa 2025 will fly missions until 2055 and beyond. The bomber must therefore do more than meet minimum requirements. It must have a healthy margin of extra power, capacity for additional weight from new subsystems, and a way to integrate additional apertures for communications, sensors or advanced technologies such as laser self-defense. The bomber's radar and engines may be upgraded over its lifespan and the design should anticipate and pave the way for those additional capabilities. Over time, it may employ directed energy in defensive and offensive systems, and be armed with hypersonic missiles among other weapons. This means planning now for an airframe with space, power, suitable engines, and cooling to allow adaptation. While controlling cost is important, there is no point in cutting corners to buy a bomber that is technology-limited within a decade.

Employment Concepts

The USAF bomber force is the only force in the world capable of carrying out ongoing precision strikes against targets that may gravely jeopardize US national security and the world order. Our bombers stand ready to answer the call to strike hostile missile launch systems, weapons of mass destruction, hardened command and control, systems that threaten the peaceful use of space, and more.

Direct Attack. Direct attack is essential because cruise missiles and other stand-off weapons cannot take out all targets. The inbound cruise missile has survivability issues of its own. The number of cruise missiles needed to attack a significant percentage of targets in a hypothetical major campaign adds up to greater cost than the penetrating attack bomber. Many types of both mobile and deeply buried targets cannot be confidently struck with stand-off weapons. A target can reposition during the cruise missile's time of flight. Hardened targets require hits with multiple, heavier weapons.

Extensive Target Sets. World events compel us to consider new target sets that may not have been as great a concern five years ago. The bomber force is a unique strategic tool; however it is also indispensable in missions associated with theater war plans. Bombers may have to attack airfields to suppress enemy air forces; help hunt, contain and destroy enemy surface naval vessels and submarines; and counter enemy air defenses. We all hope America won't need to use these capabilities; however, effective deterrence depends on having modern stealth bombers ready to do so.

Persistence. These target sets will truly test the persistence of the force. The bomber force must be persistent – that is, able to continue attacks day and night, in all conditions, for as long as needed. Persistence builds effect through continuous, unrelenting strikes as required to achieve the joint force commander's goals.

Sortie Generation. Sortie generation is key to persistence. The bomber force should be able to generate 30 or more sorties per day at maximum capacity. This is to cover multiple target areas, in two widely separated theaters. Precision weapons are a given but bombers cannot be in two places at once. A sizeable force is necessary to hold at risk mobile targets because they are hard to locate. For reference, the USAF deployed 66 B-52Gs in 1991 for Operation Desert Storm and flew an average of 40 sorties per day (ranging from 27 on 20 Jan 91 to a high of 51 on 11 Feb 91. Data is from the Gulf War Air Power Survey, Volume 5, pages 22 and 246.)

Maintainability. Maintenance is also crucial to sortie generation. The new bomber must be designed from the start to make component replacement easy for the flight line maintainers. The USAF should consult its B-2 crew chiefs in particular to gain their insights and feed this back into the design process.

A Note on Risk Reduction and Cost

Extensive design work for risk reduction is the final step to ensure capability. Fear of technical risk stretching acquisition timelines has overshadowed many current programs. However, it can't be solved by adhering to cost targets alone. It takes sound evaluation of risk levels at preliminary and critical design review.

Risk Reduction. The Air Force says it has funded extensive risk reduction for both competitors. The winning design will be far more mature than the B-2 design at EMD award. For example, the USAF via the Rapid Capabilities Office selected typical high-risk features such as propulsion integration, and apertures and antennae integration, and commissioned risk reduction work. This approach is somewhat new in bomber design, and reflects lessons from an array of other manned and unmanned programs. Careful risk reduction prior to EMD has created a much different position. Instead of asking competitors to turn in designs meeting minimum performance standards, the risk reduction for LRS-B has proceeded significantly further than with B-2, F-22 and F-35. This means the Department of Defense's final choice of a winner will reflect analysis of readiness for manufacturing and production to adhere to schedule and cost targets. These steps normally begin in earnest after EMD – here, the USAF has taken a rather bold new path that lets officials judge not just design quality, but the factors in a seamless transition to manufacturing. It also means that the USAF can be more certain the winning design truly has the mandated margins for upgrade capacity, extra power, range, etc.

Cost. The extensive risk reduction and design work for this bomber prior to EMD award should increase confidence in cost estimates. Target cost has been a factor in design decisions. Advances in technology make it entirely possible for a bomber somewhat smaller than the B-2 to come in at or under the cost target because designs and component technologies are mature. Of course, future program management factors such as yearly unit quantities, inflation, or truncated buys could affect cost far more than EMD.