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Safe and Efficient Use of Mine Dogs in the Republic of Croatia

In this article, the authors discuss the use of mine-detecting dogs in the mine-action community as a whole, using the Republic of Croatia as an example. Specifically, they describe guidelines that must be followed to ensure MDDs are employed properly and maintain a high level of effectiveness.

by Mirko Ivanušić, Davor Laura and M. Sc. Željko Šarić [Croatian Mine Action Centre]

In the Republic of Croatia, a large mine-suspected area covers forests, pastures, agricultural areas and karst.¹ The fact that only one-third of the 1,044 square kilometres (1,249 square yards) of mine-suspected area in Croatia is actually mine-contaminated speaks in favour of using dog-handler teams in mine-search operations for the purpose of simpler, faster and more cost-effective work. However, the matters of safety, efficiency and creating the preconditions for their use need to be considered. For these reasons, special attention must be paid to all technical requirements in the process of testing approaches, methods of monitoring, conditioning and training procedures, quality-assurance activities, test-site preparations, daily tests prior to the commencement of works, daily inspections, status of dog-handler teams, and prescribed forms of verifying efficiency.

Brief Historical Overview

Humanitarian demining as well as wider usage of MDDs have had a relatively short development period. MDDs have been used for 15 years globally and 10 years in Croatia, and their usage and training is a maturing process.

In 1998 RONCO Consulting Corporation began training and using mine-detecting dogs. Croatia was the first country where the company used dogs to find mines on a consistent basis. Soon the Croatian Mine Action Centre legally undertook the commitment of using dogs to perform quality control over mine-clearance operations.

Development of demining companies from 1999 to 2000 and especially in the period that followed resulted in the procurement of several dogs and creation of teams for area inspection as a second method after mechanical mine clearance. The level of training for the dogs, trained mostly in foreign countries, depended upon which centre trained them. During this time, CROMAC was active in a number of important international workshops and assemblies, learning about MDD usage. Leading authorities were visiting CROMAC and setting the guidelines for team usage and competence verification modes. When CROMAC took over the commitment of accreditation and testing of demining teams, it started the process of developing the methodology of testing the teams, monitoring their work in the field and constructing test sites.



Expecting the call for testing - outer part of Rakovo Polje test site. PHOTO COURTESY OF MIRKO IVANUŠIĆ (CROMAC).

During that period, demining companies in Croatia were also trying to upgrade their own methodology by creating standard operating procedures mandatory for the testing and accreditation process. With the assistance of the representatives of the United Nations Scientific Council and members of the Committee for the Establishment of MDD Information, the first test site was built in Sisak on the area called Jodno, which is no longer in use. There have been four more sites established since then, but only two are currently in use: Cerovac (continental part of Croatia) and Škabrnja (southern coastal part of Croatia).

Sphere and Forms of Dog-handler Usage

Countries today use dogs for mine-clearance operations in a variety of ways. MDDs are used:

- To reduce mine-suspected areas by defining mine-field boundaries primarily in the low-risk areas.
- As the first method during mine detection combined with other manual-detection methods.
- During the MSA search from the safe access lanes on the area of differently marked and defined minefields—safe access lanes are areas of lower risk and a good location for beginner dogs and dog trainers.
- As the second method in mine-clearance projects, mostly on mechanically treated areas after some period of soil stabilisation.
- During mine detection in devastated buildings with significant quantities of metal, along with removal of rubble in layers.
- For mine clearance of railway infrastructure as well as other firm surfaces along asphalt, stony



MDD testing at Pridraga test site, May, 2002. PHOTO COURTESY OF MIRKO IVANUŠIĆ (CROMAC)

and concrete systems, and areas with significant quantities of metal (water-supply systems, gas pipelines, etc.).

- For sample search during final quality control over clearance operations.
- To inspect the safe access lane in case of an urgent need to approach a mine victim.

It is important to note that for all activities, CROMAC sends at least two dogs, one by one, into the test site or actual mine clearance area.

Dog-handler Usage Laws

Implemented in Croatia during 2005, the Law on Humanitarian Demining and the Rules and Regulations on Methods of Demining enabled the use of dogs and handlers as an independent method in mine-search projects. The two legal acts that regulate mine action in Croatia are the Law on Humanitarian Demining and

Year	2000	2001	2002	2003	2004	2005	2006
Demining companies with MDD teams	10	23	23	15	17	18	18
Deminers in all demining companies	292	420	408	586	601	599	609
Demining machines in all demining companies	10	27	30	41	43	62	54
MDD	15	40	52	111	127	129	130

Table 1: The growth of demining companies and MDD teams. GRAPHIC COURTESY OF MAIC/CROMAC

Rules and Regulations on Methods of Demining.² Several key guidelines regulate dogs and handlers in the mine-detection and mine-clearance process from the Rules and Regulations on Methods of Demining.

When search operations are conducted using MDDs, the demining team leader must carry out certain tasks prior to the beginning of work. First the leader must hold a meeting with handlers and define individual tasks. The leader then temporarily sends handlers who are incapable of performing their daily task off the site. After these handlers leave, the leader then directly assigns the remaining handlers to the worksite. Continuous monitoring of handlers during worksite search and the conditions for the work of MDDs is required. A dog handler, who must be accredited by the relevant ministry, directs the dog towards terrain search and gives orders during mine search. Finally the leader must enter the meteorological characteristics such as surface soil temperature, air temperature at the height of one metre (1.1 yards), and speed and direction of the wind into the record.

In addition to the number of duties of the worksite leader, records are kept of dog conditioning. Prior to the commencement of mine clearance, the authorised legal entity is obliged to carry out test-site markings to prepare it for the work of mine-detection dogs. While MDDs conduct a worksite search, deminers mark off a section of the worksite with red-topped stakes. This is done by the company conducting the operations. Only CROMAC-approved dogs and handlers may be used.

The handler who gives the dog certain instructions must be a deminer or a supporting worker. The deminer must also do a second search of the area where the dog detected mines and unexploded ordnance to be positive nothing was missed. When the worksite is searched by MDDs, two different dogs must search the same part of the worksite to ensure the same UXO is discovered and that none is missed.

The Law on Humanitarian Demining and the Rules and Regulations on Methods of Demining, passed in 2005, enabled the use of dogs and handlers as an independent method in mine-search projects. The ultimate goal, after testing and accreditation for dog and handler, is that all other factors in monitoring and con-



Acclimatization to test site conditions (resting). PHOTO COURTESY OF IVAN STEKER (CROMAC-CTDT LTD.)

trol meet the standards of legal regulations. Accreditation includes issuance of the assessment for dog-handler team usage for the period of six months, nine months or a year and depends on the number of points reached during testing.

Trainability Verification and Dog-Handler Team Evaluation

Though there is a widespread necessity for dog-handler teams, these teams must exercise care and take their time with every task. In every situation, four points must be taken into consideration before using dogs: the size and structure of a mine-suspected area, developed and sufficient capacities, legal and normative regulations, and quality of dog accreditation. The development of dog-training companies in Croatia during 1999–2000 resulted in not only the strong expansion of the programme from four companies to 10 but also the procurement of machines and dogs. In 2000, 10 companies existed with a total of 15 dogs.

By 2005, 18 companies with over 130 dogs existed. In the early period of development, demining companies in the Republic of Croatia were achieving varying results from the use of MDD teams. The results of CROMAC's Quality Assurance and Quality Control Department from 2005 also undoubtedly confirm the value of certain MDD teams as questionable.

Assessment of Searches and Demining

This SOP defines the efficiency estimates of MDD search and clearance operations in different mine, soil, vegetation and climatic conditions with different work methods. This SOP also clearly defines the situation and limiting factors when dog-handler team usage is not allowed, such as when the air temperature is below freezing.

SOPs prescribe other important conditions for working with dogs. For instance, marked boxes can be 50 metres x 10 metres (54 yards by 11 yards), 4 x 25 (4.5 x 27) and/or 10 x 10 (11 x 11). Also, if there has been a fire on the area previously demined, MDD inspection cannot go forward until two days after the fire so fumes do not disrupt the dogs' sense of smell.

It is extremely important to maintain cooperation between the Team Leader, QA Officer and QC Monitor with the purpose of achieving good results and accurate mine detection in the field. If these parties do not work together properly, items may not be found, which could lead to a "worksite fail" rating. In this event, the whole demining process would have to be repeated.

Work in humanitarian-demining operations is assessed for a period of six, nine or 12 months according to a point system. One important precondition is that the dogs detect all buried mines in the boxes assigned. The maximum number of points is 100.

The average number of points in CROMAC's collective practice is 62, indicating an inadequate quality of work and a need for quality control and monitoring during activities conducted by the Committee for Testing Dogs and Handlers in Humanitarian Demining Operations, QA Officers and QC Monitors.

Generally, the aim is to monitor all the processes—accreditation and testing provide the conditions for the work in the field. QA Officers and QC Monitors control the work in the field and after the completion of operations, Quality Control procedures have to determine whether the area remains mine contaminated. According to the Law on Humanitarian Demining and Rules and Regulations on Methods of Demining, the clearance company has to guarantee the complete clearance of mines, UXOs and their fragments.

Other Factors

Besides the large number of limiting factors, experience from around the world shows that even when dogs receive training related to

No	Working procedures description	Prescribed number of points
1	Assessment of level of handler's knowledge-written exam	0-5
	Obedience exercises	
2	Walking by handler's leg on leash	0-5
3	Walking by handler's leg without leash	0-5
4	Stops, while walking	0-5
5	Abort of the dog	0-5
6	Moving in front of the handler	0-5
7	Resting dog	0-5
8	Modes to let a dog enter the test field	0-5
9	Evaluation of systematic searching method in accordance to the	0-10
10	Handler's rapport with the dog	0-5
11	Safety of the dog while detecting mines	0-10
12	Reliability of dog's findings and handlers	0-10
13	Distance between an indication and a buried mine	0-5
14	Number of wrong indications	0-5
15	Evaluation of found and indicated UXO fragments	0-5
16	Level of motivation to search	0-5
17	Level of focus intensity during search	0-5
Evaluation of overall work quality and behaviour of handler-dog team, total number of points=100		

Table 2: Point system for rating MDD teams. GRAPHIC COURTESY OF MAIC

the scent of explosives, there are situations when they do not detect UXO containing the explosive TNT, the type most frequently used. Research and indicators show this anomaly actually occurs with UXO that is hermetically sealed. This was clearly evident from two of CROMAC's 2005 demining projects. All those involved in the mine-action community should bear in mind that MDDs are trained to recognize "the complete bouquet" related to all scents of a "military arsenal." Also, it has been proven that a soil temperature of 26 C (78 F) is the most suitable for spreading of the explosive particles to the environment, and this range is the most optimal for MDDs.

Conclusion

The training and assessment of the MDDs is not easy, and daily and weekly conditioning conducted by the handler is needed to guarantee quality MDDs. Several factors are responsible for the total quality rating and should be closely connected. The first two involve accreditation and rules and regulations. For accreditation,

the handler needs to have a certificate or other type of proof that he passed the test in schools involved in training and dog breeding, which should be compliant with conditions prescribed by the established rules and regulations. The company also should submit breeding, training and performance documents for each dog as per standard operating procedure.

The final factors concern testing and monitoring/quality control. These basic measures should result in wider and safer usage of dog-

handler teams in humanitarian demining in the near future. High quality and equitable testing must exist along with field survey to gain an insight into the status of companies' test sites and prescribed forms of daily, weekly and monthly conditioning and verification. Permanent monitoring and quality control, as well as education of QA Officers and QC Monitors, is necessary. ♦

See Endnotes, Page



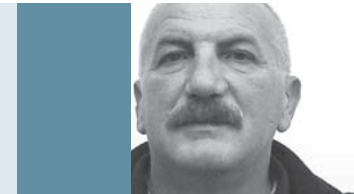
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News Brief

New Bug-like Demining Robots Tested in Arizona

Explosives investigation is a common task for remotely operated robots, but Mark Tilden has developed a new kind of robot with a unique approach to explosives. The robotics physicist at the Los Alamos National Laboratory built a demining robot resembling a stick insect that is nearly autonomous.

The insect-robot recently participated in a live-fire test at the Yuma Test Grounds in Arizona and performed well, according to reports. The robot sought out landmines, purposefully stepping on a mine and losing one of its many legs. When it lost a limb, the robot simply picked itself up and readjusted to move on its remaining legs through the minefield.

Left with only one leg, the machine continued to pull itself forward and demine the field. At this point, the Army colonel in charge of the test ordered the exercise stopped.

The colonel, it seemed, could not watch the scorched, crippled robot dragging itself through the desert minefield with just one leg. He said the test was just too inhumane.