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Quality Management and Standards for Humanitarian Improvised Explosive Device (HIED) Response Activities

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There is an ongoing debate about the need for standards for improvised explosive device (IED) activities. The emergence of civilian **IED response** follows the development of humanitarian mine action (HMA) in many ways. In particular, the problems of defining contractual targets and norms were problematic in the early days of HMA, when, as for the IED response today, money has started to change hands for services rendered. It is the premise of this editorial that the need for humanitarian IED (HIED) response standards derives from the contractual nature of the relationship between the client and the service provider. Therefore, if they are to be of use, any new IED response standards for use in the humanitarian sector must not simply rehash existing technical military-oriented counter-IED (C-IED) procedures but must address the problems caused by the introduction of a civilian business model, and also take account of their relationship with the humanitarian sphere.

Such tasks, when conducted by security forces, are managed using what amounts to an honor system. Teams carry out work to the best of their ability, with supervision and quality management provided through the chain of command. There are no requirements for extra, contractual stipulations as work processes are defined by internal norms such as organizational standard operating procedures (SOP).

However, when financial pressures are applied to services provided under contract, standard economic theory suggests that there is an added, economic incentive to increase output at the expense of quality. This was widely observed in the early days of HMA and a series of process controls evolved to address this issue. Thus, the question remains: what problems are likely to be faced in the quality management of civilian IED response, and what processes can be used to address these problems?

Definitions and Assumptions

Firstly, it is important to take a view on the debate regarding the definition of **IED** and its relationship to other terms, namely **(improvised) landmine** and **booby trap**. For the purposes of this editorial, it is held that these terms overlap and describe different attributes of any particular device. The term IED refers solely to the way an explosive device is made, and a mine is a weapon activated by the victim. Thus, a device that is manufactured in an improvised manner and set up to be activated by the victim is both an IED and a mine. Similarly, given that a booby trap functions when the victim carries out an apparently harmless act, there is considerable room for overlap between the three terms.

Secondly, there is increasing recognition in the HMA sector that the status of an IED is particularly relevant in determining the technical response. The sector is discussing the use of terms like **active** and **legacy** to describe whether or not an IED is **in play** or is, in effect, an explosive remnant of war (ERW). This article uses the following definitions:

Active device. The term active device is used to describe any IED that is still under the effective control of the individual or group that deployed them, or where the local populations and relevant authorities in those locations do not wish to see them removed.

Legacy device. The term legacy device is used to describe any IED that is no longer under the effective control of the individual or group that deployed them, and where the local populations and relevant authorities in those locations wish to see them removed. Any device that does not meet the definitions of a legacy device should be considered an active device.

Thirdly, there needs to be a common understanding of what IED response means. C-IED is commonly held to be an overarching range of activities, including actions to:

- Attack the network (of insurgents using IEDs).
- Reduce casualties.
- Defeat the device.
- Train the capacity.

It is the assumption of this editorial that HIED response will not attack the network but can be involved in any (or all) of the other elements of C-IED.

Fourthly, it is also the assumption of this editorial that HIED is as much a subset of the HMA sector as it is a subset of C-IED. Thus, this can be visualized as a Venn diagram (see Figure 1).

Finally, these notes are written to help understand how civilian organizations (both commercial and NGO) can contribute to HIED activities. One issue that has become increasingly clear in recent months is the difference between working in a humanitarian or a security environment (as illustrated in Figure 1). This is often linked in discussions about whether or not the IED is an active or legacy device (as described previously). While there is a link between these questions, the terms should not be used interchangeably. Rather it is suggested that the following distinctions should be drawn:

Legacy IED. Only humanitarian considerations are relevant.

Active IED. Both HIED and C-IED approaches are relevant, depending on the requirement.

These notes are primarily intended to consider HIED under conditions where the IED is no longer considered active or in play. There is a brief discussion at the end of this editorial about what difference an active scenario might make to contractual standards for HIED activities.

Challenges: How Much Search is Enough?

All HIED activities—and particularly search activities—represent a need to strike a reasonable balance between **effectiveness** and **efficiency**. One of the main differences between

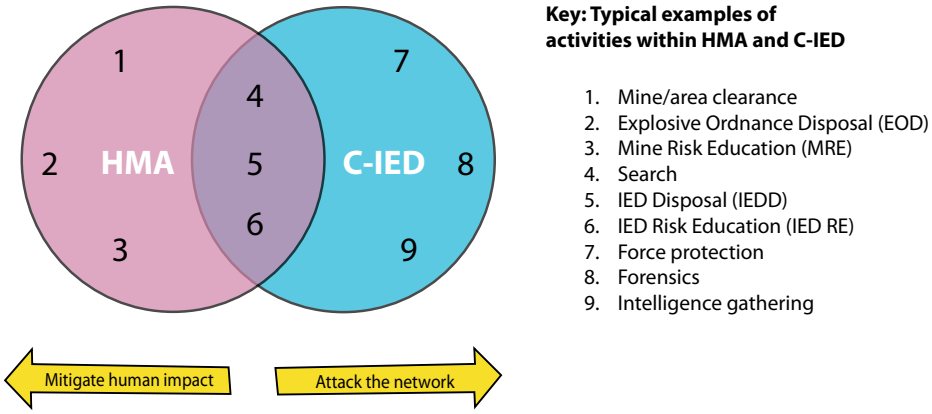

Figure 1. Interrelationship between HMA and C-IED. The rugby-ball-shaped area in the center represents the HIED response subsector. Note that humanitarian responses tend to focus on mitigating impact, whereas C-IED activities tend to focus on attacking the network. A list of examples of typical activities in both sectors, including in the HIED subsector, are shown in the key. These activities are discussed in more detail in the text.
All graphics courtesy of the author.

IEDs and other explosive weapons is that IEDs are (almost) always disguised. As a result, significant effort must be spent to locate the device before disposal action can be taken. Given the range of complexity (particularly in terms of disguise) of many modern IEDs, to always be fully effective one might have to dismantle all buildings brick by brick to be 100 percent certain that the building does not contain IEDs. This is akin to destroying the village in order to save it and is, in effect, doing the enemy's job for them. Such a comprehensive approach to search is also very inefficient as dismantling of a building will take a search team a very long time.

On the other hand, there is potentially a perverse incentive for civilian HIED operators to maximize efficiency (particularly if they are paid by the number of tasks completed or the square meterage covered) by minimizing the effort (or effectiveness) of search activities. Without clear, contractual requirements and norms in place, there is a risk of 'rush to the bottom' quality in civilian HIED work. A similar problem was resolved in the early days of HMA through the development of clearance norms, resulting in, for example, the need to search 100 percent of a designated area to a specific depth in area clearance, i.e., either mine clearance or battle area clearance (BAC). Quality assurance (QA) and quality control (QC) procedures were developed to help ensure and check that clearance was carried out to the required extent. Similar requirements can be applied to area clearance of victim activated IEDs (VOIED) where these have been employed as improvised mines. However, as described previously, this is problematic in terms of other search tasks, particularly building tasks. It begs the question: how much search is enough?

Is it a new device, or one that was missed? Another problem encountered in the early days of HMA was when a mine was subsequently found in an area declared as clear. This often resulted in claims of **re-mining** even when there was no ongoing conflict. This is likely to be a more significant problem in civilian HIED activities given the very real risk of continued IED use by stay-behind personnel or renewed activity by insurgents. However, as in HMA, claims of re-mining may also be a convenient excuse for poor HIED activities. The use of formal handover processes and the retention of liability for a task site helped reduce claims of re-mining in HMA. Identifying the difference between active and legacy tasks in what is emerging as the **humanitarian IED sector** has been an early step to help ameliorate this problem, but there is still a need to consider how to address any stay-behind IED activities in this regard.

What should be expected of HIED? A third problem addressed in the development of the HMA sector was the need to clarify the outputs (and hence outcomes) of various HMA activities. The development of the five HMA pillars (see Figure 2) was an early but perhaps flawed attempt to do this.[1] It was useful because it helped explain that mine action was greater than mine clearance. It was flawed because it mixed field operations with the advocacy elements of mine action, and specifically because it did not recognize the key role played by mobile explosive ordnance disposal (EOD) teams in dealing with spot tasks involving unexploded ordnance (UXO).

Subsequent work identified the three main field products of the HMA sector as area clearance (minefield or BAC), mobile EOD spot tasks, and mine risk education (MRE).[2] This clarification in turn helps identify the **incommensurate values** of these actions: area clearance is something that produces cleared land and does not necessarily reduce casualties, and EOD spot tasks and MRE, which act to reduce casualties (either by removing hazards or modifying behavior) but do not act to clear areas of land. These clarifications assist in the establishment of a **Theory of Change** (ToC) for HMA by setting out the different outputs and outcomes for the main HMA products.

Scoping HIED tasks

Defining core HIED response pillars. The core humanitarian HIED pillars can be defined as follows:

1. **Search** involves all actions to locate, access, and confirm suspect IED, or to establish the absence of such devices.[3]
2. **IED Disposal (IEDD)** includes all actions required to make an IED permanently ineffective.[4]
3. **IED risk education (IED RE)** is an educational process intended to reduce casualties from IEDs through the modification of behavior.[5]

A Theory of Change for HIED

A similar treatment needs to be done to establish the metrics of HIED activities. Indeed, this can be considered the prime requirement to establish a quality management regime for HIED. A ToC for typical HIED activities can be summarized as in Figure 3. Danish Demining Group (DDG) is currently doing more work on the ToC for HIED, including a linkage with the Sustainable Development

- **CLEARANCE.** Removing and destroying landmines and explosive remnants of war, and marking or fencing off areas contaminated with them
- **EDUCATION.** Risk education helps people understand the risks they face, identify mines and explosive remnants of war, and learn how to stay out of harm's way
- **VICTIM ASSISTANCE.** Medical assistance and rehabilitation services to victims, including job-skills training and employment opportunities
- **ADVOCACY.** Advocating for a world free from the threat of landmines and encouraging countries to participate in international treaties and conventions
- **STOCKPILE DESTRUCTION.** Helping countries destroy their stockpiles of mines as required by international agreements

Figure 2. The HMA Pillars.[1]

Goals (SDG), and it is hoped that this more detailed work can be shared soon.

Note again the incommensurate values in these different tasks. Search tasks, like mine clearance or BAC, do not necessarily find IEDs, thus they cannot be considered as primarily resulting in a reduction of casualties. They do however result in the release of safe land. Similarly, IEDD and IED RE do not result in cleared land but can be expected to reduce casualties either by the removal of hazards or by the modification of behavior (again, this is akin to conventional EOD spot tasks and MRE in the HMA sphere).

Also note that Figure 3 does not consider area clearance of VOIED fields. As has been made clear elsewhere, VOIED employed as improvised mines are covered adequately by existing HMA definitions and approaches, providing the appropriate equipment and detailed, render-safe procedures are in place.

Possible Contracting Modalities and Deliverables for HIED Activities

There are two contracting models available to address the problems discussed in this editorial. Firstly, there is the **output-based model**, as commonly used in commercial mine clearance. This model normally uses a firm, fixed-price bidding process to maximize efficiency. In an output-based model, service providers would be paid for the area of land cleared, normally through a pre-defined scope of works (including specifications of the product quality) as included in the contract. This model is attractive for clients requiring a specific area cleared to a defined depth, but it lacks flexibility in case of any new requirements identified during the course of the project. It is also unsuitable for spot tasks. Output-based models are also particularly suitable for training or RE projects where the key deliverable is the number of training recipients. The main risk with output-based contracting for area clearance is ensuring effectiveness, i.e., that the quality of the output meets the desired specification, but this can be addressed with appropriate quality management processes.

The second potential contracting model for HIED activities is the **service-contract model**. In a service contract, the suppliers would be contracted to provide a capacity capable of carrying out pre-defined types of tasks for a specified period of time. Acceptable response times can be included in the specification. Service contracts are suited to tasks that are not easily measurable in terms of units of output, and therefore lend themselves to more complex spot tasks such as a building search (or IEDD). Service contracts are flexible as it allows the client to deploy the teams when and where desired. Such contracts thus lend themselves to maximizing effectiveness, but there is a risk of poor efficiency if the client does not contract for the appropriate number of teams or if the teams are slow at responding. This can be managed through use of response time analysis and a contracting model that allows for penalizing of poor service provision.[6] The application of these two contracting models in HIED is summarized in Figure 4.

It should be noted that it is possible to use service contracts for area work such as area or route searches, and this may be appropriate where a number of small or otherwise unpredictable search tasks are expected. However, there is an increased risk in lower contractual efficiency as a result. It may even be appropriate to use both models, where large output-based search contracts allow for economies of scale, and service-contract models are used to allow for unplanned or otherwise complex tasks.

As has been discussed previously, one of the key issues in HIED search is that, unlike for mine clearance or BAC, it is not possible to define the scope of a building-search task in terms of 100 percent search to a defined depth. A reputable search team commander will investigate any ground sign until they are sure that there

Ser	HIED activity	Area or spot	Output	Outcome	Remarks
(a)	(b)	(c)	(d)	(e)	(f)
1	Area (rummage) search for cache/ hides	Area	M2 searched Cache found	Increased productive use of safe land	Note: clearance of VOIED fields as for HMA minefields
2	Route search	Area	Linear m/km searched	Increased productive use of safe route	
3	Building search	Spot	Building searched	Safe access to building	
4	IED disposal (IEDD)	Spot	IED destroyed	•Removal of hazard •Reduction of casualties	Includes vehicle search
5	IED risk education (IED RE)	n/a	RE given	•Modification of behavior •Reduction of casualties	As for MRE but taking account of 'do no harm' and improvised nature of devices

Figure 3. Summary Theory of Change of HIED activities, key outputs, and outcomes.

Ser	HIED activity	Output	Contracting model	Key deliverables	Remarks
(a)	(b)	(c)	(d)	(e)	(f)
1	Area (rummage) search for cache/hides	M2 searched Cache found	Output based/ service contract	m2/km2	
2	Route search	Linear m/km searched	Output based/ service contract	Linear m/km	
3	Building search	Building searched	Service contract	Availability of search team in working days/years	Monitored by response time analysis
4	IED disposal (IEDD)	IED destroyed	Service contract	Availability of search team in working days/years	Monitored by response time analysis
5	IED risk education (IED RE)	RE given	Output based	Number of recipients	

Figure 4. Possible contracting deliverables for HIED activities.

are no IEDs present, but the risk in a civilian scenario is where an amoral service provider decides to maximize profit through either expediting search quickly or by skimping on the training or other costs of the teams. Thus, in any circumstance where the only contracting proviso is unit cost, reputable search teams will tend to lose out to providers willing to provide a cheaper but potentially ineffective service.

Quality Management Techniques Available for HIED

The establishment of a quality management (QM) framework for HIED activities becomes easier now that the definitions of the activities are established, their inter-relationships are clear, and a ToC for each activity is in place. Many of the QM techniques as set out in Figure 5 may be familiar from HMA. Others may be additionally appropriate for HIED actions, particularly for search. Figure 5 represents a summary of the various QM techniques. More work needs to be done to adapt them to HIED in detail.

Quality in HIED Contract Design

As set out previously, the handover process developed in HMA for area clearance is applicable to HIED area and route search. However, contracts for building search may need to account for finds after handover. This could involve the use of follow-up studies in the event of missed items to identify whether the search team could have been expected to find the item if conducting drills properly. The assumption of legacy items will be key in this regard. It may also be useful for such contracts to be able to cancel funding in cases of poor technical performance. The details of contract design will vary greatly with each funder, but it may make sense to include a periodic progress and quality review for the purposes of continuing or cancelling contracts. One other point: it is clear that simply going for the lowest price in the absence of contractual benchmarks will **not** result in a HIED service that is **fit for purpose**.

Bonds, Indemnities, and Compensation

To indemnify is to compensate for loss or damage; to provide security for financial reimbursement to an individual in case of a specified loss incurred by the person.[7]

Given that a specific problem is how to ensure that HIED service providers guarantee that enough effort is spent on a search, then it might be appropriate to require some form of indemnity as compensation in the event that an item is missed and then either subsequently found or inadvertently detonated. This could be in the form of a bid bond or through retaining part of the payments until after the contract is completed. The retention of part of the payment to ensure quality is a common practice in the construction sector and may be appropriate in HIED, particularly for search tasks.

Are the Problems Addressed?

Effectiveness, efficiency, and defining the scope of works. This editorial helps to highlight the tension between effectiveness and efficiency in HIED activities, particularly during search actions. The clarification of the outputs from different activities will help manage expectations. Whereas the products of area and route search, and IEDD itself, can be treated much like their HMA equivalents for the purposes of contracting, these discussions also highlight that building-search tasks are going to be the most problematic from a contractual point of view. Use of a service-contract model in addition to a strong accreditation and quality management framework may be the best approach for funding a building-search capacity, with an added use of bonds or indemnities against items being found after a search is complete. Price must not be the only criteria for awarding HIED contracts or grants.

Re-mining or missed items. In IED response actions against legacy items, it would appear theoretically clear that there should be no instances of re-mining. Providing an appropriate risk assessment is completed by the contracting or tasking agency, work should only be done in areas where there is limited risk of new, active items being used. However, it is realistic to recognize that a return of insurgent activity is likely in many areas where there has not been some sort of comprehensive peace settlement. Thus, the use of robust handover procedures will help mitigate the liability of the service provider, who would not be liable for devices found or activated after the handover process, but strong QM procedures will help ensure that the task site is not accepted unless there is sufficient confidence that the work has been fit for purpose.

Implications for work on active tasks. One of the assumptions made at the beginning of this editorial was that HIED work would tend to focus on legacy tasks. However, this may not always be the case every time civilian organizations are contracted for IED response work. Tasks may involve the full range of IED initiation mechanisms, and there is also a much greater risk of re-mining. The latter can be dealt with contractually through a rigorous application of the handover process, and through the maintenance of a security cordon normally in place during C-IED operations to prevent re-entry by insurgents in the period between IED response activities and handover. The increased complexity of active devices (in terms of their means of initiation) can similarly be addressed by ensuring that the contracting process pays sufficient attention to the need for training, equipment, and procedures for time- and

Ser	QM technique	Description	Time frame	Remarks
(a)	(b)	(c)	(d)	(e)
1	Accreditation	Including assessment of training, equipment, key personnel qualifications and SOP	Pre-operations	
2	Quality Assurance (QA)	Observation: adherence with scope of works (SOW) and approved SOP	During operations	SOW = scope of works
3	Handover procedures	Formal acceptance of completed task by customer from clearance agency (for route or area search)	Immediately at end of task	Establish point in time for mitigation of liability
4	Quality Control (QC)	Post clearance sampling and checks	Post-operation	
5	Performance analysis	Including: • Number of items found after search • Damage caused during disposal	Post-operation	See discussion below
6	Accident investigations	Casualties caused by missed items or other poor procedures	As necessary	Could be for injuries involving C-IED personnel or for civilians
7	Response time analysis	Comparison of performance compared to estimated norms, looking at number of tasks done and any backlog of tasks	Periodically	Measurement of efficiency
8	KAP studies	Measuring knowledge of people receiving IED RE	Baseline and endline studies	
9	Reduction in casualties	Comparison of casualty numbers over time	Time-series study to compare effect of intervention over time	Can also compare with figures in area where program was not working (cross-sectional analysis)

Figure 5. Range of QM techniques available for HIED.

command-initiated devices used by insurgents in the country in question at the time of the contract, implying a far more rigorous accreditation process.

It should be clear that there is no contractual impediment for non-profit organizations undertaking active tasks: the questions of security and impartiality are questions for each organization to determine themselves, and should not be assumed or imposed externally. For DDG, the question of active and legacy is a key part of a rigorous risk management process. Other organizations, including commercial organizations, may have a different approach depending on their appetite for risk. They may also be willing to take on other C-IED and force protection tasks that fall outside this editorial definition of HIED response.

Product definition. The third problem highlighted previously was the need to understand what can be expected of HIED activities. This is a question of product definition and this editorial has set out how the lessons learned from HMA can be used to formulate both a set of HIED pillars and also the outlines for a ToC for all three of these main HIED components. It is important to note that while conversations often focus on IEDD, the need to first locate the device (through search) is a significant product in its own right. Also, one must recognize that IED RE for local populations must account for both the similarities and differences between landmines, UXO, and IEDs.

Recommendations

There is a widespread demand for HIED standards. Firstly, it is recommended that any such standards need to focus on the contractual parameters, recognizing that the significant development in HIED is the increased funding of civilian organizations to carry out such work. Secondly, in order to develop contractual standards, it should be recognized that the first step is to define the main activities carried out under HIED, and that in the humanitarian sphere these include search and RE as well as IEDD. Thirdly, it is important to adopt the appropriate contractual model to reflect the nature of the activity. Fourthly, a range of quality management tools can be adapted for use in HIED contracts once this process of product definition is in place.

This editorial does not pretend to address the complete requirement for HIED standards: much more work is needed to develop such standards in detail. However, it is hoped that it has set out the main areas of focus that will be needed if it is to be possible to effectively civilianize some IED response activities in the humanitarian sphere.

See endnotes page 66

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1. See the UNMAS mine action portal at http://www.mineaction.org/issues.
2. Assuming victim assistance is mainstreamed into health and disability sectors and supported by specialist organizations that may not be involved in the 'field' elements of mine action.
3. Based on NATO Allied Joint Doctrine for Countering – Improvised Explosive Devices, AJP-3.15 (A) March 2011, Para 0418.
4. Based on NATO Allied Joint Doctrine for Countering – Improvised Explosive Devices, AJP-3.15 (A) March 2011, Para 0419.
5. Based on International Mine Action Standards (IMAS) 04.10 2nd Edition Amdt 3, Para 3.168.
6. See the explanation of response time analysis in "Joint Evaluation of Mine Action in Cambodia for the Donor Working Group on Mine Action", Griffin and Keeley, 2004.
7. "Indemnify." The Free Dictionary. Accessed 13 September 2017. http://bit.ly/2h1en9C.