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United States Government Accountability Office
Washington, DC 20548

May 20, 2011

Congressional Committees

Subject: *Counter-Improvised Explosive Devices: Most Initiatives Supported by the Joint Improvised Explosive Device Defeat Organization Have Limited Applicability to Humanitarian Demining*

Landmines and other explosive remnants of war cause thousands of casualties worldwide each year. Since 1993, the United States—through the Department of State’s (State) Humanitarian Mine Action Program—has contributed funding to more than 80 countries, providing tens of millions of dollars annually to rid the world of landmines and other explosive remnants of war. In 2006, to address the counter-improvised explosive device (IED) threat against U.S. military forces, the Department of Defense (DOD) established the Joint IED Defeat Organization (JIEDDO). Through fiscal year 2010, Congress has appropriated more than \$17 billion to JIEDDO to quickly develop and field counter-IED solutions.

In the committee report accompanying the House of Representatives’ version of the National Defense Authorization Act for fiscal year 2011, the House Armed Services Committee directed that we review the applicability of JIEDDO initiatives to humanitarian demining efforts.¹ To respond to the requirements of this mandate, we addressed the following questions: (1) What JIEDDO-supported technologies has DOD identified that could be applicable to humanitarian demining? and (2) To what extent does coordination occur (a) within DOD and (b) between DOD and State regarding JIEDDO-supported technologies that could be applicable to humanitarian demining?

To conduct our work, we reviewed the information paper DOD presented to Congress in August 2010 on the potential for applying JIEDDO-supported technologies to humanitarian demining efforts. We also analyzed State humanitarian demining-related policies and procedures issued since 2002 and related DOD guidance issued since JIEDDO was established in 2006. To understand the analysis and assumptions used to prepare DOD’s information paper, we conducted interviews with officials from JIEDDO; DOD’s Office of Assistant Secretary of Defense/Special Operations Low-Intensity Conflict & Interdependent Capabilities/Stability Operations Capabilities (SOLIC), OSD’s lead agency for DOD support of humanitarian mine actions; and DOD’s Humanitarian Demining Research & Development Program (HD R&D), which focuses on the development, testing, demonstration, and validation of

¹ H.R. Rep. No. 111-491, at 354 (2010).

technology for immediate use in humanitarian demining actions worldwide. We also spoke with Army Night Vision and Electronic Sensors Directorate (NVESD) officials to review and understand the DOD-wide database used to manage explosive hazards technology programs and Naval Explosive Ordnance Disposal Technology Division officials concerning current explosive ordnance disposal technologies. To identify specific formal and informal coordination mechanisms used within DOD and between DOD and State, we interviewed officials from SOLIC; HD R&D; the Unexploded Ordnance Center of Excellence (UXOCOE), which serves as the clearinghouse for information on DOD's explosive hazards technology programs; NVESD; and State's Bureau of Political Military Affairs' Office of Weapons Removal and Abatement.

We conducted this performance audit from October 2010 through May 2011 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

In summary, DOD reviewed 150 JIEDDO-supported technologies and identified 6 that could potentially be applicable to humanitarian demining. However, 4 of the 6 technologies identified by DOD either duplicated those already being used or, because of technical issues, were not suitable for use in humanitarian demining. DOD plans to further review the other two technologies for possible use in humanitarian demining. In general, inherent differences between counter-IED and humanitarian demining operations limit the extent to which JIEDDO-supported technologies can be used in humanitarian demining. For example, in counter-IED operations, DOD's mission is to clear the affected area only to the extent that forces can mobilize safely. In humanitarian demining operations, the purpose is to clear the affected area of all (100 percent) landmines and other explosive remnants of war so that it can be used for civilian purposes, such as farming.

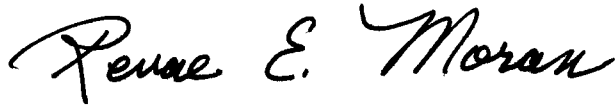
Coordination mechanisms exist within DOD and between DOD and State regarding their efforts to determine whether JIEDDO-supported technologies could be applicable to humanitarian demining. Within DOD, SOLIC and HD R&D use both formal and informal mechanisms to coordinate with other DOD offices about which off-the-shelf technologies are being developed or supported by JIEDDO that might be applicable to humanitarian demining. These mechanisms include attendance at weekly JIEDDO board meetings, participation in the UXOCOE annual Resources Managers Meeting, and communication with DOD offices through e-mails and phone calls. To coordinate which off-the-shelf or JIEDDO-supported technologies might be applicable to humanitarian demining, DOD and State use informal coordination mechanisms—e.g., participation in the HD R&D Biennial Requirements Workshop and communication through e-mails and phone calls. Given the extent to which DOD and State regularly communicate, coupled with the limited applicability of counter-IED technologies to humanitarian demining, the level of coordination within DOD and between DOD and State appears to be adequate for identifying technologies applicable to humanitarian demining.

We are not making recommendations in this report.

Enclosure I contains briefing slides that provide additional details regarding our findings. DOD and State did not provide written comments on this report. However, after reviewing a draft of this report, DOD officials agreed with its content and provided technical comments, which we incorporated where appropriate. Similarly, State officials said that our report was presented accurately but did not provide any additional comments.

We are sending copies of this report to the appropriate congressional committees. We are also sending copies to DOD and State. This report will also be available at no charge on our Web site at <http://www.gao.gov>.

Should you or your staff have questions concerning this report, please contact me at (202) 512-3863 or moranr@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report were Cary Russell, Assistant Director; Connie Sawyer, Jr.; Rebecca Guerrero; Lonnie McAllister; and Mae Jones.

A handwritten signature in black ink that reads "Revae E. Moran". The signature is written in a cursive, flowing style.

Revae Moran
Acting Director, Defense Capabilities and Management

Enclosure

List of Committees

The Honorable Carl Levin
Chairman
The Honorable John McCain
Ranking Member
Committee on Armed Services
United States Senate

The Honorable John F. Kerry
Chairman
The Honorable Richard Lugar
Ranking Member
Committee on Foreign Relations
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The Honorable Thad Cochran
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House of Representatives

The Honorable C. W. Bill Young
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The Honorable Norman Dicks
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Subcommittee on Defense
Committee on Appropriations
House of Representatives



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Counter Improvised Explosive Devices: Most Initiatives Supported by the Joint Improvised Explosive Device Defeat Organization Have Limited Applicability to Humanitarian Demining

Briefing for Congressional Committees
May 20, 2011



- Introduction
- Key Questions
- Scope and Methodology
- Summary
- Background
- Findings
- Agency Comments



- Each year, landmines and explosive remnants of war cause thousands of casualties worldwide. Since 1993, the United States, through the Department of State's (State) Bureau of Political-Military Affairs/Office of Weapons Removal and Abatement Humanitarian Mine Action Program, has contributed funding for humanitarian demining to more than 80 countries, providing tens of millions of dollars annually to rid the world of landmines and other explosive remnants of war. In 2010, State reported that, since 1993, it had received almost \$2 billion in total funding for the Humanitarian Mine Action Program. Humanitarian demining is one of the focus areas of humanitarian mine action and is primarily conducted by foreign militaries, contractors, non-governmental organizations, and host country personnel.
- In 2006, to address the threat of improvised explosive devices (IED) to military missions, the Department of Defense (DOD) established the Joint IED Defeat Organization (JIEDDO). Its mission is to lead, advocate, and coordinate all DOD actions to defeat IEDs. Through fiscal year 2010, Congress has appropriated over \$17 billion to JIEDDO to rapidly develop and field counter-IED solutions, such as detectors and electronic jammers.
- In the Committee report accompanying the House of Representatives' version of the National Defense Authorization Act for fiscal year 2011, the House Armed Services Committee directed that we review the applicability of JIEDDO initiatives to humanitarian demining efforts.¹

¹ H.R. Rep. No. 111-491, at 354 (2010).



To respond to this mandate, we addressed the following questions:

1. What JIEDDO-supported technologies has DOD identified that could be applicable to humanitarian demining?
2. To what extent does coordination occur (a) within DOD and (b) between DOD and State regarding JIEDDO-supported technologies that could be applicable to humanitarian demining?



- To address the first question, we reviewed the August 2010 information paper DOD presented to Congress on the potential for applying JIEDDO-supported technologies to humanitarian demining efforts. To understand the analysis and assumptions used to prepare this paper, we interviewed officials from the three DOD entities that prepared it:
 - the Office of the Assistant Secretary of Defense/Special Operations Low-Intensity Conflict & Interdependent Capabilities/Stability Operations Capabilities (SOLIC), OSD's lead agency for DOD support of humanitarian mine actions;
 - JIEDDO; and
 - the Humanitarian Demining Research & Development Program (HD R&D), which focuses on the development, demonstration, and validation of technology for immediate use in humanitarian demining actions worldwide. The Countermine Division of the Army's Research, Development and Engineering Command's Night Vision and Electronic Sensors Directorate executes this program for SOLIC, which provides oversight and guidance.

During our interviews with key officials from these entities and State, we corroborated our understanding of the differences between counter IED and humanitarian demining operations. We discussed plans with officials from HD R&D for deciding which of the identified technologies would be tested to determine their applicability to humanitarian demining. We also interviewed officials from the Army Night Vision and Electronic Sensors Directorate to review and understand DOD-wide data they manage for DOD's explosive hazards technology programs and the Naval Explosive Ordnance Disposal Technology Division concerning current explosive ordnance disposal technologies.



Scope and Methodology (continued)

- To address the second question, we reviewed DOD and State policies and procedures to determine requirements for coordination related to JIEDDO-supported technologies that could be applicable to humanitarian demining. We focused on State guidance issued since 2002 and on DOD guidance issued since JIEDDO was established. Specifically, we reviewed
 - State’s Humanitarian Demining Programs Policy and Procedures Manual,
 - DOD Directive 2000.19E for JIEDDO, and
 - the Chairman of the Joint Chiefs of Staff Instruction 3207.01B for Military Support to Humanitarian Mine Actions.

To identify specific formal and informal coordination mechanisms, we interviewed officials from

- SOLIC;
- HD R&D;
- the Unexploded Ordnance Center of Excellence (UXOCOE), which serves as the clearinghouse for information on DOD’s explosive hazards technology programs;
- the Army Night Vision and Electronic Sensors Directorate; and
- State’s Bureau of Political-Military Affairs/Office of Weapons Removal and Abatement Humanitarian Mine Action Program.



Scope and Methodology (continued)

We conducted this performance audit from October 2010 through May 2011, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

**Question 1:**

DOD reviewed 150 JIEDDO-supported technologies and identified 6 that could potentially be applicable to humanitarian demining. However, 4 of the 6 technologies identified by DOD either duplicated those already being used or, because of technical issues, were not suitable for use in humanitarian demining. DOD plans to further review the remaining two technologies for possible use in humanitarian demining. Differences between counter-IED and humanitarian demining operations limit the extent to which JIEDDO-supported technologies can be used for humanitarian demining. For example, counter-IED focuses on force mobility whereas humanitarian demining focuses on clearing all mines in a large area.

Question 2:

Several mechanisms exist for coordination within DOD and between DOD and State regarding technologies that could be applicable to humanitarian demining. Although there are no formal criteria requiring coordination within DOD and between DOD and State to identify JIEDDO-supported counter-IED technologies that may be applicable to humanitarian demining, we found that the informal coordination mechanisms in place worked fairly well.

- Within DOD, SOLIC and HD R&D determine what commercial off-the-shelf or DOD technologies could be applicable to humanitarian demining efforts by coordinating with other DOD offices through formal and informal mechanisms (e.g., attending weekly JIEDDO Board meetings, participating in the UXOCOE annual Resources Managers Meeting, and by communicating through emails and phone calls with DOD offices).



- Between DOD and State, informal mechanisms for coordination include the HD R&D Biennial Requirements Workshop and regular phone calls between State, SOLIC, and HD R&D.
- Given the extent to which DOD and State regularly communicate, coupled with the limited applicability of counter-IED technologies to humanitarian demining, the level of coordination within DOD and between DOD and State appears to be adequate for identifying technologies applicable to humanitarian demining.



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- Humanitarian mine action focuses on three main areas: (1) mine detection and clearance - humanitarian demining, (2) mine-risk education - teaching local citizens how to recognize landmines, and (3) survivor assistance - providing medical, rehabilitation and support services to victims and their families.
 - Humanitarian demining includes activities directly related to the identification and clearance of landmines and explosive remnants of war. HD R&D, the lead organization for developing humanitarian demining technologies within DOD, develops, demonstrates, and validates cost effective technologies for use in humanitarian demining. Humanitarian demining operations are generally manual, labor-intensive, and conducted after military conflicts have ended. Fields must be completely cleared of all landmines and unexploded ordnance in order for them to be certified by the host country as being cleared.
 - Counter-IED operations can be mechanized (involving technologies such as jammers and electronic sensors) and conducted during military conflicts. They often involve using classified technologies. Counter-IED operations are often conducted quickly for specific military purposes, such as clearing roads so that military troops and equipment can be moved into an area. In many cases, the areas do not have to be completely cleared; they only need to be cleared for the purpose of the military operation.



Table 1: Functions and Funding for Some Organizations Related to Humanitarian Mine Actions and Demining Technologies

Organization	Function	Funding	
		Source	Dollar amount (in millions) fiscal years 2006--2010
HD R&D (DOD)	Under the oversight of SOLIC and operating within the Army's Night Vision and Electronic Sensors Directorate, serves as DOD's lead for developing humanitarian demining technologies. Conducts humanitarian demining research and development focusing on the development, testing, demonstration, and validation of technology for immediate use in humanitarian demining efforts worldwide.	SOLIC Research, Development, Technology & Evaluation	\$69.8
Defense Security Cooperation Agency (DOD)	Among other activities—supervises, manages, and funds the Humanitarian Demining Training Center located at Fort Leonard Wood, Missouri	Overseas Humanitarian, Disaster and Civic Aid	\$12.8
UXOCOE (DOD)	Serves as a clearinghouse for information on DOD's explosive hazards technology programs	Assistant Secretary of Army Installations Energy and Environment, Research Development Technology & Evaluation	\$5.6
Bureau of Political Military Affairs' Office of Weapons Removal and Abatement (State)	Lead organization in coordinating U.S. humanitarian demining efforts worldwide	Non-Proliferation, Anti-Terrorism, Demining and Related Programs	\$569.5

Source: GAO generated from agency data.



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- Under law, DOD personnel are restricted in the extent to which they may actively participate in humanitarian demining operations.

 - 10 United States Code (USC) § 401(a)(1) states that DOD personnel may carry out certain “humanitarian and civic assistance activities in conjunction with authorized military operations of the armed forces in a country if the Secretary concerned determines that the activities will promote—
 - (A) the security interests of both the United States and the country in which the activities are to be carried out; and
 - (B) the specific operational readiness skills of the members of the armed forces who participate in the activities.”

 - 10 USC § 407(a)(3) specifies that the Secretary of Defense shall ensure no member of the U.S. Armed Forces, while providing humanitarian demining assistance does the following:
 - (A) “engages in the physical detection, lifting, or destroying of landmines or other explosive remnants of war (unless the member does so for the concurrent purpose of supporting a United States military operation); or
 - (B) provides such assistance as part of a military operation that does not involve the armed forces.”



- In response to congressional issues raised in H.R. Rep. No. 111-491, SOLIC, JIEDDO, and HD R&D conducted a one-time effort to review JIEDDO counter-IED initiatives and jointly identified 6 out of a total 150 technologies that might be used for humanitarian demining: three handheld detectors, two vehicular-based detectors and an airborne detector. According to HD R&D officials:
 - They are planning to further evaluate two of the six available technologies, which are both handheld technologies, to determine their potential usefulness in humanitarian demining.
 - The other four available technologies will not be further evaluated for the following reasons:
 - Two technologies (one handheld and one vehicular-based) duplicate technologies that are already being used by DOD for humanitarian demining.
 - The other vehicular-based technology is being used by the Army for military countermine operations but will not be explored further for humanitarian demining because it requires special vehicles for use and organizations performing humanitarian demining generally do not have these special vehicles available.
 - The airborne technology's usefulness is reduced when used in areas with vegetation, so DOD officials concluded that it would not work for humanitarian demining.



Table 2 lists the six identified technologies, how they are used and HD R&D's plans for further testing.

Table 2: JIEDDO-Supported Technologies that DOD Identified as Potentially Applicable for Humanitarian Demining

System name	Technology	How used	Further testing
Mini Handheld Stand-off Mine Detection System	Ground Penetrating Radar (GPR) and Metal Detector	Handheld	Yes
Minehound	GPR	Handheld	Yes
Lightweight Beachcomber	Metal Detector	Handheld	No, already have similar technology
Vehicle Borne Assisted Detection System	Metal Detector	Vehicle based	No, already have similar technology
Husky Mounted Detection System	GPR	Vehicle based	No, requires special vehicles—organizations performing humanitarian demining generally do not have these special vehicles available
Hawkeye	Ground Penetrating Synthetic Aperture Radar	Airborne	No, not useful in vegetation

Source: GAO generated from agency data.



According to DOD and State officials, humanitarian demining operations are very different from counter-IED operations. Table 3 shows some of these key differences.

Table 3: Differences between Counter-IED and Humanitarian Demining Operations

Counter-IED operations	Humanitarian demining operations
Take place during wartime	Take place in a peacetime environment where the threat is essentially static
Focus on force mobility	Focus on the detection of each landmine rather than mobility
Provide for the rapid clearance of mines but not for the need to find every device (i.e., 100-percent clearance of an area is not required)	Require 100-percent detection and elimination of all landmines and explosive remnants of war within a large designated area
Occur with the primary goal often being to disrupt the active communication link of IEDs	Occur without the primary goal being to disrupt an active communications link. (Landmines and explosive remnants of war do not have active communications links; they are accidentally set off with the application of pressure)
Take into consideration that an IED can be made up of any type of explosive device	Take into consideration that the models and components of landmines and most unexploded ordnance are well known
May use classified technologies	May use only unclassified technologies
Take place often under tight time constraints	Take place without specified time constraints

Source: GAO generated from agency data.



- SOLIC and HD R&D use both formal and informal mechanisms to coordinate their efforts to identify technologies that could be applicable to humanitarian demining.
 - SOLIC
 - SOLIC officials said that they identify JIEDDO technologies that could be applicable to humanitarian demining through participation in two weekly meetings of JIEDDO Boards that review counter-IED technology proposals:
 1. JIEDDO Requirements, Resources, and Acquisitions Board
 2. JIEDDO Integrated Process Team
 - HD R&D
 - HD R&D officials said that they update information related to humanitarian demining technologies and review a database of DOD-wide science and technology efforts to identify technologies that may be applicable to humanitarian demining.
 - Attends UXOCOE's annual Resources Managers Meeting
 - Communicates and coordinates regularly through emails and phone calls with officials from SOLIC, State, the DOD Humanitarian Demining Training Center, and UXOCOE



Objective 2: Coordination Mechanisms between DOD and State

- State officials said they keep current on technologies that could be applicable to humanitarian demining—including JIEDDO supported technologies—through various informal coordination and communication mechanisms with the following offices:
 - SOLIC and HD R&D
 - State officials have regular phone conversations with SOLIC officials and the HD R&D Program Manager
 - State officials attend conferences and research development symposiums sponsored by HD R&D
 - HD R&D’s Biennial Requirements Workshop brings demining organizations together to present and share information related to upcoming technology advancements



DOD and State did not provide written comments on this report. However, after reviewing a draft of this report, DOD officials agreed with its content and provided technical comments, which we incorporated where appropriate. Similarly, State officials said that our report was presented accurately but did not provide any additional comments.

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