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Department of Defense
OFFICE OF PREPUBLICATION AND SECURITY REVIEW

Modernized Selected Acquisition Report (MSAR)

B-52J Commercial Engine Replacement Program (B-52J CERP)

FY 2025 President's Budget

Effective: December 31, 2023

Defense Acquisition Visibility Environment

Table of Contents

(U) Common DoD Abbreviations

$B	Billions of Dollars
$K	Thousands of Dollars
$M	Millions of Dollars
ACAT	Acquisition Category
Acq O&M	Acquisition-Related Operations and Maintenance
ADM	Acquisition Decision Memorandum
APA	Additional Performance Attribute
APB	Acquisition Program Baseline
APPN	Appropriation
APUC	Average Procurement Unit Cost
BA	Budget Authority or Budget Activity
Blk	Block
BY	Base Year
CAE	Component Acquisition Executive
CAPE	Cost Assessment and Program Evaluation
CARD	Cost Analysis Requirements Description
CCE	Component Cost Estimate
CCP	Component Cost Position
CDD	Capability Development Document
CLIN	Contract Line Item Number
CPD	Capability Production Document
CY	Calendar Year or Constant Year
DAB	Defense Acquisition Board
DAE	Defense Acquisition Executive
DAES	Defense Acquisition Executive Summary
DAVE	Defense Acquisition Visibility Environment
DoD	Department of Defense
DSN	Defense Switched Network
EMD	Engineering and Manufacturing Development
EVM	Earned Value Management
FD	Full Deployment
FDD	Full-Deployment Decision
FMS	Foreign Military Sales
FOC	Full Operational Capability
FRP	Full-Rate Production
FY	Fiscal Year
FYDP	Future Years Defense Program
ICD	Initial Capabilities Document
ICE	Independent Cost Estimate
Inc	Increment
IOC	Initial Operational Capability
IT	Information Technology
JROC	Joint Requirements Oversight Council
KPP	Key Performance Parameter
KSA	Key System Attribute

LRIP	Low-Rate Initial Production
MDA	Milestone Decision Authority
MDAP	Major Defense Acquisition Program
MILCON	Military Construction
N/A	Not Applicable
O	Objective
O&M	Operations and Maintenance
O&S	Operating and Support
ORD	Operational Requirements Document
OSD	Office of the Secretary of Defense
PAUC	Program Acquisition Unit Cost
PB	President's Budget
PE	Program Element
PEO	Program Executive Officer
PM	Program Manager
POE	Program Office Estimate
R&MF	Revolving and Management Funds
RDT&E	Research, Development, Test, and Evaluation
SAR	Selected Acquisition Report
SCP	Service Cost Position
T	Threshold
TBD	To Be Determined
TY	Then Year
U.S.	United States
U.S.C	United States Code
UCR	Unit Cost Reporting
USD(A&S)	Under Secretary of Defense (Acquisition and Sustainment)

(U) Program Description

Full Name
B-52J Commercial Engine Replacement Program

PNO
NFM

Lead Component
Department of the Air Force

Joint Program
No

Adaptive Acquisition Pathway
Major Capability Acquisition

Acquisition Category
IB

Acquisition Status
Active Acquisition

Short Name
B-52J CERP

Milestone Decision Authority
Component Acquisition Executive

Program Executive Office
Bombers Directorate (AFPEO/BOMBERS)

Acquisition Type
Major Defense Acquisition Program

Acquired Systems
B-52J

Mission
The B-52J Commercial Engine Replacement Program (CERP) supports nuclear and conventional operations by replacing the current TF33-PW-103 engine on the B-52H aircraft. The TF33-PW-103 engine is experiencing significant supportability challenges due to diminished manufacturing sources and obsolescent technologies. This program will replace the current TF33-PW-103 engine with new military derivative commercial Rolls-Royce F130 engines of similar size, weight, and thrust characteristics. Along with the new engines, CERP will replace associated subsystems, such as engine struts and nacelles, the electrical power generation system, and cockpit displays. The development, production and installation of new engines and related subsystems will replace the legacy equipment on all 76 B-52H aircraft. Any B-52H aircraft modified with the new commercial engines and associated subsystems will be designated as B-52J. B-52J CERP is taking advantage of advances in technology and on-going development efforts to acquire engines and integrate them into the B-52. The new technology will increase both the overall reliability and maintainability of the propulsion system and produce additional electrical power generation capabilities for emerging requirements. The B-52J CERP will allow the operational command (Air Force Global Strike Command) to fully utilize the capabilities of the B-52 aircraft to employ an array of nuclear and conventional weapons while increasing fuel efficiency and extending the range/loiter capabilities of the aircraft. In addition, applicable training devices must be developed, modified and/or upgraded in conjunction with the aircraft modifications. As B-52J CERP brings additional capability to the B-52, emerging security/certification requirements (nuclear hardening, cyber security, program protection, etc.) are being addressed.

(U) Responsible Office

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(U) Executive Summary

Program Highlights Since Last Report

This is an early MSAR submission in advance of Milestone B for the B-52J Commercial Engine Replacement Program (CERP) as directed by the FY 2022 National Defense Authorization Act (NDAA). The FY 2022 NDAA established an original baseline estimate for CERP set to the FY 2020 Program estimate. This was prior to the Program completing the Preliminary Design Review (PDR) and Milestone B projected for 4QFY 2024. Establishing a cost baseline before PDR adds risk to the Program as the baseline estimate is not based on an established allocated baseline system design. The Program plans to establish the APB and associated Program certification in accordance with Title 10 United States Code Section 4252 at Milestone B. The baseline estimate used for the Current and Original APB in this Program's SAR reflects the FY 2020 POE per the FY 2022 NDAA; the Program will update values at Milestone B.

The Program awarded Rapid Prototype Material contracts 0 and 1 (RPM0, RPM1) as undefinitized contract actions in March and October 2021, respectively, for the development and delivery of long-lead material to support the test aircraft. The Program could not definitize these contracts as expected in Calendar Year 2022 or 2023 due to delays and difficulties during fact-finding and negotiations. The Program expects to definitize both RPM0 and RPM1 in Calendar Year 2024. Additionally, a lack of funds availability imposed a delay in awarding an associated materials contract which caused systems CDR to move into FY 2025.

Integrated test and evaluation continued with system performance testing. The B-52J CERP completed three phases of Rapid Twin Pod Tests (RTPT) led by Rolls-Royce at the National Aeronautics and Space Administration Stennis Space Center. The data from this testing was used to assess compatibility of the power pod inlet design with the F130 engine, and the Program continues to gain additional data about engine operability in the twin-pod configuration. The final RTPT phase will complete in April 2024. Meanwhile, B-52J CERP completed high speed inlet verification wind tunnel testing at the Arnold Engineering Development Complex (AEDC) on June 22, 2023. Data from this testing is being analyzed to validate aerodynamic performance throughout the performance envelope. Finally, B-52J CERP completed weapon separation wind tunnel testing at AEDC on December 21, 2023. Data will be used to verify safe weapons separation in the new B-52J configuration.

On August 9, 2023, B-52J CERP successfully held a demonstration of the virtual System Prototype (vSP) Residual Operational Capability (ROC) final increment. The vSP ROC simulation enables stakeholders to visualize and interact with a B-52J using a desktop or through a virtual reality application. This capability aids training and procedural planning and gives Air Force Global Strike Command (AFGSC) pilots and maintainers familiarity with the modified aircraft four years ahead of modified test jet delivery. The vSP was the MTA phase prototype deliverable and satisfied MTA closure criteria.

As noted in last year's SAR, in March 2022 the Service Acquisition Executive (SAE) approved B-52J CERP to transition from the MTA pathway to the MCA pathway. On November 7, 2023, the Program met with the SAE to request closure of the MTA phase and entry into the MCA pathway, and on December 7, 2023, the SAE approved both requests. However, multiple contract actions

are required to refine cost and schedule maturity. Therefore, the Program was not ready to establish an APB at MCA entry and continues Technical Maturation and Risk Reduction activities in the MCA pathway in advance of a Milestone B decision. The certification at Milestone B and the associated APB will establish the cost, schedule, and performance baseline.

In FY 2023, Congress marked B-52 CERP $16.3M due to under-execution. The Program made adjustments to align execution with funding changes due to marks. The Program was not marked in FY 2024.

The Program Office is currently mitigating and/or monitoring risks reported in previous SAR. A design change mitigated the previously reported wing leading edge ignition potential due to Auxiliary Starter Air Unit discharge temperature risk to a low risk. Purchase of Radar Modernization Program kits for CERP test aircraft mitigated the EMD aircraft modification timeline risk to a moderate risk. Monitoring continues of the engine fan flutter risk which remains unchanged as a moderate risk. Current mitigation includes Rolls-Royce RTPT acoustic inner liner testing expected to complete in April 2024.

The Program identified a key risk due to a common obsolete component used by both B-52J CERP and B-52 Radar Modernization Program. If a lifetime buy is not executed for this component, then the B-52J CERP Data Concentrator Unit will need to be redesigned because a form-fit-function substitute is not available. To mitigate this risk, the SAE approved a Life-of-Type Buy to procure components for both Programs.

Defense Cost and Resource Center and Cost and Software Data Reporting Compliance Rating: Green

There are no significant software-related issues with this program at this time.

(U) History of Significant Developments Since Program Inception

Date	Description
March 2018	The SAE approved the B-52J CERP Materiel Development Decision.
September 2018	The SAE approved B-52J CERP as a Rapid Prototype Section 804 program with two distinct prototype deliveries, virtual and physical and delegated Source Selection Authority for the B-52 CERP engine contract to the PEO for Fighters and Bombers.
December 2018	The B-52J CERP awarded the Risk Reduction Requirements contract to Boeing.
October 2019	The B-52J CERP conducted the System Requirements Review.
December 2019	The SAE approved the award of the Rapid Prototyping 1 contract.
February 2020	The B-52J CERP conducted the System Functional Review.
February 2020	The B-52J CERP awarded the Rapid Prototyping 1 contract to Boeing.
March 2021	The B-52J CERP awarded the Rapid Prototype Material Phase 0 Undefinitized Contract Action to Boeing.
September 2021	Boeing delivered the B-52J CERP Virtual System Prototype Increment 1.
September 2021	The B-52J CERP awarded the Engine contract to Rolls-Royce.
October 2021	The B-52J CERP awarded the Rapid Prototype Material Phase 1 Undefinitized Contract

Date	Description
	Action to Boeing.
October 2022	The B-52J CERP conducted the Preliminary Design Review.
November 2022	The B-52J CERP awarded the PDR to CDR Transition Undefinitized Contract Action to Boeing.
March 2023	The Chief of Staff of the Air Force signed the revised B-52J CERP Capability Development Document.
October 2023	The B-52J CERP successfully delivered the vSP ROC final increment.
December 2023	The SAE approved closure of the B-52J CERP Middle Tier of Acquisition phase and entry into the Major Capability Acquisition pathway.

(U) Schedule

(U) Schedule Events

Events		Pre-Milestone B (Milestone) 4/5/2022 Objective	Pre-Milestone B (Current) 4/5/2022 Objective / Threshold		Current Estimate 12/31/2023	Actual
Materiel Development Decision	MDD	Mar 2018	Mar 2018	Mar 2018	-	8 Mar 2018
MTA Designation	MTA Designation	Sept 2018	Sept 2018	Sept 2018	-	20 Sept 2018
MTA Funds First Obligated	FFO	Dec 2018	Dec 2018	Dec 2018	-	20 Dec 2018
Virtual System Prototype Decision Point (MTA)	Other	Dec 2019	Dec 2019	Dec 2019	-	29 Dec 2019
MTA Operational Demonstration	Other	Sept 2021	Sept 2021	Sept 2021	-	31 Aug 2021
MTA Program Completion Date	MTA Completion	Dec 2023	Dec 2023	Dec 2023	-	7 Dec 2023
Milestone B (MTA)	MS B	Dec 2023	Dec 2023	Dec 2023	Sept 2024*	-

* Baseline Deviation

Notes

The B-52J CERP transitioned to the MCA pathway after receiving MTA closure approval from the SAE in December 2023. The program plans to enter Milestone B in the 4th Quarter FY 2024. The program schedule will be updated in a subsequent SAR submission when a formal APB is approved by the MDA.

1. The B-52J CERP was directed by the FY 2022 National Defense Authorization Act to submit a SAR in advance of Milestone B. The Milestone B (MTA) date in the schedule table was a preliminary forecast and was not established by the MDA in a formal APB process.

Schedule Baseline Deviation Explanation

The difference in schedule for Milestone B (MTA) is tracked against the NDAA defined Administrative baseline and is not considered a reportable breach. An MCA APB will officially set the baseline for the program at Milestone B planned for 4th Quarter FY 2024.

(U) Current Significant Schedule Risks and Risks Identified at Milestones/Decisions

Event	Date	Description
Current	12/31/2023	Risk: EMD Aircraft Modification Timeline: If the EMD aircraft modification timeline exceeds 24 months, then Integrated Test (3) Activities will be delayed

		and will delay IOC day-for-day beyond 24 months. Mitigation: The EMD aircraft modification timeline risk has been reduced to a moderate risk by buying Radar Modernization Program kits for CERP test aircraft.
Current	12/31/2023	Risk: Data Concentrator Unit Graphics Processor Unit Diminishing Manufacturing Sources and Materiel Shortages (DMSMS): If a lifetime buy is not executed for this component, then the Data Concentrator Unit Graphics Processor Unit is at risk for reselection or redesign. Mitigation: To mitigate this risk, the program received approval to accomplish a Life-of-Type Buy (LoTB) to procure components.

(U) Performance

(U) Performance Attributes

Cyber Survivability Endorsement		KPP
Current Estimate 12/31/2023		The program projects performance will meet or exceed threshold.
Demonstrated Performance -		TBD
Pre-Milestone B (Current) 4/5/2022	Objective	B-52H with the CERP developed modifications installed, must operate and survive in a rapidly evolving cyber-contested environment. The system shall be protected against any level actor through prevention, mitigation, and recovery of system capabilities in response to cyber/ electronic warfare (C/EW) by actively managing system configuration to protect and counter vulnerabilities at tactically relevant rates.
	Threshold	B-52H with the CERP developed modifications installed, must operate and survive in a rapidly evolving cyber-contested environment. The system shall be protected against any level actor through prevention, mitigation, and recovery of system capabilities in response to cyber/ electronic warfare (C/EW) by actively managing system configuration to protect and counter vulnerabilities at tactically relevant rates.
Pre-Milestone B (Milestone) 4/5/2022	Objective	B-52H with the CERP developed modifications installed, must operate and survive in a rapidly evolving cyber-contested environment. The system shall be protected against any level actor through prevention, mitigation, and recovery of system capabilities in response to cyber/ electronic warfare (C/EW) by actively managing system configuration to protect and counter vulnerabilities at tactically relevant rates.
Nuclear Hardness		KPP
Current Estimate 12/31/2023		The program projects performance will meet or exceed threshold.
Demonstrated Performance -		TBD
Pre-Milestone B (Current)	Objective	B-52H with the CERP developed modifications installed, shall include sufficient hardening to survive High-altitude Electromagnetic Pulse (HEMP) and nuclear radiation effects. B-52H with the CERP developed modifications installed, shall remain fully functional and without degradation of performance during and after exposure to the HEMP environments specified in MIL-STD-2169C, shall incorporate design margins for HEMP IAW MIL-STD-3023 for a Category II asset, and shall remain fully functional and without degradation of performance during and after exposure to nuclear radiation, thermal radiation, and blast per D520-19041-1. Any technical methodology used to meet these requirements shall maintain thrust levels generated by the CERP

		modifications required for safe operation during exposure to the HEMP environment.
4/5/2022	Threshold	B-52H with the CERP developed modifications installed, shall include sufficient hardening to survive High-altitude Electromagnetic Pulse (HEMP) and nuclear radiation effects. B-52H with the CERP developed modifications installed, shall remain fully functional and without degradation of performance during and after exposure to the HEMP environments specified in MIL-STD-2169C, shall incorporate design margins for HEMP IAW MIL-STD-3023 for a Category II asset, and shall remain fully functional and without degradation of performance during and after exposure to nuclear radiation, thermal radiation, and blast per D520-19041-1. Any technical methodology used to meet these requirements shall maintain thrust levels generated by the CERP modifications required for safe operation during exposure to the HEMP environment.
Pre-Milestone B (Milestone) 4/5/2022	**Objective**	B-52H with the CERP developed modifications installed, shall include sufficient hardening to survive High-altitude Electromagnetic Pulse (HEMP) and nuclear radiation effects. B-52H with the CERP developed modifications installed, shall remain fully functional and without degradation of performance during and after exposure to the HEMP environments specified in MIL-STD-2169C, shall incorporate design margins for HEMP IAW MIL-STD-3023 for a Category II asset, and shall remain fully functional and without degradation of performance during and after exposure to nuclear radiation, thermal radiation, and blast per D520-19041-1. Any technical methodology used to meet these requirements shall maintain thrust levels generated by the CERP modifications required for safe operation during exposure to the HEMP environment.
Chemical, Biological, Radiological, and Nuclear (CBRN) Survivability		**KPP**
Current Estimate 12/31/2023		The program projects performance will meet or exceed threshold.
Demonstrated Performance -		TBD
Pre-Milestone B (Current)	**Objective**	B-52H with the CERP developed modifications installed shall be operated in the same CBRN environment as the current B-52H aircraft. As such, B-52H with the CERP developed modifications installed is categorized as CBRN mission critical and shall comply with the requirements of DoDI 3150.09. Personnel will be able to operate, maintain, and support CERP engines and related LRUs while wearing Mission-Oriented Protective Posture (MOPP) 4 protective clothing IAW MIL-STD-3056.
4/5/2022	Threshold	B-52H with the CERP developed modifications installed shall be operated in the same CBRN environment as the current B-52H aircraft. As such, B-52H with the CERP developed modifications installed is categorized as CBRN mission critical and shall comply with the requirements of DoDI 3150.09. Personnel will be able to operate, maintain, and support CERP engines and related LRUs while

		wearing Mission-Oriented Protective Posture (MOPP) 4 protective clothing IAW MIL-STD-3056.
Pre-Milestone B (Milestone) **4/5/2022**	**Objective**	B-52H with the CERP developed modifications installed shall be operated in the same CBRN environment as the current B-52H aircraft. As such, B-52H with the CERP developed modifications installed is categorized as CBRN mission critical and shall comply with the requirements of DoDI 3150.09. Personnel will be able to operate, maintain, and support CERP engines and related LRUs while wearing Mission-Oriented Protective Posture (MOPP) 4 protective clothing IAW MIL-STD-3056.
Fuel Efficiency		**KPP**
Current Estimate **12/31/2023**		The program projects performance will meet or exceed threshold.
Demonstrated Performance -		TBD
Pre-Milestone B (Current) **4/5/2022**	**Objective**	40% less fuel required to execute mission type.
	Threshold	Equal to the existing TF33-PW-103 to execute the mission types.
Pre-Milestone B (Milestone) **4/5/2022**	**Objective**	40% less fuel required to execute mission type.
Operational Availability		**APA**
Current Estimate **12/31/2023**		The program projects performance will meet or exceed threshold.
Demonstrated Performance -		TBD
Pre-Milestone B (Current) **4/5/2022**	**Objective**	Should achieve operational availability of 80%
	Threshold	Shall not degrade operational availability below 73%.
Pre-Milestone B (Milestone) **4/5/2022**	**Objective**	Should achieve operational availability of 80%
Non-propulsion System Reliability		**APA**
Current Estimate **12/31/2023**		The program projects performance will meet or exceed threshold.
Demonstrated Performance -		TBD
Pre-Milestone B (Current) **4/5/2022**	**Objective**	Shall not degrade the MTBF of the design specification for legacy Line Replaceable Units. This excludes the propulsion system.
	Threshold	Shall not degrade the MTBF of the design specification for legacy Line Replaceable Units. This excludes the propulsion system.
Pre-Milestone B (Milestone)	**Objective**	Shall not degrade the MTBF of the design specification for legacy Line Replaceable Units. This excludes the propulsion system.

4/5/2022		
Unscheduled Engine Removal and Scheduled Engine Removal		**APA**
Current Estimate **12/31/2023**		The program projects performance will meet or exceed threshold.
Demonstrated Performance -		TBD
Pre-Milestone B (Current) **4/5/2022**	**Objective**	Shall improve upon UER rate 0.26 events based on 1000 EFH and shall not have any SER prior to 2050 based on 250 EFH per engine per year.
	Threshold	Shall improve upon UER rate 0.26 events based on 1000 EFH and shall not have any SER prior to 2050 based on 250 EFH per engine per year.
Pre-Milestone B (Milestone) **4/5/2022**	**Objective**	Shall improve upon UER rate 0.26 events based on 1000 EFH and shall not have any SER prior to 2050 based on 250 EFH per engine per year.

(U) Requirement Source:

Sponsor(s): United States Air Force

1. Capability Development Document*, Capability Development Document for B-52H Commercial Engine Replacement Program (CERP)*
   Validated By: Joint Requirements Oversight Council, May 20, 2020

Notes

The program projects performance will meet or exceed thresholds specified in the CDD. The CDD was updated and approved on March 30, 2023.

Performance Deviation Explanation

None

(U) Acquisition Budget Estimate

(U) Total Acquisition Estimates and Quantities

Category ($M) Base Year: 2019	Pre-Milestone B (Milestone) 4/5/2022 CY$ obs Objective	Pre-Milestone B (Current) 4/5/2022 CY$ obs Objective / Threshold		Current Estimate PB 2025 CY$ obs / TY$ obs	
RDT&E	2,201.6	2,201.6	2,421.8	3,529.4*	4,350.6
Procurement	6,757.4	6,757.4	7,433.1	5,767.0	8,319.0
MILCON	-	-	-	216.1	292.0
Total Acquisition	8,959.0	8,959.0	-	9,512.4	12,961.6
Program Acquisition Unit Cost	117.882	117.882	129.670	125.164	170.547
Average Procurement Unit Cost	91.316	91.316	100.448	77.932	112.419
Program End-Item Quantity					
Development	2	2		2	
Procurement	74	74		74	
O&M-Acquired	-	-		0	

* Baseline Deviation

Budget Notes

The Cost table showing objective and threshold values has been imported from the Administrative baseline that was required as a result of the 2022 National Defense Authorization Act direction to submit a SAR and reflects the entire Program. The objective and threshold values are based on the FY 2020 NACA. B-52J CERP will establish an MCA APB at Milestone B.
The Current Estimate (CE) is based on budgetary actuals for FY 2018 - FY 2022, current budget authority for FY 2023 FY 2024, FY 2025 PB for FY 2025 - FY 2029, and the FY 2025 NACA dated June 7, 2023, for FY 2030 - 2036.
The current Administrative baseline does not account for MILCON funding. The Program's current MILCON funding was approved in the FY 2025 budget cycle and does not yet have a budget line established.

Quantity Notes

None

Cost Baseline Deviation Explanation

Parameter	Explanation
Acquisition Cost (RDT&E)	The difference in RDT&E cost is tracked against the NDAA defined Administrative baseline and is not considered a reportable breach. An MCA APB will officially set the baseline for the program at Milestone B planned for 4th Quarter FY 2024.

(U) Risk and Sensitivity Analysis

Current Procurement Estimate Risks (12/31/2023)	
1	Risk: Data Concentrator Unit Graphics Processor Unit Diminishing Manufacturing Sources and Materiel Shortages (DMSMS): If a lifetime buy is not executed for this component, then the Data Concentrator Unit Graphics Processor Unit is at risk for reselection or redesign. Mitigation: To mitigate this risk, the program received approval to accomplish a Life-of-Type Buy (LoTB) to procure components.
2	Risk: EMD Aircraft Modification Timeline: If the EMD aircraft modification timeline exceeds 24 months, then Integrated Test (3) Activities will be delayed and will delay IOC day-for-day beyond 24 months. Mitigation: The EMD aircraft modification timeline risk has been reduced to a moderate risk by buying Radar Modernization Program kits for CERP test aircraft.
Current Baseline Risks (4/5/2022)	
There are no risks to the program original estimate. The estimate for B-52 CERP is based upon analogous historical re-engine programs and takes inherited risks/issues from those programs into account.	
Original Baseline Risks (4/5/2022)	
There are no risks to the program original estimate. The estimate for B-52 CERP is based upon analogous historical re-engine programs and takes inherited risks/issues from those programs into account.	

(U) Unit Costs

(U) Current Estimate Compared with Current Baseline

Category (CY$M) Base Year: 2019	Current Baseline 04/05/2022	Current Estimate PB 2025	% Change
Program Acquisition Unit Cost			
Acquisition Cost	8,959.0	9,512.4	
Program Quantity	76	76	
PAUC	117.882	125.164	6.18%
Average Procurement Unit Cost			
Procurement Cost	6,757.4	5,767.0	
Procurement Quantity	74	74	
APUC	91.316	77.932	-14.66%

(U) Current Estimate Compared with Original Baseline

Category (CY$M) Base Year: 2019	Original Baseline 04/05/2022	Current Estimate PB 2025	% Change
Program Acquisition Unit Cost			
Acquisition Cost	8,959.0	9,512.4	
Program Quantity	76	76	
PAUC	117.882	125.164	6.18%
Average Procurement Unit Cost			
Procurement Cost	6,757.4	5,767.0	
Procurement Quantity	74	74	
APUC	91.316	77.932	-14.66%

(U) Cost Growth Details

Impacts of Schedule Changes on Unit Cost

Not Applicable.

Impacts of Performance Changes on Unit Cost

Not Applicable.

Actions taken or Proposed to Control Future Cost Growth

Not Applicable.

Status of Each Major Contract and Significant Factors Contributing to Cost and Schedule Variance; Projected Effects on Future Program Costs

See Contracts section.

Notes

The B-52J CERP was directed by the FY 2022 NDAA to submit a SAR with an administrative baseline in advance of Milestone B. The unit cost information is based on the administrative baseline and will be updated when the APB is established at Milestone B which is planned for 4th Quarter FY 2024..

(U) Life-Cycle Costs

(U) Operating and Support and Disposal Cost Estimates Compared with Baseline

No Data

(U) Current Cost Estimate Sources

None

Operating and Support Baseline Deviation Explanation

None

Cost Notes

O&S costs are currently not tracked separately in the B-52J CERP MSAR. O&S costs are included in the overall operational costs for the existing B-52 fleet managed by the program office at Tinker Air Force Base, Oklahoma.

O&S and Disposal Cost Sources: For Programs with an O&S Cost estimate or Disposal Cost estimate the O&S Cost Source and Disposal Cost Source listed in the MSAR are inaccurate due to a system limitation. See MSAR Supplement for corrected source(s).

(U) Operating and Support Variance with Prior Estimate

No Data

(U) Operating and Support Cost Element Structure Estimates by Acquired System

No Data

(U) Annual Operating and Support Costs per Unit Compared with Antecedent System

No Data

(U) Operating and Support Cost Estimate Assumptions

No Data

Additional O&S Estimate Assumptions

None

Antecedent Estimate Assumptions

None

O&S Annual Cost Calculation Memo

None

(U) Performing Activities and Contracts

(U) External Government Activities

None

(U) Contracts and Efforts

Contract Title	Contract Number / Effort	Contractor	Phase
Engine	FA810721D0001	ROLLS-ROYCE CORPORATION	Development
Rapid Prototyping 1 (RP1)	FA862819D1000	THE BOEING COMPANY	Development
Rapid Prototyping Material Phase 0 (RPM0)	FA862819D1000	THE BOEING COMPANY	Development
Rapid Prototyping Material Phase 1 (RPM1)	FA862819D1000	THE BOEING COMPANY	Development

(U) Contract and Effort Identification, Price, Quantity and Performance

Contract Number:	FA810721D0001	**Order Number:**	-
Contract Title:	Engine	**Strategy:**	FAR 12: Commercial Items
CAGE:	63005 - ROLLS-ROYCE CORPORATION	**Contracting Office:**	-
City, State/Province:	INDIANAPOLIS, IN		
Effort Number:	-	**Supported Phase:**	Development
Type:	Firm-Fixed-Price	**Award Date:**	September 24, 2021
Latest Modification Date:	-	**Definitization Date:**	September 24, 2021
Latest Modification No.:	P00005	**Work Start Date:**	September 24, 2021
Technical Data Rights:	-		
Notes:	Cost and Schedule variance reporting is not required on this FFP type contract.		

Target Price Change Explanation
The difference between the Original Target Price and the Current Target Price is due to the negotiated amount for Critical Design Review extension, which was due to a Government caused delay.

Initial Price (TY$M) Target / Ceiling		Current Price (TY$M) Target / Ceiling		Estimate at Completion (TY$M) Contractor / PM	Initial Quantity	Current Quantity	Delivered Quantity
2,604.3	-	2,641.3	-	2,641.3	-	-	-

(U) Contract and Effort Identification, Price, Quantity and Performance

Contract Number:	FA862819D1000	**Order Number:**	FA810720F0001
Contract Title:	Rapid Prototyping 1 (RP1)	**Strategy:**	FAR 15: Negotiated Contracts

CAGE:	1N929 - THE BOEING COMPANY	**Contracting Office:**	AFLCMC/PK - Contracting Directorate
City, State/Province:	OKLAHOMA CITY, OK		
Effort Number:	-	**Supported Phase:**	Development
Type:	Cost Plus Incentive Fee (Cost Based)	**Award Date:**	February 14, 2020
Latest Modification Date:	-	**Definitization Date:**	-
Latest Modification No.:	P00029	**Work Start Date:**	February 14, 2020
Technical Data Rights:	-		

Notes: Contract definitization is estimated for November 2024.

Target Price Change Explanation
The difference between the Original Target Price and the Current Target Price is due to an extension to the RP1 contract. Originally awarded to develop the system preliminary design and virtual System Prototype, the contract was extended through an undefinitized contract action to complete detailed design.

Initial Price (TY$M) Target / Ceiling		Current Price (TY$M) Target / Ceiling		Estimate at Completion (TY$M) Contractor / PM		Initial Quantity	Current Quantity	Delivered Quantity
282.4	-	1,222.5	-	-	1,222.5	-	1	-

Work Completed (%):	51.76%
Cost Variance (TY$M):	-51.7
Schedule Variance (TY$M):	-43.6

Factors Contributing to Cost Variance and Projected Effects on Program Costs

The unfavorable variance is primarily attributed to Propulsion Subsystems, Airframe Integration, Assembly, Test and Checkout and Labs. Electrical Subsystem design required more resources than originally planned and time to complete layout pre-designs and drawing development negatively impacted cost. Negative margins in the primary wing structure (wing box) were discovered and the effort to quantify impacts cost more than budgeted. Strut and strut fairing analysis was significantly more complex than planned. Electrical Power Lab (EPL) detailed design and lab integrator and oversight costs were more than anticipated for the Lab IPT. Costs to complete detailed design drawings for the EPL cost more than budgeted and took longer to complete than originally anticipated.

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule

The unfavorable variance is due to the Airframe Integration, Assembly, Test & Checkout, the Data Concentrator Unit (DCU) and the Electrical Subsystem. Boeing added more resources than originally planned to address negative schedule margin in the wing structure (wing box). This delayed starting other analyses for integration. For electrical subsystems, engineering needed more information about battery and ECS architecture requirements, connectors and circuit breakers for the power distribution and relay boxes as well as waiting for Supplier Change Notices. Additional analyses and resolution time was needed to address diminishing manufacturing sources and material shortage issues for the DCU.

(U) Contract and Effort Identification, Price, Quantity and Performance

Contract Number:	FA862819D1000	**Order Number:**	FA810721F0008
Contract Title:	Rapid Prototyping Material Phase 0 (RPM0)	**Strategy:**	FAR 15: Negotiated Contracts
CAGE:	1N929 - THE BOEING	**Contracting Office:**	AFLCMC/WBD - B-52 Division

	COMPANY
City, State/Province:	OKLAHOMA CITY, OK

Effort Number:	-	**Supported Phase:**	Development
Type:	Cost Plus Fixed Fee	**Award Date:**	March 31, 2021
Latest Modification Date:	-	**Definitization Date:**	-
Latest Modification No.:	P00008	**Work Start Date:**	March 31, 2021
Technical Data Rights:	-		
Notes:	Rapid Prototype Material Phase 0 (RPM0) was awarded by the program as an UCA in March 2021 for the development and delivery of critical long-lead material to support the test aircraft. Contract definitization date is estimated for July 5, 2024.		

Initial Price (TY$M) Target / Ceiling		Current Price (TY$M) Target / Ceiling		Estimate at Completion (TY$M) Contractor / PM		Initial Quantity	Current Quantity	Delivered Quantity
665.3	-	665.3	-	-	665.3	-	-	-

Work Completed (%):	34.40%
Cost Variance (TY$M):	+26.5
Schedule Variance (TY$M):	-16.4

Factors Contributing to Cost Variance and Projected Effects on Program Costs

The Cost variances are favorable to date, however, upon definitization of the undefinitized contract action (UCA) workload will be replanned and cost variances will be reassessed.

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule

The unfavorable variance is due to the electrical subsystem and environmental control subsystem control accounts. However, this should be mitigated as the spend profile will be aligned with an updated schedule from the electrical subsystem supplier. Additionally, once supplier invoices catch up for the Environmental Control System, the schedule variance should be mitigated.

(U) Contract and Effort Identification, Price, Quantity and Performance

Contract Number:	FA862819D1000	**Order Number:**	FA810722F0002
Contract Title:	Rapid Prototyping Material Phase 1 (RPM1)	**Strategy:**	FAR 15: Negotiated Contracts
CAGE:	1N929 - THE BOEING COMPANY	**Contracting Office:**	AFLCMC/WBD - B-52 Division
City, State/Province:	OKLAHOMA CITY, OK		

Effort Number:	-	**Supported Phase:**	Development
Type:	Cost Plus Fixed Fee	**Award Date:**	October 15, 2021
Latest Modification Date:	-	**Definitization Date:**	-
Latest Modification No.:	P00011	**Work Start Date:**	October 15, 2021
Technical Data Rights:	-		
Notes:	Rapid Prototype Material Phase 1 (RPM1) was awarded by the program as an undefinitized contract action in October 2021 for the development and delivery of long-		

lead material to support the test aircraft. Contract definitization is estimated for May 25, 2024.

Initial Price (TY$M) Target / Ceiling		Current Price (TY$M) Target / Ceiling		Estimate at Completion (TY$M) Contractor / PM		Initial Quantity	Current Quantity	Delivered Quantity
296.0	-	296.0	-	-	296.0	-	-	-

Work Completed (%):	17.90%
Cost Variance (TY$M):	-2.7
Schedule Variance (TY$M):	-4.8

Factors Contributing to Cost Variance and Projected Effects on Program Costs

The unfavorable variance is due to the Avionics Software Release and Mock-ups/System Integration Labs (SILs). For the avionics release, the Priced Bill of Materials came in much higher than what was originally proposed for the effort, causing a negative projected cost variance. The negative cost variance for the SILs is a direct result of HW now required approximately 10 months later than originally planned.

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule

The unfavorable variance is due to the Nacelle and Displays. With respect to the Nacelle, the cumulative schedule variance is due to the delay between planned milestones and billing. Display cumulative variance is attributed to a delay of supplier CDR from original June time frame to September and the subsequent delay of Line Replaceable Units by three months.

(U) Deliveries and Expenditures

(U) Acquisition Funding

	Total Estimate	Actual to Date	Actual, Percent Complete
Years Appropriated	-	-	-
Appropriations (TY, $M)	12,961.6	12,961.6	100.0%
Expenditures (TY, $M)	12,961.6	1,064.0	8.2%

(U) End Items Delivered

	Total Required	Planned to Date	Actual to Date	Actual, Percent Complete
Development	2			
Procurement	74			
Total	**76**	-	-	-

Notes

None

(U) International Program Aspects

General Memo

Not applicable

Exportability and Business Issues

Not applicable

Is design for international exportability planned?	No	**Industry/Partner Exportability Cost-Sharing?**	No
If not, has the MDA approved an exportability waiver for a U.S.-only design?	Not Applicable		

Program Protection: Technology Security and Foreign Disclosure Issues

Not applicable

(U) Agreements

No International Agreements have been defined for B-52J CERP

Modernized
Selected Acquisition Report
Supplement

B-52J Commercial Engine Replacement Program
(B-52J CERP)

FY 2025 President's Budget
As of: December 31, 2023

MSAR Supplement Sections

Program Description

Program Use of the Adaptive Acquisition Framework

Technologies and Systems Engineering

Funding Sources (Acquisition)

Funding Sources (Operating and Support)

Acquisition Estimate and Quantity Summary

Annual Acquisition Estimates by Appropriation Account

Acquired System Annual End-Item Quantities by Appropriation Account

Nuclear Costs

Operational Fielding Plan

O&S Independent Cost Estimate

Annual Operating and Support Estimates by Cost Element

Program Description

Full Name
B-52J Commercial Engine Replacement Program

Short Name
B-52J CERP

PNO
NFM

Lead Component
Air Force

AAF Pathway
MCA

Acquisition Type
MDAP

Acquired Systems
B-52J

Related Programs

Full Name	PNO	Pathway	Type	ACAT/ BCAT	Acquisition Status	Costs in SAR? Acq	O&S
B-52 Commercial Engine Replacement Program Rapid Virtual Prototype	631	MTA	MTRP		Transitioned/ Restructured	Yes	No

Program Use of the Adaptive Acquisition Framework

The B-52J CERP began in March 2018 with a Materiel Development Decision. In September 2018, the Service Acquisition Executive (SAE) approved B-52 CERP as a Rapid Prototype Section 804 program with two distinct prototype deliveries, virtual and physical, and delegated Source Selection Authority for the B-52J CERP engine contract to the PEO for Fighters and Bombers. In December 2018, the program awarded a Risk Reduction Requirements contract to Boeing to conduct early risk reduction and system requirements activities culminating in the creation of a B-52 engine procurement specification. In December 2019, the SAE approved the updated Acquisition Strategy, the program execution tracking parameters, and the award of the Rapid Prototype 1 contract to Boeing. Boeing developed an end-item virtual System Prototype system configuration which served as the B-52J CERP's prototype for Rapid Virtual Prototyping (RVP) and defined and encapsulates the B-52J CERP modification that is proposed for the B-52 aircraft.

An Acquisition Strategy Panel was held on March 22, 2023, approving the program's transition in the acquisition framework to a MCA program at Milestone B after completion of the currently executing RVP MTA phase. On November 7, 2023, B-52J CERP met with the SAE approved closure of the B-52J CERP MTA phase, transitioning the program to the MCA pathway. Milestone B is currently estimated for 4th Quarter FY 2024.

Technologies and Systems Engineering

B-52J Commercial Engine Replacement Program

Major Software Efforts

Title	Status	Fielding Date	Description

Major Engineering Changes

Title	Original Need Date	Fielding Date	Description, Rationale and Program Impacts

Funding Sources (Acquisition)

Acquisition Funding Notes

Current Administrative baseline does not account for MILCON funding. The program's current MILCON funding was approved in the FY 2025 budget cycle and does not yet have a budget line established.

B-52J Commercial Engine Replacement Program

Category	Account	BA	Line Item	Program Element	RDT&E Project	Shared	Sunk
RDT&E	3600F	07	0101113F - B-52 Squadrons	0101113F	675129 - Comm Engine Re-Program	x	
Procurement	3010F	05	B05200 - B-52	0101113F	-	x	

Funding Sources (Operating and Support)

Note: Budget lines fund activites executed by the Program Office or Sustainment Office.

Operating and Support Funding Notes

O&S costs are currently not tracked separately for B-52J CERP MSAR. O&S costs are included in the overall operational costs for the existing B-52 fleet managed by the Program Office at Tinker Air Force Base, Oklahoma.

B-52J Commercial Engine Replacement Program

Category	Account	BA	Line Item	Program Element	RDT&E Project	Shared	Sunk

Acquisition Estimate and Quantity Summary

B-52J Commercial Engine Replacement Program

Acquisiton Estimates

Category	PB 2025	TY ($M)	Current Base Year CY2019 ($M)	Original Base Year CY2019 ($M)	Report Fiscal Year CY2024 ($M)
RDT&E		4,350.6	3,529.4	3,529.4	4,228.8
Procurement		8,319.0	5,767.0	5,767.0	6,909.9
MILCON		292.0	216.1	216.1	258.9
O&M		-	-	-	-
Total Acquisition		12,961.6	9,512.4	9,512.4	11,397.6
PAUC		170.547	125.164	125.164	149.969
APUC		112.419	77.932	77.932	93.377

Acquisiton End-Item Quantities

System	PB 2025	Development	Procurement
B-52J		2	74
Total		**2**	**74**

Unit Description

Unit of Measure is a modified B-52 aircraft.

Current and Future Years Defense Program Summary, TY($M)

Appropriation	Prior	2024	2025	2026	2027	2028	2029	To Complete	Total
RDT&E	1,175.8	576.0	785.0	594.7	360.3	416.3	419.8	22.5	4,350.6
Procurement	-	-	2.1	20.8	735.4	708.1	722.2	6,130.5	8,319.0
MILCON	-	-	-	50.0	150.0	92.0	-	-	292.0
O&M	-	-	-	-	-	-	-	-	-
PB 2025 Total	**1,175.8**	**576.0**	**787.1**	**665.5**	**1,245.7**	**1,216.4**	**1,142.0**	**6,153.1**	**12,961.6**

Annual Acquisition Estimates by Appropriation Account

(Aligned to Budget Position: PB 2025)

B-52J Commercial Engine Replacement Program

Source for TY$-CY$ Conversion: SAF/FMCE Raw and Weighted Inflation Indices for DAF Accounts: 23 Feb 2024

3600F - Research, Development, Test & Eval, AF					
fiscal year		Other/ Unallocated	Total TY($M)	Weighted Rate	Total CY2019 ($M)
Total		**4,350.6**	**4,350.6**	**-**	**3,529.4**
2018		9.428	9.4	0.996692	9.5
2019		59.743	59.7	1.015221	58.8
2020		129.449	129.4	1.041332	124.3
2021		216.015	216.0	1.090257	198.1
2022		381.809	381.8	1.148744	332.4
2023		379.401	379.4	1.189574	318.9
2024		576.016	576.0	1.219873	472.2
2025		784.975	785.0	1.246053	630.0
2026		594.734	594.7	1.272220	467.5
2027		360.341	360.3	1.298936	277.4
2028		416.323	416.3	1.326214	313.9
2029		419.828	419.8	1.354064	310.1
2030		22.538	22.5	1.382500	16.3

Annual Acquisition Estimates by Appropriation Account

(Aligned to Budget Position: PB 2025)

B-52J Commercial Engine Replacement Program

Source for TY$-CY$ Conversion: SAF/FMCE Raw and Weighted Inflation Indices for DAF Accounts: 23 Feb 2024

3010F - Aircraft Procurement, Air Force									
fiscal year	End Item Recurring Flyaway	Non-End Item Recurring Flyaway	Non-Recurring Flyaway	Initial Spares	Depot Activation	Other/ Unallocated	Total TY($M)	Weighted Rate	Total CY2019 ($M)
Total	**0.0**	**-**	**-**	**-**	**-**	**8,319.0**	**8,319.0**	**-**	**5,767.0**
2018							-	1.034663	-
2019							-	1.070560	-
2020							-	1.115828	-
2021							-	1.163577	-
2022							-	1.201959	-
2023							-	1.231613	-
2024							-	1.256434	-
2025						2.104	2.1	1.282950	1.6
2026						20.757	20.8	1.309892	15.8
2027						735.391	735.4	1.337400	549.9
2028						708.079	708.1	1.365485	518.6
2029						722.150	722.2	1.394161	518.0
2030						1,506.100	1,506.1	1.423438	1,058.1
2031						1,566.200	1,566.2	1.453330	1,077.7
2032						1,547.100	1,547.1	1.483850	1,042.6
2033						1,010.300	1,010.3	1.515011	666.9
2034						202.200	202.2	1.546826	130.7
2035						150.000	150.0	1.579309	95.0
2036						148.619	148.6	1.612475	92.2

Annual Acquisition Estimates by Appropriation Account

(Aligned to Budget Position: PB 2025)

B-52J Commercial Engine Replacement Program

Source for TY$-CY$ Conversion: SAF/FMCE Raw and Weighted Inflation Indices for DAF Accounts: 23 Feb 2024

3300F - Military Construction, Air Force					
fiscal year		Other/ Unallocated	Total TY($M)	Weighted Rate	Total CY2019 ($M)
Total		**292.0**	**292.0**	**-**	**216.1**
2018			-	1.045070	-
2019			-	1.077288	-
2020			-	1.124260	-
2021			-	1.173878	-
2022			-	1.211203	-
2023			-	1.239903	-
2024			-	1.265925	-
2025			-	1.292550	-
2026		50.000	50.0	1.319693	37.9
2027		150.000	150.0	1.347407	111.3
2028		92.000	92.0	1.375702	66.9

Acquired System Annual End-Item Quantities by Appropriation Account

(Aligned to Budget Position: PB 2025)

B-52J Commercial Engine Replacement Program

3600F - Research, Development, Test & Eval, AF				
fiscal year	B-52J			Total
Total	**2**			**2**
Undistributed	-			-
2025	1			1
2026	1			1

Acquired System Annual End-Item Quantities by Appropriation Account

(Aligned to Budget Position: PB 2025)

B-52J Commercial Engine Replacement Program

3010F - Aircraft Procurement, Air Force				
fiscal year	B-52J			Total
Total	**74**			**74**
Undistributed				-
2025				-
2026				-
2027				-
2028	6			6
2029	6			6
2030	15			15
2031	15			15
2032	15			15
2033	11			11
2034	6			6

Nuclear Costs

B-52J Commercial Engine Replacement Program

Program's Use of Department of Energy Resources

None

Operational Fielding Plan

B-52J Commercial Engine Replacement Program

System: B-52J

Fielding and Inventory Notes

Some of this Program's Operational Fielding Plan contains Controlled Unclassified Information (CUI) and has been removed per the Implementation Plan for the DoD's Modernized Selected Acquisition Report Process, dated June 2023, which required the SAR be submitted without any designation relation to dissemination control.

B-52J Fielding Plan and Inventory

fiscal year	Store	Field	Expend/Loss	Decommission	Inventory
2023					
2024					-
2025					-
2026					-
2027					-
2028					-
2029					-

O&S Independent Cost Estimate

B-52J Commercial Engine Replacement Program

Independent and Current Cost Estimate Comparison

Category CY2019 ($M)	Independent Cost Estimate	Current Estimate	Variance with ICE (%)
Unit-Level Manpower			-
Unit Operations			-
Maintenance			-
Sustaining Support			-
Continued System Improvements			-
Other			-
Total O&S	**-**	**-**	**-**

Independent Cost Estimate Source

Event:

Type:

Approved by:

Note: O&S costs are currently not tracked separately for B-52J CERP MSAR. O&S costs are included in the overall operational costs for the existing B-52 fleet managed by the Program Office at Tinker Air Force Base, Oklahoma.

Current Cost Estimate Source

Type:

Approved by:

Note: O&S costs are currently not tracked separately for B-52J CERP MSAR. O&S costs are included in the overall operational costs for the existing B-52 fleet managed by the Program Office at Tinker Air Force Base, Oklahoma.

Cost Estimate Variance Explanation

Annual Operating and Support Estimates by Cost Element

B-52J Commercial Engine Replacement Program

System: B-52J

Source for TY-CY Conversion:

Operating and Support Cost Elements							
fiscal year	1.0 Unit-Level Manpower	2.0 Unit Operations	3.0 Maintenance	4.0 Sustaining Support	5.0 Continuing System Improvements	Other	Total CY2019 ($M)
Total	-	-	-	-	-	-	-