

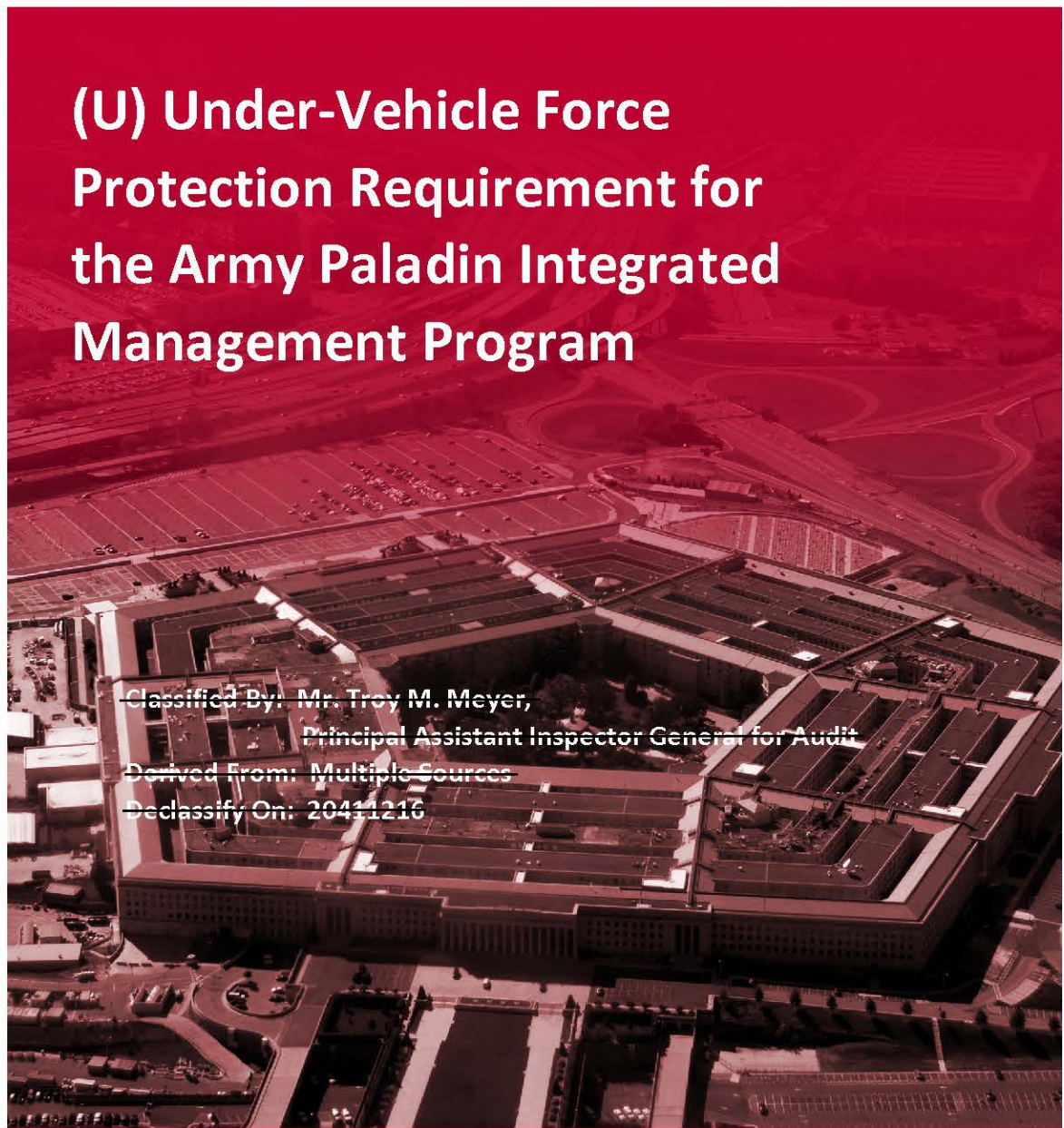
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# INSPECTOR GENERAL

*U.S. Department of Defense*

JULY 21, 2017



## (U) Under-Vehicle Force Protection Requirement for the Army Paladin Integrated Management Program

~~Classified By: Mr. Troy M. Meyer,  
Principal Assistant Inspector General for Audit  
Derived from: Multiple Sources  
Declassify On: 20411216~~

INTEGRITY ★ EFFICIENCY ★ ACCOUNTABILITY ★ EXCELLENCE

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# (U) Results in Brief

## (U) Under-Vehicle Force Protection Requirement for the Army Paladin Integrated Management Program

July 21, 2017

### (U) Objective

(U) We determined whether the Army adequately protected soldiers from under-vehicle blasts as part of the force protection requirement for the Paladin Integrated Management (PIM) program.

### (U) Background

(S) The Army's PIM program has estimated program costs of \$1.10 billion in research, development, test and evaluation and \$6.85 billion in procurement funds. The PIM program includes ammunition carriers and projectile-firing armored vehicles, called howitzers, for use in ground combat. PIM program vehicles operate as a set of one ammunition carrier and one howitzer. The PIM program increases force protection and improves survivability, mobility, and lethality of the vehicles. Army officials required PIM program vehicles to protect soldiers from [REDACTED]

Additionally, Army officials developed under-vehicle armor kits to protect soldiers from [REDACTED]

### (U) Findings

(S) [REDACTED]

### (U) Findings (cont'd)

(S) [REDACTED] PIM program officials estimated that the redesign of ammunition stowage and floor mats would cost \$30.3 million. However, Army Fires Center of Excellence officials delayed the redesign of ammunition stowage and floor mats to future budget years so that the Army could fund other existing field artillery systems. [REDACTED]

(S) Additionally, Army officials did not justify whether [REDACTED] under-vehicle armor kits, valued at \$12.7 million, which would be added to the vehicle to protect soldiers from [REDACTED] were the appropriate planned quantity for future combat and training needs. This occurred because Army officials relied on the historical number of Paladin vehicles deployed to Iraq and did not complete an analysis or provide evidence to support future combat and training needs. As a result, the Army does not know whether the planned procurement quantity of [REDACTED] under-vehicle armor kits is the appropriate quantity to protect soldiers from [REDACTED] and meet training needs.

### (U) Recommendations

(U) We recommend that the Commander, Army Fires Center of Excellence:

- (U) Consider requesting funds to redesign ammunition stowage and floor mats to protect soldiers on combat missions that require increased under-vehicle protection.
- (U) Analyze future combat and training needs for under-vehicle armor kits to ensure appropriate quantities are available.



## (U) Results in Brief

### *(U) Under-Vehicle Force Protection Requirement for the Army Paladin Integrated Management Program*

#### **(U) Recommendations (cont'd)**

(U) We recommend that the Deputy Chief of Staff of the Army, G-3/5/7, Operations, review and approve quantities of under-vehicle armor kits.

(U) We recommend that the Deputy Chief of Staff of the Army, G-8, Programming, consider seeking funds to redesign ammunition stowage and floor mats for PIM program vehicles.

(U) We recommend that the Program Executive Officer, Ground Combat Systems, consider redesigning ammunition stowage and floor mats to protect soldiers on combat missions that require increased under-vehicle protection.

#### **(U) Management Comments and Our Response**

(U) The Commanding General, Army Fires Center of Excellence, agreed with and addressed all specifics of the recommendations. The Commanding General stated that Fires Center of Excellence officials will request funds to redesign ammunition stowage and floor mats in PIM program vehicles in FY 2018. Additionally, the Commanding General stated that Fires Center of Excellence officials will conduct analysis in FY 2018 to determine operational requirements for under-vehicle armor kits. Therefore, these recommendations are resolved but will remain open. We will close these recommendations once we verify that Fires Center of Excellence officials re-submit the request for funds for the redesign of ammunition stowage and floor mats and complete an analysis for quantities for under-vehicle armor kits in FY 2018.

(U) The Director of Force Management, responding for the Deputy Chief of Staff of the Army, G-3/5/7, Operations, agreed with and addressed all specifics of the recommendation. The Director established new procedures to validate and document equipment quantities. Therefore, this recommendation is resolved

#### **(U) Management Comments and Our Response (cont'd)**

(U) but will remain open. We will close this recommendation once we verify that G-3/5/7 officials review and approve quantities of under-vehicle armor kits.

(U) The Fires Division Chief, G-8, answering for the Deputy Chief of Staff of the Army, G-8, Programming, agreed with and addressed all specifics of the recommendation. The Fires Division Chief stated that an unfunded request for the redesign of ammunition stowage and floor mats will be submitted as part of the FY 2018 Army budget. Therefore, this recommendation is resolved but will remain open. We will close this recommendation when we verify that a request was resubmitted.

(U) The Deputy Program Executive Officer, Ground Combat Systems, responding for the Program Executive Officer, agreed with and addressed all specifics of the recommendation. The Deputy Program Executive Officer stated that PIM program officials began researching the redesign of ammunition stowage and floor mats in June 2016 with an estimated completion date of February 2018. Therefore, this recommendation is resolved but will remain open. We will close this recommendation once we verify that PIM program officials complete the redesign research in February 2018.

(U) Please see the Recommendations Table on the next page.

**(U) Recommendations Table**

(U) Management	Recommendations Unresolved	Recommendations Resolved	Recommendations Closed
Deputy Chief of Staff of the Army, G-3/5/7, Operations		B.2	
Deputy Chief of Staff of the Army, G- 8, Programming		A.2	
Commander, Army Fires Center of Excellence		A.1, B.1	
Program Executive Officer, Ground Combat Systems		A.3	<b>(U)</b>

(U) The following categories are used to describe an 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** – The DoD OIG verified that the agreed-upon corrective actions were implemented.



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

July 21, 2017

(U) MEMORANDUM FOR AUDITOR GENERAL, DEPARTMENT OF THE ARMY

(U) SUBJECT: Under-Vehicle Force Protection Requirement for the Army  
Paladin Integrated Management Program  
(Report No. DODIG-2017-103)

(S) We are providing this report for your information and use. [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] Additionally, Army officials did not justify whether [REDACTED] under-vehicle armor kits, valued at \$12.7 million, which would be added to the vehicle to protect soldiers from [REDACTED] were the appropriate planned quantity for future combat and training needs. We conducted this audit according to generally accepted government auditing standards.

(U) We considered management comments on the draft of this report when preparing the final report. Comments from the Deputy Chief of Staff of the Army, G-3/5/7, Operations and G-8, Programming; Commander, Army Fires Center of Excellence, and Program Executive Officer, Ground Combat Systems, addressed all specifics of the recommendations and conformed to the requirements of DoD Instruction 7650.03. Therefore, we do not require additional comments.

(U) We appreciate the courtesies extended to the staff. Please direct questions to Ms. Sarah Davis at (703) 604-9031 (DSN 664-9031).

Handwritten signature of Troy M. Meyer in blue ink.

Troy M. Meyer  
Principal Assistant Inspector General  
for Audit

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## **(U) Introduction**

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### **(U) Objective**

(U) We determined whether the Army adequately protected soldiers from under-vehicle blasts as part of the force protection requirement for the Paladin Integrated Management (PIM) program. This audit was the second in a series of audits on the PIM program. The first audit was DODIG-2016-118, “Army Justified Initial Production Plan for the Paladin Integrated Management Program but Has Not Resolved Two Vehicle Performance Deficiencies,” August 5, 2016. In the first audit, we determined that PIM program officials justified their plan to produce 133 initial production vehicles. Furthermore, PIM program officials initiated system fixes to address seven of the nine performance deficiencies identified by the test community during the system development phase. See Appendix A for a discussion of the audit scope and methodology and prior coverage related to the objective and Appendix B for a list of derivatively classified sources.

### **(U) Background**

(U) The Army’s PIM program is an acquisition category IC major defense acquisition program with estimated program costs of \$1.10 billion in research, development, test and evaluation and \$6.85 billion in procurement funds. The PIM program includes ammunition carriers and projectile-firing armored vehicles, called howitzers, for use in ground combat. PIM program vehicles operate as a set of one ammunition carrier and one howitzer (See Figure 1). The PIM program increases force protection and improves survivability, mobility, and lethality of the vehicles. Force protection safeguards soldiers in PIM program vehicles from top- and side-directed bullets, artillery, blast fragments, and under-vehicle blasts.

*(U) Figure 1. PIM Program Vehicle Sets – Ammunition Carrier and Howitzer*



(U) Source: PIM Program Office.

(U) The Army uses PIM program vehicles to fire at enemies [REDACTED]. The Army will use PIM program vehicles in field artillery battalions as part of armored brigade combat teams. Several DoD organizations are responsible for developing, testing, or overseeing PIM program vehicles to ensure the Army achieves required vehicle capabilities for use in ground combat. Table 1 summarizes key organizations responsible for the PIM program.

*(U) Table 1. Key Organizations Responsible for the PIM Program*

(U) Organizations	Responsibilities for the PIM Program
Joint Requirements Oversight Council	Validates operational program requirements
Director, Operational Test and Evaluation	Oversees and evaluates live-fire tests
Deputy Chief of Staff of the Army, G-3/5/7, Operations	Validates program operational requirements and equipment quantities
Deputy Chief of Staff of the Army, G-4, Logistics	Establishes and oversees policies, programs, and plans to equip and sustain the readiness of Army force and equipment
Deputy Chief of Staff of the Army, G-8, Programming	Determines funding resources for Army programs
Assistant Secretary of the Army for Acquisition, Logistics, and Technology	Sole and final decision authority for milestone reviews
Army Test and Evaluation Command	Independent tester and evaluator for program vehicles
Army Fires Center of Excellence	Develops program operational requirements and represents users of program vehicles
Program Executive Officer, Ground Combat Systems	Oversees development and acquisition of ground combat vehicles, including PIM program vehicles
PIM Program Office	Develops program vehicles to meet operational requirements and procures vehicles for the Army Fires Center of Excellence

(U)

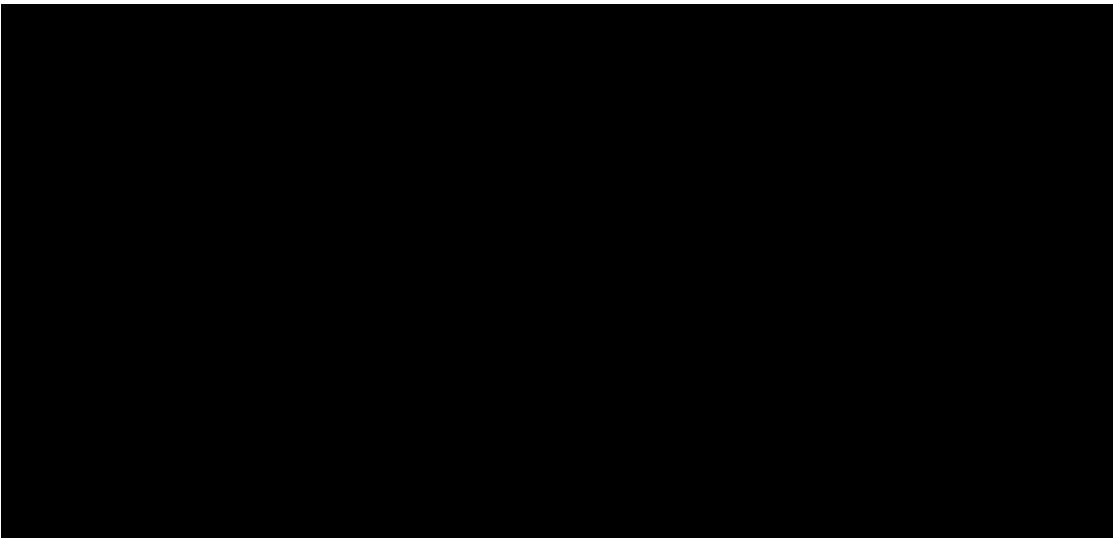
(U) Source: DoD OIG.

### ***(U) Force Protection Requirements for Under-Vehicle Blasts***

~~(S)~~ On December 19, 2011, the Vice Chairman of the Joint Chiefs of Staff, Joint Requirements Oversight Council, validated operational requirements for PIM program vehicles in the capability production document. According to the capability production document, PIM program vehicles have two levels of under-vehicle blast protection—threshold and objective. The Joint Capabilities Integration and Development System manual states that the threshold level is the minimum requirement and the objective level is a higher-level performance requirement that can further mitigate operational

(S) threats.<sup>1</sup> Army officials required PIM program vehicles to protect soldiers, at the minimum, from [REDACTED] Army officials developed under-vehicle armor kits to protect soldiers at the objective level from [REDACTED] (See Figure 2). PIM program under-vehicle armor kits will give commanders an option to increase protection for soldiers as missions require. [REDACTED] [REDACTED] When the Vice Chairman approved the capability production document, he encouraged the Army to purchase appropriate quantities of under-vehicle armor kits if the Army demonstrated that the kits are suitable and economical.

*(U) Figure 2. Add-on Armor Plates Installed on a PIM Program Vehicle*



(U) Source: PIM Program Office.

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<sup>1</sup> (U) Manual for the Operation of the Joint Capabilities Integration and Development System, updated December 18, 2015.

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

(U) 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>2</sup> We identified an internal control weakness with under-vehicle armor kit quantities. Specifically, Army Fires Center of Excellence (FCoE) officials did not complete analysis or provide evidence for under-vehicle armor kit quantities. We will provide a copy of the report to the senior Army FCoE official responsible for internal controls.

## **(U) Management Comments on the Report Background and Our Response**

### *(U) Program Executive Officer, Ground Combat Systems, Comments on Force Protection Requirements for Under-Vehicle Blasts*

(U) The Deputy Program Executive Officer, Ground Combat Systems, responding for the Program Executive Officer, stated that the Vice Chairman of the Joint Chiefs of Staff approved the capability production document but did not approve the under-vehicle armor kits. The Deputy Program Executive Officer also stated that the Under Secretary of Defense for Acquisition, Logistics, and Technology approved testing to determine whether the under-vehicle armor kits performed at the higher-level requirement and whether the under-vehicle armor kits impacted PIM program vehicle mobility. The Deputy Program Executive Officer stated that PIM program officials asked the Army about purchasing under-vehicle armor kits; however, the Vice Chairman of the Joint Chiefs of Staff did not encourage the ordering of under-vehicle armor kits. Additionally, the Deputy Program Executive Officer, Ground Combat Systems, stated that the audit team should replace “minimum” with “threshold” and replace “higher” with “objective.”

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<sup>2</sup> (U) DoD Instruction 5010.40, “Managers’ Internal Control Program Procedures,” May 30, 2013.

*(U) Our Response*

(U) We agree the Vice Chairman of the Joint Chiefs of Staff approved the capability production document. We did not question whether the Under Secretary of Defense for Acquisition, Logistics, and Technology approved testing to evaluate under-vehicle armor kit performance on PIM program vehicles or whether PIM program officials asked the Army for under-vehicle armor kits. However, in Joint Requirement Oversight Council Memorandum 172-11, "Review of Analysis of Alternatives and Capability Production Document for the M109 Family of Vehicles (Paladin)," December 19, 2011, the Vice Chairman encouraged the purchase of under-vehicle armor kits if they proved to be suitable and economical.

(U) Additionally, the use of minimum and higher are consistent with the Joint Capabilities Integration and Development System manual. The manual states that the threshold level is the minimum requirement and the objective level is a higher-level performance requirement that can further mitigate operational threats.

## (U) Finding A

### (U) Paladin Integrated Management Program Vehicles Generally Met Under-Vehicle Blast Protection Requirements, but Improvement Needed

(S) [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] PIM program officials estimated that the redesign of ammunition stowage and floor mats would cost \$30.3 million. However, Army FCoE officials delayed the redesign of ammunition stowage and floor mats to future budget years so that the Army could fund other existing field artillery systems. [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

### (U) PIM Program Vehicles Met the Minimum Under-Vehicle Protection Requirement

(S) [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] The test plan, approved by the Director, Operational Test and Evaluation (DOT&E), stated

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<sup>3</sup> (S) [REDACTED]  
[REDACTED]

(S) that PIM program vehicles would meet the [REDACTED]  
[REDACTED]

- (S) [REDACTED]
- (S) [REDACTED]
- (S) [REDACTED]  
[REDACTED]

(S) According to the ATEC test report prepared for the PIM program office, [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

### **(U) Higher Under-Vehicle Protection Requirement Met, but Loose Interior Hardware Injured Soldiers**

(S) [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] The DOT&E approved test plan stated that PIM program vehicles would meet the [REDACTED]  
[REDACTED]

- (S) [REDACTED]
- (S) [REDACTED]
- (S) [REDACTED]  
[REDACTED]

(S) [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

---

<sup>4</sup> (S) [REDACTED]

<sup>5</sup> (S) [REDACTED]

<sup>6</sup> (S) [REDACTED]



(S) [Redacted]  
[Redacted]  
[Redacted]

- (S) [Redacted]  
[Redacted]  
[Redacted]  
[Redacted]  
[Redacted]  
[Redacted]  
[Redacted]

- (S) [Redacted]  
[Redacted]  
[Redacted]

- (S) [Redacted]  
[Redacted]  
[Redacted]  
[Redacted]  
[Redacted]

(S) [Redacted]  
[Redacted]

(U) Table 2. Test Results of Under-Vehicle Blasts

<b>SECRET</b>						
Vehicle	Under-Vehicle Armor Kit	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
Howitzer 1	Yes	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
Howitzer 2	Yes	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
Ammunition Carrier	Yes	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]

(U) Source: DoD OIG.

## (U) Redesign Funds for Interior Hardware Delayed Because of Competing Army Priorities

(S) PIM program officials estimated that the redesign of ammunition stowage and floor mats to protect soldiers from the explosive force of [REDACTED] would cost \$30.3 million. Additionally, PIM program officials planned to develop options to redesign ammunition stowage and floor mats. PIM program officials stated that they briefed FCoE officials about the redesign effort in June and October 2016. However, FCoE officials delayed the redesign of ammunition stowage and floor mats to future budget years so that the Army could fund other existing field artillery systems.

(U) FCoE officials delayed the redesign of ammunition stowage and floor mats to future budget years so that the Army could fund other existing field artillery systems.

(U) In December 2016, FCoE officials prioritized 96 unfunded requirements, valued at \$4.6 billion, for 26 Army field artillery systems. Based on their priorities, FCoE officials requested funds for 21 unfunded requirements, valued at \$2.4 billion, but did not include the redesign of ammunition stowage and floor mats for PIM program vehicles in the funding request. FCoE officials stated that they continue to delay many valid unfunded requirements, including the redesign of ammunition stowage and floor mats, to support other existing field artillery systems.

(S) In March 2017, PIM program officials stated that FCoE officials did not have an opportunity to determine funds needed for the redesign of ammunition stowage and floor mats because they did not receive the under-vehicle blast test report until December 2016. FCoE officials stated that they included the redesign of ammunition stowage and floor mats in the FY 2017 budget cycle but rated the redesign as a lower priority pending the under-vehicle blast final test report, specific redesign options, and funding guidance related to the higher-level protection requirement from [REDACTED]. FCoE officials stated that they will address the funding need to redesign ammunition stowage and floor mats in the FY 2018 budget cycle. The Commander, FCoE, should consider requesting funds to redesign ammunition stowage and floor mats to protect soldiers on combat missions that require increased

~~(S)~~-under-vehicle protection. The Deputy Chief of Staff of the Army, G-8, Programming, should consider seeking funds to redesign ammunition stowage and floor mats for PIM program vehicles. The Program Executive Officer, Ground Combat Systems, should consider redesigning ammunition stowage and floor mats to protect soldiers on combat missions that require increased under-vehicle protection.

## **(U) Soldiers Could Sustain Moderate Injuries From Under-Vehicle Blast Threats**

~~(S)~~ [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

## **(U) Conclusion**

~~(S)~~ [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

## **(U) Management Comments on the Finding and Our Response**

### *(U) Commander, Army Fires Center of Excellence Comments on Interior Hardware Redesign Delay in Finding Paragraph*

(U) The Commanding General, Army FCoE, proposed a revision to the Finding to clarify why FCoE officials delayed the redesign of interior hardware. Specifically, the Commanding General stated that the redesign requirement was included in the FY 2017 budget but was not funded due to competing Army funding requirements and lack of test results. The Commanding General also stated that upon completion of the redesign and testing, FCoE officials will resubmit the request for the redesign of interior hardware in the FY 2018 budget.

*(U) Our Response*

(U) As stated in the report under the heading section titled “Redesign Funds for Interior Hardware Delayed Because of Competing Army Priorities” we included FCoE officials’ statements on redesign options and tests results for interior hardware; therefore, we made no change to the report.

*(U) Program Executive Officer, Ground Combat Systems, Comments on the Finding*

(S) The Deputy Program Executive Officer, Ground Combat Systems, responding for the Program Executive Officer, stated that [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]

[REDACTED] The Deputy Program Executive Officer also stated that the audit team needs to replace “mannequin” with “hybrid III anthropomorphic test devise.” Furthermore, the Deputy Program Executive Officer stated that combining unclassified portions of the report with footnotes elevates the overall classification of the report. Lastly, the Deputy Program Executive Officer stated that the report headings represented an incorrect representation of PIM program vehicle safety and under-vehicle blasts.

*(U) Our Response*

(S) We did not include test results from [REDACTED] because the capability production document did not require PIM program vehicles to protect soldiers at that level. We disagree that the [REDACTED] tests did not cause injuries to mannequins representing soldiers. According to the ATEC test report, [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

(U) Additionally, as stated in the report, at the first use of mannequin, we described in a footnote that ATEC officials used hybrid III anthropomorphic test devices, also known as test mannequins, to represent soldiers seated inside PIM program vehicles for under-vehicle blast tests.

(U) Furthermore, with regard to security markings, we adjusted the portion markings on specific paragraphs and footnotes based on comments provided during the security marking review. Lastly, with regard to report headings, we reviewed comments from the Deputy Program Executive Officer and made changes to headings as appropriate.

## **(U) Recommendations, Management Comments, and Our Response**

### **(U) Recommendation A.1**

**(U) We recommend that the Commander, Army Fires Center of Excellence, consider requesting funds to redesign ammunition stowage and floor mats to protect soldiers on combat missions that require increased under-vehicle protection.**

#### *(U) Commander, Army Fires Center of Excellence, Comments*

(U) The Commanding General, Army FCoE, agreed with the recommendation, and stated that funds are available through September 2017 to support initial development and testing of redesign options for ammunition stowage and floor mats. The Commanding General stated that results from initial redesign options and testing will inform future decisions and associated funding requests. He stated that, because of competing Army funding requirements and the impending test results of redesign options, FCoE officials' funding request for redesign of ammunition stowage and floor mats did not get approved in FY 2017. He also stated that FCoE officials will request funds to redesign ammunition stowage and floor mats in PIM program vehicles again in FY 2018.

#### *(U) Our Response*

(U) The Commanding General's comments addressed all specifics of the recommendation; therefore, this recommendation is resolved but will remain open. We will close this recommendation once we verify that FCoE officials re-submit the request for funds to redesign ammunition stowage and floor mats in FY 2018.

**(U) Recommendation A.2**

**(U) We recommend that the Deputy Chief of Staff of the Army, G-8, Programming, consider seeking funds to redesign ammunition stowage and floor mats for Paladin Integrated Management program vehicles.**

*(U) Deputy Chief of Staff of the Army, G-8, Programming, Comments*

(U) The Fires Division Chief, G-8, responding for the Deputy Chief of Staff of the Army, G-8, Programming, agreed with the recommendation. The Fires Division Chief stated that the unfunded request to redesign ammunition stowage and floor mats for PIM program vehicles will be submitted as part of the FY 2018 Army budget.

*(U) Our Response*

(U) The Fires Division Chief comments addressed all specifics of the recommendation; therefore, this recommendation is resolved but will remain open. We will close the recommendation once we verify that a request for the funds has been resubmitted.

**(U) Recommendation A.3**

**(U) We recommend that the Program Executive Officer, Ground Combat Systems, consider redesigning ammunition stowage and floor mats to protect soldiers on combat missions that require increased under-vehicle protection.**

*(U) Program Executive Office, Ground Combat Systems, Comments*

~~(S)~~ The Deputy Program Executive Officer, Ground Combat Systems, responding for the Program Executive Officer, agreed with the recommendation [REDACTED]

[REDACTED]  
[REDACTED] The Deputy Program Executive Officer stated that PIM program vehicles met the [REDACTED] requirement with under-vehicle armor kits. Additionally, the Deputy Program Executive Officer stated that soldier safety is important to PIM program officials.

(U) The Deputy Program Executive Officer also stated that PIM program officials were researching options to redesign ammunition stowage and floor mats to reduce secondary projectile effects. The Deputy Program Executive Officer stated that PIM program officials started the redesign research in June 2016 with an estimated completion date of February 2018. The Deputy Program Executive Officer stated that PIM program officials will consider additional measures in the development of the next increment of PIM program vehicles.

*(U) Our Response*

(U) Comments from the Deputy Program Executive Officer addressed all specifics of the recommendation; therefore, this recommendation is resolved but will remain open. We will close this recommendation once we verify that PIM program officials complete the redesign options in February 2018.

## (U) Finding B

### (U) Army Officials May Not Have Appropriate Quantities of Under-Vehicle Armor Kits to Protect Soldiers

(S) Army officials did not justify whether [REDACTED] under-vehicle armor kits, valued at \$12.7 million, which would be added to the vehicle to protect soldiers from [REDACTED] [REDACTED] were the appropriate planned quantity for future combat and training needs. This occurred because Army officials relied on the historical number of Paladin vehicles<sup>7</sup> deployed to Iraq and did not complete an analysis or provide evidence to support future combat and training needs. As a result, the Army does not know whether the planned procurement quantity of [REDACTED] under-vehicle armor kits is the appropriate quantity to protect soldiers from [REDACTED] and meet training needs.

### (U) Quantity of Under-Vehicle Armor Kits Not Justified

(S) Army officials did not justify whether [REDACTED] under-vehicle armor kits, valued at \$12.7 million, and used to protect soldiers from [REDACTED] were the appropriate planned quantity to support future combat and training needs. A basis of issue plan describes new equipment, equipment capabilities, equipment components, and where the equipment is needed. Officials from the Deputy Chief of Staff of the Army, G-3/5/7, developed the initial basis of issue plan in June 2013. The basis of issue plan stated that for PIM program vehicles, under-vehicle armor kits are theater provided equipment<sup>8</sup> and that each field artillery battalion will have access to enough kits for training purposes. However, the basis of

(U) Army officials did not justify whether [REDACTED] under-vehicle armor kits, valued at \$12.7 million ... were the appropriate planned quantity to support future combat and training needs.

<sup>7</sup> (U) The predecessor of PIM program vehicles.

<sup>8</sup> (U) Theater provided equipment is equipment provided to deploying units in combat areas.



(S) issue plan did not identify under-vehicle armor kit quantities. An official for the G-3/5/7, stated that the Army did not include under-vehicle armor kit quantities in the basis of issue plan because the kit was not required for all PIM program vehicles or missions. The official also stated that the Army uses a variety of equipping processes, including theater provided equipment, in support of specific missions.

(U) Officials from the Deputy Chief of Staff of the Army, G-3/5/7, G-4, and G-8, stated that they were not responsible for determining quantities of under-vehicle armor kits and did not review the number of under-vehicle armor kits needed. Army Regulation 71-9 states that the Headquarters, Department of the Army, should identify theater provided equipment and that the Deputy Chief of Staff of the Army, G-3/5/7, should review and approve the equipment.<sup>9</sup> In March 2017, G-3/5/7 officials responded to a discussion draft of this report, stating they were finalizing guidance to establish new procedures to validate and document equipment quantities that are not normally documented in the basis of issue plan. Therefore, the Deputy Chief of Staff of the Army, G-3/5/7, should review and approve quantities of under-vehicle armor kits.

## (U) Historical Deployments and Inadequate Analysis Used to Support Future Combat and Training Needs

(U) Army officials relied on the historical number of Paladin vehicles deployed to Iraq to determine the number of under-vehicle armor kits necessary to support future combat and training needs. The deputy product manager for the PIM program explained that the Army based the procurement quantity of [redacted] under-vehicle armor kits on past deployments of [redacted] field artillery battalions to Iraq plus [redacted] field artillery battalion for training. [redacted]

**(U) Army officials relied on the historical number of Paladin vehicles deployed to Iraq to determine the number of under-vehicle armor kits necessary to support future combat and training needs.**

[redacted]

[redacted] However, Army Equipping Guidance from 2013 states that the Army needs to transition from a historical Iraq model to a future force model that

<sup>9</sup> (U) Army Regulation 71-9, "Warfighting Capabilities Determination," December 28, 2009.

<sup>10</sup> (U) Maneuver Center of Excellence Supplemental Manual 3-90, "Force Structure Reference Data for Armored Brigade Combat Team," October 2016.

(U) supports regionally aligned and mission tailored forces.<sup>11</sup> For example, the Army planned to deploy PIM program vehicles to deter enemy aggression in Europe. However, the European theater will not require the same equipment the Army used in Iraq.

(U) FCoE officials did not complete an analysis or provide evidence to show that [REDACTED] under-vehicle armor kits supported future combat and training needs. The Joint Capabilities Integration and Development System manual states that planned operations should drive capability requirements.<sup>12</sup> Capability requirements, specifically under-vehicle armor kits, if not readily available, may result in inadequate soldier protection or capability gaps. The capability production document for PIM program vehicles indicated that under-vehicle armor kits give commanders the option to increase force protection as missions require. FCoE officials explained that they would allocate [REDACTED] under-vehicle armor kits to future combat locations and use 36 kits as training assets. However, FCoE officials did not demonstrate which missions required increased protection using under-vehicle armor kits. Additionally, FCoE officials did not demonstrate why 36 under-vehicle armor kits were appropriate to support future training. In March 2017, FCoE officials responded to a discussion draft of this report, stating that they must base under-vehicle armor kits on future threats, changes to force structure, and updates to war plans and scenarios. Therefore, the Commander, FCoE, should analyze future combat and training needs for under-vehicle armor kits to ensure appropriate quantities are available.

### **(U) The Army Has No Assurance Appropriate Quantities of Under-Vehicle Armor Kits Will be Available**

(S) The Army does not know that the planned procurement quantity of [REDACTED] under-vehicle armor kits, valued at \$12.7 million, is the appropriate quantity to protect soldiers from [REDACTED] and meet training needs. If the Army acquires too few under-vehicle armor kits, commanders may not have the option to equip all

<sup>11</sup> (U) Army Equipping Guidance 2013 through 2016, June 20, 2013. The purpose of this guidance is to field the right equipment to the right units and locations and at the least possible cost.

<sup>12</sup> (U) Manual for the Operation of the Joint Capabilities Integration and Development System, updated December 18, 2015.

(S) PIM program vehicles when executing missions that require increased under-vehicle protection. Conversely, if the Army acquires too many under-vehicle armor kits, it will waste limited resources.

## (U) Conclusion

(S) Army officials developed under-vehicles armor kits to give commanders options to protect soldiers on missions where they may encounter [REDACTED] Army officials indicated that they needed [REDACTED] under-vehicle armor kits. However, Army officials relied on the historical number of Paladin vehicles deployed to Iraq and did not complete an analysis to support future combat and training needs as required by the Army's equipping guidance. Therefore, Army officials did not ensure that [REDACTED] under-vehicle armor kits, at a cost of \$12.7 million, were necessary or valid to meet future combat mission and training needs.

## (U) Management Comments on the Finding and Our Response

### *(U) Commander, Army Fires Center of Excellence, Comments on Quantity of Under-Vehicle Armor Kits Needed for Training*

(U) The Commanding General, Army FCoE, proposed a report revision to indicate that 36 under-vehicle armor kits are needed for training and that these under-vehicle armor kits support training for the field artillery battalion.

### *(U) Our Response*

(U) We acknowledge in the report that FCoE officials plan to use 36 under-vehicle armor kits for training; however, they did not provide evidence or supporting documents to demonstrate that these under-vehicle armor kits were appropriate to support future training needs. The specific statement in the report is accurate; therefore, we made no change to the report.

## **(U) Recommendations, Management Comments, and Our Response**

### **(U) Recommendation B.1**

**(U) We recommend that the Commander, Army Fires Center of Excellence, analyze future combat and training needs for under-vehicle armor kits to ensure appropriate quantities are available.**

#### *(U) Commander, U.S. Army Fires Center of Excellence, Comments*

(U) The Commanding General, Army FCoE, agreed with the recommendation. The Commanding General stated that FCoE officials will conduct analysis in FY 2018 to determine operational requirements for under-vehicle armor kits. He stated that FCoE officials will base the analysis on recent threat analysis, force structure changes, training implications, and results from operational test and evaluation scheduled for the second quarter of FY 2018.

#### *(U) Our Response*

(U) The Commanding General's comments addressed all specifics of the recommendation; therefore, this recommendation is resolved but will remain open. We will close this recommendation once we verify that FCoE officials complete an analysis in FY 2018 to ensure appropriate under-vehicle armor kits are available.

### **(U) Recommendation B.2**

**(U) We recommend that the Deputy Chief of Staff of the Army, G-3/5/7, Operations, review and approve quantities of under-vehicle armor kits.**

#### *(U) Deputy Chief of Staff of the Army, G-3/5/7, Operations, Comments*

(U) The Director of Force Management, responding for the Deputy Chief of Staff of the Army, G-3/5/7, Operations, agreed with the recommendation. The Director stated that he implemented the recommendation by publishing Executive Order 165-17, "Procedures for Maintaining the Army Acquisition Objective, Army Procurement Objective, and Retention Objective," which establishes a process to determine requirements quantities.

*(U) Our Response*

(U) The Director's comments addressed all specifics of the recommendation; therefore, this recommendation is resolved but will remain open. We will close this recommendation once we verify that Deputy Chief of Staff of the Army, G-3/5/7, officials review and approve quantities of under-vehicle armor kits.

## (U) Appendix A

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### (U) Scope and Methodology

(U) We conducted this performance audit from August 2016 through May 2017 according to 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 interviewed PIM program stakeholders to understand the requirement for under-vehicle blast protection, operational threats, results from under-vehicle blast tests, plans to purchase under-vehicle armor kits, and interior redesign of the PIM program vehicle. Specifically, we interviewed officials from the Joint Chiefs of Staff, J-8, Force Structure, Resource, and Assessment; Joint Improvised-Threat Defeat Agency; DOT&E; Deputy Chief of Staff of the Army, G-2, Intelligence; G-3/5/7, Operations; and G-8, Programming; Assistant Secretary of the Army (Acquisition, Logistics, and Technology); PIM Program Office; ATEC; FCoE; Army National Ground Intelligence Center; and Army TACOM Life Cycle Management Command.

(U) We collected, reviewed, and analyzed PIM program documents dated from April 2010 to December 2016 to determine whether the Army adequately protected soldiers from under-vehicle blasts as part of the force protection requirement. The program documents collected, reviewed, and analyzed included:

- (U) Report for the Full Up System Level Live Fire Test of the M109 Family of Vehicles, M109A7 Self Propelled Howitzer and M992A3 Carrier, Ammunition, Tracked, December 2016;
- (U) Program Objective Memorandum 19-23 Unfunded Requirements Update, December 2016;
- (U) FY2017 M109A7 Family of Vehicles Program Objective Memorandum Process (FY19-23), November 2016;
- (U) Basis of Issue Plans, February 2016;
- (U) Test Record for the M109 Family of Vehicles Self-Propelled Howitzer 5A System Level Ballistic Test Events, January 2016;

- (U) Detailed Test Plan for the Full Up System Level Live Fire Test of the M109 Family of Vehicles, M109A7 Self Propelled Howitzer and M992A3 Carrier, Ammunition, Tracked, November 2015;
- (U) System Threat Assessment Report for M109A7 Family of Vehicles, October 2015;
- (U) Operational Test Agency Test Plan for the M109 Family of Vehicles Full Up System Level Live Fire Test, November 2015;
- (U) Operational Test Agency Test Plan for M109 Family of Vehicles Self-Propelled Howitzer 5A Ballistic Test, December 2014;
- (U) Capability Production Document for the M109 Family of Vehicles, January 2014;
- (U) Test and Evaluation Master Plan for the M109 Family of Vehicles Paladin Integrated Management Self-Propelled Howitzer and Carrier, Ammunition, Tracked, July 2013;
- (U) Paladin Integrated Management Performance Specification Annex A, Version 1.4, June 2012;
- (U) Joint Requirement Oversight Council Memorandum 172-11, "Review of Analysis of Alternatives and Capability Production Document for the M109 Family of Vehicles (Paladin)," December 2011; and
- (U) System Threat Assessment Report for Heavy Brigade Combat Team, April 2010.

(U) Additionally, we worked with officials from the Deputy Chief of Staff of the Army, G-3/5/7, Operations; G-4, Logistics; G-8, Programming; PIM Program Office; and FCoE to determine whether the quantity of under-vehicle armor kits was appropriate to give commanders the option to increase under-vehicle blast protection.

(U) To meet our objective, we reviewed the following DoD guidance.

- (U) Manual for the Operation of the Joint Capabilities Integration and Development System, updated December 18, 2015;
- (U) DoD Instruction 5000.02, “Operation of the Defense Acquisition System,” January 7, 2015;
- (U) Army Regulation 71-32, “Force Development and Documentation,” July 1, 2013;
- (U) Army Equipping Guidance 2013 Through 2016, June 20, 2013;
- (U) Army Regulation 71-9, “Warfighting Capabilities Determination,” December 28, 2009; and
- (U) Army Regulation 381-10, “Intelligence Support to Capability Development,” January 26, 2007.

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

(U) We did not use computer-processed data to perform this audit.

## **(U) Prior Coverage**

(U) During the last 5 years, the Government Accountability Office (GAO) issued one report discussing the PIM program’s force protection requirement for under-vehicle blasts. The DoD Office of Inspector General (DoD OIG) issued one report discussing the effectiveness of PIM program management during the production and deployment phase. Unrestricted GAO reports can be accessed [at http://www.gao.gov](http://www.gao.gov). Unrestricted DoD OIG reports can be accessed at <http://www.dodig.mil>.



**(U) GAO**

(U) Report No. GAO-15-503, "DOD OPERATIONAL TESTING: Oversight Has Resulted in Few Significant Disputes and Limited Program Cost and Schedule Increase," June 2015

(U) The DOT&E identified the operational environment for PIM program vehicles was inconsistent with the way the Army would use the vehicle in combat. The DOT&E stated that PIM program vehicles would provide insufficient protection to its crew members against existing threats in its intended operational environment.

(U) The DOT&E recommended that the Army increase the force protection requirement or change the operational environment for PIM program vehicles. In response, the Army updated the requirements and changed the operational environment to routes with minimal improvised explosive device threats. However, the DOT&E cited recent operational experience that indicated the Army's updates were inadequate to address threats. The DOT&E recommended that the Under Secretary of Defense for Acquisition, Technology, and Logistics fund, develop, and test an under-vehicle armor kit to address the under-vehicle blast threats.

**(U) DoD OIG**

(U) Report No. DODIG-2016-118, "Army Justified Initial Production Plan for the Paladin Integrated Management Program but Has Not Resolved Two Vehicle Performance Deficiencies," August 5, 2016

(U) PIM program officials justified their plan to produce 133 initial production vehicles. Furthermore, PIM program officials initiated system fixes to address seven of the nine performance deficiencies identified by the test community during the system development phase. PIM program officials also updated test plans to evaluate vehicle performance before full-rate production. [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]

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## **(U) Appendix B**

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### **(U) Derivatively Classified Sources**

- (U) Report for the Full-Up System Level Live Fire Test of the M109 Family of Vehicles, M109A7 Self-Propelled Howitzer and M992A3 Carrier, Ammunition, Tracked, December 2016;
- (U) Test Record for the M109 Family of Vehicles Self-Propelled Howitzer 5A System Level Ballistic Test Events, January 2016;
- (U) Detailed Test Plan for the Full-Up System Level Live Fire Test of the M109 Family of Vehicles, M109A7 Self-Propelled Howitzer and M992A3 Carrier, Ammunition, Tracked, November 2015;
- (U) Operational Test Agency Test Plan for the M109 Family of Vehicles Full-Up System Level Live Fire Test, November 2015;
- (U) System Threat Assessment Report for M109A7 Family of Vehicles, October 2015;
- (U) Operational Test Agency Test Plan for M109 Family of Vehicles Self-Propelled Howitzer 5A Ballistic Test, December 2014;
- (U) Paladin Integrated Management Performance Specification Annex A, Version 1.4, June 2012;
- (U) Joint Requirement Oversight Council Memorandum 172-11, "Review of Analysis of Alternatives and Capability Production Document for the M109 Family of Vehicles (Paladin)," December 2011;
- (U) Security Classification Guide for M109 Family of Vehicles, June 2010; and
- (U) System Threat Assessment Report for Heavy Brigade Combat Team, April 2010.

## (U) Management Comments

### (U) Deputy Chief of Staff of the Army, G-3/5/7, Operations



DEPARTMENT OF THE ARMY  
OFFICE OF THE DEPUTY CHIEF OF STAFF, G-3/5/7  
400 ARMY PENTAGON  
WASHINGTON, DC 20310-0400

DAMO-FMZ

MEMORANDUM FOR DoDIG OIG Team Leader, Acquisition and Sustainment Management [REDACTED] Inspector General, DoD, 4800 Mark Center Drive, Alexandria, VA 22350-1500

SUBJECT: DoDIG Draft Report: The Army Should Improve Under-Vehicle Blast Protection and Determine the Appropriate Quantity of Under-Vehicle Armor Kits for Paladin

Reference: Audit of Under-Vehicle Force Protection Requirement for the Army Paladin Integrated Management Program (Project No. D2016-D000AU-0203.000).

1. DAMO-FM concurs with the DoDIG Draft Report as written: DAMO-FM previously provided comments at the GS-15/O-6 level. Our comments were adjudicated and incorporated into this draft report. I concur with finding #2 and the corresponding recommendation to establish a process to determine requirements quantities. I have executed recommendation #2, by publishing EXORD 165-17 Procedures for Maintaining the Army Acquisition Objective, Army Procurement Objective, and Retention Objective.
2. The follow on action to refine the requirements will be accomplished during the milestone decision (MD) process, with the development of the Basis of Issue Plan Feeder Data (BOIPFD) and approval of a Basis of Issue Plan (BOIP).
3. The HQDA G-3/5/7 (DAMO-FM) point of contact is the undersigned, DAMO-FMD, at commercial: [REDACTED]

BRIAN J. MENNES  
Brigadier General, GS  
Director of Force Management

**(U) Deputy Chief of Staff of the Army,  
G-8, Programming**



DEPARTMENT OF THE ARMY  
OFFICE OF THE DEPUTY CHIEF OF STAFF, G-8  
700 ARMY PENTAGON  
WASHINGTON DC 20310-0700

DAPR-FDG

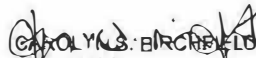
12 June 2017

MEMORANDUM FOR

Department of Defense Inspector General (DoDIG), 4800 Mark Center Drive, Alexandria, VA 23604-0200

SUBJECT: U.S. Army G-8 Response to the Report for Project D2016-D000AU-0203.000, "The Army Should Improve Under-Vehicle Blast Protection and Determine the Appropriate Quantity of Under-Vehicle Armor Kits for Paladin Integrated Management (PIM) Program Vehicles"

1. The memorandum is in response to the above referenced report: Recommendation A.2 - DoDIG recommends that the Deputy Chief of Staff (DCS) of the Army, G-8, Programming, consider seeking funds to redesign ammunition stowage and floor mats for the PIM program vehicles.
2. The PIM Program Office estimates that the redesign of the ammunition stowage and floor mats would cost approximately \$30.3M. A \$30.3M unfunded request (UFR) was submitted by the PM Office at the POM 19-23 review, and will compete as we move through the POM process.
3. DCS G-8 (FDG) concurs with Recommendation A.2.
4. POC for this memorandum is [REDACTED] SSO, DAPR-FDG, HQDA G-8 at commercial: [REDACTED] and email at [REDACTED]

  
Carolyn S. BIRCHFIELD  
Colonel, GS  
Fires Division Chief

(U) Commander, Army Fires Center of Excellence



DEPARTMENT OF THE ARMY  
HEADQUARTERS, UNITED STATES ARMY FIRES CENTER OF EXCELLENCE AND FORT SILL  
455 MCNAIR AVENUE, SUITE 100  
FORT SILL, OKLAHOMA 73503

REPLY TO:  
ATTENTION OF:  
ATZR-C

22 May 2017

MEMORANDUM THRU

Army Capabilities Integration Center (ARCIC) <sup>EM</sup> ATTN: Chief, Fires Division, Training and Doctrine Command (TRADOC), 950 Jefferson Avenue, Fort Eustis, VA 23604

Headquarters, Training and Doctrine Command (TRADOC) <sup>KDC (ATIR)</sup>, 950 Jefferson Avenue, Fort Eustis, VA 23604-5700

Headquarters, Department of the Army (HQDA) <sup>KEM</sup> ATTN: G3/5/7, 200 Army Pentagon, Washington D.C. 20310-0200

FOR Department of Defense Inspector General, 4800 Mark Center Drive, Alexandria, VA 22350-1500

SUBJECT: U.S. Army Fires Center of Excellence Response to the Report for Project D2016-D000AU-0203.000, "The Army Should Improve Under-Vehicle Blast Protection and Determine the Appropriate Quantity of Under-Vehicle Armor Kits for Paladin Integrated Management Program Vehicles"

1. Reference Memorandum, Department of Defense Office of the Inspector General, 5 May 2017. Subject: "The Army Should Improve Under-Vehicle Blast Protection and Determine the Appropriate Quantity of Under-Vehicle Armor Kits for Paladin Integrated Management Program Vehicles" (Project No. D2016-D000AU-0203.000).
2. The enclosed responses and clarifying comments to the draft report from the U.S. Army Fires Center of Excellence (FCOE) have been reviewed and approved by Capabilities Development and Integration Directorate (CDID), Field Artillery Commandant, and the FCOE.
3. The Commanding General, FCOE, concurs with comments for finding A.1 and B.1 depicted in enclosure one (1).
4. POC for this memorandum is [redacted] TCM BCT-Fires, CDID, FCOE, Fort Sill, Oklahoma, at commercial: [redacted], and email at [redacted]

BRIAN J. MCKIERNAN  
Major General, USA  
Commanding

- 2 Encls
1. FCOE Response to DoD IG
  2. CRM

## (U) Commander, Army Fires Center of Excellence (cont'd)

**DOD IG REPORT- DATED 5 MAY 2017  
DOD IG REPORT NO.**

**"THE ARMY SHOULD IMPROVE UNDER-VEHICLE BLAST PROTECTION AND DETERMINE THE APPROPRIATE QUANTITY OF UNDER-VEHICLE ARMOR KITS FROM PALADIN INTEGRATED MANAGEMENT PROGRAM VEHICLES"**

**COMMANDER, U.S. ARMY FIRES CENTER OF EXCELLENCE (FCOE)  
RESPONSE TO THE DOD IG REPORT**

(5 MAY 2017) DOD Recommendation for Commander, U.S. Army Fires Center of Excellence:

~~(FOUO)~~ **Recommendation A.1:** We recommend that the Commander, U.S. Army Fires Center of Excellence, consider requesting funds to redesign ammunition stowage and floor mats to protect Soldiers on combat missions that require increased under-vehicle protection.

**(U) Recommendation B.1:** We recommend that the Commander, U.S. Army Fires Center of Excellence, analyze future combat and training needs for under-vehicle armor kits to ensure appropriate quantities are available.

(8 MAY 2017) Commander, U.S. Army Fires Center of Excellence Response:

~~(FOUO)~~ **Recommendation A.1: Concur with comments.** Funding is available through September 2017 to support initial concept development and bench testing of design options for floor mats and ammunition storage. Results from this bench testing will inform future decisions and associated funding requests. A funding request was submitted as part of the 2019-2023 POM cycle for design and bench testing options. Due to competing Army funding requirements, and the uncertainty from the impending test results, this effort was not funded. Upon completion of the 2017 design and bench testing, this request will be re-submitted as part of the upcoming 2020-2024 POM cycle.

~~(FOUO)~~ **Recommendation B.1: Concur with comments.** The Commanding General, U.S. Army Fires Center of Excellence, will initiate analysis to be conducted in FY18 to determine the operational requirements for under-vehicle armor kits. This analysis will be based on recent threat analysis, force structure changes, training implications, and the results from the IOT&E 2 scheduled for 2nd QTR FY 18 (T).

**(U) Commander, Army Fires Center of Excellence (cont'd)**

**SECRET**

Management Comments

**UNCLASSIFIED**

<b>Document Title</b>	DoD Inspector General Draft Report Project No. D2016-D000AU-0203.000	
<b>Control Number</b>	<b>Date Submitted</b> 16 MAY 2017	<b>Staffing Level:</b> AO
Results:		

Tracking #	Organization/ Reviewer	Pg #	Para #	Line #	Type C/S/A	Comments	A/R/P
1	[REDACTED]	1	1		C	<p><b>Comment/Change proposed:</b> Change  <b>Recommendation:</b> Change Sentence from: "However, Army Fires Center of Excellence (FCoE) officials delayed the redesign of ammunition storage and floor mats to future budget years so that the Army could fund existing field artillery systems." to "An unfunded requirement (UFR) for this redesign was included in the 2019-2023 POM cycle. Due to competing Army funding requirements, the uncertainty from the impending test results, this effort was not funded. Upon completion of the 2017 design and testing, this request will be re-submitted as part of the upcoming 2020-2024 POM cycle."</p> <p><b>Rationale:</b> Accuracy. The decision to fund the redesign of the ammunition storage and floor mats must be done holistically as part of a larger decision on funding to meet underbelly objective requirements. The \$30.3 million cost is a Rough Order of Magnitude (ROM) estimate and specifics have not been made available to support a decision at this time. The majority of the funding for this effort is in fy20-21(\$25M) and will be addressed in POM 20-24.</p>	

**UNCLASSIFIED**

1

**SECRET**

(U) Commander, Army Fires Center of Excellence (cont'd)

UNCLASSIFIED

Tracking #	Organization / Reviewer	Pg #	Para #	Line #	Type C/S/A	Comments	A/R/P
2	[REDACTED]	14	2		C	<b>Comment/Change proposed:</b> Change "Additionally, FCoE officials did not demonstrate why 36 under-vehicle armor kits were appropriate to support future training." <b>Recommendation: Change</b> "Additionally, the 36 kits will be earmarked for the National Training Center (NTC). The Battalion set will enable a Field Artillery Battalion to train at the T2 configuration, with under-vehicle armor kits installed, throughout the rotation."	

UNCLASSIFIED



## (U) Program Executive Officer, Ground Combat Systems



~~SECRET~~

**DEPARTMENT OF THE ARMY**  
PROGRAM EXECUTIVE OFFICE  
GROUND COMBAT SYSTEMS  
6501 EAST ELEVEN MILE ROAD  
WARREN, MICHIGAN 48397-5000

SFAE-GCS

24 MAY 17

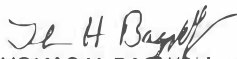
MEMORANDUM THRU Assistant Secretary of the Army (Acquisition, Logistics and Technology) (ASA (ALT)), 105 Army Pentagon Washington, DC 20310-0105

FOR Inspector General, Acquisition and Sustainment Management, Department of Defense Inspector General (DODIG), (██████████), 4800 Mark Center Drive, Alexandria, Virginia 22350-1500.

SUBJECT: The Army Should Improve Under-Vehicle Blast Protection & Determine the Appropriate Quantity of Under-Vehicle Armor Kits for Paladin Integrated Management Program Vehicles (Project Number: D2016-D000AU-0203.000)

1. Reference Official Draft Report, DoDIG, dated 5 MAY 17, SAB.
2. The Program Executive Office, Ground Combat Systems (PEO GCS) has reviewed the subject draft report and recommendation A.3. The PEO GCS 'concur' to the recommendation. The official comments to recommendation A.3 are enclosed.
3. The information in the final report requires a 'SECRET' security marking.
4. Point of contact for this reply is ██████████  
██████████

Encls  
1. Official Comments,  
16052017  
2. Security Review,  
16052017

  
THOMAS H. BAGWELL, JR.  
Deputy Program Executive Officer,  
Ground Combat Systems

REGRADE UNCLASSIFIED WHEN  
SEPARATED FROM CLASSIFIED  
ENCLOSURE

~~SECRET~~

## (U) Program Executive Officer, Ground Combat Systems (cont'd)

~~(SECRET)~~

Program Executive Office, Ground Combat System  
Comments to the DODIG Report on  
Under-Vehicle Force Protection Requirement for the Army Paladin Integrated  
Management (PIM) Program  
(Project No. D2016-D000AU-0203.000)

**DODIG OBJECTIVE:** (U) To determine whether the Army is adequately protecting Soldiers from under-vehicle blasts as part of the force protection requirement.

**DODIG CONCLUSION:** (S) [REDACTED]

**(U) ADDITIONAL FACTS:**

1. (U) Adjustment to page 4: The vice chairman did not approve the underbelly (UB) kits, he approved the Capabilities Production Document (CPD). Mr. Kendall approved characterization testing of the UB kit to inform leadership as to whether the kit was effective at the objective level and if it caused detrimental effects to mobility. PdM SPHS has asked the Army about purchasing kits. There was no encouraging (direction) to order kits or quantities.
2. (U) Adjustment to terminology throughout: "Minimum" needs to be replaced with "threshold," and "higher" needs to be replaced with "objective" per the CPD when referring to requirements throughout the report.
3. (S) [REDACTED]
4. (U) Adjustment to terminology: "Mannequin" needs to be replaced with "Hybrid III Anthropomorphic Test Device" (ATD).
5. (U) Foot Notes: Combining the unclassified portions of the report with the foot notes elevates the overall classification of the report.
6. (U) Titles: Overall the titles within the report depict an incorrect representation of the safety of the M109A7 and the underbelly blast.

(U) Current titles and recommended adjustments:

## (U) Program Executive Officer, Ground Combat Systems (cont'd)

Final Report Reference

~~(SECRET)~~

- a. (U) Paladin Integrated Management Program Vehicles Generally Met Under-Vehicle Blast Protection Requirements, but Improvement Needed  
(U) Recommendation: Paladin Integrated Management Program Vehicles Met Under-Vehicle Blast Protection Requirements
- b. (U) PIM Program Vehicles Met the Minimum Under-Vehicle Protection Requirement  
(U) Recommendation: PIM Program Vehicles Exceeded the Threshold 2 Under-Vehicle Protection Requirement
- c. (U) Higher Under-Vehicle Protection Requirement Met, but Loose Interior Hardware Injured Soldiers  
(U) Recommendation: Objective Under-Vehicle Protection Requirement Met, but Loose Interior Hardware Moderately Injured Soldiers (per the CPD, moderately is defined as [REDACTED])
- d. (U) Redesign Funds Were Not Requested for Interior Hardware  
(U) Recommendation: Redesign Funds Were Requested for Interior Hardware, But Were Not Funded Due to Army Priority Levels
- e. (U) PIM Program Vehicles May Not Protect Soldiers From Under-Vehicle Blast Threats
  - i. (U) Comment: This title could cause lack of Soldier confidence in equipment and misinform the reader. All underbelly blast requirements were met. Incorporating the size of threat is crucial to understanding blast effects.
  - ii. (U) Recommendation: PIM Program Vehicles Met Survivability Requirements, But Not Without Some Moderate Injuries
- f. (U) Army Officials May Not Have Appropriate Quantities of Under-Vehicle Armor Kits to Protect Soldiers  
(U) Recommendation: Initial Planning Quantities For T2 Kits With Underbelly Armor Does Not Meet Entire Army Requirement
- g. (U) Quantity of Under-Vehicle Armor Kits Not Justified  
(U) Recommendation: Current Plan For Underbelly Armor Quantities Is Being Determined
- h. (U) Historical Deployments and Inadequate Analysis Used to Support Future Combat and Training Needs  
(U) Recommendation: Historical Deployments From Operation Iraqi Freedom (OIF) Were Used to Support Future Combat and Training Needs As An Initial Planning Tool
- i. (U) The Army Has No Assurance Appropriate Quantities of Under-Vehicle Armor Kits Will be Available

Revised heading title, see report page 10

Revised heading title, see report page 11

## (U) Program Executive Officer, Ground Combat Systems (cont'd)

~~(SECRET)~~

(U) Recommendation: The Army Has Some Assurance That There Aren't Appropriate Quantities; However There Are Long Term Plans to Equip Every Artillery Vehicle With T2 Kits With Underbelly Armor

**(U) RECOMMENDATION AND COMMAND COMMENTS:**

For the Program Executive Officer,  
Ground Combat Systems

**Recommendation A.3:** (U) We recommend that the Program Executive Officer, Ground Combat Systems, consider redesigning ammunition stowage and floor mats to protect soldiers on combat missions that require increased under-vehicle protection.

**(U) Program Executive Officer Ground Combat Systems (PEO GCS) Comments:**

Concur -

(S)

(U) The PMO is researching concepts for internal ammunition stowage and ancillary equipment (floor mats) to reduce secondary projectile effects. This effort began in June 2016 and is currently ongoing. Additional measures will be considered in the development of the next increment of the weapon system/vehicle.

(U) Target Completion Date: 28 February 2018

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

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<b>ATEC</b>	Army Test and Evaluation Command
<b>DOT&amp;E</b>	Director, Operational Test and Evaluation
<b>FCoE</b>	Fires Center of Excellence
<b>GAO</b>	Government Accountability Office
<b>PIM</b>	Paladin Integrated Management

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