Application of the Technical Survey in the Demining Process

J.J. van der Merwe
United Nations Office for Project Services
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The author proposes a way that Technical Surveys can be used as a step in the process to eliminate the negative socio-economic impact of mines/UXO in the most productive, cost-effective, efficient manner and to guarantee that the best technology for the task is applied.

by J. van der Merwe, UNOPS

The opinions expressed in this paper are those of the author and do not necessarily reflect those of the United Nations Office for Project Services (UNOPS).

Introduction

The mine action industry has grown out of one very specific technical area of interest relating to the physical destruction of mines and UXO. From there it has become necessary to step back and look at the broad implications of what it does and to encompass peripheral activities that fall under the same general heading of mines, including survey, awareness and prioritization. It is also true that mine clearance resources are typically scarce and should be effectively utilized. This calls for correct application of available clearance technologies and careful targeting of these resources in order to have a critical impact on the problem.

Some major developments have been recently in the field of demining. The International Mine Clearance Standards for Humanitarian Mine Clearance Operations have been revised and updated to take into account the progress made by the New 1-0 Level Impact Survey completed in Yemen. The information that has become available as a result of the survey provides a better definition of the mine problem in a specific country and also allows for a better method to prioritize and rank impacted communities.

Many mine clearance organizations have traditionally publicized their efforts by focusing on the number of cleared mines and UXO, without considering the unexploded munitions that have been found. This is in reality as meaningless as assessing the effectiveness of the clearance operation based purely on its size. It is becoming better understood that mine clearance is as much or more about the dismobilization of the socio-economic impact of mines on communities as it is about clearance of the actual contamination.

Experience over the past few years has indicated that within a zone of probability for mine clearance in the majority of mine-affected countries, the majority of the ground is not mined. In addition, most of the areas contain few mines. Out of the 18,000 mine records received from the former warring factions in Bosnia and Herzegovina, 60 percent of the records indicated that the mined areas contained less than 10 mines, and in Yemen the Level One Impact Survey concluded that there was approximately a 40 percent exaggeration of the actual size of the contaminated area. Therefore, by faster the ground that is not mined, rule out, the greater productivity and the impact of the clearance efforts will be linked to the need to rapidly rule out the mine-free ground is the need to decide which ground needs to be cleared first. The size of these areas is a function of the subsequent users' requirements. Defining the minimum areas ensures that mine clearance resources are not committed to clearing any more ground than what is actually required at the time.

Many non-governmental organizations have traditionally publicized their efforts by focusing on the number of cleared mines and UXO, in order to make a country "free from their effects." This approach may result in the unnecessary reduction of accident; however, accidents will be rare, economic impacts will be negligible and the people will have learned to live with the residual levels of contamination. The effects of UXO and UXO can be reduced to a tolerable level through clearance of the most dangerous areas followed by a continual capacity to conduct limited clearance and/or Explosive Ordnance Disposal (EOD) tasks, mine risk reduction education (MRRE) and maintenance of a marking system.

It is clearly beneficial to adopt the second option and address high-impact areas first and then divided into two groups: those areas more moderately impacted. Hazard areas impacting communities should also be prioritized and the solution selected to decrease the impact should be applicable to provide the greatest relief in the shortest time or in the most cost-effective manner.

Prioritization/Targeting

Prioritization is only the first step in the process that will lead to the eventual selection of sites to be demined. A number of other factors need to be taken into account before the final selection is made. For example, could there be seasonal factors to be considered, the situation could have an influence on what may be a requirement to clusters tasks to allow for the efficient use of resources. The key for humanitarian mine clearance in the future is the accurate targeting and then the subsequent allocation of resources to address the problem in a safe, productive and cost-effective manner. Program should ask themselves where they could achieve the greatest impact with the available demolition sources. It is no longer an option to tie resources down for long periods of time if they are only working on one site. It might be better to work on a number of shorter projects in order to have a high turnover. Targeting should be done at the macro and micro level. The General Mine Action Assessment (GMAA) Process includes the socio-economic impact that the mines and UXO have on communities in an impact-priority list, which should be used to develop a clearance works program. The same should be done on the micro level. Identified tasks should be unrolled to reveal the most critical areas that should be cleared as a first priority and then clearance should expand to address the other less critical areas. As a first step, the less critical areas should be marked or fenced off. The process for prioritization and selection of sites for demining can be compared to a situation in which a medical doctor arrives at an accident scene finding a number of injured patients. Before any patient is treated, a doctor must assess each of their injuries. Patients are then divided into two groups: those with minor injuries and those with serious, life-threatening injuries. The injuries on these patient are then treated in order of priority, meaning some minor injuries might be left while the doctor moves on to another patient to treat cardiac injuries, loss of blood and pulmonary injuries. Targeting for mine clearance operations should follow the same principles. Communities are ranked according to the number of mines/UXO, the number of "blockages" and the number of recent victims. In addition, there might be priority given to the area that the government has identified that also have to be taken into account before the final priority list can be produced. In order to prepare the work plan there should be another step similar to when the doctor in the example above takes the pulse of the patient, which is to carry out a Technical Survey to collect specific information on the suspect area.

Revisions of the International Mine Action Standards

The term technical survey is not applied universally. Some mine action authorities and demining organizations consider the detailed examination of known or suspected hazardous areas and the related documentation and marking as defined in IMAS 08.10 to be merely the first stage of an integrated survey - clearance operation. However, it is described here, technical surveys are an important part of the demining process, since they provide the information needed for safe, effective and efficient area reduction, clearance and marking.

Prior to date, prioritization and clearance have generally been aimed at mined areas. With the introduction of the GMAA process, which includes an assessment on the socio-economic impact, there has been a shift to focus towards impacted communities. The old Level Two survey, by default, became associated with area reduction, and only after the area was reduced was an attempt made to plan the clearance activity. IMAS two new changes to operational procedures, practices and norms that have occurred over the past three years, and in a number of cases where new terminology was created, it also included an expansion of the old definitions. The changes in the different surveys and assessments are one example where not only was the old terms replaced, but the definitions have also expanded considerably. The main differences between the level one Level Two and the two new Impact Assessments and Technical Surveys are outlined below:

ost Level One surveys were used by the objective of the old Level One General Survey was to collect information on the general locations of suspected or mined areas. Mined areas were prioritized according to the following criteria:

• Provision of emergency assistance, access to land with high civilian casualty rates.
• Land required for the resettlement of refugees/IDPs.
• Land required for agriculture.
• Community development.
NOTES FROM THE FIELD

Application of the Technical Survey in Demining

The Technical Survey is the primary source of planning information for mine and UXO operations and usually involves gathering specific information, entering the contaminated area and mapping the suspect area. In doing so, the survey process

cell will:

• Provide essential information for regional and local planning.

• Provide information to assist in defining training areas or targets.

• Provide planning information for subsequent area reduction, clearance and mapping operations.

• Provide the basis for scheduling demining assets to limit down time.

• Expedite demining activities through the provision of accurate and in-time information on the particular site.

During the Technical Survey, the following information should be collected:

• Confirmation of the blockage data that was collected during the National Survey.

• Assessment of the ground in terms of the soil, metal contamination, vegetation and slope.

• Presence of mines and UXO.

• A definition of the area in terms of its size, described through angles and bearings. Area measurements should be more accurate than those calculated during the national survey and should be within ±10 percent of the actual area.

• Suggestion of the depth to which clearance should be conducted. This suggestion does not replace the requirement to clear to a depth determined by the future intended use of the land; it is rather a suggestion based upon actual information collected in the hazardous area.

• Resources required to carry out demining activities per identified area and the estimated time for manual teams, mechanical teams, mine detection dog.
teams and EOD teams as appropriate.

In addition to the information mentioned above, a detailed site sketch must also be prepared, as this will be provided to the demining organization that will eventually carry out the task. The following information should be noted on the sketch of the area:

- Exploratory lanes and safe access routes as applicable.
- Benchmarks and turning points as applicable.
- Distances and bearings from the benchmarks and turning points.
- Location of visible mines/UXO and the pattern of mines (if known).
- Location(s) of any mine, UXO or other devices destroyed during survey.
- Location(s) of any accidents in or around the contaminated area.
- Natural prominent features such as hill contours, creeks, busby areas, etc., and other prominent man-made features within the hazardous area (houses, tombs, fortifications, canals, roads, hills, rivers, etc.).

In order to collect the required information, it will be necessary to enter hazardous areas by breaching exploratory lanes into the suspect area. Once the information has been collected and documented, it should be returned to the Mine Action Center to be included in the mine database. This will assist in the preparation of the annual program and the tasking orders that will be provided to demining organizations. These tasking orders will describe in detail what the demining requirements are (area and depth), which kind of resources and how many of them are best to use and how long they are expected to work on the task to address the impact that was defined during the GMAA process.

**Sequence for Carrying Out the Technical Survey**

After impacted communities have been ranked in priority order and a selection has been made, the Technical Survey should be carried out to collect sufficient information to enable the demining requirements to be more accurately defined. These demining activities include areas that need to be reduced, cleared and/or marked. Sketch Map 1 shows an example of a village and six suspect mines located within the village boundary. These hazardous areas were identified by interviewing the inhabitants of the village during the National Survey. The identified suspect areas have impact on the villages or present them from living a normal life free from the danger of mines and UXO.

Sketch Map 2 shows one of the suspect areas and indicates the blockages caused by the presence of mines. The suspect area is blocking access to:

- Pasture land for grazing.
- The identified suspect area is right in the middle of agricultural land and at the moment an area of 12,500 m² is blocked for grazing.
- Drinking water. The villagers have to walk around the hazardous area, instead of through it, to the spring that supplies the village with drinking water.
- Powerline. The powerline was damaged in the war, and the area underneath the line would have to be cleared to reconstruct the line and pylons.

The next step in the process should be to plan, prepare for and execute the Technical Survey. As previously stated, the aim of the survey is "to collect sufficient information to enable the clearance requirement to be more accurately defined and for the subsequent clearance operation to be conducted in a safe, effective and efficient manner."

Using the road and the already defined benchmark as the starting point, one should analyze the blockages caused by the mines, and then prepare solutions to address how these blockages can be eliminated through marking, reducing and/or clearing the areas concerned. The initial planning is done before carrying out the Technical Survey, and it is done by analyzing all available information and preparing an initial plan. The survey is then focused on collecting the correct information that would allow such a final plan to be devised. Exploratory crossing lanes into the suspect area should also be planned. The purpose of these lanes is to allow safe access into the suspect area in order to collect specific information that can be used to develop a detailed plan for the site. The number and location of these lanes will depend on the information requirements. There could be a number of solutions to remove the impact in this particular case. One possibility would be to treat the areas as follows:

- **Pasture land.** Depending on the terrain, vegetation and mine threat, the area could be covered using mechanical systems or mine detection dogs. The terrain feature in the bottom right hand corner of the suspect area could either be fenced off or cleared manually.
- **Drinking water.** As a first step, a safe lane could be made through the suspect area to provide villagers access to the spring.
- **Powerline.** Due to the fact that the powerline is part of the area required for pasture land, one should clear the area around the powerline and pylons at the same time when the pasture land is being cleared. However, a different method might be applied due to the presence of scrap metal and power cables on the ground.

This pre-planning exercise will focus on the members of the Technical Survey team on the information they need to collect in order to confirm the initial plan. To support the identified planning requirements, lanes would have to be breached into the suspect area. To collect the information identified above, one could establish lanes as shown in Sketch Map 3. The information collected through the survey will either confirm the preliminary plan or indicate that the plan needs to be amended.

After the survey has been completed and the information has been entered into the mine information database, a final plan should be developed for this particular site. The same process has to be carried out for each one of the six other identified suspect areas. These areas could eventually become one cluster, and resources should be shared and moved among the six different sites to prepare the ground, reduce the suspect area and/or clear and mark contaminated areas.

As a result of analyzing the information collected through the Technical Survey, a plan to manage the mine problem is developed. The main focus of the plan is to address the impact of the mines and UXO on the community where they are found. One of many solutions is shown graphically in Sketch Map 4. The plan should ensure that the whole area identified in the GMAA process is taken care of and as a result is accounted for.

**Conclusion**

In the absence of effective new technologies, better resource allocation can reduce demining costs and increase the rate of land release and clearance. Technical Surveys will provide the planners of demining activities with crucial information to plan area reduction, clearance and marking activities. It will also ensure that the resources on a particular site are used with the highest efficiency and that these resources are targeted to provide the identified relief. Finally, the Technical Survey will provide the necessary milestones to estimate and later gauge the progress of operational activities.

**Contact Information**

J. J. van der Merwe
UNOPS Mine Action Advisor (or)
The Chyder Building
405 Lexington Avenue
New York, NY 10174
Tel: (212) 457-1280
Fax: (212) 457-4049
E-mail: johnnm@unops.org