Picking the Right Tool for the Right Task: Mine Clearance with the MineWolf Machine in Sudan

In 2002, the United Nations reported that landmines on key logistical routes were a great impediment to the delivery of humanitarian aid. Consequently, much of the aid has been delivered by air at tremendous cost. The involved parties have specified clearance of the road network as the first priority, the second priority being access to water and the third, food security. Almost four years after setting these priorities, they are still struggling with the first one.

In 2005, Norwegian People’s Aid decided to support its mine-action program in Yei with a mechanical mine-clearance machine called the MineWolf. The MineWolf is a German machine that combines the advantages of both the tiller and flail systems. It is designed as a multi-purpose tool to provide maximum flexibility for the user, especially in the challenging environment of Sudan. As a result of a feasibility study in January 2005, it became clear that in order to support and move a 25-ton machine in South Sudan, a well-equipped and perfectly organized team must be formed to deliver cost-effective results. The main challenges would be transportation, hard ground conditions during the dry period and dense vegetation after the rainy period. Based on its experience in the Balkans, MineWolf Systems provided NPA with a tailor-made transport and support solution.

Getting There and Moving Around

To achieve operational flexibility and maximum deployment, the system needs its own transport and support assets. Taking into account the IMATC to become humanitarian deminers and EOD technicians respectively, was funded by the British government’s Department for International Development and the U.K. Ministry of Defence. MAT has been contracted through the United Nations Development Programme by the Department for International Development to provide the Technical Advisors to supervise the Ugandans in their new role, ensuring that the International Mine Action Standards are maintained and the teams operate at their maximum capability.

Upon completion of the course and re-configuration of MAG, MAT was essential in helping to shape the strategic policy for the deployment of these newly trained forces. The Office of the Prime Minister and the Ministry of Defence, with the UNDP, have agreed to acquire the necessary life support and operational funding for the teams to undergo refresher training and deploy to the field to conduct clearance operations. This has by no means been an easy feat, and with this new approach to national governmental infrastructure to include mine action within its national regeneration plan and assign essential funding and personnel.

At present, MAT Chief Technical Advisor in Uganda Danny Danneborn is assisting in the development of the national mine-clearance programme and will then deploy on operations with the UNDP. It is a very delicate balance that the staff has to manage, as there must be some close supervision to ensure that standards are maintained while allowing the command element to develop.

The government of Uganda’s mine-action aspiration is to free the country from the most severe humanitarian and economic effects of landmines and UXO by 2009. The prioritisation of mine-action tasks will be in accordance with the government’s newly published document, “National Policy for IDPs [Internally Displaced Persons],” taking into consideration the government’s rehabilitation and reconstruction requirements. In order to implement this policy effectively, the staff needs a good deal of cultural sensitivity and empathy to ensure that the right capabilities are employed to maximum effect.

Concurrently, MAT has secured additional funding from the UNDP to conduct another needs assessment, which will concentrate on the two northern districts of Lira and Soroti. With the desire for this NAs to incorporate even more districts, there is a creditable drive by all involved toward securing mine funding to make this possible so that valuable and critical information required for a focused and efficient mine-action plan can become a reality.

Mine Detection Dog Programme

With the development of Uganda’s mine-action capacity, MAT has started to build a mine-detection dog training facility on the grounds of the IMATC. At present, the German-owned commercial dog-training company that operates globally, means that the supply of high-calibre and well-trained MDDs will soon be well-established in eastern Africa to move and support the newly mine-action programmes/agencies in countries such as Uganda, Rwanda, Somalia, and South Sudan.

Duncan Leitch, the MAT Technical Advisor and head of the MDD training facility, the Dork-Edge Dog Centre, controls the day-to-day running of the centre and occasionally assists the instructors from the IMATC during the course. Leitch provides specific EOD knowledge from his experiences gained during his career in a British Army EOD team operating in countries such as Iraq, Afghanistan, Sierra Leone and Macedonia. Andreas Steinberger, the MDD TA employed by Securatec, is responsible for the actual dog and handler training beyond the standard required by the IMATC.

Once the MDD teams are trained, MAT will deploy them to countries that have a need for MDDs, and with the help of NGOs/commercial organizations, will put the MDDs to work, utilising them in area reduction and quality assurance as part of a national mine-action programme.

The Future

MAT has provided programmes in Eritrea and the Democratic Republic of the Congo for the development of MDD capability in Kenya. MAT aims to consolidate these activities and to expand its “toolbox” most cost-effectively.

With the influx of mine-action activity in Sudan and as donors are re-educated to the plight of African sufferings and the threat of landmines and UXO, a concerned effort is needed to create a method that enables the humanitarian community to act, and the need to curb the need for MDDs to work, utilising them in area reduction and quality assurance as part of a national mine-action programme.

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Getting There and Moving Around

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The MineWolf System combines both the tiller and flail systems. The mine-clearance team overcame several challenges to transport the 25-ton machine to South Sudan. Once there, the MineWolf was used to clear over 280,000 square meters (39 acres) of land, including a school complex, a planned housing complex and a teacher-training centre.

by Christoph Freseke [MineWolf Systems GmbH]
accounts the poor road conditions en route to and within Sudan, the team faced off-road challenges. MineWolf chose an off-road-equipped truck equipped with a mobile workshop—to pull the 16-wheeled customized off-road trailers from the port at Mombasa, Kenya, through Kenya and Uganda into Sudan. In addition, a MAGIC four-wheel drive vehicle with bridging equipment and spare parts was supplied.

The first stage of the journey brought the team from Mombasa to the International Mine Action Training Center in Nairobi, Kenya, where a demonstration of the equipment was given to various donors and other mine-action agencies. On Oct 7, 2005, the two trucks left Nairobi to drive to Koki, the Sudanese capital.

**Getting Started**

Ten days after leaving Nairobi, the MineWolf convoy reached its final destination in Yei, South Sudan. Upon arrival, the camp was set up, and training of the Sudanese staff began, conducted in four major stages. First, Michael Killy, Senior Technical Advisor for MineWolf Systems, and Christoph Frehsee, Director of Product and Services, conducted a general introduction to the MineWolf mechanical mine clearing machine. Second, they gave in-depth lectures on the operating procedures for all team members. After that, specialized courses, such as the basket-type flail, were taught for field commanders, section leaders, operators, medics and deminers. Finally, the team had to mechanically prepare a training area as if it were a real minefield.

Only one month after the equipment arrived in Africa, the NPA MineWolf team started operations in the Renty community on the Yei-Kaya road. This first task was to clear the perimeter of the abandoned St. Augustine Seminary School complex. Due to heavy fighting in the area, the school was moved to northern Uganda. The whole danger area accounted for more than 150,000 square meters (37 acres). Force from the government of Sudan protected Renty from the Sudan People’s Liberation Army operations using landmines. There were numerous reports of stake mines (POMZ), which were only visible in the dry season, as well as mine accidents involving locals gathering building materials from the abandoned school and its gardens. During the first week of operations, the MineWolf cleared 70,000 square meters (17 acres) and activated two fragmentation mines along the main road. On a visit, Aggrey Cynua Kanyika, Executive Director of Yei River county, and Matara Khama Charles, the Yei Community Development Officer, inspected the task and confirmed the high socioeconomic impact of the results for the community. Furthermore, Kanyika thanked NPA for deploying the MineWolf in Yei country since “it certainly speeds up the process and gives confidence that the mine problem of Yei will be solved soon.”

**Let’s Keep Things Running**

Within 17 working days, the team completed the task and was ready for the next deployment. The next task for the MineWolf team was to clear the area of the U.N. High Commissioner for Refugees’ planned housing compound. The mine-suspected area was located directly next to a major road within Yei town. In order to ensure maximum safety, guards had to block the road and confirm that no one entered the dangerous area during operations. Within five working days, the team had cleared 28,000 square meters (7 acres) and handed the land back to UNHCR.

After several mine incidents near the teacher training centre in Yei, the MineWolf team was deployed as a rapid-response task force. On the morning of November 30, the fully mobile team left the NPA camp. After the team arrived on site, the equipment was unloaded, a control point installed and a site reconnaissance conducted. The MineWolf then cleared 13,000 square meters (three acres) and activated five AP mines. The next evening, only 36 hours after deployment, the whole team arrived back at the NPA’s main camp with all equipment.

For the next task, the NPA MineWolf team was called to extend the Yei airport. With Yei having become the most important entry point from Uganda, the 1.2-kilometer-long (¾-mile) runway was too short for big cargo-type armored vehicles. To maintain its important role in transporting the food supply into South Sudan, the runway had to be extended by another half a kilometer (about a third of a mile) into the bush.

Based on these first promising results, the NPA MineWolf team was deployed by the U.N. World Food Programme to open the Yei-Juba Road, one of the most important transport lines from Uganda into South Sudan. With Juba becoming the new capital of South Sudan, it is of great importance that the road is opened for safe passage not only to distribute food but also to develop infrastructure and enable local trade. The danger area was located on the old demarcation line between government of Sudan and Sudan People’s Liberation Army forces and was heavily mined from both sides. Within the first 13 working days, the MineWolf detonated five heavyweight anti-tank mines, crushed eight AT mines to pieces and activated 14 anti-personnel mines while clearing more than 62,000 square meters (17 acres) of road.

**Hard Ground, Heavy Vegetation And AT Mines**

Depending on ground conditions and the mine threat, NPA could choose to operate in open field, a road or a bush. This first task was to clear the MineWolf with either the open tiller or a standard flail. The use of quick couplings facilitates replacement of the demining tool attachments in less than 30 minutes. Both tools are equipped with a proven depth-control unit for quality control.

After the team tried both methods, it concluded that the tiller proved its sustain-ability and had a clear advantage over the flail, especially against heavy vegetation and hard ground. Furthermore, a tiller has the advantage of continuously penetrating the ground to the required depth since, in contrast to a flail, the rotor is a solid piece pushing the ground. Consequently, the deployment of the tiller allows ground-processing results unmatched by common flail systems, particularly with respect to vegetation and ground penetration.

The patented open-tiller design showed unprecedented results when used against both AP and AT mines. The basket-type segment structure allows the mine blast to expand through the tiller to avoid or reduce damage. Nevertheless, the tiller is designed in such a way that every 13.4 millimeters (0.7 inches), a wheel with a diameter of 44 millimeters hits the ground, ensuring that every piece of soil is processed. This guaran-tees even the smallest AP mines like the M14 or the PMA2 will be hit.

In total, the machine cleared more than 280,000 square meters (69 acres) within the first nine weeks of operation. The tiller successfully won the several Type 72, M59 and TM57 AT mines and also reliably destroyed 21 AP mines, like the M14, and bounding fragmentation mines like Type 69. No intact mines have been found be- hind the machine. The clearance result of the MineWolf allows safe and fast manual quality control as well as mine detection dog follow-up.

As a recent issue of the Journal of Mine Action, A. Griffiths of the Geneva International Centre for Humanitarian Demining stated, “Demining should be about reducing the extent of the world’s mined areas in as short a time as possible. Machines are here to do just that.” MineWolf Systems is committed to putting this statement into practice.

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**Australia Rejects Anti-vehicle Mine Ban**

Citing legitimate military use, the Australian government refused to support an international ban on anti-vehicle mines, which the government last endorsed in 1991. Though the government has supported global restrictions to ensure the easy detection of mines, it said anti-vehicle mines, which contain more explosive material and require more pressure to detonate, still have legitimate applications. Australian officials said the last time the government used the larger mines was in 1942 during the Battle of El Alamein, Egypt.