

B-52H Commercial Engine Replacement Program (CERP)

The B-52H Commercial Engine Replacement Program (CERP) is in the engine source selection and system design phase. In FY21, following engine source selection, the Air Force developed initial test plans for contractor and government assessments using digital system models.



System Description

The B-52H is a long-range, all-weather bomber that can carry up to 70,000 pounds of precision-guided or unguided conventional and nuclear stores. Units equipped with the B-52H conduct long-range, all-weather conventional and nuclear strike operations against ground and maritime targets in low-to-medium adversary threat environments. The B-52H CERP replaces the legacy TF33 engines with more fuel-efficient, commercial-derivative engines to increase system reliability and reduce sustainment costs. This upgrade will also increase electrical power generation capacity and provide modern digital engine controls and displays.

Program

B-52H CERP is a Middle Tier of Acquisition (MTA) rapid prototyping development program. DOT&E approved the initial B-52 CERP Test and Evaluation Master Plan (TEMP) in March 2020. In September 2021, the Air Force selected the Rolls Royce F130 as the commercial replacement engine.

In FY22, Boeing will deliver the initial increment of the CERP digital design, known as the Virtual System Prototype. The Virtual System Prototype will be used to support initial performance analysis, production process planning, system support analysis, and early training activities, and inform the decision to transition to the second MTA phase.

This second phase will focus on maturation of the digital model, leading to a decision to modify two B-52 aircraft prototypes. These aircraft would be used to conduct developmental testing and an operational demonstration.

Aircraft rapid prototyping test results are currently planned to support the Air Force decision to transition from an MTA program to a Major Defense Acquisition program at the low-rate initial production decision intended to modify 11 B-52 aircraft. The Air Force is assessing options to complete this transition earlier in the acquisition cycle and will document such changes in acquisition program documents at the selected entry milestone.

An IOT&E is currently planned to support a full-rate production/modification decision for the remaining 63 aircraft.

Major Contractors

Boeing Defense, Space, and Security – St. Louis, Missouri. Rolls Royce North America-Defense – Indianapolis, Indiana.

Test Adequacy

The B-52H CERP TEMP defines an adequate operational test strategy for the rapid prototyping program and IOT&E. The Program Office is developing a B-52 enterprise-level cybersecurity strategy to progressively evaluate cybersecurity vulnerabilities across multiple modernization programs, including B-52H CERP.

Performance

B-52H CERP is in the system design phase. In FY21, in advance of engine source selection, the Air Force developed initial test plans for contractor and government assessments using digital system models. Integrated ground and flight test of the MTA prototype aircraft is scheduled to begin in FY25, leading to an operational demonstration in FY26. The IOT&E, designed to determine operational effectiveness, suitability, and survivability in both the conventional and nuclear environments, is planned for FY28.

Recommendation

1. The Air Force should complete development of a B-52 enterprise-level cybersecurity test strategy.