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Quality Assurance for Mined and Survey Areas

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Conclusion

Some years ago the major issue in mine action was about safety and quality versus productivity. Now is the time to take a more pragmatic approach and look at all the three subjects in a balanced manner. A foundation based on standards has now been accepted by the international community as essential to maintaining quality and safety. However, control must be exercised by donors not to fund studies and improvements that fail to provide a noticeable improvement in the quality of life of those whose daily struggle is one of survival.

What is critical is the need to modify the present IMAS and the other documents in order to conduct strategic planning in a systematic manner. Policies concentrating on local aspects need to take a broader view and a recognition of the importance of prioritization is needed, which must be initiated at the earliest possible opportunity. Even with the best intentions, an approach that is less effective in some places than it is in others is simply demining in the wrong place and is an ineffectual use of time, effort and limited financial resources. Currently the documentation presented does not complete the picture or provide a coherent approach; there is now an urgent need to “close the circle” by providing and utilizing the missing information.

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Mechanical demining is an important and essential part of any demining process, and quality-assurance methods must constantly be revised to address the balance between safety and efficiency. Based on experience from the MineWolf mechanical demining experience, the tiler system would improve the demining process significantly, thereby increasing speed and reducing the costs of demining operations.

by Heinz Rath and Dieter Schröder

Safety Technology Systems

Important Requirements

A Total Quality Control system—a management tool for improving, performing that aggressive drive for a defined and continuous process—a required and includes the demining-organizations, equipment choices, standard operating procedures, training programs and the following essential requirements:

1. Ground-penetration depth up to 30 centimeters (12 inches).
2. Multiple operations with the tiler, to break up partially demoted or remaining mines and explosives components not completely destroyed by the tiler.
3. Effective depth control for both the tiler and tiler system. We recommend placing two rows of sensors on both sides of the vehicle so the movement on either side is independent from the movement of the opposite side (otherwise, effective depth of demining might be reduced due to topographical variants).
4. Monitoring of drive control to be displayed inside the cabin for all relevant technical data such as clearance depth, rate of revolution for tiler and tiler, vehicle speed, engine temperature and vehicle positioning.
5. Global-positioning system navigation for directional control.
6. Driver on board to intervene if needed with difficult topography and obstacles.
7. Quality track record for all relevant data to be printed from data loggers.

The tiler process has the potential to be capable of destroying all mines, provided the tiler rotates clockwise with a rotation speed of at least 300–400 revolutions per minute and is fitted with specialized cutting tools to destroy all mines, avoiding slipstreaming, burying and low waves.1 In general, a TQC program provides a modern, overall quality concept of a company or system. It is easy to see if the process is capable or not by looking at the area after the demining process. The area has to be homogeneous after a uniform process as this is the basis for a capable process.

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Department officials announced that, owing in part to U.S. assistance, Costa Rica, Djibouti, Guatemala and Honduras would not appear in the report because they have become free from landmine impact. Attention is also paid to U.S. policy toward landmines and total U.S. contributions to landmine action, which exceed $1 billion.

The Office of Weapons Removal and Abatement, divisions of the Department of Defense and U.S. Army, James Madison University’s Mine Action Information Center and several in-country centers are profiled in the report. There is also coverage of the DOS Quick Reaction Demining Force, the only standing humanitarian-demining unit with worldwide deployment capabilities.

A PDF version of the sixth edition is available at http://emip1.org/6es/To request a printed copy of To Walk the Earth in Safety, e-mail your complete mailing address and postal (or ZIP) code to John Stevens at stevej@state.gov.

News Brief

To Walk the Earth in Safety Chronicles U.S. Mine-Clearance Efforts

It is common knowledge that mechanical demining has to be part of the complete demining process to improve the speed of operations, defeat major obstacles for minimal deminers, reduce costs and simplify quality assurance. It is also common knowledge in the car and aircraft industry that quality must be continuous and cannot be guaranteed by inspection alone. Modern quality-assurance programs (such as the Failure Mode and Effect Analysis) have to be used to ensure a capable process. The FMEA is a method for failure-prevention and should be used for the design, system, assembly, production and, of course, demining process. The FMEA for tiler operation must include clearing-depth control, vehicle-speed control, rate of revolution for tiler and tiler, and engine-temperature control.

Based on our demining operations in Bosnia and Herzegovina with Hilfe zur Selbsthilfe eV (HELP) and Norwegian People’s Aid, we reached the following conclusion: The tiler process suffers from limited and uncontrolled demining depth and limitations imposed by soil, terrain and vegetation—meaning it can miss intact mines. These findings are confirmed in various other publications.1 The tiler process requires intensive follow-up verification of clearance—additional demining operation by hand and dog—which is time-consuming and costly.

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The Essential Guide to International Standards

...the importance of prioritization is needed...
figure 1:Proposed quality-assurance methods.

• Scheme 1. Visual control of the cleared area by means of an armed tractor to identify and mark areas requiring additional quality measures. If no detonations are reported or mine residue found, the area can then be declared mine safe, meaning no further quality measures are required.

• Scheme 2. If detonations are reported or mine residue found, a complete search of the cleared area needs to take place, by means of establishing a grid of working lanes as given by the standard operating procedure, followed by a manual or explosives-detecting dog team. Residue must be removed. The area can then be declared mine safe.

• Scheme 3. If only a small number of detonations were reported or residue of mines found, a partial manual-demining operation is proposed to ensure that fuses and explosives are found and excavated. The area can then be declared mine safe.

• Scheme 4. If there are records or signs of fragmentation mines or items of UXO, the Foerster MultiCAT or the Ebinger large-loop detector UPEX 740 can be used. The search is focused on steel bodies greater than 0.7 kilograms (1.5 pounds) because fragmentation mines have steel bodies that cannot be fully destroyed by mechanical domining (only the fuses are cut). Foerster and Ebinger equipment is proposed to find the remaining bodies because they are specialized to locate steel objects within this range. The equipment can be fitted to an armed tractor to locate the steel bodies or items of UXO. Supplement the search for fuses and explosives with a handheld detector around the steel bodies to excavate fuses and explosives. The area can then be declared mine safe.

Summary

The tiller-demining process, combined with total quality-control methods, strives to move from the ground-preparation process currently used, to a "mine free" process. By using the follow-up verification system, additional quality control after mechanical demining will be minimal, fast and more cost-effective without reducing aspects of safety.

For additional references for this article, please visit http://snipurl.com/15ixk.