

# Development of Demining Machines for Anti-Personnel Landmines: Incorporating Construction Equipment Technologies

It is estimated that there are 20,000 casualties caused by anti-personnel landmines around the world today. It is also estimated that 6 million and 10 million anti-personnel landmines were placed during the civil wars in Cambodia and Afghanistan, respectively.

Conventionally, landmines have been removed manually. Needless to say, it is very dangerous and inefficient. In 2003, we at Komatsu applied for the public offering of subsidies of Japan's Ministry of Economy, Trade and Industry and The New Energy and Industrial Technology Development Organization (NEDO) for the development of anti-personnel demining equipment based on bulldozers. Our machine has already been tested for its performance and safety in Afghanistan and Cambodia since 2004 and 2006, respectively. With its demining capability of 500 square meters per hour, it has demonstrated productivity at 50 times that of manpower.

To maximize the safety of demining workers, we incorporated the remote control technologies of construction equipment, which have been proven in actual reconstruction projects of natural disaster-devastated areas, into our demining machine.

Equally dispensable as the development of machines is the technical training of local operators. In 2004, we invited two members of a non-governmental organization specializing in demining in Afghanistan for the first technical training in Japan. In May 2007, we offered a second training to three Afghan people from a different NGO. We are going to continue our support for demining projects in a variety of ways.



▲ Bulldozer-based anti-personnel demining machine



Mr. Shah Wali Ayubi  
Executive Manager of Operation  
Mine Detection and Dog Centre  
(MDC), Afghanistan

"We estimate 700 km<sup>2</sup> of our land is contaminated with landmines and unexploded ordnance (UXO), which covers 23 provinces with 4.2 million people. Even today there are about 60 victims per month by mines or UXO. In addition, mines are a big problem for infrastructure development for schools, hospitals, et cetera. We are one of seven NGOs, that have been working to remove mines since 1988 under the coordination of the UN Mine Action Program for Afghanistan (MAPA). We have about 2,000 staff members, including 10 mine dog groups each with 30 people and 4 dogs, 24 demining teams each with 21 people, 6 demining mechanical units, including this Komatsu-made D85EX demining machine, 46 mine dog sets each with 4 people and 3 dogs, and 2 explosive disposal teams each with 12 specialists. Our organization has cleared 170 km<sup>2</sup>, about half of the highly impacted areas of Afghanistan. Compared to more conventional ways of using metal detectors and mine dogs, this demining machine will be a lot more effective and significantly safer especially in the highly impacted areas. It will be used first in Parwan Province, north of Kabul. We hope to clear all highly impacted areas by 2013. Lastly, I would like to thank the government of Japan, the Japanese people and Komatsu for all the assistance we have received."



Mr. Mohammad Ibrahim  
Demining Machine Operator/  
Mechanic

"I have been working for this organization exactly 10 years now. I am very impressed by this Komatsu-made machine. I feel very safe to operate it and I can easily imagine that it will be very productive once it's deployed for demining in Afghanistan. While I have seen a lot of demining machines, I am particularly impressed by the powerful roller in the front and the remote control system, which I have never seen before in demining machines. The remote control is very responsive, allowing for excellent maneuverability of the machine. When I go back, I will also be training other staff members for machine operation."



Mr. Mohammad Amin  
Demining Machine Operator/  
Mechanic

"Since I joined MDC in 1998, I have been working most of the time in the workshop as mechanic. I have worked on bulldozers, tractors, loaders and other construction machines. Concerning this demining machine, I am most of all impressed by the roller which can dig the ground in the depth of 30 cm. When landmines are located around the depth of 30 cm especially in bushy areas, dogs are not effective. But with this machine, I am very sure that no mines will be left undetected. I am very excited about this machine."