Convention on Cluster Munitions

30 July 2013

Original: English

Fourth Meeting of the States Parties
Lusaka, 10–13 September 2013
Item 10 (c) of the provisional agenda
Consideration of matters pertaining to clearance and risk reduction in accordance with Article 4

Implementation of Article 4
Effective steps for the clearance of cluster munition remnants

Submitted by Ireland and Lao People's Democratic Republic[*]

I Introduction

1. As of July 2013, 38 countries and three other territories[1] are believed to have been contaminated by Cluster Munition Remnants (CMR), the great majority of which are unexploded sub-munitions. Although significant progress has been made on CMR clearance in some affected states, the dangers to civilian populations from CMR contamination remain, as do the negative impacts on development in affected areas.

2. Considerable progress has been achieved both inside and outside the Convention on Clusters Munitions[2] framework in recent years on the clearance of CMR. Mine Clearance operators played a significant role in informing the negotiation of Article 4 of the Convention and this enabled the incorporation of many lessons learned during the implementation of the Anti-personnel Landmine Convention (1997)[3] and of the Protocol V (2003) on Explosive Remnants of War (ERW) to the Convention on Certain Conventional Weapons (CCW)[4]. Australia as Friend of the Chair on Clearance for the period 2010-2011 presented an excellent initial paper[5] on the implementation of Article 4 to the Second Meeting of States Parties of the Convention on Cluster Munitions in Beirut in September 2011. When the new implementation architecture was adopted by 2MSP, Lao People's

[*] Coordinators on Clearance for the period 2011-2013.

[1] http://www.stopclustermunitions.org/the-problem/.

[2] Convention on Cluster Munitions (2008).

[3] Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction (1997).

[4] Convention on Prohibitions or Restrictions on the use of Certain Conventional Weapons which may be deemed to be excessively injurious or to have indiscriminate effects (1980).

[5] 'Application of all available methods for the efficient implementation of Article 4', Australia, September 2011.

Democratic Republic and Ireland were appointed as joint Coordinators on Clearance of Cluster Munition Remnants for the period 2011-2013. In November 2011, Ireland and Lao People's Democratic Republic adopted as a theme for their coordinatorship 'Clearance of Cluster Munition Remnants can be accomplished and can be accomplished quickly'.

3. In April 2012 the Coordinators on Clearance invited operators from affected States and territories including areas as diverse as Bosnia and Herzegovina, Cambodia, Croatia, Kosovo, Lao People's Democratic Republic, Lebanon, Serbia and Western Sahara to share their experiences with the representatives of the States Parties[6]. Much of the content of this paper is drawn from their inputs. The clearance community has also completed a considerable body of work in parallel with the CCM most notably in the review of the relevant International Mine Action Standards (IMAS)[7] which were finalised in March 2013.

4. These contributions, in particular by those with practical field experience, have further enhanced understanding of how best to accomplish CMR Clearance. The use of new detection technologies, the application of non-technical survey techniques and the adoption of clearance procedures tailored specifically to CMR tasks have been successfully piloted in the field in a variety of terrain and environmental conditions.

5. The targeted application of such procedures and technologies by an affected State can accelerate the release of CMR contaminated land while not compromising on the safety standards required both during clearance operations and for land release.

Impact of CCM on clearance operations in the field

6. Clearance operators and international organisations have consistently highlighted the added value and focus which the CCM has brought to clearance operations since its adoption in 2008 and its entry into force in 2010. The CCM has provided impetus not just in terms of funding but also in prioritisation of clearance activities, development of new procedures and testing of new technologies.

International Mine Action Standards (IMAS)[8]

7. Since the release by UNMAS of the first edition of International Standards for Humanitarian Mine Clearance Operations, in March 1997, the United Nations has had a general responsibility for enabling and encouraging the effective management of mine action programmes, including the development and maintenance of Mine Action Standards. The original Standards have been redeveloped and are now named International Mine Action Standards (IMAS). IMAS are produced with the assistance of the Geneva International Centre of Humanitarian Demining (GICHD). IMAS have played a key role in the successful evolution of mine action activities, especially clearance, since 1997 by capturing relevant lessons learned in a format that is readily accessible to all stakeholders in clearance operations.

8. However, while there are obvious similarities with contamination of anti-personnel landmines there are also considerable differences. Therefore by tailoring procedures and technology to suit the CMR challenge more rapid clearance should be achievable.

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6 Presentations – http://www.clusterconvention.org/meetings/intersessional-meetings/intersessional-meeting-2012/.

7 http://www.gichd.org/standards/international-standards/.

8 http://www.gichd.org/standards/international-standards/.

9. For selected definitions related to this paper, see the annex.

Aim of this Paper

10. The aim of this paper is to demonstrate that CMR contamination can be addressed effectively and relatively quickly if available resources are targeted appropriately, by adopting a systematic step by step approach to the challenges presented by such contamination.

11. The target audience includes all decision makers and stakeholders engaged in mine action in affected States, donors, international organisations and clearance operators.

12. The Australian paper[9] of 2011 strongly recommended the ‘Application of all available methods for the efficient survey and clearance of cluster munition remnants’. This paper will seek to supplement that advice in specific areas such as identification of hazardous areas, survey techniques, adoption of optimal procedures and selection of technology most appropriate to the particular tasking.

II Evidence from the Field[10]

13. Contributors from amongst field operators have reported that clearance of CMR has been hampered by a wide variety of problems some of which are outlined below:

(a) Clearance operations have been impaired by the poor quality of information available on the location of CMR either because of the quality of bomb data or the quality of survey conducted.

(b) Inadequate survey procedures have led to the identification of overly large suspected hazardous areas which in many instances has significantly slowed the rate of clearance and land release.

(c) Operators have often adopted an excessively conservative approach to clearance operations increasing the duration of the operation and also the costs.

(d) Some operators have persisted with time consuming procedures more appropriate to mine clearance.

(e) Concern was also expressed that problems have been compounded by the lack of consistent pressure from donors to improve efficiency.

(f) Some clearance operations have been complicated by the presence of new and old contamination on the same territory.

(g) Bombing data while valuable has on occasions been inaccurate and misleading.

(h) Clearance operations have also been complicated considerably by the presence of ‘mixed contamination’, i.e. CMR, other ERW and/or landmines all present in the same area. This is especially true of areas which have seen intense armed conflict over a prolonged period.

[9] ‘Application of all available methods for the efficient implementation of Article 4’, Australia, September 2011.

[10] Feedback from ISM, international organisations, operators in the field etc.

(i) Problems have also arisen with the criteria for tasking of survey and clearance teams. There is evidence that some are tasked on a community or developmental basis which is often heavily influenced by political factors rather than on the basis of hard evidence.

(j) Experience gained in the field has indicated that no explosive ordnance at all was found on approx 33 per cent of clearance tasks. This unsatisfactorily high level is due to a combination of several factors including poor survey techniques, inappropriate taskings and inaccurate sources such as bombing data.

III A path to CMR clearance

14. This paper will propose key steps that can be taken in order to accomplish efficient clearance of CMR contaminated areas and subsequent land release. An essential starting assumption as proposed in the Australian Paper of 2011 is to acknowledge that CMR contamination is different to landmine contamination and clearance of such contamination therefore requires a different approach.

(a) There are several key differences. Most notably:

(i) Unlike mines, CMRs are predominantly found on the surface,

(ii) CMRs almost always contain substantial amounts of metal,

(iii) CMRs are not designed to function on inadvertent contact unlike 'victim operated' anti-personnel mines, and

(iv) CMRs are normally easier to locate and they are less prone to accidental victim initiation than anti-personnel mines.

(b) There are also differences, albeit less striking, between CMR and other ERW:

(i) CMR are rather less likely to penetrate the surface of the ground than other ERW, and

(ii) CMR which are dispersed by known weapon systems with particular specifications are more likely to lie within a reckonable footprint than other ERW dispersed during conflict from many systems firing from very diverse locations.

15. Although circumstances will of course vary considerably from one affected area to another the following broad steps are appropriate in dealing with CMR contamination:

Step 1 – Identify extent of contamination,

Step 2 – Categorise contaminated areas,

Step 3 – Utilise a suite of appropriate procedures and technologies to clear and release the affected land, and

Step 4 – Secure a satisfactory and enduring end state. The desired end state is the full clearance of all CMR contaminated land and the release of land to normal productive use with a high level of confidence.

Step 1 – Identify extent of contamination

16. In the absence of a 'magic bullet' solution to the myriad problems of detection and clearance of unexploded ordnance, effective survey remains the most useful tool for speeding up the rate of clearance of suspected hazardous areas.

17. Survey techniques have developed considerably over the past 15 years, especially through lessons learned in the implementation of the Anti-personnel Landmine Convention. The relevant IMAS and associated National Mine Action Standards (NMAS) have captured much of those lessons.

18. The application of non-technical survey techniques[11] have been particularly successful in reducing the areas of land suspected or confirmed to be contaminated with CMR. These are defined in IMAS as Suspected Hazardous Areas (SHA) and Confirmed Hazardous Areas (CHA).

19. During recent meetings in the CCM Framework operators from the field have presented on areas of concern and possible improvements.

(a) When prioritising Confirmed Hazardous Areas and Suspected Hazardous Areas for clearance, consideration should be given to the evidence, both direct and indirect, of contamination adduced from the application of systematic survey techniques. Clearance taskings should not be based on political or developmental priorities which some operators believe has led in the past to unproductive use of clearance assets.

(b) In circumstances where the extent of contamination is unclear, concern was expressed at the delineation of Suspected and Confirmed Hazardous Areas by means of notional polygons often covering large areas rather than basing the CHA or SHA on ‘Evidence Points’ where there is confirmed direct or indirect evidence of contamination.

(c) Unexploded cluster submunitions, which form the vast majority of CMRs to be cleared, have several characteristics that lend themselves to structured survey work.

(i) Records are likely to be available of where cluster munitions were dropped, the intended targets and the type of munitions used, including the number and type of submunitions.

(ii) Although failure rates will vary according to type of munition, ground and weather conditions and other variables there is a strong probability that if one CMR is discovered then more will be discovered in its vicinity.

(iii) Cluster munitions impact in a predictable “footprint” according to the type of munition used and the altitude and velocity at which the submunitions were released. Therefore the CMRs or unexploded submunitions will almost always be within the perimeter of the predictable footprint.

(iv) The risk of injury to clearance operators due to inadvertent contact when surveying for CMRs will vary according to the types of submunitions used. However the risk is very low when compared to anti-personnel landmines. Therefore survey from the inside outwards is possible in most cases (i.e. from a known evidence point outwards to the limit of the predictable footprint.)

(v) The starting point for a CMR technical survey can be determined through the use of bombing data alone, through non-technical survey or by a combination of the two.

(vi) Once a starting point has been located a technical survey team can divide up the area around in a structured manner and start the technical survey.

[11] IMAS 08.10 Non-technical Survey.

(d) Clearance should be precisely targeted in order to minimise waste of resources. Ideally the only area in which no CMRs are detected should be the prescribed fadeout[12] area around the last cluster munition found.

(e) Bombing data is welcome and potentially of great assistance to clearance operations. However bombing data should also be confirmed by non-technical and technical survey. Inaccuracies in bombing data have led to waste of resources especially with very old data such as in Lao People's Democratic Republic. Even data for Lebanon in 2006 has been inaccurate at times and an error as small as 400 metres can lead to serious delays in completion of clearance.

Step 2 – Categorise areas contaminated by CMR

20. Although many contaminated areas contain only CMRs, there are also frequent incidences of cross contamination with other types of explosive ordnance including landmines and other ERW. The presence of landmines, especially of anti-personnel landmines, will greatly escalate the level of risk to clearance personnel and this allied to the greater detection challenge presented by landmines is likely to lead to a substantial increase in the time required for clearance. If the cross-contamination is with other ERW only, the risk levels will not increase significantly but the time required for detection and disposal will increase substantially.

21. Therefore land suspected to be contaminated by ERW and mines can be categorised as follows:

Category 1: CMR contamination only,

Category 2: CMR and other ERW contamination (excluding landmines), and

Category 3: CMR combined with landmine contamination (This may include other types of ERW also).

22. If there is a risk of either military boobytraps or victim operated improvised explosive devices being present on a site, it will be necessary to approach such a site as if it contained landmines and would therefore be considered within the third category of 'CMR and landmine contamination'.

23. These three categories will present in most instances an ascending level of difficulty for clearance operations. Sites contaminated only with CMR will normally present a less complex threat in terms of risk to clearance personnel and in difficulty of detection. The added complications associated with the presence of landmines and to a lesser extent other ERW and will lead to a progressive increase in the risks involved in clearance, in the difficulty of detection and in the time per square metre required to complete the task.

24. Therefore it is reasonable to expedite the release of contaminated land by prioritising clearance tasks as follows:

Priority 1: CMR only,

Priority 2: CMR and other ERW contamination (excluding landmines), and

[12] A fade-out is the agreed distance from a specific 'evidence point' where the Technical Survey/clearance is carried out. The fade-out distance is determined by the conditions specific to the area (eg. geographical conditions, hazard type, delivery methods, etc). It should be based on operational experience, and described in National Mine Action Standards (NMAS) and Standing Operating Procedures (SOPs) – Land Release and Cluster Munitions, GICHD (May 2011).

Priority 3: CMR and landmine contamination (may include other types of ERW).

25. Giving priority to CMR only contaminated land will be the most effective option for expediting land release and for rapidly reducing the amount of land that an affected State is required to clear.

Step 3 – Utilise most appropriate suite of clearance methods and technologies to clear and release land

26. The objective of users and donors in applying clearance methods and metal detection technologies has to be to ensure that survey and clearance operations are faster, safer and more efficient.

27. As there is minimal risk of a clearance operator inadvertently detonating sub-surface CMRs the procedures for searching, detection and ultimately clearance of hazardous areas can be conducted more speedily and efficiently than for landmine clearance.

28. The high metal content of CMRs permits the use of purpose designed detection systems such as the ferromagnetic based large loop detector (LLD) which greatly reduces the false alarm rate and interference from metallic clutter and is also much faster than using standard electromagnetic induction metal detectors.

29. Conditions for the successful introduction of clearance technology. Technology provides some very effective tools that enable clearance operations. However technology of itself is of little use unless it is the right technology and provides added value to the clearance operations. Clearance organisations and technical experts who have contributed to CCM meetings made a number of suggestions regarding technology including the following:

(a) The user must be certain that the technology is required. Much time and money has been expended in experimentation with inappropriate technologies.

(b) The development of the technology must be complete. Clearance operators should not be expected to act as guinea pigs in pilot projects for new technology.

(c) The manufacturer must be competent and should preferably have a proven track record in the manufacture of equipment for clearance or related areas. New manufacturers should also be encouraged to provide equipment on a trial basis but it was not recommended that any operations become over-reliant on such equipment.

(d) The technology should be affordable and not place an undue burden on national clearance budgets or on scarce donor funding.

(e) Sustainable quantities of the equipment must be available and affordable within the funding envelope.

Recent field experience

30. There have been many positive developments in the deployment of technology in recent years. Much of this success has been due to close collaboration between operators, manufacturers and designers in advance of fielding new types of equipment.

(a) Commercial off the Shelf equipment has been successfully integrated into clearance operations.

(b) GPS and GIS systems are greatly assisting in survey and post clearance documentation.

(c) Testing and evaluation standards have now become normative and the results from tests are publicly available greatly facilitating donors and operators in making their choice of technology to use.

(d) Metal detectors have improved both in terms of reliability and performance.

(e) The use of Large Loop Detection systems has had a significant impact on CMR clearance operations.

Developments in metal detection technology

31. Metal detection is a key factor in the location of CMRs which generally have a strong metallic signature. The introduction of more appropriate technologies over the past five years has led to significant improvements in performance including the following:

(a) Improvement in probability of detection;

(b) Improved ground compensation capability;

(c) Improved discrimination of scrap metal and

(d) Reduced false alarm rate.

Introduction of signature metal detectors

32. Signature metal detectors will not replace the existing portfolio of electro-magnetic induction detectors, magnetometers and magnetic locators.

33. They should not be used if anti-personnel mines are present or suspected within the area to be cleared.

34. Signature metal detectors are appropriate for special circumstances such as the clearance of CMRs and the decommissioning of military firing ranges.

Priorities for the consideration of appropriate technology

35. Technology has played an important role in the clearance of CMR and it is important that this contribution continues. Experts in the field have made a number of recommendations including the following in order to maintain and enhance the use of technology:

(a) Equipment designers and donors should visit the field on a regular basis to assess needs and to verify the contribution of deployed technology;

(b) Designers and donors should bear in mind how the technology will be integrated into existing systems and ensure that new technology is not disruptive of systems which have proven themselves in live operations;

(c) Mechanical mine clearance equipment, flails, tillers, ploughs etc have been of considerable value in mine clearance and battle area clearance. Such equipment is not necessarily appropriate for clearance of CMR. They may in fact complicate and delay completion of effective clearance and also do unnecessary damage to valuable land in advance of land release. However there are technologies, e.g. vegetation cutters, which are of clear value and the effectiveness of others should be assessed on a case by case basis; and

(d) Designers, manufacturers, donors and operators must collaborate effectively and maintain a focus on key solutions that are both achievable and appropriate. Two of the areas in which technology can continue to enhance clearance are survey activities related to area reduction and close-in detection to improve the quality of clearance.

Step 4 – Securing a satisfactory and enduring end state

36. It is essential that the land that is released by reduction or clearance is released with a high level of confidence and in accordance with rigorous verifiable and internationally recognised procedures. The relevant IMAS provide excellent guidance in this regard.

37. The desired end state must be quantifiable and clearly stated. The targets set for a CMR clearance program should include not only the area of land cleared but should also state what precisely is meant by clearance in this context. The criteria for land released following a CMR only clearance program may be different from the land release criteria appropriate to a mine clearance program.

38. The relevant National Mine Action Authority (NMAA) must ensure that the survey, reduction and clearance processes are comprehensively recorded and the records retained.

39. Quality Management (QM)[13] and Quality Assurance (QA)[14] measures must be in place at all levels of operation including both operators and the NMAA.

40. Post-clearance survey should be conducted to assess success of land release whether arising from reduction or clearance operations, and to assess the social and economic impact of the release.

IV Further work in CCM framework

41. The evidence presented by expert contributors from States Parties, observers, international organisations and clearance operators has demonstrated that clearance can be accomplished quickly. This was evident from the experiences in places as diverse as Bosnia and Herzegovina, Croatia, Lao People's Democratic Republic, Lebanon, Serbia and Western Sahara despite the very different challenges specific to each case. All stakeholders should continue their work towards the goal of ensuring a world free of CMRs and of achieving this as speedily as possible.

42. Experts from the field emphasised in particular the importance of effective land release methodologies, of the choice of technology appropriate to the munitions and the terrain, and the importance of acquiring comprehensive data on the problem. States Parties should continue to facilitate progress in these areas and to arrange regular reports from the field in order to keep the States Parties in touch with developments in the field.

43. Donors have a key role to play in ensuring that funding is expended appropriately and ensuring value for money by seeking the application of best practice in all aspects of clearance operations.

44. Clearance operators and other stakeholders have highlighted the energising impact that the entry into force of the CCM has had already on the clearance community. The CCM States Parties should continue their best efforts to maintain this momentum and ensure that the CCM continues to be a catalyst for new thinking in the area of clearance.

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[13] Coordinated activities to direct and control an organisation with regard to quality. [ISO 9000:2000].

[14] The purpose of QA in humanitarian demining is to confirm that management practices and operational procedures for demining are appropriate, are being applied, and will achieve the stated requirement in a safe, effective and efficient manner. Internal QA will be conducted by demining organisations themselves, but external inspections by an external monitoring body should also be conducted (IMAS 04.10).

45. The States Parties to the Convention on Cluster Munitions must continue to seek ways in which to work smarter with the right technology to achieve better results as we all strive to attain as quickly as possible the strategic goal of a world free of CMRs.

46. Ireland and Lao People's Democratic Republic have produced this paper for the consideration of the Fourth Meeting of States Parties to the Convention on Cluster Munitions with a view to its adoption at that meeting or subsequently.

Annex

Selected Definitions[1]

Clearance – the term “Clearance” in the context of mine action, refers to tasks or actions to ensure the removal and/or the destruction of all mine and ERW hazards from a specified area to a specified depth.

Cancelled land (m2) – A defined area concluded not to contain evidence of mine/ERW contamination following the non-technical survey of a SHA/CHA.

Reduced land (m2) – A defined area concluded not to contain evidence of mine/ERW contamination following the technical survey of a SHA/CHA.

Cleared land (m2) – A defined area cleared through the removal and/or destruction of all specified mine and ERW hazards to a specified depth.

SHA – the term “Suspected Hazardous Area” refers to an area where there is reasonable suspicion of mine/ERW contamination on the basis of indirect evidence of the presence of mines/ERW.

CHA – the term “Confirmed Hazardous Area” refers to an area where the presence of mine/ERW contamination has been confirmed on the basis of direct evidence of the presence of mines/ERW.

Non-technical Survey[2] – the term “Non-technical Survey” refers to the collection and analysis of data, without the use of technical interventions, about the presence, type, distribution and surrounding environment of mine/ERW contamination, in order to better define where mine/ERW contamination is present, and where it is not, and to support land release prioritisation and decision-making processes through the provision of evidence.

Technical Survey[3]– the term “Technical Survey” refers to the collection and analysis of data, using appropriate technical interventions, about the presence, type, distribution and surrounding environment of mine/ERW contamination, in order to define better where mine/ERW contamination is present and where it is not, and to support land release prioritisation and decision making processes through the provision of evidence.

[1] IMAS 07.11 Land Release.
[2] IMAS 08.10 Non-technical Survey.
[3] IMAS 08.20 Technical Survey.