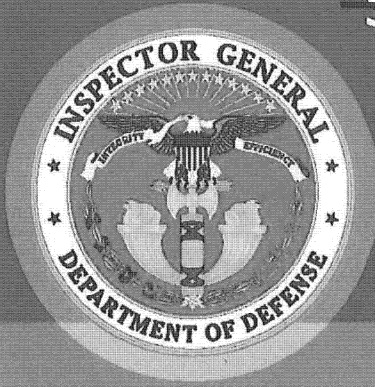


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# INSPECTOR GENERAL

*U.S. Department of Defense*

APRIL 19, 2019

## (U) Audit of the B61-12 Tail Kit Assembly Program

Classified By: Theresa Hull  
Derived From: Multiple Sources  
Declassify On: Not Applicable to Formerly Restricted Data

INTEGRITY ★ INDEPENDENCE ★ EXCELLENCE

Released by the DoD OIG FOIA Office  
under FOIA request DODOIG-2019-000606  
on 7/8/2022

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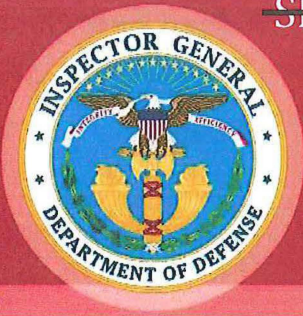


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## (U) Results in Brief

### (U) Audit of the B61-12 Tail Kit Assembly Program

April 19, 2019

#### (U) Objective

(U) We determined whether the Air Force was developing the B61-12 tail kit assembly within cost, schedule, and performance requirements. The B61-12 is a 12-foot long, 825-pound nuclear bomb that U.S. Air Force and North Atlantic Treaty Organization aircraft can drop on targets. We focused this audit on whether the Air Force met the baselines for cost, schedule, and performance, which are discussed below.

#### (U) Background

(U) Cost: In December 2012, the acquisition program baseline for the B61-12 Tail Kit Assembly Program established maximum research, development, test and evaluation costs of USAF (b)(4) and procurement costs of USAF (b)(4) during the program's engineering and manufacturing development phase of the acquisition life cycle.

(U) Schedule: The acquisition program baseline also established a schedule requirement to attain Milestone C between April 2018 and April 2019. Milestone C is the program approval to begin the initial production phase of the acquisition life cycle. During initial production, the contractor will produce limited quantities for initial operational test and evaluation and maintain production until the milestone decision authority authorizes full-rate production after operational test and evaluation. The first tail kit assembly production delivery is planned between USAF (b)(4), with full-rate production occurring no later than September 2020.

(U) Performance: In October 2018, the capability production document for the B61-12 Tail Kit Assembly Program established the performance requirements at Milestone C. The performance requirements for the tail

#### Background (cont'd)

(U) kit assembly include integration, accuracy, availability, storage, survivability, operating and support costs, reliability, and service life.

(U) The B61-12 life extension program will refurbish or replace all of the bomb's nuclear and non-nuclear components and add a new tail kit assembly, while extending the system's service life. The bomb assembly includes the nuclear explosive and weapon control unit, and allows aircraft to communicate with the bomb. The tail kit assembly includes the electronic guidance controls. The addition of the tail kit assembly increases the bomb's accuracy, allowing for a reduction in its nuclear explosive power. Program officials will also procure a Stand Alone Test Set, a hand-held computer used to install the operational flight program and perform diagnostics on the tail kit assembly.

~~(FOUO)~~ Program officials completed developmental testing and obtained Milestone C approval (initial production) on October 26, 2018. As of December 2018, Tail Kit Assembly Program officials estimated research, development, test, and evaluation costs of USAF (b)(4) and procurement costs of USAF (b)(4). Program officials plan to procure USAF (b)(4) at an average procurement unit cost ceiling of USAF (b)(4).

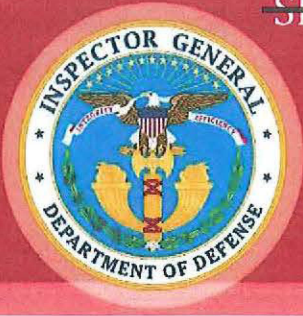
#### (U) Finding

(U) As of Milestone C, program officials developed the tail kit assembly within the estimated cost, schedule, and performance baselines established. Specifically, the program officials:

- (U) kept cost estimates under the ceiling of USAF (b)(4) for research, development, test, and evaluation and USAF (b)(4) for procurement of USAF (b)(4) established at Milestone B

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## (U) Results in Brief

(U) Audit of the B61-12 Tail Kit Assembly Program

### Finding (cont'd)

(U) (the decision to enter the engineering and manufacturing development phase of the acquisition life cycle);<sup>1</sup>

- (U) achieved Milestone C approval on October 26, 2018, prior to the April 2019 required date; and
- (U) demonstrated that the tail kit assembly met performance requirements for integration, accuracy, availability, storage, operating and support costs, reliability, and service life.

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

[REDACTED]

### Recommendation

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

[REDACTED]

### Management Comments and Our Response

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

[REDACTED]

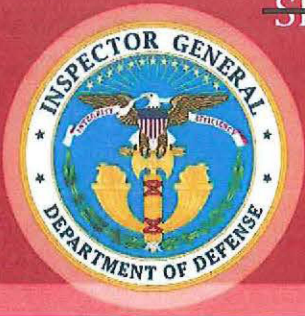
(FOUO) OSD/JS (b)(3); DOE (b)(1) 6.2(a), (b)(3)

[REDACTED]

<sup>1</sup> (U) The total quantity includes 77 tail kit assemblies for research, development, and evaluation and USAF (b)(4) for procurement.

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## (U) Results in Brief

*(U) Audit of the B61-12 Tail Kit Assembly Program*

### Comments (cont'd)

(FOUO) OSD/JS (b)(3); DOE (b)(1) 6.2(a), (b)(3)

[REDACTED]

(SPRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

[REDACTED]

(SPRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

[REDACTED]

(U) Please see the Recommendation Table on the next page for the status of the recommendations.

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### **Recommendation Table**

(U) Management	Recommendations Unresolved	Recommendations Resolved	Recommendations Closed
B61-12 Tail Kit Assembly Program Office	None	1	None (U)

(U) The following categories are used to describe agency management's comments to individual recommendations:

- **(U) Unresolved** – Management has not agreed to implement the recommendation or has not proposed actions that will address the recommendation.
- **(U) Resolved** – Management agreed to implement the recommendation or has proposed actions that will address the underlying finding that generated the recommendation.
- **(U) Closed** – OIG verified that the agreed upon corrective actions were implemented.





INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE  
4800 MARK CENTER DRIVE  
ALEXANDRIA, VIRGINIA 22350-1500

April 19, 2019

(U) MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR RESEARCH  
AND ENGINEERING  
UNDER SECRETARY OF DEFENSE FOR ACQUISITION  
AND SUSTAINMENT  
DIRECTOR, OPERATIONAL TEST AND EVALUATION  
AUDITOR GENERAL, DEPARTMENT OF THE AIR FORCE

(U) SUBJECT: Audit of the B61-12 Tail Kit Assembly Program  
(Report No. DODIG-2019-080)

(U) We are providing this report for your information. We conducted this audit in accordance with generally accepted government auditing standards.

(U) We considered comments from the Principal Deputy Assistant Secretary of the Air Force on the draft of this report when preparing the final report. Comments from the Principal Deputy did not address the specifics of the recommendation. However, we concluded that the comments from the Principal Deputy addressed the intent of the recommendation and conformed to the requirements of DoD Instruction 7650.03; therefore, we do not require additional comments.

(U) We appreciate the cooperation and assistance received during the audit. Please direct questions to me at DoD OIG (b)(6) (DSN DoD OIG (b)(6)).

A handwritten signature in cursive script, reading "Theresa S. Hull", is positioned above the typed name.

Theresa S. Hull  
Assistant Inspector General for Audit  
Acquisition, Contracting, and Sustainment

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## **(U) Introduction**

### **(U) Objective**

(U) We determined whether the Air Force was developing the B61-12 tail kit assembly within cost, schedule, and performance requirements. We focused this audit on whether the Air Force met the baselines for cost, schedule, and performance, which are discussed below.

### **(U) Background**

(U) Cost: In December 2012, the acquisition program baseline for the B61-12 Tail Kit Assembly Program established maximum research, development, test and evaluation (RDT&E) costs of **USAF (b)(4)** and procurement costs of **USAF (b)(4)** during the program's engineering and manufacturing development phase of the acquisition life cycle.

(U) Schedule: The acquisition program baseline also established a schedule requirement to attain Milestone C between April 2018 and April 2019. Milestone C is the program approval to begin the initial production phase of the acquisition life cycle. During initial production, the contractor will produce limited quantities for initial operational test and evaluation and maintain production until the milestone decision authority authorizes full-rate production after operational test and evaluation. The first tail kit assembly production delivery is planned between **USAF (b)(4)**, with full-rate production occurring no later than September 2020.

(U) Performance: In October 2018, the capability production document for the B61-12 Tail Kit Assembly Program established the performance requirements at Milestone C. The performance requirements for the tail kit assembly include integration, accuracy, availability, storage, survivability, operating and support costs, reliability, and service life.

(U) See Appendix A for the scope, methodology, and prior audit coverage related to the audit objective and Appendix B for a list of derivatively classified sources.

### **(U) B61-12 Life Extension Program**

(U) The B61 is a nuclear bomb deployed from U.S. Air Force and North Atlantic Treaty Organization aircraft. The Air Force, Department of Energy, and National Nuclear Security Administration are developing a B61-12 life extension program to consolidate



(U) different variations of the bomb into a single bomb, the B61-12. The B61-12 is a 12-foot long, 825-pound nuclear bomb that aircraft can drop on its targets. The B61-12 life extension program is critical to the nation's air-delivered nuclear deterrent capability. Figure 1 shows a B61-12 mounted to an F-15E aircraft.

(U) Figure 1. B61-12 Test Bomb



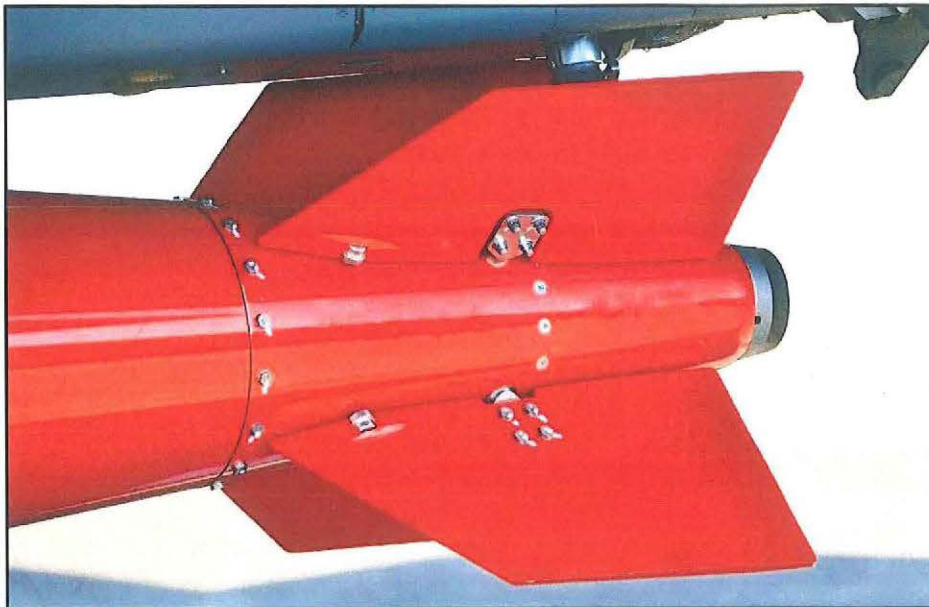
(U) Source: The Air Force.

(U) The B61-12 life extension program will refurbish or replace all of the bomb's nuclear and non-nuclear components and add a new tail kit assembly, while extending the system's service life. The B61-12 consists of a bomb assembly and a tail kit assembly. The bomb assembly includes the nuclear explosive and weapon control unit, and allows aircraft to communicate with the bomb. The tail kit assembly includes the electronic guidance controls. The addition of the tail kit assembly increases the bomb's accuracy, allowing for a reduction in its nuclear explosive power. Program officials will also procure a Stand Alone Test Set (SATS), a hand-held computer used to install the operational flight program and perform diagnostics on the tail kit assembly.

(U) The B61-12 will operate in two modes. The first mode uses unguided, free-fall delivery. The free-fall delivery mode does not use the electrical or software capability of the tail kit assembly. The tail kit assembly mechanically locks its control fins and follows a gravitational path to its target. North Atlantic Treaty Organization aircraft, such as the F-16 and PA-200, can use the free-fall delivery mode.

(U) The second mode uses digital guided delivery. The tail kit assembly controls the bomb's flight path using moveable control fins. Air Force aircraft, such as the F-15E and B-2A, use guided delivery mode. The Air Force plans to deploy the B61-12 from the F-35A and the B-21 aircraft in the future. Figure 2 shows the tail kit assembly.

(U) Figure 2. Tail Kit Assembly



(U) Source: The Air Force.

### **(U) Program Management**

(U) The DoD and Department of Energy share management and funding responsibilities for the B61-12 life extension program. The Air Force Nuclear Weapons Center is responsible for the tail kit assembly. The Air Force B61-12 Tail Kit Assembly System Program Office officials (referred to hereafter as program officials) are responsible for managing the tail kit assembly throughout its life cycle. The Department of Energy and the National Nuclear Security Administration are responsible for all aspects of the B61-12's nuclear warhead, including design, manufacture, and portions of sustainment.

(U) The B61-12 Tail Kit Assembly Program is a category IC, Major Defense Acquisition Program. A category IC, Major Defense Acquisition Program, is an acquisition program that has an estimated total cost of more than \$480 million for RDT&E, or more than \$2.79 billion for procurement. The milestone decision authority of a category IC, Major Defense Acquisition Program, is the head of the responsible DoD service. Program officials plan to procure USAF (b)(4) at an average procurement unit cost of USAF (b)(4).<sup>2</sup> Program officials completed developmental testing and obtained Milestone C approval (initial production) on October 26, 2018.

<sup>2</sup> (U) Average procurement unit cost included costs for procurement but excluded costs for RDT&E and operating and support. All values are in base year 2012 unless otherwise noted.



## **(U) Program Baselines and Requirements**

(U) At Milestone B, the decision authority approves an acquisition program's entry into the engineering, manufacturing, and development phase and defines cost, schedule, and performance requirements to achieve Milestone C, the initial production phase.

### **(U) Cost Requirements**

~~(FOUO)~~ The Milestone B Acquisition Program Baseline (APB), dated December 2012, established a cost ceiling of USAF (b)(4) for RDT&E and USAF (b)(4) for procurement during tail kit assembly engineering, manufacturing, and development. The APB also established a cost ceiling for operating and support costs of USAF (b)(4). As of December 2018, program officials estimated costs of USAF (b)(4) for RDT&E and USAF (b)(4) for procurement.

(U) Program officials updated the APB for Milestone C on February 4, 2019. The Milestone C APB established a cost ceiling of USAF (b)(4) for RDT&E and USAF (b)(4) for procurement. The APB also established a cost ceiling for operating and support costs of USAF (b)(4).

### **(U) Schedule Requirements**

(U) The Milestone B APB established schedule requirements for the first tail kit assembly production delivery between USAF (b)(4), with full-rate production occurring no later than September 2020. Program officials expect production of the tail kit assembly to conclude by USAF (b)(4). Program officials kept the production schedule the same in the Milestone C APB.

~~(SPRD)~~ The Air Force is responsible for integrating the tail kit assembly with the bomb assembly for initial operational capability. OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

[REDACTED]

[REDACTED]

[REDACTED]

### **(U) Performance Requirements**

(U) Performance requirements for the tail kit assembly included aircraft integration, accuracy, sustainment, weapons storage and security vault compatibility, system survivability, operating and support costs, reliability, and service life. Program officials established the tail kit assembly performance requirements in the capability production document, dated October 17, 2018.

*(U) Aircraft Integration Requirement*

(U) The B-2A and F-15E aircraft must be able to deploy the B61-12 in guided delivery mode. In addition, the B61-12 should be deployable from the F-35A and the B-21 aircraft in guided delivery mode.<sup>3</sup> The B61-12 should also be deployable from North Atlantic Treaty Organization F-16 variants and the PA-200 aircraft in free-fall delivery mode.

*(U) Accuracy Requirement*

~~(SFRD)~~ Accuracy is the primary measure of performance and is measured in miss distance from the aim point. OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

In addition, the B61-12 should follow a predictable path to its target in free-fall delivery mode.

*(U) Materiel Availability Requirement*

~~(SFRD)~~ Materiel availability is the percentage of the total inventory capable of performing an assigned mission. OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

*(U) Weapons Storage and Security System Vault Compatibility Requirement*

(U) Weapons storage vaults provide safe, secure storage of assets in hardened aircraft shelters, maintaining close proximity to assigned aircraft. Four B61-12s, with the tail kit assembly attached, must fit in a single weapons storage and security system vault.

*(U) System Survivability Requirement*

(U) System survivability ensures the tail kit assembly maintains its critical capabilities under applicable threat environments, including kinetic and cyber survivability. Kinetic survivability is the ability to endure nuclear radiation and an electromagnetic pulse, whereas cyber survivability is the ability to protect and prevent damage to computer components from unauthorized access. The tail kit assembly must achieve its accuracy requirement after exposure to kinetic testing.

<sup>3</sup> (U) The aircraft integration, accuracy, and reliability performance requirements include a desired objective where the requirement "should" be achieved. Because desired objectives are not required, we did not report on their progress.



*(U) Operating and Support Cost Requirement*

~~(FOUO)~~ The tail kit assembly must have annual operations and maintenance costs under USAF (b)(4) and an average procurement unit cost of under USAF (b)(4).

*(U) Reliability Requirement*

~~(SPRD)~~ Reliability is a measure of the probability that the system will perform without failure over a specific interval, under specified conditions. OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

[REDACTED]

*(U) Service Life Requirement*

(U) The tail kit assembly must remain functional and meet system requirements for a minimum of 20 years. The Air Force will conduct surveillance testing throughout the service life.

## **(U) Review of Internal Controls**

~~(SPRD)~~ DoD Instruction 5010.40 requires DoD organizations to implement a comprehensive system of internal controls that provides reasonable assurance that programs are operating as intended and to evaluate the effectiveness of the controls.<sup>4</sup> OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

[REDACTED]

We will provide a copy of the report to the senior Air Force official responsible for internal controls.

<sup>4</sup> (U) DoD Instruction 5010.40, "Managers' Internal Control Program Procedures," May 30, 2013.

## (U) Finding

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

(U) As of Milestone C, program officials developed the tail kit assembly within the estimated cost, schedule, and performance baselines established. Specifically, the program officials:

- (U) kept cost estimates under the ceiling of USAF (b)(4) for RDT&E and USAF (b)(4) for procurement of USAF (b)(4) established at Milestone B;<sup>5</sup>
- (U) achieved Milestone C approval on October 26, 2018, prior to the April 2019 required date; and
- (U) demonstrated that the tail kit assembly met performance requirements for integration, accuracy, availability, storage, operating and support costs, reliability, and service life.

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

## (U) The Tail Kit Assembly Met Program Baselines

(U) The Air Force developed the tail kit assembly within its estimated cost, schedule, and performance baselines. Program officials established the cost and schedule requirements in the Milestone B APB, dated December 2012. Program officials also established the performance requirements in the Milestone C capability development document, dated October 2018. An APB provides a summary of approved program requirements, and is the agreement between the milestone decision authority and the

<sup>5</sup> (U) The total quantity includes 77 tail kit assemblies for research, development, and evaluation and USAF (b)(4) for procurement.



(U) program manager. The APB incorporates the cost, schedule, and performance requirements from validated requirements documents. Program officials updated the APB for Milestone C on February 4, 2019 and decreased the baseline cost estimates.

***(U) Program Officials Stayed Under Estimated Cost and the Schedule Remains on Track***

(FOUO) Program officials estimated program costs under their established ceiling of USAF (b)(4) for RDT&E and USAF (b)(4) for procurement of USAF (b)(4) established at Milestone B. As of December 2018, program officials estimated the RDT&E efforts would cost USAF (b)(4). Program officials attributed a portion of the USAF (b)(4) difference between the RDT&E cost ceiling and the estimate to USAF (b)(4). Program officials stated that they USAF (b)(4)

[REDACTED]

[REDACTED] In addition, as of December 2018, program officials estimated a total procurement cost of USAF (b)(4) for USAF (b)(4), USAF (b)(4) below the cost ceiling. The February 2019 Milestone C APB established a new cost ceiling of USAF (b)(4) for RDT&E and USAF (b)(4) for procurement.

**(U) Program officials achieved Milestone C approval on October 26, 2018, prior to the April 2019 required date.**

(U) Program officials achieved Milestone C approval on October 26, 2018, prior to the April 2019 required date. The milestone decision authority approved starting production of 250 tail kit assemblies (Lot 1) and procuring some tail kit assembly parts in advance to eliminate any gaps

in production for full-rate production (Lot 2). The milestone decision authority also required the program office to complete the initial operational test and evaluation and ensure the tail kit assembly meets design specifications prior to initiating full-rate production.

(FOUO) Furthermore, the Milestone B APB established the first tail kit assembly delivery between USAF (b)(4), and full-rate production no later than September 2020. As of December 2018, program officials estimated the delivery of the first production unit in USAF (b)(4) (Lot 1), and starting full-rate production (Lot 2) in USAF (b)(4), ahead of the original planned dates. Program officials estimate the contractor will complete production of the USAF (b)(4) by USAF (b)(4). The February 2019 Milestone C APB maintained the same production schedule.

### ***(U) Tail Kit Assembly Performing as Required***

(U) Program officials demonstrated that the tail kit assembly met performance requirements for integration, accuracy, availability, storage, operating and support costs, reliability, and service life. The Air Force Requirements Oversight Council validated these requirements at Milestone C, as required by the Joint Capabilities Integration and Development System Manual.<sup>6</sup>

### ***(U) Aircraft Integration***

(U) Program officials demonstrated that the tail kit assembly met performance requirements for aircraft integration. The B-2A and F-15E aircraft must be able to deploy the B61-12 in guided delivery mode. Program officials consider the B61-12 fully integrated when it functions together with the B-2A and F-15E aircraft mission-planning software to launch the weapon in guided delivery mode. As of July 2018, program officials successfully completed all 31 guided flight tests for both the B-2A and F-15E aircraft, which demonstrated B-2A and F-15E aircraft integration.

### ***(U) Accuracy***

~~(SPRD)~~ Program officials demonstrated that the tail kit assembly met performance requirements for accuracy. OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

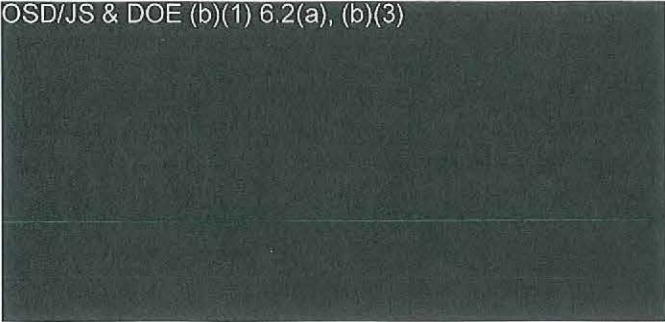
Program officials developed each guided flight test based on multiple variables—such as aircraft type and speed, launch altitude, and distance from target—to test the tail kit assembly guidance capability. Each guided flight test evaluated the tail kit assembly's overall performance, including communications, flight position data, separation characteristics, arming system, and system accuracy. OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

<sup>6</sup> (U) Manual for the Operation of the Joint Capabilities Integration and Development System, August 31, 2018.




(~~SPRD~~) Table 1. Flight Test Summary

OSD/JS & DOE (b)(1) 6.2(a), (b)(3)








(U) Source: The DoD OIG.

### (U) Materiel Availability

(~~SPRD~~) Program officials demonstrated that the tail kit assembly met performance requirements for materiel availability. Materiel availability consists of the percentage of the total inventory capable of performing an assigned mission. 

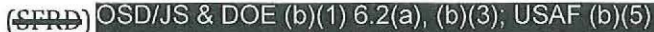
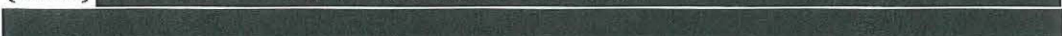




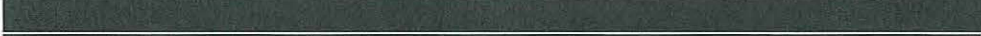


OSD/JS & DOE (b)(1) 6.2(a), (b)(3)



Program officials calculate materiel availability by dividing the total number of tail kit assemblies minus unserviceable (failed or damaged) tail kit assemblies by the total number of tail kit assemblies.

$$(U) \text{ Materiel Availability} = \frac{\text{All tail kit assemblies} - \text{unserviceable tail kit assemblies}}{\text{All tail kit assemblies}}$$

(~~SPRD~~) OSD/JS & DOE (b)(1) 6.2(a), (b)(3); USAF (b)(5)

<sup>7</sup> (U) DOE (b)(1) 6.2(a), (b)(3)

(SFRD) [REDACTED] OSD/JS & DOE (b)(1) 6.2(a), (b)(3), USAF (b)(5)

(FOUO) [REDACTED] USAF (b)(4)

[REDACTED] The tail kit assembly depot source of repair memorandum, dated January 2018, stated that it was not cost-effective to invest in the resources associated with standing up an Air Force repair capability because of the unpredictable nature of the workload. However, program officials plan to include an option to procure technical data rights in the production contract to reduce the risk of a spare tail kit assembly shortage in the future. The technical data rights would allow Air Force officials to diagnose and repair the tail kit assembly in the future if the tail kit assembly cannot meet the materiel availability requirement. The technical data rights would also provide program officials with an opportunity to procure more tail kit assemblies if needed. [REDACTED] USAF (b)(4)

[REDACTED]<sup>8</sup> Program officials will reevaluate the product support strategy every 5 years. While the production contract has not yet been awarded, we agreed with the Air Force that procuring technical data rights is a cost-effective approach to fixing tail kits if needed in the future.

### *(U) Weapons Storage and Security System Vault Compatibility*

(U) Program officials demonstrated that the tail kit assembly met performance requirements for weapons storage and security system vault compatibility. The Air Force must be able to store four B61-12s in the existing weapons storage vaults. Weapons storage vaults provide safe, secure storage of bombs in concrete aircraft shelters within close proximity to assigned aircraft. The design of the weapon's vaults protects the bombs in operational locations. The Air Force stores weapons within the vault in a "prep for strike" configuration to expedite transfer from the vault to an aircraft. Program officials verified that the addition of the tail kit assembly did not affect storage capability of the B61-12. Figure 3 shows weapons loaded in a weapons storage vault.

<sup>8</sup> (U) Values are in current year 2019.



(U) Figure 3. Weapons Storage and Security System Vault



(U) Source: The Air Force.

### *(U) Operating and Support Costs*

(U) Program officials demonstrated that the tail kit assembly met performance requirements for operating and support costs. Operating and support costs include the average procurement unit cost and the tail kit assembly operations and maintenance costs. Furthermore, Cost Assessment and Program Evaluation officials estimated costs by developing an independent cost estimate within 2 percent of the program office estimated costs.<sup>9</sup>

### *(U) Acquisition Program Unit Cost*

(FOUO) The October 2018 Milestone C capability production document required the tail kit assembly to maintain an average procurement unit cost USAF (b)(4). USAF (b)(4)

[REDACTED]. The February 2019 Milestone C APB updated the average procurement unit cost ceiling to USAF (b)(4). Even after the APB update, program officials' average procurement unit cost estimate was still under the cost ceiling. Since the Cost

<sup>9</sup> (U) Cost Assessment and Program Evaluation officials provide independent analytic advice on all aspects of DoD programs.

(FOUO) Assessment and Program Evaluation independent cost estimate was within 2 percent of the program office estimated costs, and the program office estimate was under the cost ceiling, we determined that the program was meeting the average procurement unit cost requirement.

(FOUO) In addition, the October 2018 Milestone C capability production document required the tail kit assembly to have annual operations and maintenance costs under USAF (b)(4) . USAF (b)(4)

[REDACTED]

Since the Cost Assessment and Program Evaluation independent cost estimate was within 1 percent of the program office estimated costs, and the program office estimate was under the cost ceiling, we determined that the program was meeting the operations and maintenance cost requirement.

#### *(U) Reliability and Service Life*

(SPRD) Program officials demonstrated that the tail kit assembly met performance requirements for reliability and service life. Reliability is a measure of the probability that the system will perform without failure over a specific interval, under specified conditions. OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

The tail kit assembly must remain functional and meet system requirements for a minimum of 20 service years in a tail kit assembly storage container, a B61-12 configuration, or any combination of both. USAF (b)(5)

[REDACTED]

(SPRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3); USAF (b)(5)

[REDACTED]



(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [REDACTED]

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [REDACTED]

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [REDACTED]

**(U) Program Officials Demonstrated Kinetic Survivability Requirement**

(SFRD) Program officials demonstrated that the tail kit assembly met the kinetic survivability requirement. OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [REDACTED]

The tail kit assemblies were subjected to a high-altitude electromagnetic pulse and nuclear radiation. In addition, the program office conducted environmental testing that included vibration, thermal shock, humidity, and simulated aircraft noise to "age" the tail kit assembly to 80 percent of the total life prior to accuracy testing. OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [REDACTED]

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [REDACTED]

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [REDACTED]

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)  
[Redacted]  
[Redacted]  
[Redacted]  
[Redacted]

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)  
[Redacted]  
[Redacted]  
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1. (SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [Redacted]
2. (SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [Redacted]
3. (SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [Redacted]  
[Redacted]
4. (SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [Redacted]
5. (SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3) [Redacted]

(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)  
[Redacted]  
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(SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)  
[Redacted]  
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[Redacted]  
[Redacted]



(SPRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

## (U) Conclusion

(FOUO) Air Force officials generally developed the tail kit assembly within cost, schedule, and performance requirements. As of December 2018, program costs remained under the original cost ceiling by USAF (b)(4) for RDT&E and USAF (b)(4) for procurement. Program officials also achieved Milestone C approval on October 26, 2018, 6 months before the requirement. In addition, the tail kit assembly demonstrated its ability to meet the performance requirements. However, the Tail Kit Assembly Program is not expected to reach full-rate production until March 2020. The tail kit assembly will continue to undergo operational testing through August 2019, which could identify additional cost, schedule, and performance risks if testing and results do not go as planned.

(SPRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

## (U) Recommendation, Management Comments, and Our Response

(SPRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

### (U) Principal Deputy Assistant Secretary of the Air Force Comments

(SPRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

(SPRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)  
[Redacted]  
[Redacted]  
[Redacted]  
[Redacted]

(FOUO) OSD/JS (b)(3); DOE (b)(1) 6.2(a), (b)(3)  
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*(U) Our Response*

(SPRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)  
[Redacted]  
[Redacted]  
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[Redacted]  
[Redacted]  
[Redacted]  
[Redacted]  
[Redacted]

(SPRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)  
[Redacted]  
[Redacted]  
[Redacted]



(U) To close this recommendation, Air Force officials need to:

- (SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)  
[REDACTED]  
[REDACTED]
- (SFRD) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)  
[REDACTED]  
[REDACTED]

(U) We will close this recommendation once we verify that the actions taken by the Air Force fully address the recommendation.

## (U) Appendix A

### (U) Scope and Methodology

(U) We conducted this performance audit from June 2018 through February 2019 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

(U) We conducted a site visit to Eglin Air Force Base, Florida, and interviewed program officials. We also interviewed officials from the following offices:

- (U) Director, Operational Test and Evaluation
- (U) Assistant Secretary of Defense, Research and Evaluation
- (U) Assistant Secretary of Defense, Acquisition and Sustainment
- (U) Deputy Assistant Secretary of Defense, Developmental Test and Evaluation
- (U) Defense Contract Management Agency
- (U) Secretary of the Air Force, Acquisition
- (U) Secretary of the Air Force, Test and Evaluation
- (U) Air Force 47th Cyber Test Squadron

(U) We reviewed documentation that program officials used to develop the tail kit assembly. We collected and analyzed documents dated September 2012 through October 2018. Examples of documents we reviewed and analyzed include:

- (U) B61-12 Life Extension Program Tail Kit Assembly Milestone B Acquisition Decision Memorandum, November 2012
- (U) B61-12 Life Extension Program Tail Kit Assembly Advance Procurement Acquisition Decision Memorandum, January 2017
- (U) B61-12 Life Extension Program Tail Kit Assembly Milestone C Acquisition Decision Memorandum, October 2018
- (U) Acquisition Program Baseline, B61-12 Life Extension Program Tail Kit Assembly, December 2012



- (U) Acquisition Program Baseline (APB), B61-12 Life Extension Program Tail Kit Assembly, February 2019
- (U) B61-12 Tail Kit Assembly (TKA) Depot Source of Repair Memorandum, January 2018
- (U) B61-12 Tail Kit Assembly – ACAT [Acquisition Category] 1D, Acquisition Strategy, June 2018
- (U) Test and Evaluation Master Plan for B61-12 Tail Kit Assembly, April 2013 and July 2018
- (U) B61-12 Tail Kit Assembly – ACAT [Acquisition Category] 1D – Life-Cycle Sustainment Plan, July 2018
- (U) Cost Analysis Requirements Description for B61 Mod 12 Life Extension Program Tail Kit Assembly, May 2018
- (U) B61-12 Life Extension Program Tail Kit Assembly – ACAT [Acquisition Category] 1D - Systems Engineering Plan, April 2018
- (U) Defense Acquisition Executive Summaries for B61-12 Life Extension Program Tail Kit Assembly, December 2018
- (U) Selected Acquisition Reports for B61-12 Life Extension Program Tail Kit Assembly, annually, December 2012 to December 2017
- (U) B61-12 Tail Kit Assembly Developmental Test Operational Aging Test Reports, 24 total, June 2017 to May 2018
- (U) B61-12 Tail Kit Assembly HEMP [High Altitude Electromagnetic Pulse] Aging Reports, 31 total, June 2017 through May 2018
- (U) B61-12 Tail Kit Assembly, B61-12 TKA, System Performance Specifications, January 2016
- (U) B6-12 Tail Kit Assembly Aircraft and Support Equipment Final Fit Check Report, June 2014

(U) We identified policies, procedures, and practices used by the Air Force to develop the tail kit assembly and gathered corroborating evidence to ensure a reasonable basis for the findings and conclusions within the context of audit objectives. We reviewed guidance contained in:

- (U) DoD Directive 5000.01, "The Defense Acquisition System," certified as of November 2007

- (U) DoD Instruction 5000.02, "Operation of the Defense Acquisition System," Change 3, August 2017
- (U) Manual for the Operation of the Joint Capabilities Integration and Development Systems, August 2018
- (U) Air Force Pamphlet 63-128, "Integrated Life Cycle Management," July 2014

### **(U) Use of Computer-Processed Data**

(U) We used computer-processed data to determine whether the tail kit assembly met the accuracy requirement. Program officials provided 31 guided flight test results to support their effort to meet the accuracy requirement. We assessed the reliability of the data by (1) checking for duplicate records, (2) identifying corroborative witness verification, (3) interviewing program officials knowledgeable about the data, and (4) verifying independent oversight of the drop tests. We determined that the data were sufficiently reliable for the purposes of this report.

### **(U) Prior Coverage**

(U) No prior coverage has been conducted on the tail kit assembly during the last 5 years.



## (U) Appendix B

### (U) Sources of Classified Information

(U) The documents listed below are sources used to support classified information within this report.

- Source 1:** (U) Final Reliability Test Summary Report (Document classified at Secret/Formerly Restricted Data)  
Declassification Date: Not Applicable to Formerly Restricted Data  
Generated Date: September 2018
- Source 2:** (U) Reliability, Availability, Maintainability, and Cost (RAM-C) Rationale Report (Document classified at Secret/Formerly Restricted Data)  
Declassification Date: Not Applicable to Formerly Restricted Data  
Generated Date: May 2018
- Source 3:** (U) Reliability, Availability, Maintainability, and Cost (Ram-C) Rationale Report Change Page (Document classified at Secret/Formerly Restricted Data)  
Declassification Date: Not Applicable to Formerly Restricted Data  
Generated Date: August 2018
- Source 4:** (U) Capability Production Document for B61-12 Life Extension Program Tail Kit Assembly (Document classified at Secret/No Foreign/Formerly Restricted Data)  
Declassification Date: Not Applicable to Formerly Restricted Data  
Generated Date: October 2018
- Source 5:** (U) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)  
[REDACTED]
- Source 6:** (U) OSD/JS & DOE (b)(1) 6.2(a), (b)(3)  
[REDACTED]

**Source 7:** (U) B61-12 Tail Kit Assembly Flight Test Reports (Documents classified at Secret/Formerly Restricted Data)

Declassification Date: Not Applicable to Formerly Restricted Data

Generated Date: 31 Reports from August 2017 to June 2018

**Source 8:** (U) Capability Development Document for B61-12 Life Extension Program Tail Kit Assembly (Document classified at Secret/No Foreign/Formerly Restricted Data)


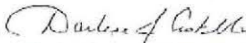
Declassification Date: Not Applicable to Formerly Restricted Data

Generated Date: September 2012



## (U) Management Comments

### (U) Principal Deputy Assistant Secretary of the Air Force

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DEPARTMENT OF THE AIR FORCE	
WASHINGTON DC	
	
OFFICE OF THE ASSISTANT SECRETARY	15 MAR 2019
MEMORANDUM FOR DEPARTMENT OF DEFENSE INSPECTOR GENERAL	
FROM: SAF/AQ 1060 Air Force Pentagon Washington, DC 20330-1060	
SUBJECT: Air Force Response to DoD Office of Inspector General Draft Report, "B61-12 Tail Kit Assembly Program" (Project No. D2018-D000AU-0176.000)	
(U) This is the Department of the Air Force response to the DoDIG Draft Report, "B61-12 Tail Kit Assembly Program" (Project No. D2018-D000AU-0176.000). The Air Force non-concurs with the report as written and welcomes the opportunity to resolve the issue. Please see the attached management comments for additional details.	
The SAF/AQ point of contact is [REDACTED]	
	
DARLENE J. COSTELLO Principal Deputy Assistant Secretary of the Air Force (Acquisition, Technology & Logistics)	
Attachment: Management Comments	
<del>SECRET//FORMERLY RESTRICTED DATA</del>	

**(U) Principal Deputy Assistant Secretary of the  
Air Force (cont'd)**

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Department of Defense Inspector general  
Final Report on B61-12 Tail Kit Assembly Program  
(Project No. D2018-D000AU-0176.000)

~~(SFR)~~ RECOMMENDATION 1: OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

~~(SFR)~~ AIR FORCE RESPONSE: OSD/JS & DOE (b)(1) 6.2(a), (b)(3)

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**(U) Principal Deputy Assistant Secretary of the  
Air Force (cont'd)**



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AIR FORCE NUCLEAR WEAPONS CENTER  
KIRTLAND AIR FORCE BASE NEW MEXICO

FEB 22 2019

OSD/JS (b)(3); DOE (b)(1) 6.2(a), (b)(3)




  
JOSEPH M. ODER, SES  
Executive Director

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**(U) Principal Deputy Assistant Secretary of the  
Air Force (cont'd)**

DOE (b)(1) 6.2(a), (b)(3)





## **(U) Acronyms and Abbreviations**

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- (U) APB Acquisition Program Baseline
- (U) RDT&E Research, Development, Testing, and Evaluation
- (U) SATS Stand Alone Test Set

## (U) Glossary

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**(U) Capability Production Document.** An acquisition document that specifies capability requirements and other related information necessary to support production of an acquisition program.

**(U) Department of Energy.** The U.S. department that addresses energy, including environmental and nuclear challenges, through science and technology solutions.

**(U) High Altitude Electromagnetic Pulse.** The blast of energy generated by a high-altitude nuclear explosion, which can interfere with and disrupt electronic equipment.

**(U) Milestone B.** A decision point that approves an acquisition program's entry into the engineering and manufacturing phase of the DoD acquisition life cycle.

**(U) Milestone C.** A decision point that approves an acquisition program's entry into the production and deployment phase of the DoD acquisition life cycle.

**(U) Milestone Decision Authority.** The designated individual with overall responsibility for a program. The milestone decision authority approves entry of an acquisition program into the next phase of the acquisition process and is accountable for cost, schedule, and performance reporting to higher authority, including Congress.

**(U) National Nuclear Security Administration.** An agency that maintains and enhances the safety, security, and effectiveness of the U.S. nuclear stockpile without nuclear explosive testing.

**(U) North Atlantic Treaty Organization.** An alliance of countries from Europe and North America that consults, cooperates, and conducts multinational defense and security crisis-management operations.



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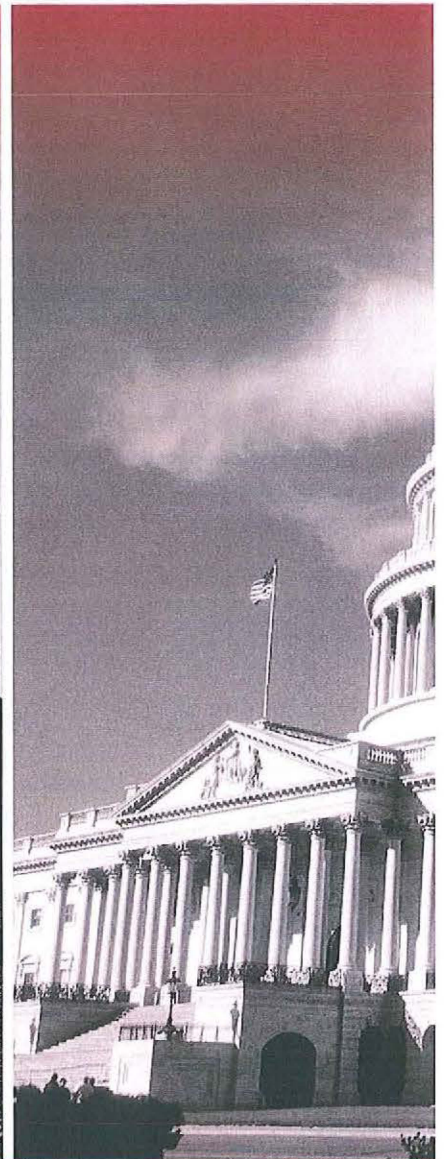
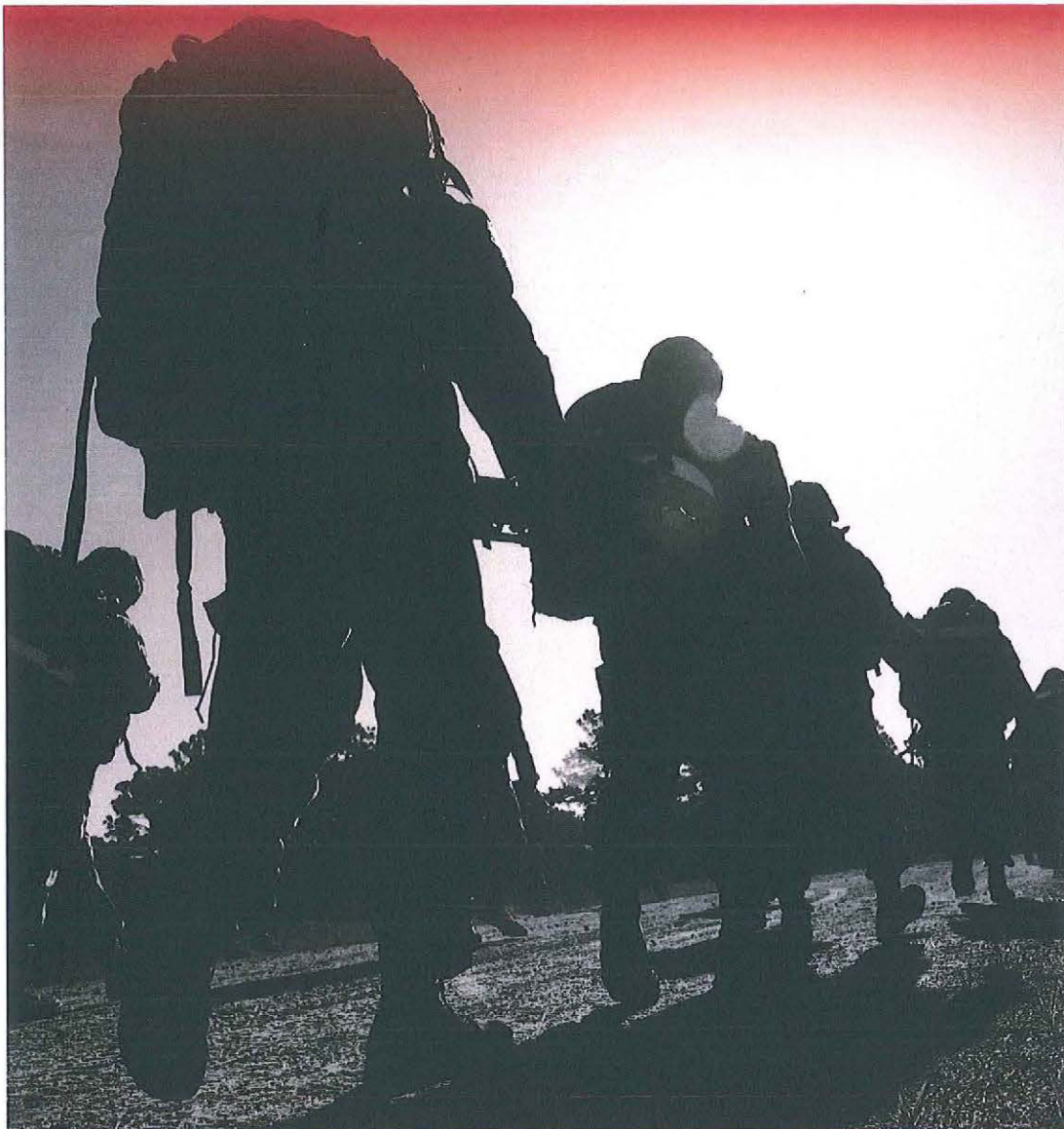
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