It’s a Bird, It’s a Plane—It’s the Mineseeker Airborne Mine Detector!

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It's a Bird, It's a Plane—It's the Mineseeker Airborne Mine Detector!

Partnering with QinetiQ and The Lightship Group, the Mineseeker Foundation is developing a system to revolutionize mine detection. By deploying the first operational airborne landmine survey system, the foundation aims to provide the mine action community with a quicker and more efficient survey tool. Additionally, the Mineseeker has the potential to be useful in a number of other areas necessary for development in mine-affected countries.

by Nicole Kreger, MAIC

**Background: A Need for Improved Mine Detection Techniques**

The Mineseeker Airship hopes to fulfill current demining and survey needs. This airborne mine detector utilizes the airborne Synthetic Aperture Radar (UWB SAR), which is able to penetrate soft targets and can detect objects buried in the ground. UWB SAR is able to produce the highest resolution images of any radar of its kind. Use of this radar requires as little vibration as possible in an environment that is nearly free of metal. Other aircraft cannot fly steadily and slowly enough over an area to use UWB SAR or are not big enough to accommodate UWB SAR. Thus, the Mineseeker Airship is perfect for the job as it “provides a mobile, stable platform that has long endurance, low noise and vibration, no propeller downwash (downward air pressure, possibly strong enough to trigger a mine)... exceptionally low risk of critical failure, a large payload capacity and a good operate environment...”

**Mineseeker Trials**

In January 2000, the Mineseeker underwent trial usage at the Defence Evaluation and Research Agency (DERA). This marked the first airborne trial using UWB SAR of this type in the world. The trial determined that the airborne system was at least as effective as previously conducted ground-based trials and led to further development of the Mineseeker system.

The United Nations Mine Action Coordination Center (UN MACC) in Kosovo requested that the Mineseeker be deployed there as a simple aerial reconnaissance and survey tool. A prototype was sent to Kosovo in the fall of 2000, which enabled the Mineseeker to be used in a red mine environment. It marked the world’s first use of an airship in a humanitarian role and in a post-conflict environment.

The US in 2000 showed that the Mineseeker is able to detect mines and UXO that are laid on the surface, hidden by foliage and buried in the ground. The UWB SAR can detect a UXO at a rate of 100 sq m per second, and it records an overwhelming amount of information. As Mineseeker Founder Mike Kendrick put it, “in that second, it transmits as much data as is contained in the entire British Library.” Such information would be useful to any number of organisations and government ministries.

**The Mineseeker Platform**

The Mineseeker makes use of Ultra Wideband Synthetic Aperture Radar (UWB SAR), which is able to penetrate soft targets and can detect objects buried in the ground. UWB SAR is able to produce the highest resolution images of any radar of its kind. Use of this radar requires as little vibration as possible in an environment that is nearly free of metal. Other aircraft cannot fly steadily and slowly enough over an area to use UWB SAR or are not big enough to accommodate UWB SAR. Thus, the Mineseeker Airship would be useful to any number of organisations and government ministries.
Kendrick recognizes the potential positive impact of Rotarian involvement and is eager to partner with them. "We hope to get the foundation adopted by the Rotarian movement in order to raise cash on a global basis. Several clubs have shown their interest in this project already and the newly formed Fellowship of Rotarians for Mine Action may lead to further support.

**The Future of the Mineseeker**

The Mineseeker Foundation's goal is to develop and deploy several systems to countries with severe landmine problems. The organization aims to provide the system at no cost to the host nation. Mr. Kendrick explains, "We don't want to differentiate just by money; in other words, we shall go to the area of the most need."

Once Mineseeker has acquired the necessary funding, the organization will use a closed tender bid process to determine which suppliers will develop the prototype into the customized system they plan to deploy, and the Mineseeker advisory board will decide which suppliers to contract for the project. As a leading company in its field, QinetiQ, Britain's largest independent science and technology company, is the leading contender for providing these services. From development through to the deployment of the first system will take about one year. According to Mr. Kendrick, the first Mineseeker system will go to "an area of outstanding need yet to be defined." Many countries have a great need for better wide-area mine-detection tools and are interested in receiving the system. The foundation hopes to deploy five ships to mine-affected parts of South America, Africa, Asia and Central Europe.

**Conclusion**

Through trial implementation, the prototype Mineseeker system has proven its viability as an aerial survey tool. It is gathering support from many people, and has already been endorsed by Nelson Mandela, Sir Richard Branson and Queen Noot of Jordan. With hopeful prospects for funding and growing visibility worldwide, the Mineseeker Foundation will soon be able to go forward with the momentum it gained through its successful trials. With the Mineseeker in the toolbox, the mine action community will be one large step closer to making the world safe from landmines.

**Endnotes**


3. E-mail correspondence with Mike Kendrick. October 22, 2003.


**Contact Information**

Mike Kendrick
Mineseeker Foundation
PO Box 3361
Bridgewater, Slovenia
WVTS 52F
UK
Tel: +44 01746 788069
Fax: +44 01746 760859
E-mail: mkendrick@virgin.net
Website: www.mineseeker.com

Nicole Sturgeon
MAC
E-mail: nsturgeon@mjaus.com

Landmine Impact Survey: Measurement and Display of Suspected Hazard Areas

The purpose of a Landmine Impact Survey (LIS) is "to facilitate the prioritisation of human, material and financial resources supporting humanitarian mine action at the national, regional and global level." The LIS process provides a different approach by measuring the socio-economic impact of landmines on affected communities. The global application of the LIS has successfully refocused attention away from a purely quantitative measurement of a mine and UXO threat to a qualitative assessment of impact on mine-affected communities.

by Heml Morete, Programme Officer, CMA

**Introduction**

The planning of safe, effective and efficient mine action requires accurate, appropriate and timely information. During the early stages of a mine action programme, the availability of such information may be limited. Once time, however, systems are established to collect, collate and evaluate information on the landmine threat and its impact. Such information is needed for planning at the strategic and operational levels and should be made available in a timely manner to planners at the national level (normally the staff of a mine action centre), to implementing partners such as demining non-governmental organizations (NGOs) and to other stakeholders such as the donor community.

Prior to the development of the LIS process, the scope and nature of the landmine problem was generally expressed in terms of the number of mines, the total area of land contaminated, or a combination of the two. The LIS process provides a different approach by measuring the socio-economic impact of mines on affected communities. The Survey Working Group (SWG) defines the purpose of LIS as "to facilitate the prioritisation of humanitarian, material and financial resources supporting humanitarian mine action at the national, regional and global level."

The global application of the LIS has successfully refocused attention away from a purely quantitative measurement of the mine and UXO threat to a qualitative assessment of the impact on mine-affected communities. Impact surveys have been completed for six countries: Yemen, Chad, Mozambique, Thailand, Cambodia and Azerbaijan.

Those countries that have benefited from a full impact survey should have sufficient information to enable efficient and effective mine action planning. Notwithstanding the success of the global landmine survey programme, there is an ongoing debate over whether the LIS provides sufficient "technical" information on the landmine and UXO threat. It has been suggested that a national LIS should provide more detailed information on hazardous areas (by defining polygons) to enable the more efficient use of limited technical survey and clearance capabilities.

Following discussions at the SWG meeting in Geneva in February 2003, Cramfield Mine Action (CMA) was invited to prepare a discussion paper for consideration at the next SWG meeting.

**Information Needs**

An LIS forms part of a much wider information-gathering process within a mine action programme. In order to assist with the planning process, information is required on such issues as the scale and impact of the landmine problem; suspected areas of mine and UXO contamination; quantities and types of explosive hazard and general information such as the security situation, terrain, soil characteristics, climate, vegetation, infrastructure and local support facilities. The name given to this process within International Mine Action Standards (IMAS) is General Mine Action Assessment (GMA). The purpose of a GMA is to continually gather, evaluate, analyse and make available sufficient information to assist and update the strategic planning of a national mine action programme.

The information from an LIS addresses several of these issues, but it has its limitations. Without accurate technical information on a threat at a given location, a technical survey is required. A technical survey is a specific operation conducted to gather the detailed technical and topographical information of known or suspected hazardous areas. It is the usual pre-cursor to clearance, with the primary aim being to collect sufficient information to enable the clearance requirement to be more accurately defined, including the area(s) to be cleared, the depth of clearance, local soil conditions and vegetation characteristics. The LIS process is not designed to gather such information, but that is not to say an LIS should not define the extents of Suspected Hazard Areas (SHA) as accurately as possible. As it will be shown later in this article, even small inaccuracies can have significant cost implications further along in the demining process.

The status of information gathered during an LIS must not only be as accurate as possible, but it must also be placed in context. For some reason, once a polygon is drawn on a map, it tends to gain a certain status and value, which is not to be the case. Hence, it is critical to put it there in the first place. Such information becomes very difficult to alter.