Mechanical Demining: From 1942 to the Present

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They in safety and cheaply clearing their lands of these deadly mines; however, actual mine clearance is an essential component of the solution to the global problem. Contrary to what was expected, the flow of funds from donors for clearance activities has declined year after year. In the case of Mozambique, different international nongovernmental organizations have left the country or are in the process of phasing out their activities. This situation is of great concern because landmine-affected States Parties are faced with insufficient funding to continue demining activities and, thereby, fulfill the Ottawa Convention deadlines.

What is the Next Step?

Article 6 of the Ottawa Convention states that each State Party has the right to seek and receive assistance for the fulfillment of its Convention obligations and to request assistance in the implementation of its national mine-action plan. States also have the responsibility to make an effort to meet the Convention deadlines in a way which maintains the credibility of the Convention and creates maximum pressure for completion beyond the five-year strategic plan. However, many States Parties like Mozambique are still in need of assistance. The United Nations Development Programme, other international organizations, nongovernmental organizations and governments able to do so should play a vital role in mainstreaming mine action into their activities in mine-affected countries. In addition, local capacity building should be at the center of every effort to ensure sustainability of mine action in these countries.

The challenge is great, but there is an equally great opportunity to attain the goals of the Ottawa Convention through cohesive, coordinated and collective action. See Endnotes, page 112

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Although demining machines have been in existence since 1942, they were not used in the field of mine action until about the early 1990s. Demining machines were initially only used by the military. With the growing number of casualties stemming from landmines, especially among civilians, it became necessary to employ machines for humanitarian purposes. From the first demining machine constructed in early 1942 to the present, tremendous improvements have been made.

by Pehr Lodhammar

( Geneva International Centre for Humanitarian Demining )

The first demining machine was indeed to be developed by Major Abraham du Toit, a South African soldier and engineer. In early 1942, he was sent to England to refine a demining prototype he had constructed in South Africa.

Before leaving for England, du Toit discussed his ideas with Captain Norman Berry, a British mechanical engineering officer. Berry conducted his own unofficial experiments with flails in Libya before providing the results to another British army officer in an essay workshop in Egypt. This collaboration resulted in the development of the Matilda Scorpion, a Matilda tank fitted with a rotor mounted on two arms at the front. The rotor carried 24 flails and was driven at 100 revolutions per minute by a 105-horsepower Ford V8 engine. A second engine was fitted with an armored box mounted on the right side of the tank. This box included space for a crew member, who operated the flail.

A number of these vehicles were produced and became operational in October 1942 when they were used in the Second Battle of El Alamein (23 October to 5 November 1942). Although the clearance speed was slow, the Scorpion operators were able to conceal the machines from German soldiers because of the huge dust cloud they formed; however, the dust cloud also blinded and affected the breathing of the drivers, so crews had to wear gas masks in order to breathe.

Other flails that followed included the Matilda Baron and the Sherman Crab. The Crab ran on the tank’s main engine, had 43 flail hammers and included a rotor for cutting hedges to prevent the flail from getting entangled. The flail also had a mechanism to ensure that it followed ground contours and had extra protection in the form of a blast shield. This flail did not clear all mines and could only move at very low speeds; however, the Crab was used during and after the D-Day landings and allowed the Allied Forces to advance through the German minefields.

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Up to the end of the 1980s, demining machines were only used by the military. In the early 1990s, however, the need for demining machines for humanitarian purposes was recognized, and the machines were introduced into countries such as Afghanistan and Angola. Initially, military carriers were used, but later purpose-built carriers were developed. Early machines were often clumsy, unreliable and underpowered. The clearance results also fell below the minimum United Nations’ requirement.

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T he GICHD was involved in a number of international conferences, and will continue to follow and assist in the further development and improvement of these mini-action programs. It assesses the impact of different methods of marking and fencing of hazardous areas. It also discusses the contribution of medium- and long-term marking towards casualty reduction in situations where clearance cannot be conducted immediately.

Odor-detection Conference

The GICHD organized an international conference, “Odour Detection by Animals: Research and Practice,” held in Oslo, Norway, in June 2008. Around 120 participants attended including practitioners and experts involved with animal-detection systems—particularly those with animal systems for humanitarian demining detection. The purpose of this unique meeting was to encourage those with expertise in this area to share it and to highlight the research findings that are applicable across a range of animal species searching for various target odors. End-users—such as humanitarian-demining administrators, police, customs officials, defense specialists, and search-and-rescue organizations—were also represented. They discussed their practical experiences and contributed views on how animal detector systems can best meet the specific requirements. The outcomes of this meeting can be found at http://inupar.com/4546.

New Publications

The GICHD has recently released a number of new publications. These have included A Guide to Road Clearance, which aims to contribute to the development of safer, more efficient and cost-effective road clearance systems by providing recent examples, data and methodologies from the field. Along with the information gathered in this guide, the GICHD has gathered supplementary technical data through visits to road-clearance projects in four countries. The Guide to Marking and Fencing in Mine Action Programmes has also been developed. Based on research conducted by the GICHD on 10 mini-action areas and territories, the guide describes the extent to which marking and fencing are carried out in existing

GICH Offering

Three more International Mine Action Standards are under development, in addition to IMAS 09-50: Mechanical Demining. The new IMAS will include operator safety, quality management and the application of mechanical demining machines. In 2008, the GICHD published the seventh edition of the Mechanical Demining Equipment Catalogue 4 and Guide To Road Clear-
ance. The Mechanical Demining Handbook was published in 2008. Beginning in 2009, a mechanical demining reference library will be available on the GICHD Web site. The reference library will include most documents related to mechanical demining that have been published over the years and will be available to all interested in mechanical demining.

As seen above, demining machines have evolved enormously since 1942. The GICHD will continue to follow and assist in the further development and improvement over the coming years. See Endnotes, page 112