



INSPECTOR GENERAL

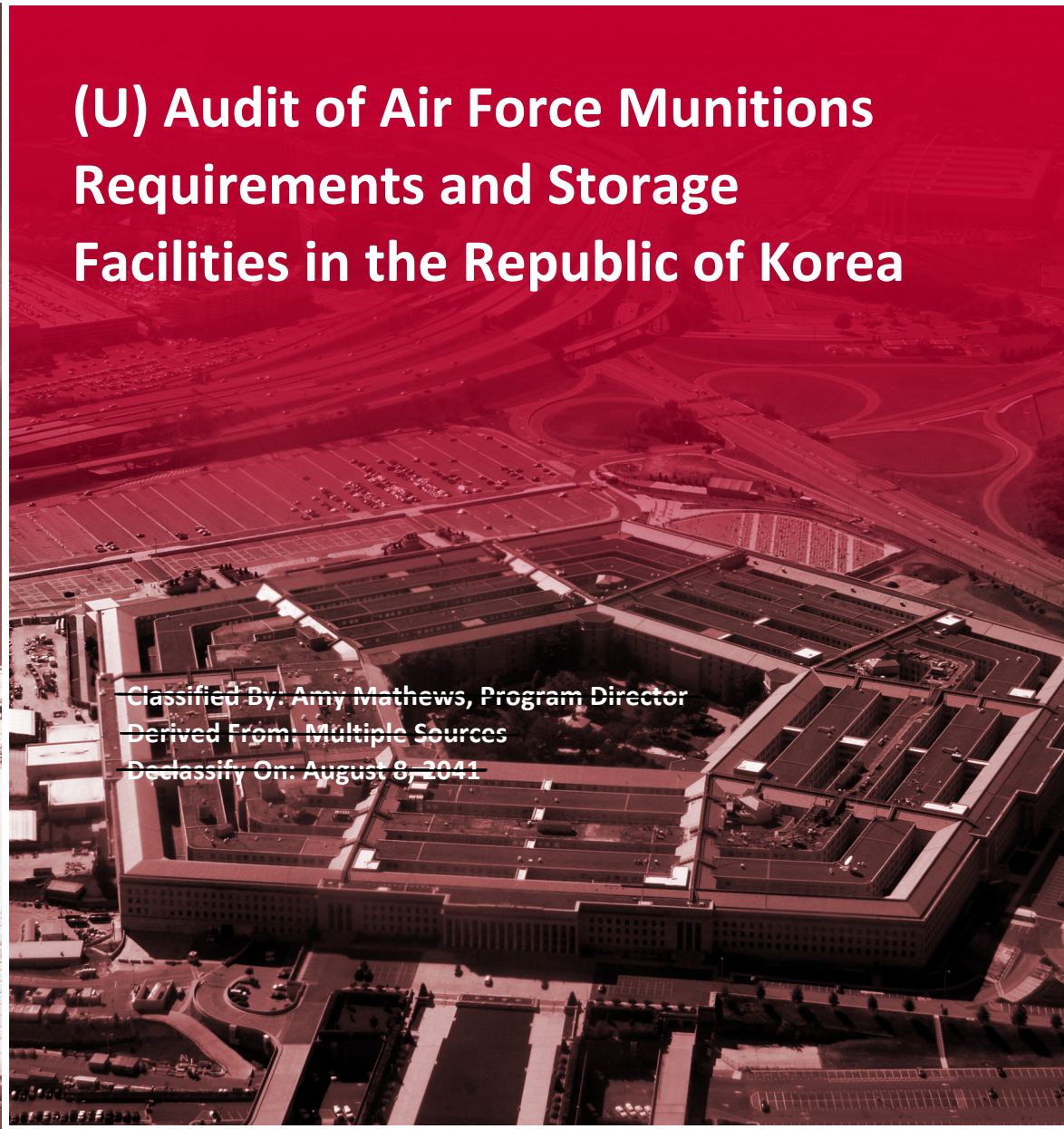
U.S. Department of Defense

JUNE 26, 2017



(U) Audit of Air Force Munitions Requirements and Storage Facilities in the Republic of Korea

Classified By: Amy Mathews, Program Director
Derived From: Multiple Sources
Declassify On: August 8, 2041



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Results in Brief

(U) Audit of Air Force Munitions Requirements and Storage Facilities in the Republic of Korea

(U) June 26, 2017

(U) Objective

(U) We determined whether the Air Force had adequate munitions storage facilities in the Republic of Korea (ROK). We statistically sampled 105 of the 452 munitions storage facilities in Korea for our audit. Munitions storage facilities include earth-covered magazines,¹ segregated magazines, multi-cubed buildings, barricaded open storage, flight line holding areas, and other types of storage locations.

(U) Finding

~~(S//NF)~~ The Air Force had sufficient munitions storage capacity in the ROK to meet overall munitions requirements.

[REDACTED]

¹ (U) A magazine is a building or structure used exclusively for the storage of ammunition and explosives.

² ~~(S//NF)~~ [REDACTED]

~~(S//NF)~~ [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]²

(U) In addition, U.S. and ROK Air Force installation munitions personnel did not post net explosive weight (NEW)³ limits at 1 of the 105 statistically sampled facilities, posted inaccurate NEW limits at 21 of the 105 facilities, reported inaccurate NEW limits in the Combat Ammunition System (CAS)⁴ for 16 of the 105 facilities, and reported NEW in excess of authorized NEW limits in CAS at 2 of 105 facilities. The NEW limits were not posted or were inaccurate because Air Force munitions guidance did not require personnel to: (1) verify NEW limits during annual inspections, (2) update posted NEW limits when changes occurred, and (3) update facility data in CAS when NEW limits changed. Additionally, Air Force guidance did not require management oversight, review, and approval of CAS overrides related to munitions reporting above NEW limits.⁵ Storing more munitions than authorized can result in explosion risks beyond the established clear zones. Also, inaccurate NEW placards and CAS data can result in inefficient use of facility storage space because the authorized capacity of a given facility could be greater than the NEW limits posted on placards or reported in CAS.

³ (U) Each munition has a NEW, which is the weight of the munition in pounds of explosive material.

⁴ (U) CAS is the Air Force's single system of record for the management of conventional munitions.

⁵ (U) An override is a decision by management or staff to bypass established controls to allow a transaction to be processed that would otherwise be rejected by the system controls.



Results in Brief

(U) Audit of Air Force Munitions Requirements and Storage Facilities in the Republic of Korea

(U) We identified 120 maintenance deficiencies out of the 2,532 facility conditions we tested at Gwang Ju, Osan, Suwon, Daegu, and Kunsan Air Base munitions storage facilities. These deficiencies were related to doors, lighting, ventilation, lightning protection systems, and breaker boxes. The deficiencies occurred because 7th Air Force personnel placed a low priority on maintenance at facilities that they anticipated would close in the near future. Deficiencies in the physical condition of munitions storage facilities can cause safety hazards resulting in personnel injury, damage to munition assets, and decreased storage capacity.

(U) Management Actions Taken

(U) In an August 2016 memorandum, the Assistant Secretary of the Air Force for Installations, Environment, and Energy directed Air Force personnel to develop a plan to obtain ROK concurrence on explosive safety risks, evaluate the Air Force's implementation of recommendations related to explosive safety exemptions and waivers from an April 1998 Air Force report, and determine whether new actions should be taken. We reviewed a draft of the proposed plan and determined it met the intent of the Assistant Secretary's directive. However, as of March 2017, the Acting Assistant Secretary of the Air Force for Installations, Environment, and Energy had not yet approved the plan.

(U) Recommendations

~~(S//NF)~~ We recommend that the Director, Headquarters Air Force, Logistics, Engineering, and Force Protection, develop guidance that requires installation munitions personnel to verify and correct NEW placards and CAS data during annual inspections, update all CAS information, and manage system overrides of NEW limits.

~~(S//NF)~~ We also recommend that the Commander, 7th Air Force, [REDACTED]

[REDACTED] implement the directives of the Assistant Secretary of the Air Force for Installations, Environment, and Energy; correct the maintenance deficiencies identified; address outstanding work orders; and assess the conditions of all facilities to identify and correct any additional maintenance deficiencies.

(U) Management Comments and Our Response

(U) The Assistant Deputy Chief of Staff, Headquarters Air Force, Logistics, Engineering, and Force Protection, responding for the Director, Headquarters Air Force, Logistics, Engineering, and Force Protection, addressed all specifics of the recommendations to develop guidance to verify and update NEW placards and CAS information, and to manage CAS overrides. Therefore, the recommendations are resolved. We will close the recommendations once we verify that the guidance is updated and fully addresses the recommendations.

(U) The Commander, 7th Air Force, addressed all specifics of the recommendations to implement the directives of the Assistant Secretary of the Air Force for Installations, Environment, and Energy; correct the maintenance deficiencies identified; address outstanding work orders; and assess the conditions of all facilities to identify and correct any additional maintenance deficiencies. Therefore, the recommendations are resolved. We will close the recommendations once we verify that actions are implemented.



Results in Brief

(U) Audit of Air Force Munitions Requirements and Storage Facilities in the Republic of Korea

~~(S//NF)~~ The Commander, 7th Air Force, did not address the recommendation to [REDACTED]. Therefore, the recommendation is unresolved. The Commander, 7th Air Force, should provide comments to the final report specifying what actions will be taken to [REDACTED]. We request that the Commander, 7th Air Force, provide comments to the final report by July 26, 2017. Please see the Recommendations Table on the next page.

(U) Recommendations Table

UNCLASSIFIED Management	Recommendations Unresolved	Recommendations Resolved	Recommendations Closed
Headquarters Air Force, Director for Logistics, Engineering, and Force Protection	None	B.1.a, B.1.b, and B.1.c	None
Commander, 7th Air Force	A.1.a	A.1.b, A.1.c, C.1.a, C.1.b, C.1.c, C.1.d, and C.1.e	None UNCLASSIFIED

(U) Please provide Management Comments by July 26, 2017.

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

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



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

June 26, 2017

(U) MEMORANDUM FOR COMMANDER, U.S. PACIFIC COMMAND
ASSISTANT SECRETARY OF THE AIR FORCE (FINANCIAL
MANAGEMENT AND COMPTROLLER

(U) SUBJECT: Audit of Air Force Munitions Requirements and Storage
Facilities in the Republic of Korea
(Report No. DODIG-2017-094)

(S//NF) We are providing this report for review and comment. The Air Force did not [REDACTED], accurately post and report authorized net explosive weight limits, or address outstanding maintenance deficiencies at Gwang Ju, Osan, Suwon, Daegu, and Kunsan Air Bases. As a result, the Air Force accepted the higher risks resulting from operations outside of safety standards. We conducted this audit in accordance with generally accepted government auditing standards.

(U) We considered management comments on a draft of this report when preparing the final report. DoD Instruction 7650.03 requires that recommendations be resolved promptly. Comments from the Assistant Deputy Chief of Staff, Headquarters Air Force, Logistics, Engineering, and Force Protection, responding for the Director, Headquarters Air Force, Logistics, Engineering, and Force Protection, addressed Recommendations B.1.a, B.1.b, B.1.c. Comments from the Commander, 7th Air Force, addressed Recommendations A.1.b, A.1.c, C.1.a, C.1.b, C.1.c, C.1.d, and C.1.e. However, comments from the Commander did not address Recommendation A.1.a; therefore, we request the Commander, 7th Air Force, provide additional comments on Recommendation A.1.a, by July 26, 2017.

(U) Please send a PDF file containing your comments to audrco@dodig.mil. Copies of your comments must have the actual signature of the authorizing official for your organization. We cannot accept the /Signed/ symbol in place of the actual signature. If you arrange to send classified comments electronically, you must send them over the SECRET Internet Protocol Router Network (SIPRNET).

(U) We appreciate the courtesies extended to the staff. Please direct questions to me at (703) 699-7331 (DSN 664-7331).



Carol N. Gorman
Assistant Inspector General
Readiness and Cyber Operations

(U) cc:
(U) Commander, U.S. Forces Korea

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(U) Introduction

(U) Objective

(U) Our audit objective was to determine whether the Air Force had adequate munitions storage facilities in the Republic of Korea (ROK). Munitions storage facilities include earth-covered magazines, segregated magazines, multi-cubed buildings, barricaded open storage, flight line holding areas, and other types of storage locations. See Figure 1 for examples of these facilities. See Appendix A for a discussion of the scope and methodology related to the audit objectives.

(U) Figure 1. Open-Area Storage, Earth-Covered Magazine, Operating Location, Multi-Cube Building. (Clockwise, From Top-Left)



(U) Source: DoD Office of Inspector General (DoD OIG).

(U) Background

(U) The Air Force stores munitions throughout the ROK in support of U.S. wartime and contingency operation plans. The 7th Air Force oversees all Air Force munitions-related operations in the ROK. 7th Air Force responsibilities include maintaining

(U) and operating sufficient munitions storage in accordance with DoD and Air Force standards. According to Air Force Combat Ammunition System (CAS) records, \$4.32 billion in Air Force munitions were stored in Korea as of May 2016.⁶ The munitions were stored at 452 munitions storage facilities on two U.S. and nine ROK Air Force installations. We statistically sampled 105 of the 452 munitions storage facilities in Korea for our audit.

(U) Munitions Storage in Korea

(U) Since at least the late 1960s, the U.S. and ROK governments have signed agreements to address U.S. ammunition logistics in the ROK. The U.S. Air Force has also signed memorandums of understanding to store U.S. Air Force munitions at ROK Air Force installations because of limited storage capacity on U.S. installations.⁷ The storage locations are known as “Munitions Activities Gained by Negotiations Between U.S. Air Force/ROK Air Force Memorandum of Understanding (MAGNUM).” MAGNUM is a concept unique to Korea, as U.S. Air Force–titled munitions are stored at facilities that are owned, operated, and protected by ROK Air Force personnel. Under the terms of the agreement, the ROK Air Force is required to manage, store, inspect, and maintain all munitions in accordance with DoD and Air Force guidance.

(U) Authorized Net Explosive Weight Storage Limits

(U) Munitions storage facilities have limits on the number and type of munitions the facilities can hold. Each munition has a net explosive weight (NEW), which is the weight of the munition in pounds of explosive material. Each munition storage facility has an authorized NEW limit that is based on building design, condition, and proximity to other munitions or inhabited buildings.

(U) The NEW limits at each munition storage facility are reviewed and approved by the DoD Explosives Safety Board (DDESB), through explosives site planning. Explosives site planning is the process used to manage the risks associated with explosive activities to ensure the safety of personnel, equipment, and assets; while meeting mission requirements. The DDESB approves explosive site plans that establish the authorized NEW limits for each munitions storage facility. The authorized NEW at each facility

⁶ (U) CAS is the Air Force’s single system of record for the management of conventional munitions. This system provides visibility of location, configuration, and status of all conventional munitions owned by, or in the custody of, the Air Force in support of mission planning, preparation, and execution.

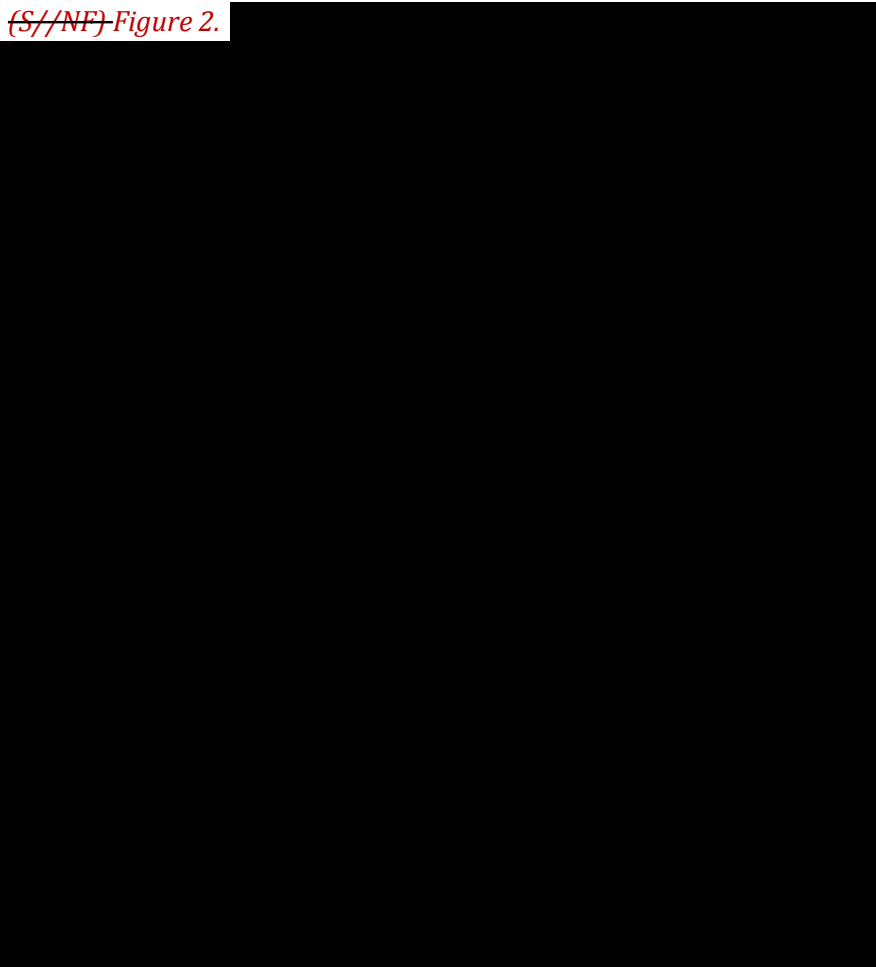
⁷ (U) A “Memorandum of Understanding International between the United States Air Force and the Republic of Korea Air Force Concerning Storage of United States Air Force Munitions in the Republic of Korea Air Force Munitions Facilities,” was re-signed on July 26, 2016, and is in effect for five years.

(U) must be visibly posted in the facility, and reported in CAS along with the actual NEW of the inventory.

~~(S//NF)~~ Furthermore, Explosive Hazard Reduction (EHR) studies identify and quantify hazards and operational restrictions posed by the presence of U.S. Air Force-titled munitions and make recommendations to mitigate risks or request an exception.⁸ For example, an EHR study published in [REDACTED]

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

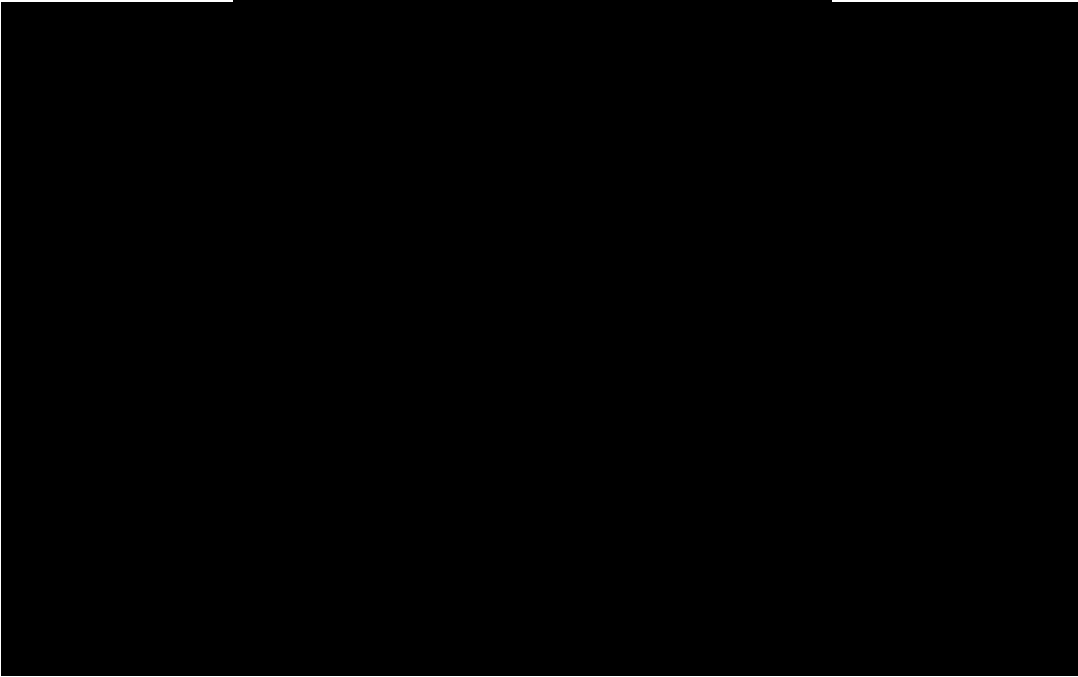
~~(S//NF)~~ Figure 2.



(U) Source: ~~(FOUO)~~ [REDACTED]

⁸ (U) The EHR studies were conducted by Integrated Systems Analysts, Incorporated.

~~(S//NF)~~ Figure 3.



(U) Source: ~~(FOUO)~~

(U) Air Force Exception Program

(U) When explosive safety standards cannot be met because of installation-level storage limitations in the ROK, the Commander, 7th Air Force, may sign a deviation request to continue explosives operations and document the mandatory safety standards not met. Air Force Manual 91-201 requires the Air Force to provide the same level of protection to ROK military and civilian personnel as they provide U.S. personnel.⁹ However, the Manual also allows the Air Force to deviate from safety standards to accomplish its mission, while accepting the added risk to personnel and property. By approving deviation requests, the Air Force accepted the higher risks resulting from operations outside of safety standards. For example, the Commander, 7th Air Force, signed a deviation request on December 2, 2016, that listed over 1,200 exceptions to explosive safety criteria that threaten the safety of 365,000 ROK civilians.

⁹ (U) Air Force Manual 91-201, "Safety: Explosives Safety Standards," January 12, 2011.

(U) Munition Requirements Process

(U) Air Force Instruction 21-201 outlines the munitions requirements process which includes the annual munitions forecast process, munitions working group meetings, theater working group meetings, and the munitions allocation process.¹⁰

(U) Munitions Forecast Process

(U) The munition requirements process begins with the annual munitions forecast process. The Global Ammunition Control Point, Air Force Life Cycle Management Center, Munitions Division, manages the global war reserve materiel for munitions. It uses, manages, and conducts analyses of CAS munitions data to implement key responsibilities such as, centrally consolidating forecasts, allocating and distributing munitions worldwide, and submitting forecasts for programming, budgeting, and funding. The Global Ammunition Control Point, in coordination with the Air Force, Force Application Directorate (AF/A5R-C);¹¹ and the Nuclear Weapons, Missiles, and Munitions Division provides munitions forecast instructions to the munition staff in major commands, such as Pacific Command, no later than October 15 of each year.¹² The major command munition staff then consolidate and validate munition requirements, and develop a consolidated forecast.

(U) Munitions Working Group

(U) The Global Ammunition Control Point hosts; AF/A5R-C; Air Force Security Forces Center; and the Air Force Civil Engineering Support Agency, Explosive Ordnance Division, co-chair the Air Force munitions working group where they review and discuss the results of the munitions forecast process with the major command munitions personnel. The working group makes adjustments before approving worldwide munitions requirements.

¹⁰ (U) Air Force Instruction 21-201, "Maintenance: Munitions Management," June 3, 2015. Incorporating Change 1, October 13, 2015, Certified Current February 12, 2016, and Air Force Instruction 21-201, PACAF Pacific Munitions Management, June 17, 2016.

¹¹ (U) As of March 2017, the A5R-C directorate split into A5RC and A5RW. The A5RW now has the munitions responsibility. Air Force Instruction 21-201 will be updated to reflect this change.

¹² (U) Munitions forecast is the annual process to identify munitions requirements.

(U) Theater Working Group

(U) The theater working group is an extension of the munitions working group. The members of the AF/A5R-C Non-Nuclear Consumable Annual Analysis Branch meet with theater-specific personnel, to obtain input and assumptions for the Non-Nuclear Consumable Annual Analysis development process.¹³ The inputs obtained from this working group are used to define each theater's war reserve materiel.

(U) Munitions Allocation Process

(U) The Global Ammunition Control Point also hosts, and the AF/A5R-C; and the Air Force Nuclear Weapons, Missiles, and Munitions Division; Security Forces Center; and Civil Engineering Support Agency, Explosive Ordnance Division, co-chair the Air Force munitions allocation working group. The munitions allocation working group matches limited worldwide inventory against validated requirements derived from the munitions working group. Specifically, the working group validates munitions plans against the approved quantity of munitions items allocated to the command, theater, or base stock record account and makes any adjustments, taking into consideration different factors such as available infrastructure, issues that impact deployments, and new or revised missions. The munitions allocation working group documents its allocation decisions in a requirements spreadsheet, which is updated annually.

(U) War Consumable Distribution Objective

(U) The War Consumable Distribution Objective (WCDO) identifies the quantities of munitions needed to support Air Force wartime missions and is created during the munitions requirement process. The WCDO is organized by Operation Plans (OPLANs)¹⁴ and is the Air Force's approved method of pre-positioning war reserve materiel consumables, such as munitions, at or near the operating bases supporting the Air Force mission requirements. We used the WCDO document to determine the total NEW required to meet OPLAN requirements.

¹³ (U) The Non-Nuclear Consumable Annual Analysis is an analytical process designed to quantitatively identify a mix of conventional air munitions to be programmed for procurement and maintained in the worldwide war reserve materiel stockpile. It documents the calculations, assumptions, and methodologies used to compute conventional air munitions theater requirements.

¹⁴ (U) Operation Plans are formal plans for the conduct of military operations prepared in response to actual or potential contingencies.

(U) Review of Internal Controls

~~(S//NF)~~ 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.¹⁵

We identified internal control weaknesses related to the Air Force [REDACTED]

[REDACTED] not verifying and updating CAS and explosive limit placard data when NEW limits changed; or not addressing outstanding maintenance deficiencies at Gwang Ju, Osan, Suwon, Daegu, and Kunsan Air Bases. We will provide a copy of the final report to the senior official responsible for internal controls in the Air Force.

¹⁵ (U) DoD Instruction 5010.40, "Managers' Internal Control Program Procedures," May 30, 2013.

~~(S//NF)~~

.16

~~(S//NF)~~

16 ~~(S//NF)~~

~~SECRET//NOFORN~~

(U) Table 1. NEW of Air Force Munitions Stored in the ROK (in Pounds)

S//NF Authorized	Actual	Requirement
		S//NF

(S//NF) Source: (FOUO) [REDACTED], (U) CAS AMST Report, (S//NF) [REDACTED]

(S//NF) [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] Table 2 shows the amount of NEW authorized, actual and required for these installations.

(U) Table 2. NEW Comparison at Installations Visited (in Pounds)

S//NF Installation	Authorized	Actual	Requirement
			S//NF

(S//NF) Source: (FOUO) [REDACTED] (U) CAS AMST Report, (S//NF) [REDACTED]

(S//NF) [REDACTED]
[REDACTED]
(S//NF) [REDACTED]
[REDACTED] 7th Air Force is required by the OPLAN to maintain [REDACTED]
[REDACTED]
[REDACTED] Table 3 shows the comparison of authorized NEW to the required NEW at

~~(S//NF)~~ Table 3. Comparison of Authorized NEW to Required NEW (in Pounds)

S//NF			
Installation	Authorized	Requirement	Difference
			S//NF

~~(S//NF)~~ Source: (FOUO) [REDACTED], ~~(S//NF)~~ [REDACTED]

~~(S//NF)~~ In addition, as of August 16, 2016, the Air Force reported [REDACTED]
[REDACTED]
[REDACTED] Table 4 shows a comparison of actual amounts to authorized amounts.

~~(S//NF)~~ Table 4. Comparison of Actual NEW to Authorized NEW (in Pounds)

Installation	Actual	Authorized	Difference
			S//NF

(U) Source: (U) CAS AMST Report, (FOUO) [REDACTED]

~~(S//NF)~~ Finally, when comparing the actual [REDACTED] stored to the requirement of [REDACTED] as of August 16, 2016, there was a [REDACTED] Table 5 shows a comparison of required amounts to actual amounts.

~~(S//NF)~~ Table 5. Comparison of Actual NEW to Required NEW (in Pounds)

Installation	Actual	Required	[REDACTED]
			S//NF

~~(S//NF)~~ Source: ~~(S//NF)~~ [REDACTED] (U) CAS AMST Report.

(S//NF)

(S//NF)

Pacific Air Forces and 7th Air Force personnel receive an annual requirements spreadsheet from Headquarters Air Force/A5 that identifies munitions requirements by the type of aircraft. Headquarters Air Force/A5 relies on 7th Air Force to fulfill the mandated munitions requirements and position the munitions where needed to meet contingency operations.

(S//NF)

(S//NF)

.¹⁸ For example, on December 2, 2016, the Commander, 7th Air Force, accepted known safety risks by signing a formal deviation request identifying exceptions to explosive safety criteria at

¹⁸ (S//NF)

(U) Management Actions Taken

(U) The U.S. Forces Korea/ROK Munitions Risk-Reduction Strategy, approved in April 2016, recommended that a Bilateral Focus Group be established to reduce munitions-related risks in the ROK and ensure U.S. Forces Korea and ROK leadership are informed of the remaining safety risks to the population and property surrounding air bases. In addition, in August 2016, the Assistant Secretary of the Air Force for Installations, Environment, and Energy directed personnel from the:

- a. (U) Air Force Installations, Environment, and Energy office to develop an 18-month plan, by November 2016, to obtain ROK concurrence with risk acceptance;
- b. (U) Air Force Chief of Safety office to review the recommendations in the April 1998 Air Force “Framework for Granting Explosives Safety Quantity-Distance Exemptions and Waivers in Korea,” report and write an updated report on the implemented recommendations and whether new actions should be taken; and
- c. (U) Pacific Air Forces to:
 1. (U) continue to include in all waiver packages clear documentation that supports the strategic and compelling operational justification, evidence of actions to protect personnel and property, and attempts to achieve ROK coordination and concurrence; and
 2. (U) develop cost estimates of projects to eliminate or mitigate explosive hazards to the local communities (including new construction, land purchases, relocation of civilians, or direct notification of civilian populations).

(U) We reviewed a draft of the proposed ROK risk concurrence plan and determined it met the intent of the Assistant Secretary’s directive. Specifically, the plan provides a timeline that outlines the process to obtain ROK concurrence with risk acceptance, including items such as, participating in the Bilateral Focus Group, and coordinating any new policies with Office of the Secretary of Defense legal counsel. However, as of March 2017, the new Acting Assistant Secretary of the Air Force for Installations, Environment, and Energy had not yet approved the plan.

(U) We commend the U.S. Air Force for recommending the establishment of this Bilateral Focus Group to reduce munitions related safety risks in the ROK. 7th Air Force should promptly implement the Assistant Secretary of the Air Force for Installations, Environment, and Energy's 18-month plan and proposed actions resulting from the Air Force Chief of Safety report.

(U) Management Comments on the Finding and Our Response

~~(S//NF)~~ Management Comments on [REDACTED]

~~(S//NF)~~ The Commander, 7th Air Force, agreed that the munitions storage [REDACTED]

[REDACTED]

[REDACTED] The Commander also stated that munitions storage [REDACTED]

[REDACTED]

[REDACTED] Specifically, the Commander stated that the [REDACTED]

[REDACTED] The Commander also stated that 7th Air Force will continue to use the process outlined in Air Force Manual 90-201 to analyze and assess risks to personnel and missions at [REDACTED] USAF installations within the 7th Air Force area of responsibility.

~~(S//NF)~~ The Commander stated that the [REDACTED] munitions storage plan [REDACTED]

[REDACTED]

[REDACTED] In addition, the Commander recommended that we not use the term "pre-positioned" regarding aircraft at [REDACTED]

[REDACTED] The Commander added that the storage requirement was based on [REDACTED]

[REDACTED]

(U) Our Response

~~(S//NF)~~ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Therefore, we did not change the report regarding the risks associated with moving munitions to meet contingency requirements. However, we

(S//NF) agree that replacing the term “aircraft pre-positioned” with “aircraft deployed for contingency operations,” or other similar language, is appropriate and have made that change throughout the report.

(U) Recommendations, Management Comments, and Our Response

(U) Recommendation A.1

(U) We recommend that the Commander, 7th Air Force:

a. (S//NF) [REDACTED]

(U) 7th Air Force Comments

(U) The Commander, 7th Air Force, agreed with the recommendation but did not state what actions would be taken.

(U) Our Response

(S//NF) Comments from the Commander did not address the recommendation.

The Commander did not describe what actions would be taken to [REDACTED]

[REDACTED] Therefore, the recommendation is unresolved. The Commander should provide comments on the final report specifying how he will [REDACTED]

b. **(U) Implement the Assistant Secretary of the Air Force for Installations, Environment and Energy’s 18-month plan, when approved.**

(U) 7th Air Force Comments

(U) The Commander, 7th Air Force, agreed with the recommendation.

(U) Our Response

(U) Comments from the Commander addressed all specifics of the recommendation; therefore, the recommendation is resolved. We will close the recommendation once we verify that the 18-month plan is implemented.

- c. **(U) Implement proposed actions resulting from the Air Force Chief of Safety report, after the report is issued.**

(U) 7th Air Force Comments

(U) The Commander, 7th Air Force, agreed with the recommendation.

(U) Our Response

(U) Comments from the Commander addressed all specifics of the recommendation; therefore, the recommendation is resolved. We will close the recommendation once we verify that actions resulting from the Air Force Chief of Safety report are implemented.

(U) Finding B

(U) Inaccurate NEW Limits Posted and Reported

(U) U.S. and ROK Air Force installation munitions personnel did not accurately post and report the NEW limits authorized by the DDESB. Specifically, at the 105, out of 452 statistically sampled munitions storage facilities included in the audit, munitions personnel:

- (U) did not post NEW limits at 1 facility,
- (U) posted inaccurate NEW limits at 21 facilities,
- (U) reported inaccurate NEW limits in CAS for 16 facilities, and
- (U) reported NEW in excess of authorized NEW limits in CAS at 2 facilities.

(U) The NEW limits were inaccurate because Air Force munitions guidance did not require personnel to: (1) verify posted NEW limits during annual inspections, (2) update posted NEW limits when information changed, and (3) update all CAS data when NEW limits changed. In addition, Air Force guidance did not require management oversight, review, and approval of CAS overrides related to munitions stored above NEW limits.¹⁹ Storing more munitions than authorized can result in explosion risks to property and personnel beyond the established explosive clear zones. In addition, inaccurate NEW placards or CAS data can result in inefficient use of facility storage space because the authorized capacity of a given facility could be greater than the NEW limits posted on placards or reported in CAS.

¹⁹ (U) An override is a decision by management or staff to bypass established controls to allow a transaction that would otherwise be rejected by the system controls to be processed.

(U) Inaccurate Net Explosive Weight Limits Posted on Placards or Reported in CAS

(U) U.S. and ROK Air Force installation munitions personnel did not accurately post and report the NEW limits authorized by the DDESB. Specifically, munitions personnel did not post, or posted inaccurate NEW limit placards at storage facilities, reported inaccurate NEW limits in CAS, and reported NEW in excess of authorized NEW limits in CAS.

(U) Nonexistent Explosive Limit Placard

(U) U.S. and ROK Air Force munitions personnel did not post a NEW limit placard at 1 of the 105 locations reviewed. Specifically, Osan facility S13A did not have a NEW limit placard posted. 7th Air Force personnel stated that there were no explosives stored at the facility at the time of the site visit, therefore a placard was not required. However, Air Force Manual 91-201 requires personnel to clearly post the hazard divisions (HD)²⁰ and authorized NEW at all explosive locations. Additionally, an August 2016 CAS report showed explosives were stored at Osan facility S13A.

(U) Inaccurate Explosive Limit Placards

(U) U.S. and ROK Air Force munitions personnel posted inaccurate NEW data on placards at 21 of the 105 locations reviewed. As previously stated, Air Force Manual 91-201 requires personnel to clearly post the HD and authorized NEW at all explosive locations. The DDESB establishes the authorized NEW limits for each munitions storage facility. Munitions storage facilities have a unique NEW limit for each HD stored at the facility. See Table 6 for an example of DDESB-authorized NEW limits and inventory by HD as reported in CAS.

²⁰ (U) HD are used to indicate the characteristics of explosive hazards. For example, HD 1.1 is characterized by mass-explosion that generally causes severe structural damage to adjacent objects. The blast effects of HD 1.2 (including HD 1.2.1, HD 1.2.2, and HD 1.2.3) items are limited to the immediate vicinity of the blast, and the items will not mass-detonate if a single item is initiated. HD 1.3 represents items that present a mass-fire hazard and minor blast effects, while HD 1.4 represents items that present a fire hazard but no blast effects.

(U) Table 6. Authorized NEW Limits and Inventory by Hazard Division (in Pounds).

U Installation	Facility Number	NEW Data Field	HD 1.1	HD 1.2.1	HD 1.2.2	HD 1.2.3	HD 1.3	HD 1.4
Kunsan Air Base	2953	Authorized NEW Limit	175,610	250,000	500,000	500,000	39,000	Capacity*
		NEW of Inventory	7,192	0	0	0	0	0 U

*(U) A capacity limit allows a storage facility to be used to its physical capacity of a specified HD with no impact on NEW limits.

(U) Source: (U) Explosive Hazard Reduction Study, Kunsan Air Base, ROK May 2008; (U) Kunsan CAS Facility View Report as of August 19, 2016.

(U) However, at 21 of the 105 facilities, the NEW limit placards posted at the facilities did not match the NEW limits authorized by the DDESB for one or more hazard divisions. In total, placard data for 21 facilities, including 39 hazard divisions, had inaccurate NEW limits when compared to the DDESB-authorized NEW limits. Table 7 details the inaccurate NEW placards.

(U) Table 7. Inaccurate NEW Limits Posted on Facility Placards

U Installation	Facility Number	Number of Hazard Divisions with Inaccurate NEW Data Posted on Placards
Osan Air Base	54115A	1
	A18R	1
	B14R	6
	GEN13	1
	GEN14	1
	2434A	2
	S6A	1
Osan Sub-Total	7 facilities	13 hazard divisions
Daegu Air Base	IG09	1
	IG23	2
	MAG01	2
	MAG03	2
	MAG04	4
Daegu Sub-Total	5 facilities	11 hazard divisions
Suwon Air Base	2410	3
	IG17	1
	MAG07	3
	MAG08	3
Suwon Sub-Total	4 facilities	10 hazard divisions
Gwang Ju Air Base	IG05	1
	IG10	1
	IG23	1
	MAG02	1
	MAG12	1
Gwang Ju Sub-Total	5 facilities	5 hazard divisions
Total	21 Facilities	39 Hazard Divisions with Inaccurate NEW Data on Placards U

(U) Source: (U) Explosive Hazard Reduction studies, (U) DoD OIG inspections and analyses.

(U) Inaccurate NEW Data in the Combat Ammunition System

(U) U.S. and ROK Air Force munitions personnel reported inaccurate NEW data in CAS for 16 of the 105 facilities. Air Force Instruction 21-200 requires Air Force munitions

(U) control personnel to update CAS and manage NEW as changes occur.²¹ The authorized NEW of each facility was reported in CAS Facility View Reports and included NEW limits for each hazard division.²² However, the authorized NEW data in CAS did not always match the NEW limits approved by the DDESB for one or more hazard divisions. Specifically, the CAS data for 16 facilities, including 41 hazard divisions, had inaccurate NEW limits. Table 8 details the CAS data inaccuracies.

(U) Table 8. Inaccurate NEW Limit Data Reported in the Combat Ammunition System

U Installation	Facility Number	Number of Hazard Divisions With Inaccurate NEW Data Reported in CAS
Osan Air Base	1832	4
	1835	4
	71837-04	4
	B14R	6
	GEN13	2
	GEN14	2
	S20A	1
Osan Sub-Total	7 facilities	23 hazard divisions
Gwang Ju Air Base	IG05	2
	IG10	2
	IG23	1
	MAG02	1
	MAG04	1
	MAG12	1
Gwang Ju Sub-Total	6 facilities	8 hazard divisions
Daegu Air Base	IG23	1
	MAG04	4
Daegu Sub-Total	2 facilities	5 hazard divisions
Kunsan Air Base	2718	5
Kunsan Sub-Total	1 facility	5 hazard divisions
Total	16 Facilities	41 Hazard Divisions with Inaccurate NEW Data in CAS

U

(U) Source: (U) Kunsan, Daegu, and Gwang Ju CAS Facility View Reports as of August 19, 2016, and Osan, Suwon CAS Facility Reports as of August 23, 2016; (U) DoD OIG analyses.

²¹ (U) Air Force Instruction 21-200, "Maintenance: Munitions and Missile Maintenance Management", January 2, 2014. (Incorporating change 1, June 30, 2016), chapter 5 "Munitions Control."

²² (U) Facility View (or AMQ03B) Reports are generated in CAS and report an individual facility's data, as of a specified date, including type of structure, square footage, safety distances, actual NEW stored, and authorized NEW. Facility View Reports for Osan, and Suwon Air Bases were as of August 23, 2016. Facility View Reports for Kunsan, Daegu, and Gwang Ju Air Bases were as of August 19, 2016.

(U) Air Force Munitions Personnel Bypassed CAS System Controls

(U) For 2 of the 105 facilities, Air Force munitions personnel were able to override the CAS controls that warned personnel about posting actual NEW in excess of authorized NEW limits. Air Force Manual 91-201 requires personnel to enforce explosives limits and ensure NEW does not exceed authorized limits. However, as of August 19, 2016, munitions personnel reported 6,800 pounds of NEW in excess of authorized limits in CAS. Specifically, CAS reported that facility MAG03 at Daegu Air Base was not authorized to store munitions classified as HD 1.2.3, but the same CAS report showed the Air Force had 6,734 pounds of HD 1.2.3 stored in facility MAG03. In addition, CAS reported that facility 2739G at Kunsan Air Base was not authorized to store munitions classified as HD 1.4, but the same CAS report showed the Air Force had 62 pounds of HD 1.4 stored in facility 2739G.

(U) For 2 of the 105 facilities, Air Force munitions personnel were able to override the CAS controls that warned personnel about posting actual NEW in excess of authorized NEW limits.

(U) On February 27, 2017, Pacific Air Forces personnel provided updated CAS Facility View reports for these two facilities. The updated reports showed that facility MAG03 at Daegu Air Base was authorized to store munitions classified as HD 1.2.3, and facility 2739G at Kunsan Air Base was authorized to store munitions classified as HD 1.4. The updated reports also showed that NEW on-hand was stored within the CAS limits.

(U) Air Force Guidance Did Not Require Updates to Facility NEW Data

(U) The NEW limits posted at munitions storage facilities and reported in CAS were inaccurate because Air Force munitions guidance did not require that: (1) posted NEW limits be verified during annual inspections, (2) posted NEW limits be updated as needed, and (3) all CAS data be updated when NEW limits change. Requiring munitions personnel to compare posted NEW limits to authorized NEW limits during annual inspections, and update placards as needed, would ensure that installation-level munitions storage decisions are based on accurate information. Therefore, the Air Force should develop and implement guidance for munitions personnel to verify and correct NEW placards at each munitions storage facility during annual inspections. While Air Force Instruction 21-200 requires personnel to “update CAS as changes occur,” it does not specify the data fields to be updated or the type of NEW changes that would initiate an update. When asked, Air Force personnel stated that they interpreted

(U) this guidance to only apply to inventory movements of assets and the NEW of the inventory, not the “facility” NEW limits in CAS. Air Force guidance should explicitly require munitions personnel to update all CAS information, including facility data, not only when inventory moves, but whenever explosive limits change.

(U) Air Force Guidance Did Not Require Management Oversight of CAS Overrides

(U) Air Force guidance did not require management oversight, review, and approval of CAS overrides related to munitions storage. According to Pacific Air Forces munitions personnel and CAS Program Management Office personnel, error messages appear in CAS when users attempt to post more NEW in a facility than authorized. However, users were able to override that error message, without management review and approval, and input NEW amounts above the facilities’ authorized NEW limits. CAS Program Management Office personnel stated that all CAS munitions control users and those users tasked to move munitions have the ability to override the system control. According to the CAS Program Management Office personnel, the system generates a daily report that lists the system overrides and includes the munition’s stock number, facility number, the error identified, and the user’s remarks.²³ However, according to 7th Air Force Munitions Accountable Systems Officers, munitions personnel did not use, review, or approve the reports that list system overrides. The Air Force should require management oversight of CAS overrides related to munitions storage; including download, review, and approval of CAS override reports; and acceptance of the associated explosive risks if they decide not to move explosives to comply with explosive limits.

(U) Explosive Risks Incurred or Inefficient Use of Munitions Storage Space

(U) Inaccurate NEW placards and CAS data can result in explosion risks beyond the explosive clear zones or inefficient use of facility storage space. As mentioned, the authorized NEW limits of a facility determine the explosive clear zones around the facility. The NEW limits reported in CAS and posted on facility placards did not always match the DDESB-authorized NEW limits for each munitions storage facility.

(U) Inaccurate NEW placards and CAS data can result in explosion risks beyond the explosive clear zones or inefficient use of facility storage space.

²³ (U) According to the CAS PMO, the CAS-generated report is called an AMC09 report.

(U) If NEW limits in CAS, or those posted on facility placards, are *greater* than the DDESB-authorized limits (see Table 9 for an example), the Air Force and the surrounding population beyond the established explosive clear zones are at risk because the zones are based on the DDESB-authorized NEW.

(U) Table 9. Example of NEW Limits by Hazard Division in the Combat Ammunition System Greater Than DDESB-Authorized Limits (in Pounds)

U Osan Air Base Facility 71837-04	HD 1.1	HD 1.2.1	HD 1.2.2	HD 1.2.3	HD 1.3	HD 1.4
CAS-reported NEW	14,606	18,000	18,000	18,000	18,000	Capacity
DDESB-authorized NEW	14,606	14,606	14,606	14,606	14,606	Capacity
Difference Above Authorized Limits	0	3,394	3,394	3,394	3,394	0 U

(U) Source: (U) CAS Facility View Reports, as of August 23, 2016, (U) Explosive Hazard Reduction Study, Osan Air Base, ROK, September 2011.

(U) Likewise, when munitions personnel override CAS controls and post actual NEW that exceeds the authorized NEW limits, the Air Force and the surrounding population can incur additional safety risks beyond the established explosive clear zones. On the other hand, if NEW limits in CAS, or those posted on facility placards, are *less* than the DDESB-authorized limits (see Table 10 for example), the Air Force may not be efficiently using munitions storage facilities because the authorized capacity of a given facility could be greater than the NEW limits posted on placards or reported in CAS.

(U) Table 10. Example of NEW Limits by Hazard Division in the Combat Ammunition System Less Than DDESB-Authorized Limits (in Pounds)

U Gwang Ju Air Base Facility MAG04	HD 1.1	HD 1.2.1	HD 1.2.2	HD 1.2.3	HD 1.3	HD 1.4
CAS-reported NEW	144,000	500,000	500,000	500,000	420,000	Capacity
DDESB-authorized NEW	250,000	500,000	500,000	500,000	420,000	Capacity
Difference/Unused Storage Space	106,000	0	0	0	0	0 U

(U) Source: (U) CAS Facility View Reports, as of August 19, 2016, (U) Explosive Hazard Reduction Study, Gwang Ju Air Base, ROK, December 2009.

(U) Recommendations, Management Comments, and Our Response

(U) Redirected Recommendation

(U) The Assistant Deputy Chief of Staff for Headquarters Air Force, Logistics, Engineering, and Force Protection (HAF/A4), responding for the Director, HAF/A4, suggested that Recommendations B.1.a, B.1.b, and B.1.c be directed to HAF/A4, which has the authority to publish Headquarters Air Force-level munitions guidance.

(U) As a result of management comments, we directed the Recommendations B.1.a, B.1.b, and B.1.c to HAF/A4.

(U) Recommendation B.1

(U) We recommend that HAF/A4 develop guidance that requires installation munitions personnel to:

- a. (U) Verify and correct net explosive weight placards in each munitions storage facility during annual inspections.**

(U) Headquarters Air Force Comments

(U) The Assistant Deputy Chief of Staff, HAF/A4, responding for the Director, HAF/A4, agreed with the recommendation, stating that by August 2017, HAF/A4 will update Air Force Instruction 21-201, "Munitions Management," to explicitly require verification and correction of posted NEW limits in each munitions storage facility during routine facility inspections at least annually.

(U) Our Response

(U) Comments from the Assistant Deputy addressed all specifics of the recommendation; therefore, the recommendation is resolved. We will close the recommendation once we verify that the Air Force Instruction is updated.

- b. (U) Update all Combat Ammunition System information, including facility data, when explosive limits change.**

(U) Headquarters Air Force Comments

(U) The Assistant Deputy Chief of Staff, HAF/A4, responding for the Director, HAF/A4, agreed with the recommendation, stating that by August 2017, HAF/A4 will update Air Force Instruction 21-200, "Munitions and Missile Maintenance Management," to explicitly require updates to CAS facility data when the data changes, including changes to authorized hazard divisions and NEW limits. In addition, the Assistant Deputy stated that the Instruction will also require validation of this data at least annually.

(U) Our Response

(U) Comments from the Assistant Deputy addressed all specifics of the recommendation; therefore, the recommendation is resolved. We will close the recommendation once we verify that the Air Force Instruction is updated.

- c. (U) Manage and oversee all Combat Ammunition System overrides related to munitions storage; including download, review, and approval of override reports; and acceptance of the associated explosive risks if they decide not to move explosives to comply with explosive limits.**

(U) Headquarters Air Force Comments

(U) The Assistant Deputy Chief of Staff, HAF/A4, responding for the Director, HAF/A4, agreed with the recommendation, stating that, by August 2017, HAF/A4 will introduce policy in Air Force Instruction 21-201, "Munitions Management," to require munitions personnel to review the CAS Storage Override Report daily and take necessary action, if required. The Assistant Deputy stated that CAS is the current Air Force Munitions Accountable Property System of Record, and it produces the Storage Override Report daily. This report details the override actions that bypassed storage controls, such as maximum NEW of a facility, compatibility groups of munitions, location restrictions, or security. The Assistant Deputy stated that it is necessary for personnel to override CAS controls because the system does not account for authorized exceptions. The Assistant Deputy added that, optimally, CAS would allow automated management review and approval of required CAS overrides, concurrent to the override action.

(U) Our Response

(U) Comments from the Assistant Deputy addressed all specifics of the recommendation; therefore, the recommendation is resolved. We will close the recommendation once we verify that the Air Force Instruction is updated, or CAS is updated to allow for automated management review and approval of required CAS overrides.

(U) Finding C

(U) 7th Air Force Generally Complied With Munitions Storage Facility Standards, but Maintenance Deficiencies Existed

(U) 7th Air Force generally complied with DoD and Air Force munitions storage facility standards in the ROK. However, we identified 120 maintenance deficiencies out of the 2,532 facility conditions we tested at the 105, out of 452, statistically sampled munitions storage facilities included in the audit. Specifically, we identified doors, lights, ventilation, lightning protection systems, and breaker boxes that did not comply with munitions facilities standards. The maintenance deficiencies occurred because 7th Air Force personnel placed a low priority on maintaining facilities that they anticipated would close by 2025. Deficiencies in the physical condition of munitions storage facilities can lead to safety hazards resulting in personnel injury or damage to munition assets. In addition, maintenance deficiencies can lead to decreased storage capacity necessary to meet munitions requirements.

(U) Air Force Storage Facility Maintenance Standards Tested

(U) Based on our review of DoD and Air Force criteria, and Air Force facility inspections checklists, we identified eight specific categories to test at the munitions storage facilities:²⁴

- (U) exterior visual inspection,
- (U) interior visual inspection,
- (U) doors,
- (U) ventilators,
- (U) lightning protection systems,
- (U) intrusion detection systems,

²⁴ (U) DoD Manual 6055-09M Volume 1, DoD Manual 5100.76, Air Force Manual 32-1084, Air Force Manual 91-201, Air Force Instruction 21-201.

- (U) breaker box, and
- (U) static grounding.

(U) We limited our testing to those procedures that could be evaluated based on visual inspection. The test chosen had a “yes, no, or not applicable” answer. We selected 27 specific facility conditions to test within the 8 categories and developed a checklist to record the results.

(U) Air Force Did Not Ensure All Munitions Storage Facilities Complied With Standards

(U) The Air Force did not ensure all munitions storage facilities complied with maintenance standards. Specifically, we identified 120 maintenance deficiencies at the 105 munitions storage facilities visited. Table 11 summarizes the maintenance deficiencies that we identified, by category. See Figure 4 for examples of deficiencies and Appendix B for descriptions of the deficiencies.

(U) Table 11. Summary of Deficiencies Identified by Category

U Category	Description of Maintenance Deficiency	Number of Deficiencies Identified
Lights	Lights did not function or no lighting existed.	82
Visual Inspection (Exterior)	NEW limits not posted at locations, fire hazard symbols not posted or not visible, gutter damage or blockage, standing water, and pest screens not installed or were damaged.	11
Visual Inspection (Interior)	Holes or cracks in the ceiling, walls, or floors and interior drainage gutters and floor were covered with insects.	9
Doors	Door damage, door hinge and chain damage, a sinking floor near the base of a door, and a site door that did not close completely.	7
Breaker Boxes	Damage to site breaker boxes, breaker box doors, or hinges.	5
Ventilators	Disconnected wiring, inoperable ventilation, and ventilators that did not move freely.	3
Lightning Protection Systems	Broken lightning protection system grounding cables and wiring necessary to protect the facility from damage caused by lightning.	3
Total		120 U

(U) Source: DoD OIG.

(U) Figure 4. Maintenance Deficiencies Observed: Rusted Door, Missing Gutter, Damaged Door Hinge, Rusted Breaker Box (Clockwise, From Top-Left)



(U) Source: DoD OIG.

(U) During our physical inspections, we identified 82 deficiencies at U.S. and MAGNUM munitions storage facilities related to inadequate interior or exterior lighting. According to 7th Air Force personnel, MAGNUM munitions storage facilities were built without electricity or lighting and before certain safety standards were required. Under the terms of the memorandum of understanding between the U.S. Air Force and the ROK, the ROK Air Force is required to manage, store, inspect, and maintain all munitions in accordance with DoD and Air Force guidance. Air Force Manual 32-1084 requires exterior and interior lighting to be provided for all munitions storage locations. While the Manual also states that improvement of existing facilities for the sole purpose of meeting the requirements of the Manual will not be initiated, we considered the existence of lighting at munitions storage facilities to be a basic safety and security feature.²⁵

²⁵ (U) Air Force Manual 32-1084, "Civil Engineering: Facility Requirements," February 26, 2016.

(U) Air Force Did Not Prioritize Maintenance of Storage Facilities

(U) According to 7th Air Force personnel, installation commands and 7th Air Force civil engineering placed a low priority on fixing maintenance deficiencies at munitions storage facilities that they anticipated would close in the future. Munitions storage facilities at Osan, Suwon, Gwang Ju, and Daegu Air Bases are scheduled to close by 2025. While we only identified 120 maintenance deficiencies out of the 2,532 facility conditions we tested, we found instances where 7th Air Force personnel did not complete open work orders to correct maintenance deficiencies at those facilities. We compared the maintenance deficiencies we identified during our facility inspections at Osan Air Base with open Air Force work order data. We identified five open work orders that matched the deficiencies we identified:

- (U) three work orders that were open for over 4 months,
- (U) one work order open for over 7 months, and
- (U) one work order open for over 17 months.²⁶

(U) See Table 12 for the list of the outstanding work orders at Osan Air Base. Air Force Manual 91-201 requires the Air Force to maintain structures in good condition and suitable for the storage of explosive and munitions.

(U) Table 12. Summary of Outstanding Work Orders at Osan Air Base, as of November 28, 2016

U Building Number	Work Order Description	
2474A	Replace 50 halogen lights	
S15A	Door frame damaged.	
S15A	Four lights inoperable	
S18A	All lights inoperable.	
S20A	Repair interior and exterior lights.	U

(U) Source: DoD OIG.

²⁶ (U) Open work orders for Osan Air Base, as of November 28, 2016.

(U) The Commander, 7th Air Force, should:

- (U) correct the maintenance deficiencies identified in this report;
- (U) conduct an inspection of facilities and immediately correct deficiencies that would affect life and safety, categorize the remaining deficiencies by importance, and schedule corrective actions in accordance with DoD and Air Force standards; and
- (U) continue to maintain the facilities until the actual closing date.

(U) Additionally, the Commander, 7th Air Force, should require maintenance personnel to complete the outstanding work orders. Furthermore, the Commander 7th Air Force should ensure the ROK Air Force personnel comply with the terms established in the MAGNUM by addressing the maintenance deficiencies identified at MAGNUM facilities.

(U) Safety Hazards to Personnel and Munition Assets and Decreased Storage Capacity

(U) Unsafe physical conditions of munitions storage facilities cause safety hazards for personnel and munition assets.

(U) Unsafe physical conditions of munitions storage facilities cause safety hazards for personnel and munition assets. For example, inoperable lightning protection systems or rusted breaker boxes with exposed wiring could cause physical injury to

personnel with access to munitions storage facilities. Also, poor lighting at storage facilities could lead to damage to the munitions during movement or maintenance if personnel cannot clearly see where munitions or other obstacles are located.

Additionally, when facility maintenance deficiencies are not addressed or corrected, the physical condition of the munitions storage facility could deteriorate to a point where the DDESB decreases the facility's authorized NEW limit. Decreased NEW limits, could affect the Air Force's ability to meet mission requirements at individual installations if storage facilities are not properly maintained.

(U) Recommendations, Management Comments, and Our Response

(U) Recommendation C.1

(U) We recommend that the Commander, 7th Air Force:

- a. (U) Correct the maintenance deficiencies identified in Appendix B.

(U) 7th Air Force Comments

(U) The Commander, 7th Air Force, agreed with the recommendation, stating that the 120 facility maintenance deficiencies needed to be addressed and corrected. The Commander added that 7th Air Force squadrons responsible for maintaining and using the facilities had begun using the Air Force Munitions Facilities Standards Guide, Volume II, or local checklists to inspect and validate the deficiencies and initiate corrective actions, using work orders as required. Additionally, the Commander stated that 7th Air Force, Logistics, Engineering, and Force Protection and installation commanders will monitor these actions until they are complete.

(U) Our Response

(U) Comments from the Commander addressed all specifics of the recommendation; therefore, the recommendation is resolved. We will close the recommendation once we verify that the deficiencies are corrected.

- b. (U) Conduct an inspection of facilities and immediately correct deficiencies that would affect life and safety, categorize the remaining deficiencies by importance, and schedule corrective actions in accordance with DoD and Air Force standards.
- c. (U) Provide maintenance at facilities scheduled to close until the actual closing date.

(U) 7th Air Force Comments

(U) The Commander, 7th Air Force, agreed with the recommendations, restating that munitions personnel will conduct facility inspections using the Air Force Munitions Facilities Standards Guide, Volume II, or local checklists, establish work orders if facility deficiencies are identified, and monitor work orders until they are complete.

(U) Our Response

(U) Comments from the Commander addressed all specifics of the recommendations; therefore, the recommendations are resolved. We will close the recommendations once we verify that the inspections are complete and deficiencies are corrected.

d. (U) Require maintenance personnel to complete outstanding work orders.

(U) 7th Air Force Comments

(U) The Commander, 7th Air Force, agreed with the recommendation, stating that personnel will monitor open work orders and follow up with the Base Civil Engineer until the work orders are complete.

(U) Our Response

(U) Comments from the Commander addressed all specifics of the recommendation; therefore, the recommendation is resolved. We will close the recommendation once we verify that all outstanding work orders are complete.

e. (U) Ensure the Republic of Korea Air Force complies with the terms established in the Munitions Activities Gained by Negotiations between the United States Air Force/Republic of Korea Air Force Memorandum of Understanding by addressing the maintenance deficiencies identified at those facilities.

(U) 7th Air Force Comments

(U) The Commander, 7th Air Force, agreed with the recommendation, stating that a Combined Coordination Group was established that includes munitions and engineering personnel from 7th Air Force and the ROK Air Force Operational Command. The Commander stated that the Group was created to address munitions storage facilities, explosive safety hazards, and operational capabilities of the MAGNUM locations.

(U) Our Response

(U) Comments from the Commander addressed all specifics of the recommendation; therefore, the recommendation is resolved. We will close the recommendation once we verify that the Combined Coordination Group is addressing and ensuring resolution of maintenance deficiencies at MAGNUM storage facilities.

(U) Appendix A

(U) Scope and Methodology

(U) We conducted this performance audit from April 2016 through April 2017 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 objective.

(U) Our audit focused on the physical condition and storage capacity of 105 of 452 randomized stratified statistically sampled munitions storage facilities at 5 installations within the ROK. Because of the low number of deficiencies we identified (120 deficiencies of 2,532 facility conditions tested), we decided not to use the results to project to the universe.

(U) Based on DoD and Air Force criteria, and an Air Force facility inspections checklist, we identified eight specific categories to test at the munitions storage facilities:

- (U) exterior visual inspection,
- (U) interior visual inspection,
- (U) doors,
- (U) ventilators,
- (U) lightning protection systems,
- (U) intrusion detection systems,
- (U) breaker box, and
- (U) static grounding.

(U) We limited our testing to those procedures that could be evaluated based on visual inspection and did not require technical expertise to conclude on the facility condition. The tests chosen had “yes, no, or not applicable” answers. Because of time constraints during our site visits, we selected 27 specific facility condition tests within the 8 categories we identified. We then developed a checklist to record the results of our review. However, some of the tests that we performed were not applicable to each facility. For example, the Air Force used aircraft flight lines or concrete pads to hold

(U) munitions as munitions were staged or moved. While these locations were designated as facilities in CAS to ensure accountability of the munitions, some locations, based on their design, did not include lightning protection systems, intrusion detection systems, doors, or ventilation, which brick and mortar facilities included. Therefore, we deemed certain facility condition tests “not applicable” for the facility. We conducted a total of 2,532 applicable facility condition tests at the 105 facilities inspected.

(U) We compared munitions requirements from the WCDO with authorized quantities for each installation to determine if the Air Force had sufficient storage capacity in the ROK. Finally, we compared reported actual munitions storage quantities in CAS with authorized quantities to verify that the Air Force did not report more munitions than authorized.

(U) We obtained and reviewed copies of:

- (U) CAS Facility View Reports for 105 sampled facilities, dated August 19, 2016, and August 23, 2016;
- (U) summary spreadsheets documenting work orders data at Osan Air Base, for work orders opened between May 2015 and July 2016;²⁷
- (U) Air Force inspection reports of lightning protection systems, static bonds, and depth checks at Osan, Suwon, Daegu, Kunsan, and Gwang Ju Air Bases, dated from April 2013 through September 2016; and
- (U) EHR studies for sampled installations, dated from May 2008 through September 2011.

(U) We identified and reviewed the following criteria.

- (U) DoD Manual 6055.09-M, Volume 1, “DoD Ammunition and Explosives Safety Standards: General Explosives Safety Information and Requirements,” March 12, 2012

²⁷ (U) We could not obtain work order data for Kunsan Air Base because they migrated to a new system to track work order information in October 2016 and lost all the data related to prior work orders. We did not ask for work orders at Suwon, Gwang Ju, and Daegu Air Bases because these installations are managed by the ROK Air Force; therefore, the ROK Air Force is responsible for maintenance at these facilities.

- (U) DoD Manual 5100.76, "Physical Security of Sensitive Conventional Arms, Ammunition, and Explosives," April 17, 2012
- (U) DoD Directive 3110.06, "War Reserve Materiel Policy," June 23, 2008
- (U) Air Force Manual 32-1084, "Facility Requirements," February 26, 2016
- (U) Air Force Manual 91-201, "Safety: Explosives Safety Standards," January 12, 2011, (Incorporating Change 1, June 22, 2012)
- (U) Air Force Instruction 21-200, "Maintenance: Munitions and Missile Maintenance Management," January 2, 2014, (Incorporating Change 1, June 30, 2016)
- (U) Air Force Instruction 21-201, "Maintenance: Munitions Management," June 3, 2015, (Incorporating Change 1, October 13, 2015; Certified Current, February 12, 2016)
- (U) Air Force Instruction 25-101, Pacific Air Forces Supplement, "War Reserve Materiel Program Guidance and Procedures," September 5, 2012
- (U) Air Force Instruction 21-201, Pacific Air Forces Supplement, "Maintenance: Munitions Management," June 17, 2016

(U) To accomplish our objectives, we performed site visits to the ROK in June and August 2016. We conducted field work at two U.S. Air Force Bases (Osan and Kunsan), and three ROK Air Force Air Bases (Daegu, Suwon, and Gwang Ju).

(U) We interviewed personnel from U.S. Forces Korea, Pacific Air Forces, DoD Explosives Safety Board, Air Force Safety Center, 7th Air Force, 51st Fighter Wing, 8th Fighter Wing, and 607th Materiel Maintenance Squadron who were responsible for munitions storage management.

(U) Use of Computer-Processed Data

(U) We used computer-processed data for our audit. Specifically, we used munitions inventory and NEW data that Air Force management obtained from the CAS to identify the number of ROK munitions storage facilities and the NEW of munitions authorized and stored at the facilities reviewed. CAS is the authoritative system for Air Force

(U) combat munitions. We relied on the CAS data, including NEW of munitions, because a prior DoD OIG opinion validated the Air Force assertion of audit readiness that existence and completeness of CAS data was fairly stated as of June 30, 2014.²⁸

(U) We also performed tests on the reliability of the CAS data by (1) interviewing CAS Program Management Office, and 7th Air Force munitions personnel to understand the controls over CAS data, (2) interviewing 7th Air Force munitions personnel responsible for compiling those data, and (3) performing basic reasonableness checks of the data by reviewing it for consistency and completeness and comparing it to DDESB-approved NEW and posted facility placards. As a result, we determined that the data were sufficiently reliable for the purposes of our audit.

(U) Use of Technical Assistance

(U) We received assistance from the DoD OIG, Quantitative Methods Division. A statistician developed a stratified statistical sample design of Air Force munitions storage facilities in the ROK.

(U) Prior Coverage

(U) No prior coverage has been conducted on the conditions of Air Force munitions storage facilities within the last 5 years.

²⁸ (U) DODIG-2015-164, "Independent Auditor's Report on the Examination of Existence, Completeness, and Rights of United States Air Force Operating Materials and Supplies-Ammunition and Tactical Missiles", August 21, 2015.

(U) Appendix B**(U) Munitions Storage Facility Deficiencies**

U Installation	Building Number	Deficiencies Observed
Osan	S6A	Sinking floor near door.
		Small hole in wall approximately 2 inches in diameter.
		50 percent of the interior lights not working.
		Breaker box door and hinges damaged.
	S13A	No NEW placard posted.
	S15A	50 percent of the exterior lights not working.
		Roof gutters missing and broken.
		Base of door damaged, did not close completely.
		Door warped.
		Front wall damaged and exposed wiring.
		75 percent of the interior lights not working.
		Breaker box rusted and in poor condition.
	S18A	All exterior lights not working.
		No interior lights installed.
	S20A	All interior lights not working.
		Broken LPS grounding strap hanging from door.
		Breaker box door rusted and removed.
	S26A	Shrubs blocked view of fire hazard symbol.
		Cracking at base of door.
		All interior lights not working.
		Breaker box rusted and hinges broken.
	S31A	Small hole in front wall.
		All interior lights not working.
		Broken LPS grounding cable.
		Breaker box rusted on door and hinges.
	S32A	Small cracks and damage to floors and walls.
		All interior lights not working.
	S200C	Exterior light damaged and inoperable.
		Standing water, moisture on walls and floor.

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U	Installation	Building Number	Deficiencies Observed
			Facility door did not close and lock.
			Door rusted and damaged.
		2422	Ventilation not working.
		2428A	50 percent of the interior lights not working.
		2432A	Door chain rusted and not secured to track.
			50 percent of the interior lights not working.
		2442A	No pest screen installed.
			Large hole in interior wall; concrete missing.
		2448A	50 percent of the interior lights not working.
			Ventilator did not move freely.
		2451A	50 percent of the exterior lights not working.
			33 percent of the interior lights not working.
		2452A	No interior lights working.
		2474A	No interior lights installed.
		2475A	No interior lights installed.
		2494A	No interior lights working.
		B6L	Ventilation wiring disconnected.
		54102	No exterior lights installed.
			No interior lights installed.
		54106	No exterior lights installed.
			No interior lights installed.
		54107	No exterior lights installed.
			No interior lights installed.
		54114	No exterior lights installed.
			Small cracks and holes in cinder blocks.
			No interior lights installed.
		54115	No exterior lights installed.
			Small cracks and holes in cinder blocks.
			No interior lights installed.
		1835	Large crack in floor near bay.
	Suwon	Igloo 03	No interior lights installed.
		Igloo 05	No interior lights installed.

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U	Installation	Building Number	Deficiencies Observed
		Igloo 17	No interior lights installed.
		Igloo 21	No interior lights installed.
		MAG 02	No interior lights installed.
		MAG 03	No interior lights installed.
		MAG 06	No interior lights installed.
		MAG 07	No interior lights installed.
		MAG 08	No interior lights installed.
		MAG 10	No interior lights installed.
	Daegu	Igloo 09	No interior lights installed.
		Igloo 23	Floor and floor gutters full of insects.
			No interior lights installed.
	Kunsan	2416	No fire symbol visible.
		2430	No fire symbol visible.
		2435	No fire symbol visible.
		2739D	No exterior lights installed.
			No interior lights installed.
		2739E	No exterior lights installed.
			No interior lights installed.
		2739F	No exterior lights installed.
			Roof ventilation screen rusted away.
			No interior lights installed.
		2739G	No exterior lights installed.
			No interior lights installed.
		2740 Pad	No fire symbol visible.
		2741A	No exterior lights installed.
			No interior lights installed.
		2953	No exterior lights installed.
			Water in gutters did not drain.
			No interior lights working.
		2959	50 percent of exterior lights not working.
		5216	No exterior lights installed.
			U

U	Installation	Building Number	Deficiencies Observed
			No interior lights installed.
		5217	No exterior lights installed.
			No interior lights installed.
		5246	No exterior lights installed.
			No interior lights installed.
		5248	No exterior lights installed.
			No interior lights installed.
		5258	No exterior lights installed.
			No interior lights installed.
			One LPS ground cable is broken.
		5259	No exterior lights installed.
			No interior lights installed.
	Gwang Ju	Igloo 05	No exterior lights installed.
			No interior lights installed.
		Igloo 10	No exterior lights installed.
			No interior lights installed.
		Igloo 23	No exterior lights installed.
			No interior lights installed.
		MAG 02	No exterior lights installed.
			No interior lights installed.
		MAG 03	No exterior lights installed.
			No interior lights installed.
		MAG 04	No exterior lights installed.
			No interior lights installed.
		MAG 05	No exterior lights installed.
			No interior lights installed.
		MAG 12	No exterior lights installed.
			No interior lights installed.
			U

(U) Management Comments

(U) Headquarters Air Force Comments



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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON DC



MEMORANDUM FOR SAF/IE

FROM: AF/A4

SUBJECT: (U//~~FOUO~~) DoDIG Draft report, [REDACTED]

Proj D2016-D000RA-

0142.000, dtd 7 April 2017

1. (U) We concur with the intent of the findings and recommendations identified in the DoDIG Draft Report, (U//~~FOUO~~) [REDACTED]

[REDACTED] However, we suggest that for Recommendations B.1.a., B.1.b., and B.1.c., the assessed organization be changed to reflect Headquarters Air Force, Director of Logistics, Engineering and Force Protection (AF/A4). AF/A4 has the responsibility for and authority to publish Headquarters Air Force (HAF)-level munitions policy guidance.

2. (U) While we feel the existing AF policy already addresses two of the three recommendations, specifically for inspection of posted explosive limits, and management of Combat Ammunition System (CAS) facility data, we concur more specificity is required to ensure the guidance is clearly understood. AF/A4 management comments for each of the three identified recommendations are as follows:

a. (U) Recommendation B.1.a.: AF/A4 agrees to change policy in AFI 21-201, *Munitions Management*, to explicitly state the requirement to verify and correct posted net explosive weights (authorized explosive limits) in each munitions storage facility during routine facility inspections, not to exceed an annual interval. Estimated completion date for recommendation B.1.a.: August 2017. (OPEN)

b. (U) Recommendation B.1.b.: AFI 21-200, *Munitions and Missile Maintenance Management*, Chapter 5 covers Munitions Control responsibilities and addresses maintenance of CAS facility data. However, AF/A4 agrees to explicitly state the requirement to update CAS facility data information, including authorized hazard divisions and net explosive weight limits, when that data changes, and to periodically validate this information with source data, not to exceed an annual interval. Estimated completion date for recommendation B.1.b.: August 2017. (OPEN)

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(U) Headquarters Air Force Comments (cont'd)

CLASSIFICATION: ~~UNCLASSIFIED//FOUO~~

c. (U) Recommendation B.1.c.: Combat Ammunition System (CAS) is the current Air Force Munitions Accountable Property System of Record (APSR), and produces a Storage Override Report daily for override actions occurring throughout the day that exceeded storage parameters such as net explosive weight, compatibility group, security, or location mal-positioning. The ability to override certain parameters is necessary due to the APSR's lack of ability to account for authorized exceptions. Optimally, management and oversight of any override would occur prior to or concurrently with the override action, not after, as is the current situation. Until such time that the APSR can incorporate automated manager approval prior to required override actions, AF/A4 agrees to introduce policy in AFI 21-201 that requires munitions personnel to review the CAS Storage Override Report daily and take necessary action if required. Estimated completion date for recommendation B.1.c.: August 2017. (OPEN)

3. (U) AF/A4 point of contact is [REDACTED].

[REDACTED]
TIMOTHY K. BRIDGES, SES
Asst DCS/Logistics, Engineering &
Force Protection

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(U) 7th Air Force Comments



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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SEVENTH AIR FORCE (AIR FORCES KOREA)

7 June 2017

MEMORANDUM FOR OFFICE OF THE INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

FROM: 7 AF/CC
Unit 2047
APO AP 96266-2047

SUBJECT: (U) 7 AF Response on Draft Report Audit of AF Munitions Storage Facilities in the ROK (Project No. D2016-D000RA-0142.000)

1. (U) We have concluded our review of the audit and offer the following responses/amplifying data to the audit of Air Force munitions storage facilities in the Republic of Korea (ROK).

2. (~~S//NF~~) Finding A: The Air Force had sufficient munitions storage capacity in the ROK to meet overall munitions requirements.

a. (U) 7 AF Response: We concur with the statement there is enough munitions storage capacity in the 7 AF Munitions Storage Areas and agree

b. (~~S//NF~~) This audit did not include the fact that the

c. (~~S//NF~~) Regarding

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(U) 7th Air Force Comments (cont'd)

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d. (U) 7 AF will also continue to use the process outlined in Air Force Manual 90-201, *Explosive Safety Standards*, to analyze and assess risks to personnel and risk to mission at Gwangju AB and all other USAF installations within 7 AF.

e. (U) Finding A Recommendations:

(1) ~~(S//NF)~~

7 AF concurs.

(2) (U) Implement the Assistant Secretary of the Air Force for Installations, Environment and Energy's 18-month plan, when approved. 7 AF concurs.

(3) (U) Implement proposed actions resulting from the Air Force Chief of Safety report, after the report is issued. 7 AF concurs.

3. (U) Finding B: U.S. and ROK Air Force installation munitions personnel did not accurately post and report the NEW limits authorized by the DDESB. Specifically, at 105 out of 452 statistically sampled munitions storage facilities included in the audit, munitions personnel:

a. (U) did not post NEW limits at 1 facility

b. (U) posted inaccurate NEW limits at 21 facilities

c. (U) reported inaccurate NEW limits in CAS for 16 facilities, and

d. (U) reported NEW in excess of authorized NEW limits in CAS at 2 facilities.

e. (U) The NEW limits were inaccurate because Air Force munitions guidance did not require personnel to: (1) verify posted NEW limits during annual inspections, (2) update posted NEW limits when information changed, and (3) update all CAS data when NEW limits changed. In addition, Air Force guidance did not require management oversight, review, and approval of CAS overrides related to munitions stored above NEW limits. Storing more munitions than authorized can result in explosion risks to property and personnel beyond the established explosive clear zones. In addition, inaccurate NEW placards or CAS data can result in inefficient use of facility storage space because the authorized capacity of a given facility could be greater than the NEW limits posted on placards or reported in CAS.

f. (U) 7 AF Response: As this finding and the associated recommendations are addressed to the Assistant Secretary of the Air Force for Installations, Environment and Energy, we do not have further comment.

g. (U) Finding B Recommendations:

(1) (U) We recommend that the Assistant Secretary of the Air Force for Installations, Environment and Energy develop guidance that requires installation munitions personnel to:

(a) (U) Verify and correct net explosive weight placards in each munitions storage facility during annual inspections.

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(U) 7th Air Force Comments (cont'd)

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(b) (U) Update all Combat Ammunition System information, including facility data, when explosive limits change.

(c) (U) Manage and oversee all Combat Ammunition System overrides related to munitions storage; including download, review, and approval of override reports; and acceptance of the associated explosive risks if they decide not to move explosives to comply with explosive limits.

4. (U) Finding C: 7 AF generally complied with DoD and Air Force munitions storage facility standards in the ROK. However, we identified 120 maintenance deficiencies out of the 2,532 facility conditions we tested at the 105 out of 452 statistically sampled munitions storage facilities included in the audit. Specifically, we identified doors, lights, ventilation, lightning protection systems, and breaker boxes that did not comply with munitions facilities standards. The maintenance deficiencies occurred because 7 AF personnel placed a low priority on maintaining facilities that they anticipated would close by 2025. Deficiencies in the physical condition of munitions storage facilities can lead to safety hazards resulting in personnel injury or damage to munition assets. In addition, maintenance deficiencies can lead to decreased storage capacity necessary to meet munitions requirements.

a. (U) 7 AF Response: 7 AF concurs with the statement that the 120 facility maintenance deficiencies need to be addressed and corrected. Squadrons within 7 AF that have the responsibility of maintaining and utilizing munition storage facilities have undertaken an inspection process utilizing local checklists or the *USAF Munitions Facilities Standards Guide, Vol. II* to validate the deficiencies and work corrective actions. Installation commanders and 7 AF/A4 will monitor these actions until completion.

b. (U) Finding C Recommendations:

(1) (U) Correct the maintenance deficiencies identified in Appendix B. **7 AF concurs.**

(2) (U) Conduct an inspection of facilities and immediately correct deficiencies that would affect life and safety, categorize the remaining deficiencies by importance, and schedule corrective actions in accordance with DoD and Air Force standard. **7 AF concurs.** Munitions personnel will conduct inspections using a local checklist or the *USAF Munitions Facilities Standards Guide Vol. II*. If deficiencies are identified, work orders will be submitted and monitored until completion.

(3) (U) Provide maintenance at facilities scheduled to close until the actual closing date. **7 AF concurs.** Munitions personnel will conduct inspections using a local checklist or the *USAF Munitions Facilities Standards Guide Vol. II*. If deficiencies are identified, work orders will be submitted and monitored until completion.

(4) (U) Require maintenance personnel to complete outstanding work orders. **7 AF concurs.** Personnel will monitor/follow-up with the Base Civil Engineer on open work orders until completion.

(5) (U) Ensure the Republic of Korea Air Force complies with the terms established in the Munitions Activities Gained by Negotiations between the United States Air Force/Republic of Korea Air Force Memorandum of Understanding by addressing the maintenance deficiencies identified at those facilities. **7 AF concurs.** We have established a Combined Coordination Group that includes munitions and engineering representatives from 7 AF and the Republic of Korea Air Force Operational Command with the purpose of addressing the munitions storage facilities, explosive safety hazardous, operational capabilities of the

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(U) 7th Air Force Comments (cont'd)

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Munitions Activities Gained by Negotiations through U.S. Air Force/ROK Air Force Memorandum of Understanding (MAGNUM) sites.

5. (U) Please contact [REDACTED] if you have any questions or need further clarification.


THOMAS W. BERGESON
Lieutenant General, USAF
Commander

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(U) List of Classified Sources

Source 1: (U) Fiscal Year 2016 War Consumable Distribution Objective, Net Explosive
Weight Requirement: (Document classified SECRET//NOFORN)
Declassification Date: August 8, 2041
Generated Date: September 12, 2015

(U) Acronyms and Abbreviations

AF/A5R-C	Air Force, Force Application Directorate
CAS	Combat Ammunition System
DDESB	DoD Explosive Safety Board
EHR	Explosive Hazard Reduction
HAF/A4	Headquarters Air Force, Logistics, Engineering, and Force Protection
HD	Hazard Division
MAGNUM	Munitions Activities Gained by Negotiations Between U.S. Air Force/ROK Air Force Memorandum of Understanding
NEW	Net Explosive Weight
OPLAN	Operation Plan
ROK	Republic of Korea
WCDO	War Consumables Distribution Objective

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U.S. DEPARTMENT OF DEFENSE

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