United States Government Accountability Office

Report to Congressional Committees

June 2023

MISSILE DEFENSE

DOD Needs to Improve Oversight of System Sustainment and Readiness

GAO-23-105578

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GAO Highlights

Highlights of GAO-23-105578, a report to congressional committees

Why GAO Did This Study

Since DOD's MDA was established in 2002, it has spent over $194 billion to develop a layered MDS comprising interceptors, sensors, and communications elements, integrated to defend against missile attacks. Potential adversaries have acquired more missiles and made significant technical advances in recent years, which requires DOD to adequately sustain the system to ensure operational readiness.

Senate Report 117-39 includes a provision for GAO to examine missile defense sustainment and readiness. GAO assessed the extent to which DOD (1) has guidance for sustaining MDS elements and (2) has communicated missile defense readiness information to relevant decision makers.

GAO selected nine MDS elements due to their roles in regional and homeland missile defense and funding received from MDA. GAO compared DOD's sustainment approach with its guidance and leading practices for portfolio management. GAO also reviewed MDA and military service readiness guidance on data reporting methods.

What GAO Recommends

GAO is making two recommendations to DOD, including to develop comprehensive guidance for oversight of MDS sustainment and guidance requiring MDA to report missile defense readiness data. DOD concurred with the recommendations.

View GAO-23-105578. For more information, contact Diana Maurer at (202) 512-9627 or maurerd@gao.gov.

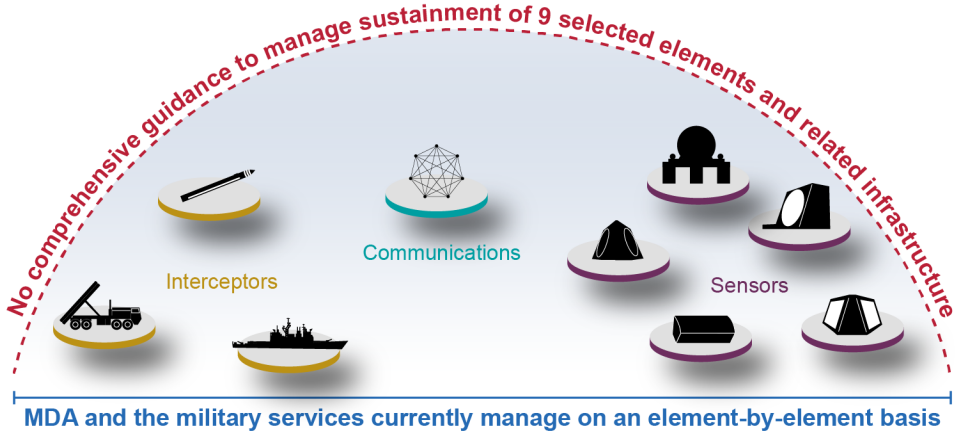
What GAO Found

The Department of Defense (DOD) lacks comprehensive guidance for sustaining Missile Defense System (MDS) elements, such as missile interceptors, sensors, and communications. The Missile Defense Agency (MDA) is responsible for acquiring and developing MDS elements. MDA and the military services have developed element-specific sustainment plans. However, DOD:

- **has not identified a specific entity assigned with responsibilities for overseeing the sustainment of MDS.** No one entity has been assigned responsibility per DOD guidance for overseeing the sustainment of MDS elements, resulting in a lack of visibility of MDS sustainment needs.
- **does not have an approach for prioritizing efforts to address sustainment challenges for MDS.** There is no approach for prioritizing and making department-wide sustainment decisions. For example, while MDA and the Army recognized corrosion as a challenge, the Army had not constructed permanent facilities for the element to prevent corrosion due to the prioritization of other projects and resource constraints.

Absent comprehensive guidance, including a responsible oversight entity and a process for prioritizing and addressing sustainment challenges, DOD lacks reasonable assurance that it can sustain MDS elements and infrastructure to address missile defense threats.

Lack of Comprehensive Guidance to Manage Sustainment of Selected Missile Defense Elements in GAO's Review



Source: GAO analysis of Department of Defense and Missile Defense Agency (MDA) information. | GAO-23-105578

GAO found that the military services and MDA report missile defense readiness data to different decision makers using different systems. The military services record unit readiness data, which are available DOD-wide and included in a semi-annual report to Congress. MDA records readiness data on MDS elements in a different system, but does not share this information within DOD, unless requested. Various DOD officials told GAO that their offices would like MDA to share its data more readily, which would enhance the department's strategic understanding of missile defense readiness.

Contents

Abbreviations

Aegis BMD	Aegis Ballistic Missile Defense
AN/TPY-2	Army Navy/Transportable Radar Surveillance and Control Model 2
BMDS	Ballistic Missile Defense System
C2BMC	Command and Control, Battle Management, and Communications
DOD	Department of Defense
DRRS-S	Defense Readiness Reporting System-Strategic
GMD	Ground-based Midcourse Defense
LRDR	Long Range Discrimination Radar
MDA	Missile Defense Agency
MDEB	Missile Defense Executive Board
MDRS	Missile Defense Reporting System
MDS	Missile Defense System
OUSD (A&S)	Office of the Under Secretary of Defense for Acquisition and Sustainment
OUSD (P&R)	Office of the Under Secretary of Defense for Personnel and Readiness
OUSD (R&E)	Office of the Under Secretary of Defense for Research and Engineering
SBX	Sea Based X-Band Radar
THAAD	Terminal High Altitude Area Defense
UEWR	Upgraded Early Warning Radars
USD (A&S)	Under Secretary of Defense for Acquisition and Sustainment
USD (R&E)	Under Secretary of Defense for Research and Engineering

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
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June 7, 2023

The Honorable Jack Reed
Chairman
The Honorable Roger Wicker
Ranking Member
Committee on Armed Services
United States Senate

The Honorable Mike Rogers
Chairman
The Honorable Adam Smith
Ranking Member
Committee on Armed Services
House of Representatives

Since 2002, the Department of Defense's (DOD) Missile Defense Agency (MDA) has spent over $194 billion to develop a layered Missile Defense System (MDS) comprising individual interceptors, sensors, and communications elements that work in an integrated manner to defend against missile attacks. According to DOD, potential adversaries have acquired greater numbers of ballistic missiles; increased their range; made them more complex, survivable, reliable, and accurate; and incorporated missile defense countermeasures.[1] In addition, technological advances are now making hypersonic glide vehicles and missiles flying non-ballistic trajectories practicable. Over the next several years, MDA plans to upgrade numerous existing elements and develop two new elements for hypersonic defense, expanding the capability and complexity of the fielded missile defense enterprise.

DOD established MDA in 2002 to quickly develop elements and then, once they reached the production phase of the acquisition process, transfer them to the military services for sustainment (i.e., the logistics

[1]Missile Defense Agency, "The Threat," accessed Nov. 2, 2022, https://www.mda.mil/system/threat.html.

and personnel services required to maintain and prolong operations).[2] In 2020 we reported that, although most elements were in production, elements such as Aegis Ballistic Missile Defense (Aegis BMD), Ground-based Midcourse Defense (GMD), and Terminal High Altitude Area Defense (THAAD) had not transferred to a military service for sustainment.[3] For a complete list of our MDS-related reports over the past decade, see the Related GAO Products page at the end of this report.

Senate Report 117-39, which accompanied a bill for the National Defense Authorization Act for Fiscal Year 2022, includes a provision for us to examine the sustainment and readiness of MDS.[4] Our review assesses the extent to which DOD (1) has guidance for sustaining MDS elements and (2) has communicated missile defense readiness information about MDS to relevant decision makers.

For both objectives, we focused on nine fielded MDS elements, including interceptors, sensors, and communications elements.[5] We selected these elements because of their key roles in regional and homeland missile

[2]The James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 amended section 1676(b) of the National Defense Authorization Act for Fiscal Year 2018, Pub. L. 115–91 (2017) (codified as amended at 10 U.S.C. 4205 note), to terminate the requirement to transition ballistic missile defense programs to the military departments 60 days after the Secretary of Defense submits to the congressional defense committees a report required by section 1675(b) of the National Defense Authorization Act for Fiscal Year 2022. Pub. L. No. 117-263, § 1655 (2022); Pub. L. No. 117-81, § 1675(b) (2021). That report is to contain the Secretary's views and recommendations on the findings and recommendations of an independent study, and the report is to be conducted and submitted to the Secretary of Defense pursuant to section 1675(a) of the same statute. Pub. L. No. 117-81, § 1675(a), (b). As of February 2023, the independent study and report have not been submitted to the Secretary of Defense.

[3]GAO, *Missile Defense: Assessment of Testing Approach Needed as Delays and Changes Persist*, GAO-20-432 (Washington, D.C.: July 23, 2020).

[4]S. Rep. No. 117-39, at 296-97 (2021). DOD defines "sustainment" as the provision of logistics and personnel services to maintain operations until mission accomplishment and redeployment of the force. DOD defines "readiness" as the ability of the U.S. military forces to fight and meet the demands of assigned missions.

[5]For the purposes of our review, we focused on nine selected fielded elements: Ground-based Midcourse Defense (GMD); Terminal High Altitude Area Defense (THAAD); Aegis Ballistic Missile Defense (BMD); Army Navy/Transportable Radar Surveillance and Control Model 2 (AN/TPY-2); Cobra Dane; Upgraded Early Warning Radars (UEWR); Long Range Discrimination Radar (LRDR); Sea-Based X-Band Radar (SBX); and Command and Control, Battle Management, and Communications (C2BMC) that feeds information between those various elements. For Aegis BMD, we focused on Aegis BMD-capable ships.

defense and because they have received operations and maintenance funding from MDA. In addition, we interviewed DOD, Joint Staff, MDA, and military service officials about MDS sustainment and readiness, including any challenges they identified. We also conducted site visits to installations in Alaska and Colorado to interview combatant command, MDA, and military officials because they are involved in overseeing and operating missile defense elements. See appendix I for a list of the key organizations we met with and installations we visited for our review.

For objective one, we reviewed available DOD guidance and compared it with MDA's and the military services' plans for sustaining the elements with leading practices for portfolio management, and criteria in the *Standards for Internal Control in the Federal Government* related to establishing an organizational structure and assigning responsibility to achieve the entity's objectives.[6] For objective two, we reviewed MDA's and the military services' guidance on collecting, reporting, and communicating readiness data for the selected MDS elements, including the Missile Defense Reporting System (MDRS) and Defense Readiness Reporting System-Strategic (DRRS-S).[7] We compared the guidance with the 2022 National Defense Strategy and with criteria in the *Standards for Internal Control in the Federal Government* related to communication.[8] In addition, we interviewed DOD officials to determine the extent to which MDA and the military services communicated readiness information.

We conducted this performance audit from March 2022 to June 2023 in accordance with generally accepted government auditing standards.

[6]Department of Defense (DOD) Directive 5134.09, *Missile Defense Agency (MDA)* (Sept. 17, 2009); Secretary of Defense Memorandum, *Missile Defense Program Direction* (Jan. 2, 2002); Deputy Secretary of Defense Memorandum, *Ballistic Missile Defense System (BMDS) Life Cycle Management Process* (Sept. 25, 2008); DOD Instruction 5000.91, *Product Support Management for the Adaptive Acquisition Framework* (Nov. 4, 2021); Deputy Secretary of Defense Memorandum, *Directive-type Memorandum (DTM) 20-002 – "Missile Defense System Policies and Governance"* (Mar. 13, 2020) (incorporating Change 2, Feb. 23, 2023); DOD, *2022 National Defense Strategy of the United States of America* (Oct. 27, 2022); GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, D.C.: Sept. 2014); and Project Management Institute, Inc., *The Standard for Portfolio Management* – Fourth Edition (2017). The Project Management Institute is a not-for-profit association that, among other things, provides standards for managing various aspects of projects, programs, and portfolios.

[7]U.S. Strategic Command Instruction 538-01, Vol II.; *Ballistic Missile Defense System (BMDS) Logistics Reporting and Assessment Procedures Volume II* (Aug. 31, 2016); and DOD Directive 7730.65, *Department of Defense Readiness Reporting System (DRRS)*, (May 11, 2015) (incorporating Change 1, May 31, 2018).

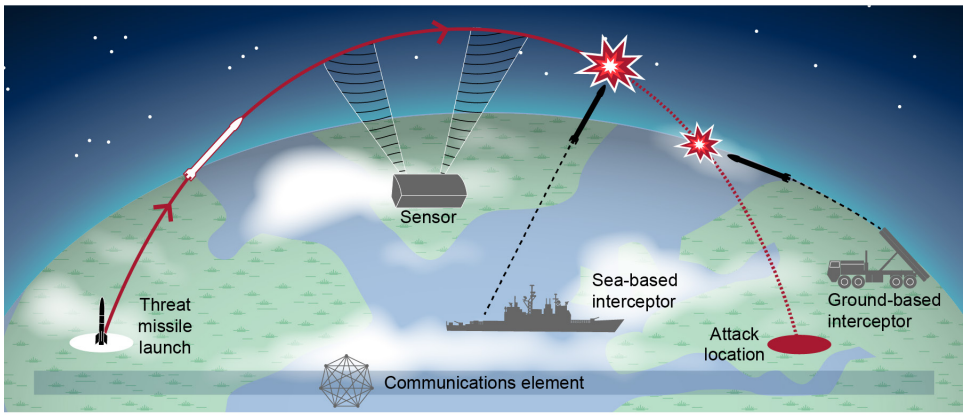
[8]*2022 National Defense Strategy of the United States of America* and GAO-14-704G.

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.

Background

MDS is a complex system of systems, consisting of interceptors, sensors, and communications elements designed to work together in an integrated manner to defend against missile attacks on the United States, deployed forces, and allies and friends (see fig. 1). In the system, the communications element feeds information back and forth among the interceptor and sensor elements.

Figure 1: Missile Defense System in a Notional Scenario



Source: GAO analysis of Department of Defense information. | GAO-23-105578

For our review, we focused on nine fielded MDS elements, including interceptors, sensors, and communications elements. Figure 2 shows the elements included in our scope.

Figure 2: Characteristics of Missile Defense System (MDS) Elements in Our Scope

Aegis Ballistic Missile Defense

Ship-based ballistic missile defense capabilities using a radar, command and control, and interceptors.

Long Range Discrimination Radar

A stationary, land-based, S-band radar that tracks incoming missiles for GMD and improves discrimination between the warhead-carrying vehicle and the decoys and other non-lethal objects.

Army Navy/Transportable Radar Surveillance and Control Model 2

A transportable X-band high-resolution radar capable of tracking missiles of all ranges. It operates in two modes: (1) forward-based mode—used to detect threat missiles once launched, or (2) terminal mode—used to guide an interceptor to the descending threat missile.

Sea-Based X-Band Radar

A mobile, ocean-going radar capable of being positioned across the globe to track missile threats. SBX primarily supports GMD missions and missile defense flight testing.

Command and Control, Battle Management, and Communications

A globally deployed system of software and hardware—workstations, servers, and network equipment—that facilitates the integration and management of diverse weapon systems and sensors to enable a coordinated response to defend against incoming threat missiles.

Terminal High Altitude Area Defense

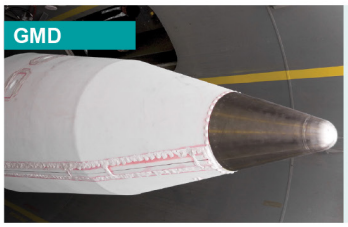
A mobile, ground-based system organized as a battery that consists of interceptors, launchers, a radar, and fire control and communications to defend against short-, medium-, and limited intermediate-range threat missiles.

Cobra Dane

A phased-array, all-weather, long-range radar that provides midcourse coverage for MDS, including detecting intercontinental ballistic missiles.

Upgraded Early Warning Radars

A solid-state, phased-array, long-range radar that detects and provides critical early warning of sea-launched or intercontinental threat missiles. There are five locations: Alaska, California, Greenland, Massachusetts, and the United Kingdom.



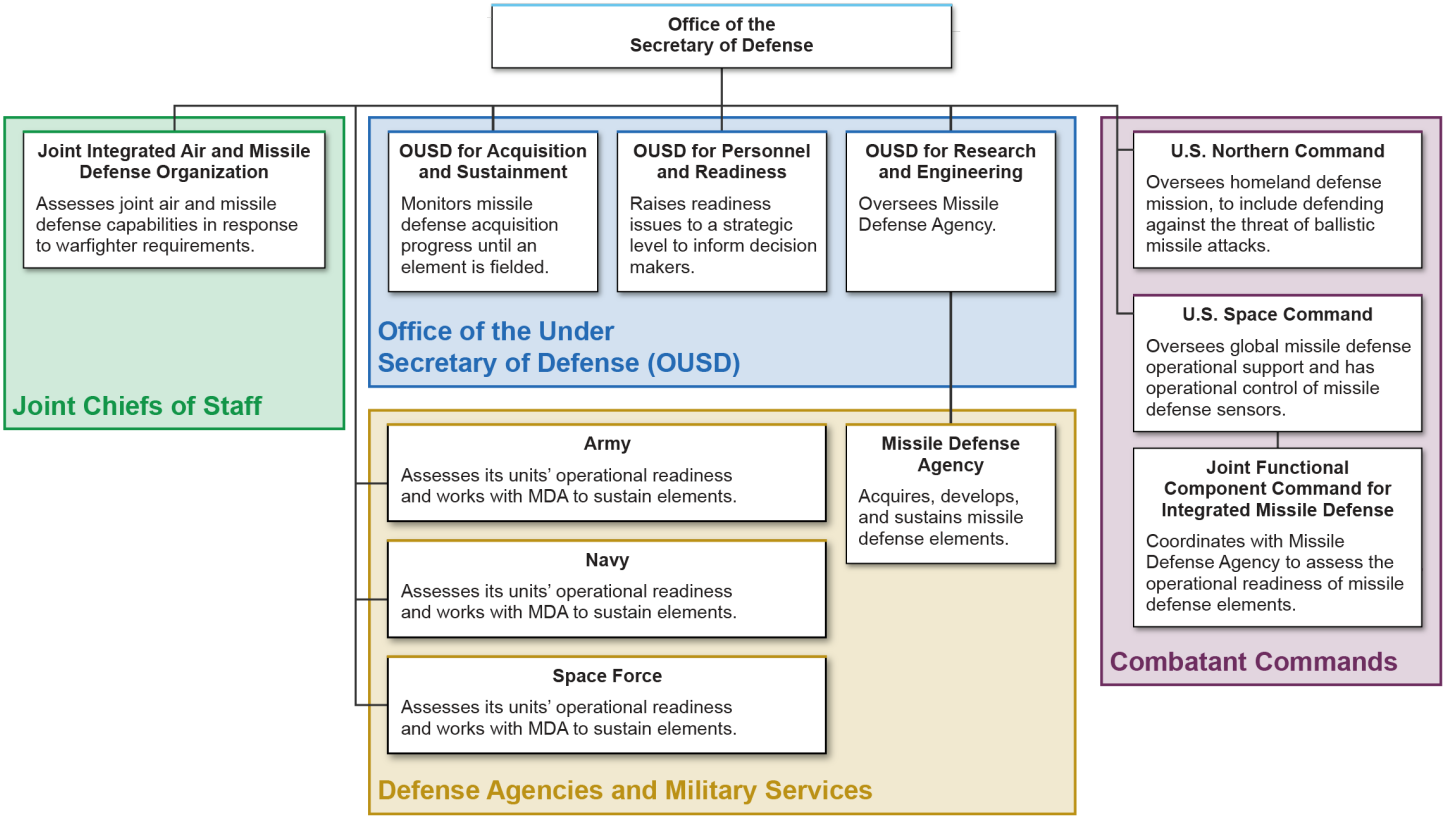
Ground-based Midcourse Defense

A ground-based system with launch, communications, and fire control that uses interceptors to defend against intermediate- and intercontinental-range missile threats.

Source: GAO analysis of Missile Defense Agency (MDA) information; MDA, U.S. Northern Command /Army Sgt. J. Carlson III, and U.S. Air Force/Chief Petty Officer B. Raile (photos). | GAO-23-105578

In addition, multiple DOD entities have MDS roles and responsibilities—including those related to recommending acquisition strategies, acquiring and developing elements, fielding and sustaining those elements, and assessing their operational readiness (see fig. 3).

Figure 3: DOD Entities Involved with Missile Defense System Sustainment and Readiness



Source: GAO analysis of Department of Defense information. | GAO-23-105578

The Under Secretary of Defense for Research and Engineering (USD (R&E)). Exercises authority, direction, and control over MDA and serves as the Missile Defense Executive Board (MDEB) co-chair for decisions regarding acquisition and the approval of acquisition and production milestones, and the MDEB chair for all other matters. The MDEB is responsible for reviewing and making recommendations regarding MDA's comprehensive acquisition strategy to develop and field an operational missile defense capability. The MDEB also serves as a venue to discuss operational MDS readiness concerns, according to U.S. Strategic Command officials.

The Under Secretary of Defense for Acquisition and Sustainment (USD (A&S)). Serves as a member and co-chair of the MDEB concerning decisions on acquisition and the approval of acquisition and production milestones.[9] USD (A&S) is also responsible for issuing and maintaining the content and approval process of the life cycle sustainment plans.

U.S. Space Command. This command has responsibility for overseeing missile defense planning and operational support, and as global sensor manager, which includes planning and coordinating efforts related to sensors across combatant commands, U.S. government agencies, allies, and partners.

MDA. This lead agency has roles related to MDS programmatic policy, development, delivery, readiness, and sustainment.[10] MDA is responsible for planning all MDS development and testing activities and coordinating program management structure and operations with the military services. The agency is also responsible for funding research, development, testing, and evaluation for MDS capabilities, and the procurement and sustainment for MDS-specific equipment, including spare parts.[11]

Military services. The military services' responsibilities include providing forces and resources to support fielded missile defense elements and planning for operations, maintenance, and installations, among other tasks, in collaboration with MDA.[12] The military services are also responsible for funding military pay and allowances, base operations, procurement, operations, and sustainment of common support equipment for MDS.[13]

[9]DOD Directive 5135.02, *Under Secretary of Defense for Acquisition and Sustainment (USD (A&S))* (July 15, 2020).

[10]DOD Directive 5134.09; Missile Defense Agency, *Missile Defense System Operational Readiness Reporting*, MDA Manual 3110.01-M (July 14, 2020).

[11]Deputy Secretary of Defense Memorandum, *Funding Responsibilities for Ballistic Missile Defense System (BMDS) Elements* (June 10, 2011).

[12]DOD Directive 5134.09. While this directive assigns these responsibilities to the Secretaries of the Military Departments, the duties are typically carried out within the relevant military services.

[13]Deputy Secretary of Defense Memorandum, *Funding Responsibilities for Ballistic Missile Defense System (BMDS) Elements*.

DOD Has Plans but Lacks Comprehensive Sustainment Guidance for Missile Defense Elements

MDA and the Military Services Have Developed Sustainment Plans for Selected MDS Elements

When MDA was established, it was granted flexibilities for applying DOD acquisition and sustainment policy, which applies to nearly all DOD entities and the military departments.[14] While it was granted these flexibilities, MDA has followed some of this guidance, including creating sustainment plans. Specifically, MDA is the primary sustainment entity for seven of nine of our selected MDS elements and is involved in sustaining the other two.[15] MDA and the military services have developed element-specific sustainment plans to manage all but one (SBX) of the nine elements we reviewed (see table 1). MDA officials stated that MDA is drafting an SBX sustainment plan and intends to finalize it by the end of fiscal year 2023.

Table 1: Sustainment Plans and Entities for Selected Missile Defense Elements (as of March 2023)

Element	Approved sustainment plan	Lead sustainment entity[a]	Supporting sustainment entity[a]
Aegis Ballistic Missile Defense (BMD)	✓	Missile Defense Agency (MDA)	Navy
Ground-based Midcourse Defense (GMD)	✓	MDA	Army
Terminal High Altitude Area Defense (THAAD)	✓	MDA	Army
Army Navy/Transportable Radar Surveillance and Control Model 2 (AN/TPY-2)	✓	MDA	Army

[14]Secretary of Defense Memorandum, *Missile Defense Program Direction* and DOD Instruction 5000.91. The instruction applies to all "DOD components" defined as follows: OSD, the military departments, the Office of the Chairman of the Joint Chiefs of Staff and the Joint Staff, the combatant commands, the Office of Inspector General of the Department of Defense, the defense agencies, the DOD field activities, and all other organizational entities within DOD. However, the memorandum provided exemptions and flexibilities for MDA.

[15]MDA supports the Space Force's sustainment work on Cobra Dane and UEWR, according to Space Force officials. MDA also plans to transfer sustainment authority of LRDR to the Space Force in fiscal year 2024, after the element becomes operational in 2023, according to MDA officials.

Element	Approved sustainment plan	Lead sustainment entity[a]	Supporting sustainment entity[a]
Cobra Dane	✓	Space Force[b]	MDA
Long Range Discrimination Radar (LRDR)[c]	✓	MDA	Space Force
Sea-Based X-Band Radar (SBX)	✗	MDA	Navy
Upgraded Early Warning Radars (UEWR)	✓	Space Force	MDA
Command and Control, Battle Management, and Communications (C2BMC)	✓	MDA	Not applicable

Legend:
✓ = yes
✗ = no

Source: GAO analysis of DOD and military service information. | GAO-23-105578

[a]We determined the lead sustainment entity and supporting sustainment entity for each element by reviewing DOD and military service documentation and by interviewing officials knowledgeable about which organization had the lead and supporting roles for the sustainment of each element.

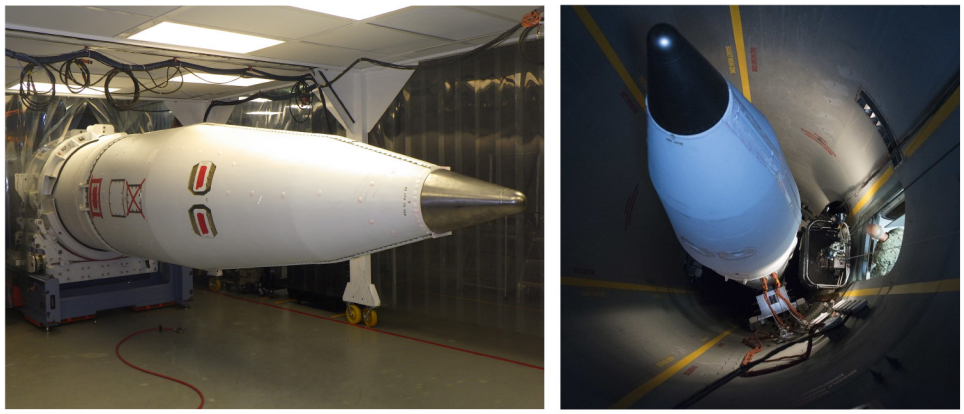
[b]The Space Force assumed authority for Cobra Dane and UEWR after being established by statute as a military service within the Department of the Air Force in December 2019.

[c]MDA officials stated that the Space Force is slated to assume responsibility for the sustainment of LRDR from MDA in fiscal year 2024 after the element becomes operational.

We found that these plans were broadly consistent with various requirements in DOD acquisition and sustainment policy. In particular, MDA and the military services' element-specific sustainment plans include information such as metrics, costs, and analyses used to support the elements' respective sustainment needs and include plans to address some identified risks. For example:

- The plan for AN/TPY-2 identified challenges and risks with parts obsolescence, diminishing manufacturing sources, and material shortages. It contained a proposal to consolidate parts for AN/TPY-2 and other MDS elements at a fleet management center and included an obsolescence management initiative to address potential supply chain concerns for the element. To implement this plan, MDA officials told us the agency and its contractor partner consolidated AN/TPY-2 parts to facilities in Nashua, New Hampshire and Fort Bliss, Texas, during fiscal year 2020 through fiscal year 2022.
- The plan for the GMD system identified MDA's GMD program office, and multiple contractors, as fully responsible for sustaining the system. As part of this plan, MDA sends components of GMD—such as the Ground Based Interceptors—to the manufacturer for repair. Figure 4 shows one Ground Based Interceptor undergoing sustainment and another being returned to a silo.

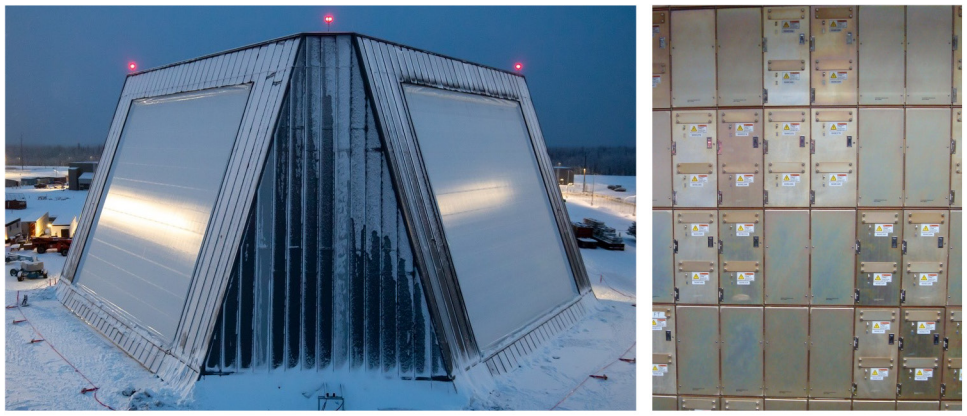
Figure 4: Ground Based Interceptor Undergoing Sustainment (left) and Returned to a Silo (right) at Fort Greely, Alaska



Source: Missile Defense Agency (left) and Office of the Chairman of the Joint Chiefs of Staff/Petty Officer 1st Class Dominique Pineiro (right). | GAO-23-105578

- The plan for LRDR included sustainment information and a detailed product support package. It also identified areas where MDA made design changes to the radar to make sustainment easier. For example, the plan identified the addition of diesel generators to provide backup to the element's commercial power source, a feature we observed during our site visit to LRDR at Clear Space Force Station. The plan also noted that the element's design uses a modular radar array panel, which allows personnel to easily access the parts most likely to fail and reduce radar repair time and downtime. During the same site visit, MDA officials discussed this feature by stating that personnel can perform maintenance and sustainment work on individual cells of LRDR's two 60-feet by 60-feet arrays without interrupting overall operations (see fig. 5).

Figure 5: Long Range Discrimination Radar (left) and Removable Cells from Array (right) at Clear Space Force Station, Alaska



Source: Missile Defense Agency. | GAO-23-105578

- The plan for THAAD identified processes and methods to assess, evaluate, and mitigate program and sustainment challenges and risks. For example, the plan stated that the element lacked a repair/recertification facility. Based on this assessment, MDA created a plan supporting the need for the facility and using interim contractor support for THAAD repairs until DOD could construct a facility.[16] The sustainment plan also identified how MDA tracks these processes/methods in a database and where and when officials address risk management and mitigation (i.e., at semi-annual and sometimes monthly meetings).

In addition to sustainment plans, MDA and the military services also have overarching memorandums of agreement between each other and created annexes to these agreements for six of the nine selected elements (all but C2BMC, GMD, and LRDR).[17] First, the agreements between MDA and the military services identify how these entities are to develop, test, and operate elements upon transitioning and transferring responsibility for selected missile defense elements from MDA to the

[16]MDA officials told us that the repair/recertification facility had not been constructed as of February 2023.

[17]According to MDA officials, MDA is the lead agency for GMD and C2BMC and plans to retain authority over those elements, thereby negating any need for memorandums of agreement with the military services. The Space Force is scheduled to assume lead sustainment responsibility over LRDR in fiscal year 2024, according to MDA officials.

military services, in accordance with the law.[18] They also describe how MDA and the military services are to approach sustaining the selected elements upon transfer. For example, the agreement between MDA and the Navy states that MDA will fund sustainment (including updates) of MDS-specific mission equipment for the life cycle of the elements, while the Navy will fund the sustainment of common support equipment.

Second, the element-specific annexes to the overarching memorandums of agreement document plans for the transition and transfer of sustainment activities and funding for the elements, among other functions, from MDA to the military services. Specifically, over a decade ago, DOD began planning for MDA to transfer these elements to the military services, with the end result being that the military services would eventually assume sustainment responsibilities for them. We have previously reported that MDA and the military services identified overarching budget, prioritization, control, and performance concerns with transferring MDS elements from MDA to the military services.[19] For example, we reported on the impasse between MDA and the Army over the transfer of THAAD and AN/TPY-2 due to mission requirement shortfalls that would require an estimated $10.1 billion investment or more to resolve.[20]

The James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 included language rescinding the requirement for MDA to transfer missile defense elements to the military departments.[21] This language is contingent on DOD submitting a report to Congress. According to MDA officials in February 2023, DOD expected to complete the report by May 2023. MDA officials further stated that sustainment and funding responsibilities are expected to remain as they currently exist, with MDA

[18]Pub. L. No. 115-91, § 1676 (2017); Pub. L. No. 116-283, § 1643 (2021); Pub. L. No. 117-81, § 1663 (2021); Pub. L. No. 117-263, § 1655 (2022).

[19]GAO-20-432.

[20]GAO, *Missile Defense: The Warfighter and Decision Makers Would Benefit from Better Communication about the System's Capabilities and Limitations*, GAO-18-324 (Washington, D.C.: May 30, 2018) and *Missile Defense: Delivery Delays Provide Opportunity for Increased Testing to Better Understand Capability*, GAO-19-387 (Washington, D.C.: June 6, 2019).

[21]Section 1655 of the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 terminates, 60 days after the Secretary of Defense submits a report on the matter to the congressional defense committees, the requirement to transition ballistic missile defense programs to the military departments. Pub. L. No. 117-263, § 1655.

heavily involved. Specifically, MDA officials said that MDA expects to continue to lead sustainment responsibility for six of nine selected elements, while Space Force officials stated that Space Force's responsibility is expected to grow from two to three elements once it assumes control over LRDR by the end of fiscal year 2024.

DOD Guidance Does Not Comprehensively Address Sustainment Challenges

DOD's element-based sustainment plans and agreements provide a framework for sustaining specific missile defense elements that is consistent with key elements of DOD's sustainment policy. However, the plans and agreements do not comprehensively or consistently address MDS sustainment challenges.[22] Specifically, we identified several sustainment challenges that various DOD entities were monitoring and attempting to mitigate during our discussions and site visits with DOD officials. These challenges either have not been included in sustainment plans for missile defense elements or the plans have not fully addressed the challenges. Our discussions and visits showed that disconnects exist at times between MDA's and the military services' priorities for missile defense-related facilities, infrastructure, and spare parts. For example:

- **Facilities.** Officials from the 94th Army Air and Missile Defense Command and its subordinate units described challenges at facilities and installations where personnel operate AN/TPY-2 radars and THAAD batteries.[23] Specifically, these officials stated that the 10th Missile Defense Battery, which operates AN/TPY-2 radars located at Shariki Communications Site, Japan, uses temporary shelters, even though it is permanently located at that site. In addition, the same officials stated that the unit faced challenges mitigating corrosion on their facilities. For example, officials from the 14th Missile Defense Battery stated they may need to purchase new equipment due to seawater corrosion.

[22]OUSD (A&S) has begun to develop a database called Advana to monitor and evaluate sustainment across more than 500 weapon systems, according to OUSD (A&S) officials. However, according to an OUSD (A&S) official, as of January 2023, DOD had not added missile defense elements to that database and did not have specific date of completion. According to DOD officials, once complete, Advana will have advanced analytics that track operational availability and sustainment efforts of DOD weapon systems, among other information.

[23]The 94th Army Air and Missile Defense Command leads and integrates all Army air defense assets in the Indo-Pacific region with joint and multi-national partners and allies, according to the command's website. See 94th AAMDC - 94th Army Air and Missile Defense Command, "Mission," accessed Feb. 13, 2023, https://www.army.mil/94thAAMDC.

Officials from Task Force Talon and the E-3 Air Defense Artillery on Guam stated that their unit, which operates a THAAD battery, has insufficient facilities for maintenance work, spares storage, protection from typhoons, and lavatories with running water. For example, the unit stores some spare parts for the THAAD battery in an Air Force hangar, because the Army storage facility does not have enough available space. This could cause a problem for the battery if the Air Force needs to use that space for its own equipment or spare parts storage needs. The Army officials also identified corrosion mitigation as a major concern. They confirmed that a team of THAAD experts visits their location to monitor potential corrosion problems, in accordance with the MDA-developed sustainment plan for THAAD. However, while Army personnel who operate the THAAD battery and MDA have identified this problem, the Army has not constructed new facilities on Guam to protect the unit's equipment from pervasive corrosion.

- **Supporting infrastructure.** During our site visits, officials from the 100th Missile Defense Brigade and its subordinate unit, the 49th Missile Defense Battalion, discussed problems with the security system at Fort Greely, one of two locations that hosts Ground Based Interceptors.[24] For example, they stated that a lack of funding has led to an inability to complete required maintenance, repairs, and upgrades to the security system. The degradation of the system has resulted in the units relying on personnel, rather than on cameras and sensors alone, to perform some security-related tasks needed to guard the interceptor fields at the Missile Defense Complex.[25] Officials stated additional personnel from other forces have helped address these issues. They also discussed challenges related to the upkeep of Fort Greely and the Missile Defense Complex, such as overgrown grass and lack of snow removal. Unless maintenance and security system challenges are addressed, the 49th Missile Defense Battalion will need additional personnel to complete these tasks at the complex, according to the officials.

  During our site visit to Clear Space Force Station, officials from the 13th Space Warning Squadron reported infrastructure challenges at Eareckson Air Station, Alaska, where Cobra Dane is located. Those challenges included issues with the HVAC systems used to partially

[24]The other location is Vandenberg Space Force Base, CA.

[25]MDA officials stated that the security system at Fort Greely, AK was transitioned from MDA to U.S. Army Space Missile Defense Command in November 2020. The command has fully taken over the security mission of the Missile Defense Complex, according to the same officials.

cool Cobra Dane, which allow it to continue to operate effectively. Officials stated that they had plans to mitigate the risks to the HVAC system, including plans for new construction in fiscal year 2026. In addition, they stated that the Pacific Air Forces are in charge of Eareckson Air Station, which creates challenges because that air component does not always prioritize Cobra Dane-specific issues highly.

- **Spare parts.** The Navy identified challenges sustaining the SPY-1 radar, which is a key component of Aegis BMD. Navy officials noted that the manufacturer ended production of this radar in 2021, leading to insufficient spare parts for the radar. Navy officials stated that the Navy plans to equip at least one destroyer with a new SPY-6 radar starting in 2023. However, according to the same officials, the Navy does not have plans to replace SPY-1 with SPY-6 radars completely, so ships could be equipped with SPY-1 radars until 2060.[26] As of October 2022, the Navy is working with the manufacturer to ensure there are sufficient parts for SPY-1, an effort that includes plans to build a depot for repairs and using parts from decommissioned and modernizing ships to repair ships equipped with SPY-1, according to Navy officials.

Along with sustainment challenges, officials noted confusion over sustainment roles and responsibilities. For example, the Army officials responsible for managing THAAD stated that Army units use five different reporting paths to document a single maintenance issue, due in part to the different Army and MDA processes. These multiple reporting paths also have increased the risk of miscommunication or inaccurate information occurring at different leadership levels, according to the same officials.

DOD is not addressing sustainment challenges for MDS elements comprehensively because there is no department-wide guidance on how to do so. The DOD directive that lays out the roles, responsibilities, and authorities for MDA (known as the MDA Charter) does not include information on how MDA or the military services should manage

[26]Navy officials noted that 40 Aegis BMD destroyers were equipped with SPY-1 radars as of fiscal year 2022.

sustainment of MDS.[27] In 2020, DOD issued Directive-type Memorandum 20-002, *Missile Defense System Policies and Governance*, to establish processes and responsibilities for acquiring missile defense capabilities.[28] However, this memorandum did not assign specific and clear sustainment responsibilities for the MDS to any specific entity. Office of the Under Secretary of Defense for Research and Engineering (OUSD (R&E)) and MDA officials stated they are in the process of drafting an updated MDA Directive with its contents being largely based on the previously issued 2020 memorandum. Furthermore, in February 2023, MDA officials stated that DOD also plans to issue a new additional governance policy on roles and responsibilities for entities involved in the MDS by 2024. However, it is unclear whether the new governance policy will address sustainment responsibilities for the entire MDS.

Due to the lack of department-wide guidance for MDS sustainment, DOD has not identified a specific entity assigned with responsibilities for overseeing the sustainment of the MDS, or established a process for prioritizing and addressing sustainment challenges. The Office of the Under Secretary of Defense for Acquisition and Sustainment (OUSD (A&S)) and OUSD (R&E) co-chair the MDEB, which recommends and oversees the implementation of strategic plans and policies, program priorities, and investment options for missile defense capabilities. However, the memorandum establishing the MDEB does not assign sustainment responsibilities for the entire MDS.[29] OUSD (R&E) is responsible for the research and engineering of new systems, among other tasks, and therefore does not monitor the sustainment of fielded and operational missile defense elements closely, according to officials

[27]DOD Directive 5134.09. In addition, a 2008 memorandum from the Deputy Secretary of Defense states that MDA and the military departments will collaborate on life cycle planning to include sustainment, but does not provide specific details on how they should collaborate. Deputy Secretary of Defense Memorandum, *Ballistic Missile Defense System (BMDS) Life Cycle Management Process* (Sept. 25, 2008).

[28]Directive-type Memorandum 20-002, *Missile Defense System Policies and Governance* (Mar. 13, 2020). The Directive-type memorandum has been revised several times, most recently in February 2023. It is focused on establishing processes and responsibilities for acquiring missile defense capabilities, and according to OUSD (A&S) officials was intended to better align with the existing DOD acquisition and sustainment policy. For example, the memorandum established policy, assigned responsibilities, and prescribed procedures for missile defense system research, development, test, and evaluation; procurement; and operations and sustainment.

[29]Deputy Secretary of Defense Memorandum, *Missile Defense Executive Board* (Mar. 15, 2007).

from that office. OUSD (A&S) has responsibility for DOD acquisition and sustainment policies, but OUSD (A&S) officials stated that their office does not make major decisions on sustaining missile defense elements once MDA receives approval to begin production of those elements. MDA and the military services develop and implement sustainment plans for MDS elements, but these entities do not look across the MDS enterprise and provide oversight.[30]

DOD guidance states that DOD will conduct comprehensive product support and sustainment planning for defense systems across the program's life cycle.[31] Further, leading practices in portfolio management emphasize the importance of prioritizing programs, projects, and operations within a portfolio to inform investments.[32] In addition, according to the *Standards for Internal Control in the Federal Government* management should establish an organizational structure, assign responsibility, and delegate authority to achieve the entity's objectives.[33]

As DOD continues to expand the capability and complexity of its fielded missile defense elements, it would benefit from designating a specific entity with overarching responsibility for sustainment of the entire MDS and a process for prioritizing and addressing sustainment needs. Although DOD granted MDA flexibility for following aspects of DOD acquisition and sustainment policy, MDA and the military services have responsibility for sustaining individual missile defense elements. However, having comprehensive sustainment guidance will lead to decision makers having a more complete view of what challenges need to be addressed to protect the United States from adversaries' missile inventories and improve the ability to sustain MDS elements.

[30]In addition, U.S. Strategic Command has a Warfighter Involvement Process that provides the command with a mechanism to advocate for and identify required missile defense characteristics and capabilities needed to modify or improve MDS elements on behalf of the warfighter. However, this process is focused more on enhancing or improving current capabilities rather than coordinating sustainment across the entire MDS. U.S. Strategic Command Instruction 538-03*, Missile Defense (MD) Warfighter Involvement Process (WIP)* (July 26, 2020).

[31]DODI 5000.91.

[32]Project Management Institute, Inc., *The Standard for Portfolio Management*.

[33]GAO-14-704G.

DOD Reports on Missile Defense Readiness Using Different Metrics in Different Systems

MDA and Military Services Report on Different Readiness Metrics in Different Systems

MDA and the military services record missile defense readiness data using different systems and metrics. MDA records the readiness of missile defense elements using the Missile Defense Reporting System (MDRS), which uses operational availability as its primary metric. This standard DOD metric describes the percent of time the element is available for use. MDRS also measures readiness using metrics such as equipment readiness rates and fully mission capable, partially mission capable, and non-mission capable readiness ratings. For more information, see sidebar. MDA officials stated that the combatant commands are the primary users of this information.

Key Missile Defense Readiness Metrics

Operational availability: percentage of time that an element is operationally capable of performing an assigned mission

Equipment readiness rate: percentage of time element is not degraded by critical failures, preventing mission accomplishment

Fully mission capable: element capable of performing all assigned missions

Partially mission capable: element not capable of fully performing one or more assigned missions

Non-mission capable: element not capable of performing any assigned missions

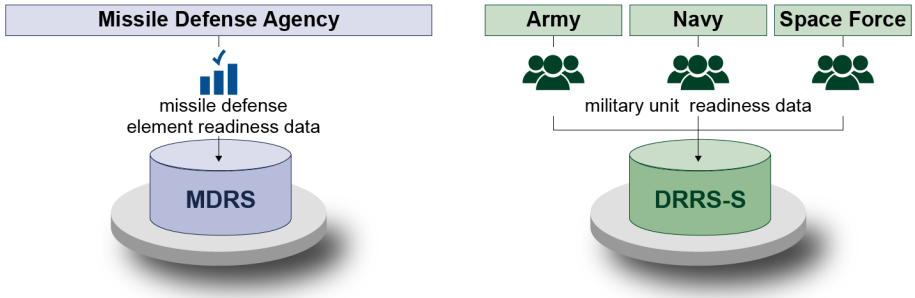
Source: Department of Defense information. | GAO-23-105578

The military services record the readiness of military units, including those operating missile defense elements, in the Defense Readiness Reporting System-Strategic (DRRS-S)—DOD's system of record for readiness data.[34] DRRS-S contains readiness information using resource and mission capability readiness ratings.[35] Resource readiness ratings measure the status of personnel, equipment, supplies, and training. Mission capability readiness ratings measure whether a unit can accomplish its designed mission(s). The military services, combatant commands, Joint Staff, and OSD levels can access DRRS-S data for planning, assessment, and mission purposes. In addition, the military services, combatant commands, and Joint Staff provide DRRS-S data included in a semi-annual report to Congress on military readiness. Figure 6 provides an overview of the difference between the data collected in MDRS and DRRS-S.

[34]DRRS-S is used to compile readiness reports for decision makers in the department and for Congress. DOD is in the process of transferring data from DRRS-Army to DRRS-S, according to Army officials.

[35]GAO, *Military Readiness: Department of Defense Domain Readiness Varied from Fiscal Year 2017 through Fiscal Year 2019*, GAO-21-279 (Washington, D.C.: Apr. 7, 2021).

Figure 6: Differences between Missile Defense Reporting System and Defense Readiness Reporting System-Strategic

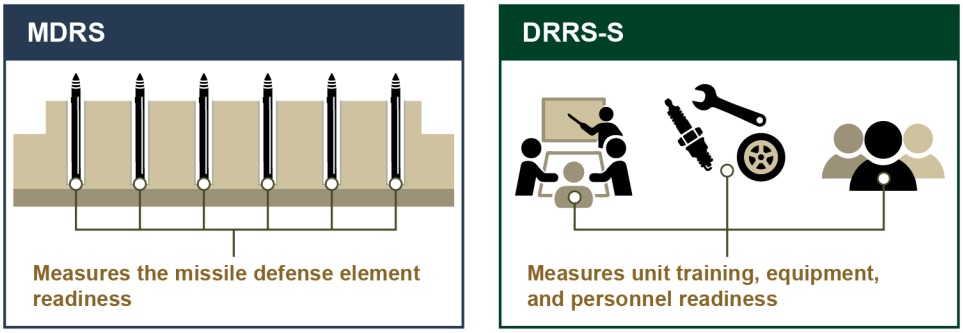


DRRS-S Defense Readiness Reporting System–Strategic
MDRS Missile Defense Reporting System

Source: GAO analysis of Department of Defense and Missile Defense Agency information. | GAO-23-105578

MDRS contains readiness metrics for individual missile defense elements, while DRRS-S contains readiness metrics for individual units as shown in figure 7. For example, the Army reports in DRRS-S on the readiness of the units operating GMD. According to MDA officials, the Army does not report specific information in DRRS-S on whether the unit's GMD systems are ready for operational use. Conversely, MDA reports readiness in MDRS as the operational availability of GMD systems and does not report on the unit's readiness to operate the systems.

Figure 7: Missile Defense Readiness Units of Measure for a Selected Missile Defense Element



DRRS-S Defense Readiness Reporting System–Strategic
MDRS Missile Defense Reporting System

Source: GAO analysis of Department of Defense and Missile Defense Agency information. | GAO-23-105578

DOD recognizes that current DRRS-S readiness metrics may not provide a complete picture to assess strategic readiness. DOD acknowledged this in the 2020 DOD *Report to the Congressional Defense Committees on*

Defense Readiness Reporting Systems Reform, which stated the need for improving the data quality, accessibility, and flexibility of DRRS-S by accessing, linking, and leveraging many data sources across DOD.[36] Further, DOD's report discussed how a future readiness reporting system must increase the type of data it analyzes in order to present a more strategic-level assessment, which may improve DOD's ability to identify readiness shortfalls. DOD is in the process of updating how it records and reports readiness to better address these issues. According to officials from the Office of the Under Secretary of Defense for Personnel and Readiness (OUSD (P&R)), DOD included missile defense as part of its ongoing efforts to review and update DRRS-S. As of March 2023, DOD was in the early stages of these efforts.

Various DOD Decision Makers Seek Improved Communication of Missile Defense Readiness Data

Various DOD and Army officials stated that they would like to have improved visibility of MDRS data. According to Army officials, MDA shares daily readiness reports on MDS elements with U.S. Army Space and Missile Defense Command, Joint Functional Component Command for Integrated Missile Defense, and U.S. Northern Command.

However, MDA officials stated that MDA does not communicate MDRS data to other DOD agencies or the military services unless specifically requested. In addition, some Space Force officials told us that they were not aware of MDRS data, and some DOD officials told us that MDA is slow to deliver this information. Officials from the 94th Army Air and Missile Defense Command also stated that they did not have access to MDRS data and that if they had this type of information Army personnel could better perform their missions. The lack of availability and visibility of MDRS data is due to U.S. Strategic Command missile defense readiness reporting guidance not requiring MDA to report MDRS data to DOD offices and other entities, such as the military services and their operational units.[37] In April 2023, the President approved DOD's updated Unified Command Plan, which transitioned missile defense-related responsibilities from U.S. Strategic Command to U.S. Space Command.[38]

[36]Department of Defense, *Report to the Congressional Defense Committees on Defense Readiness Reporting Systems Reform* (February 2020).

[37]U.S. Strategic Command Instruction 538-01, Volume II; Directive-type Memorandum 20-002.

[38]The Unified Command Plan and the combatant commands provide operational instructions and command and control to the armed forces and have a significant impact on how they are organized, trained, and resourced.

Existing instructions and policy related to missile defense readiness reporting will need to be updated to reflect this change.

The 2022 *National Defense Strategy/2022 Missile Defense Review* requires that DOD take a strategic, integrated approach to missile defense. In addition, according to the *Standards for Internal Control in the Federal Government* management should internally and externally communicate the necessary quality information to achieve the entity's objectives.[39]

U.S. Space Command could improve the strategic understanding of missile defense readiness by regularly communicating available readiness data, such as MDA's MDRS data, to OSD-level decision makers. For example, MDRS data on an MDS element could show a different readiness status when presented next to the DRRS-S unit readiness for that element. By sharing MDRS readiness data more broadly, DOD senior officials could better assess the readiness of MDS—both the unit operating the MDS and the elements—and be better positioned to make informed decisions related to missile defense.

Conclusions

As our potential adversaries continue to increase their missile capabilities, DOD continues to expand MDS to meet these growing threats. As the lead DOD agency for missile defense acquisition and sustainment, MDA will be responsible for sustaining an increasing number of operationally deployed MDS elements. MDA's role in MDS sustainment took on even greater importance after the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 conditionally rescinded the requirement for MDA to transfer missile defense programs to the military departments.

While MDA has lead responsibility for sustaining most of the currently deployed MDS elements, DOD lacks guidance assigning a DOD entity with responsibility for managing sustainment across the entire MDS enterprise. Moreover, since sustainment is managed on an element-level basis, OSD-level entities do not currently have a complete picture of missile defense elements' sustainment needs, in the context of the whole system. As a result, DOD does not have a comprehensive view of what sustainment challenges need to be addressed, which hinders DOD's ability to inform departmental investments and determine how to address

[39]GAO-14-704G.

missile defense sustainment priorities across MDA and the military services.

In addition, although DOD has recognized the need to improve the data quality, accessibility, and flexibility of readiness data metrics, improvement efforts are in their early stages. By ensuring that the current available MDRS readiness data are periodically reported and communicated to relevant entities, DOD could make better informed strategic decisions related to missile defense and senior officials could better assess the readiness of MDS, from both the unit and element perspectives.

Recommendations for Executive Action

We are making two recommendations to the Department of Defense. Specifically:

The Secretary of Defense should develop comprehensive guidance for sustaining the MDS and incorporate this guidance into MDS governance policy documents. This guidance should include designating a specific entity with responsibility for overseeing the sustainment of the entire MDS and establishing a process for prioritizing and addressing sustainment challenges among the military services and MDA. (Recommendation 1)

The Secretary of Defense should ensure that U.S. Space Command updates MDS guidance to require MDA to periodically report, at least semi-annually, MDRS readiness data to combatant commands, military services, and any other relevant entities. (Recommendation 2)

Agency Comments and Our Evaluation

We provided a draft of this report to DOD for review and comment. In written comments on a draft of this report, DOD concurred with our recommendations. DOD's comments are reprinted in their entirety in appendix II. While DOD was reviewing our draft report, the 2022 Unified Command Plan received final approval, which changed responsibility for overseeing missile defense from U.S. Strategic Command to U.S. Space Command. We updated our report and recommendation 2 to reflect that change. DOD also provided technical comments, which we incorporated as appropriate.

In technical comments, MDA stated that the department has published guidance for sustaining facilities and weapon systems that applies to missile defense elements. MDA further stated that both the agency and the military services are aware of the sustainment challenges we identified, but the challenges are not currently being prioritized given resource constraints.

We noted in our report that DOD granted MDA flexibilities in following DOD's acquisition and sustainment policies and that it has followed some of this guidance, including developing life cycle sustainment plans for most of the missile defense elements in our review. We further noted that MDA and the military services manage sustainment on an element-level basis, and OSD-level entities do not have a complete picture of missile defense elements' sustainment needs in the context of the whole system. Our first recommendation will help address sustainment issues that MDA and the services are aware of but are not currently addressing.

In technical comments, MDA also stated that the agency communicates readiness data to combatant commands and the services, and shares it with organizations upon request. In our report, we acknowledged that MDA shares its readiness data when requested, but also noted that some DOD entities were not aware of the data or that MDA was slow to provide the information. Therefore, our second recommendation will help ensure all relevant entities have the information needed to inform DOD's strategic decision making related to missile defense readiness.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Defense, Secretary of the Army, Secretary of the Navy, Secretary of the Air Force, USD (A&S), USD (R&E), and MDA Director. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-9627 or at maurerd@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

Diana Maurer
Director, Defense Capabilities and Management

Appendix I: Key Organizations and Installations We Visited for Our Review

To obtain information for our review, we met with officials from the following organizations from the Department of Defense:

- Office of the Under Secretary of Defense for Acquisition and Sustainment
- Office of the Under Secretary of Defense for Research and Engineering
- Office of the Under Secretary of Defense for Personnel and Readiness
- Office of the Under Secretary of Defense for Policy
- Office of the Under Secretary of Defense (Comptroller)
- Office of the Director of Cost Assessment and Program Evaluation
- Missile Defense Agency
- Joint Functional Component Command for Integrated Missile Defense
- Joint Integrated Air and Missile Defense Organization
- Office of the Chief of Naval Operations
- Navy Program Executive Office, Integrated Warfare Systems
- U.S. Fleet Forces Command
- U.S. Indo-Pacific Command
- U.S. Army Space and Missile Defense Command
- 94th Army Air and Missile Defense Command
- 10th Missile Defense Battery
- 14th Missile Defense Battery
- E-3 Air Defense Artillery Regiment (Task Force Talon)

We also conducted site visits to:

- U.S. Northern Command, Peterson Space Force Base, Colorado Springs, Colorado
- U.S. Space Command, Peterson Space Force Base, Colorado Springs, Colorado
- Space Operations Command, Peterson Space Force Base, Colorado Springs, Colorado
- 100th Missile Defense Brigade, Colorado Springs, Colorado

- Missile Defense Agency Integration and Operations Center, Schriever Space Force Base, Colorado Springs, Colorado
- Space Delta 4, Buckley Space Force Base, Aurora, Colorado
- 49th Missile Defense Battalion, Fort Greely, Alaska
- 13th Space Warning Squadron, Clear Space Force Station, Alaska

Appendix II: Comments from the Department of Defense

DEPUTY UNDER SECRETARY OF DEFENSE
3030 DEFENSE PENTAGON
WASHINGTON, DC 20301-3030

RESEARCH
AND ENGINEERING

Ms. Diana Maurer
Director, Defense Capabilities and Management
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Ms. Maurer:

This is the Department of Defense response to the Government Accountability Office (GAO) Draft Report GAO-23-105578SU, "MISSILE DEFENSE: DoD Needs to Improve Oversight of System Sustainment and Readiness," dated June 2023 (GAO Code 105578). The Department is providing the enclosed official response to the draft report recommendations and the enclosed technical comments for GAO's consideration to correct technical and factual inaccuracies in the draft report.

Sincerely,

HONEY.DAVID.A.1044947591
Digitally signed by HONEY.DAVID.A.1044947591
Date: 2023.05.24 13:07:31 -04'00'

David A. Honey, PhD

Enclosures:
1. Department Response to Recommendations
2. Department Technical Comments

RESPONSE TO DRAFT REPORT GAO-23-105578SU RECOMMENDATIONS

RECOMMENDATION 1: The Secretary of Defense should develop comprehensive guidance for sustaining the missile defense system and incorporate this guidance into Missile Defense System governance policy documents. This guidance should include designating a specific entity with responsibility for overseeing the sustainment of the entire Missile Defense System and establishing a process for prioritizing and addressing sustainment challenges among the military services and the Missile Defense Agency.

RESPONSE 1: Concur.

RECOMMENDATION 2: The Secretary of Defense should ensure that U.S. Strategic Command or another designated combatant command updates missile defense system guidance to require the Missile Defense Agency to periodically report, at least semi-annually, Missile Defense Reporting Systems readiness data to combatant commands, military services, and any other relevant entities.

RESPONSE 2: Concur. This is already being performed.

ENCLOSURE 1

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Diana Maurer at (202) 512-9627 or maurerd@gao.gov

Staff Acknowledgements

In addition to the contact listed above, Patricia Lentini (Assistant Director), Delia Zee (Analyst-in-Charge), Anna Beischer, Herbert Bowsher, Vincent Buquicchio, Michele Fejfar, Chad Hinsch, Mae Jones, Amie Lesser, and Kevin Newak made key contributions to this report.

Related GAO Products

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Missile Defense: Acquisition Processes Are Improving, but Further Actions Are Needed to Address Standing Issues. GAO-22-105925. Washington, D.C.: May 11, 2022.

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