

B-52H Commercial Engine Replacement Program (CERP)



The B-52H Commercial Engine Replacement Program (CERP) is a Middle Tier of Acquisition (MTA) rapid prototyping development program that will transition to a Major Capability Acquisition (MCA) program in FY23. The Air Force is currently using the MTA-developed Virtual System Prototype (VSP) digital design tool to support initial performance analysis, production process planning, system support analysis, and early training activities. The program test strategy and schedules are currently in revision to support the planned FY23 Milestone B acquisition program decision.

SYSTEM DESCRIPTION

The B-52H CERP is the final phase of a multi-program, Air Force B-52H modernization effort. B-52H CERP replaces legacy TF33 engines with Rolls Royce F130 commercial derivative engines to increase system reliability and reduce sustainment costs. This upgrade will also increase fuel efficiency, electrical power generation capacity, and provide modern digital engine controls and displays.

MISSION

Theater Commanders use units equipped with the B-52H to conduct long-range, all-weather conventional and nuclear strike operations that employ a wide range of munitions against ground and maritime targets in low-to-medium adversary threat environments. B-52H theater mission tasks include strategic attack, time-sensitive targeting, air interdiction, close air support, suppression/destruction of enemy air defenses, maritime mining, and nuclear deterrence.

PROGRAM

The B-52H CERP is an MTA rapid prototyping development program that will conclude at the end of the Rapid VSP phase in FY23. In March 2022, the Air Force Acquisition Executive directed program transition to the MCA pathway with

a Milestone B entry decision in FY23.

Boeing delivered an initial VSP digital design in September 2021. The Air Force is currently using this digital design tool to support initial performance analysis, production process planning, system support analysis, and early training activities. The final VSP product is planned to be completed in FY23. This digital design product and other supporting system models developed during the MTA phase will require extensive ground and flight test validation to enable their use as primary program data sources.

DOT&E approved the initial B-52H CERP MTA Test and Evaluation Master Plan (TEMP) in March 2020. This TEMP is in revision to support an FY23 B-52H CERP MCA Milestone B decision. The new program acquisition strategy is currently in development and engineering, manufacturing, and development schedules are not yet defined. The Air Force is initiating actions to modify B-52H CERP developmental and operational test aircraft with all preceding modernization upgrades to include the B-52H Bomber Modernized Radar System and communication system upgrades. B-52H CERP developmental and operational testing will be conducted on the final modernized B-52H fielding configuration.

The Air Force plans to submit a B-52H enterprise cybersecurity test strategy for DOT&E approval in 1QFY23. This strategy defines a comprehensive, integrated cybersecurity test approach

across all planned modernization programs, including B-52H CERP, the B-52H Radar Modernization Program, and multiple communication system upgrade programs.

» MAJOR CONTRACTORS

- The Boeing Co., – Oklahoma City, Oklahoma
- Rolls Royce Corp., – Indianapolis, Indiana

TEST ADEQUACY

The previously approved B-52H CERP MTA TEMP defines an adequate operational test strategy for the rapid prototyping design phase. This TEMP is currently in revision to support the planned FY23 B-52H CERP MCA Milestone B decision.

PERFORMANCE

» EFFECTIVENESS, SUITABILITY, AND SURVIVABILITY

B-52H CERP is in the system design phase. A revised test strategy to support a new MCA acquisition strategy is currently in development to support a planned Milestone B entry decision in FY23. This strategy will include an IOT&E to determine operational effectiveness, suitability, and survivability in both the conventional and nuclear environments.

RECOMMENDATION

The Air Force should:

1. Develop comprehensive verification and validation plans for the VSP and other digital models to enable their use as high-fidelity data sources during system development, production, and deployment.