Long Range Strike Bomber Begins to Emerge

September 2, 2015 (IN10351)

Jeremiah Gertler, Specialist in Military Aviation (jgertler@crs.loc.gov, 7-5107)

In anticipation of a contract award "in the next couple of months," and in response to press speculation about its capabilities, Air Force officials have begun revealing information about the Long Range Strike Bomber (LRS-B) program, one of the Air Force's top three procurement priorities. The LRS-B program is intended to yield 80 to 100 strategic bombers to replace aging B-52s and B-1s, beginning in the mid-2020s. This CRS Insight is based on a discussion with Air Force officials on September 1, 2015.

Basic Design

Following cancellation of the previous Next-Generation Bomber program in 2009, Air Force and Department of Defense officials conducted a "front-end analysis" looking at different concepts to accomplish the long-range strike mission. Options included large aircraft carrying long-range standoff weaponry, conventionally armed ballistic missiles, air- and sea-launched cruise missiles, and other configurations. The resulting LRS-B, approved by Defense Secretary Robert Gates in 2011, is an optionally-manned penetrating bomber.

Although the specific designs remain classified and were not disclosed, the LRS-B was designed around three specific capabilities:

- 1. A large and flexible payload bay capable of carrying a full range of current and future armament.
- 2. Range, although classified, was another significant criterion.
- 3. Projected average procurement unit cost of $550 million per plane, which was announced publicly to encourage competing manufacturers to constrain their designs. The unit cost is a key performance parameter in the program, meaning that inability to reach that price can disqualify a bid. (That price is based on acquisition of 100 aircraft; variations in quantity may affect actual unit cost.)

Initial LRS-Bs will be manned, with unmanned operation possible several years after initial operational capability (IOC). Nuclear qualification will also take two years or so after IOC.

No mention was made of speed, although the combination of long range, large payload, and cost constraints strongly suggest LRS-B will be subsonic.

It is not likely that many technical details will be revealed at the time of contract award. Air Force officials anticipate a further release of data when the system achieves its Milestone B review prior to engineering and manufacturing development (EMD).

Technical Maturity

An earlier CRS Insight noted that the LRS-B budgeted funding and deployment schedule implied that considerable development had already been accomplished. The Air Force has now confirmed this, stating that it has two robust designs in hand (from the Boeing/Lockheed Martin and Northrop Grumman teams, respectively.) The designs are at an unusually high level of detail and development for a system in which the prime contractor has not been selected, according to senior program officials. The low-observable characteristics of both designs have been investigated in detail against current and anticipated threats, and current designs are complete down to the level of, for example,

individual access panels.

Major subsystem risk reduction has also been accomplished, and both designs use substantial amounts of existing subsystems (sometimes with LRS-B-specific refinements), reducing technological risk and, presumably, shortening the time required for EMD once a contract is awarded. Indeed, although DOD's usual Technology Readiness Levels are not being used to measure maturity on the program, program officials state that no further technology development is required to move LRS-B to production. They see the most challenging part of LRS-B as the integration of technologies in the EMD phase.

LRS-B will employ open systems architecture, similar to that already being demonstrated on F-22, U-2, B-2, and other platforms. This means that the initial LRS-B aircraft can be augmented more easily by advanced technologies as they are developed; it also means that what might be expensive development of advanced sensors and/or other subsystems can be deferred and competed independently of the aircraft itself.

Air Force officials were at great pains to emphasize that LRS-B is part of a family of systems, with the implication that it is the node of a larger, distributed network of sensors and communications, not all of which may have been publicly disclosed. Connectivity with this family of systems has been included in the LRS-B designs from the start, although it is not possible to gauge the maturity or stability of these systems (and thus how much LRS-B may have to be adapted in the future should those external systems change).

Acquisition Strategy

Contract award is expected in October, 2015, although one Air Force official said, "I've been saying 'a couple of months' for five or six months now."

The initial acquisition of LRS-B will take place in five low-rate production lots totaling about 20 aircraft. Two to three test aircraft will precede the production lots.

Although it is one of the Air Force's largest programs, LRS-B is being acquired through nontraditional means. Instead of the regular acquisition process, LRS-B is being managed and acquired through the Air Force Rapid Capabilities Office, with reduced overhead and a much smaller program office than typical for such a significant program. The Undersecretary of Defense for Acquisition, Technology and Logistics is the milestone decision authority on the program.