

EXPERT MEETING

EXPLOSIVE WEAPONS IN POPULATED AREAS

HUMANITARIAN, LEGAL, TECHNICAL AND MILITARY ASPECTS

**CHAVANNES-DE-BOGIS, SWITZERLAND
24 TO 25 FEBRUARY 2015**



ICRC



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INTRODUCTION AND STRUCTURE OF THE REPORT

Cities have never been immune from warfare, but over the last century, armed conflicts have, increasingly, come to be fought in population centres, thereby exposing civilians to greater risk of death, injury, and displacement. This trend is only likely to continue with increasing urbanization. It is compounded by the fact that belligerents, and non-State armed groups in particular, often avoid facing their enemy in the open, intermingling instead with the civilian population.

Yet, armed conflicts often continue to be waged with weapon systems originally designed for use in open battlefields. There is generally no cause for concern when such weapons are used in open battlefields, but when they are used against military objectives located in populated areas their effects are often indiscriminate and devastating for civilians.

In 2011, the International Committee of the Red Cross (ICRC) stated that the use of explosive weapons with a wide impact area should be avoided in densely populated areas due to the significant likelihood of indiscriminate effects and despite the absence of an express legal prohibition on specific types of weapons.¹

On 24 and 25 February 2015, the ICRC convened a meeting of experts titled *Explosive Weapons in Populated Areas: Humanitarian, Legal, Technical and Military Aspects*. The meeting brought together government experts from 17 States² and 11 individual experts, including weapons experts and representatives of United Nations agencies³ and non-governmental organizations (NGOs).⁴

The objective of the expert meeting was to facilitate a facts-based discussion and exchange of views among government and independent experts on this important humanitarian issue – in particular on the challenges and the potential opportunities in the choice of means and methods of warfare – with a view to minimizing incidental civilian harm when a legitimate target is attacked in a populated area.

This report summarizes the expert meeting. It has been prepared by the ICRC under its sole responsibility, and is divided into three sections:

Section 1 provides the highlights of the meeting; these are not meant to be exhaustive but to summarize key points made at the meeting.

Section 2 explains the background of the issue of explosive weapons in populated areas from the ICRC's perspective, and the scope of the issue for the purposes of the meeting. It is based on the opening statement of Helen Durham, Director of International Law and Policy at the ICRC.

Section 3 provides a summary of the presentations and discussions at the meeting, structured around four sessions that addressed the humanitarian, legal, technical and military considerations arising from the use of explosive weapons in populated areas. The summary is not intended to be exhaustive; it reflects the key points made by speakers and participants.

¹ ICRC, *International Humanitarian Law and the Challenges of Contemporary Armed Conflicts*, report to the 31st International Conference of the Red Cross and Red Crescent, Geneva, 28 November-1 December 2011 (2011) pp. 40-42. Available at <https://www.icrc.org/eng/assets/files/red-cross-crescent-movement/31st-international-conference/31-int-conference-ihl-challenges-report-11-5-1-2-en.pdf>.

² Afghanistan, Austria, China, Colombia, Israel, Lebanon, Mexico, the Netherlands, Nigeria, Norway, the Philippines, the Russian Federation, Serbia, Switzerland, Uganda, the United Kingdom, and the United States.

³ United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) and United Nations Office for Disarmament Affairs (UNODA).

⁴ Article 36, Human Rights Watch and Save the Children (UK).

Where agreement or disagreement on certain points is indicated in the text, it reflects only a sense of the views among those who spoke.

Speakers are identified in the report, and have agreed to the summaries of their presentations. Otherwise, all discussions in the meeting were conducted under the Chatham House Rule.

The four guiding questions for the fourth session on existing policy and practice, the expert meeting's agenda and the list of participants are provided in **Annexes 1, 2, and 3**.

SECTION 1. MEETING HIGHLIGHTS

In 2011, the ICRC stated that the use of explosive weapons with a wide impact area should be avoided in densely populated areas, due to the significant likelihood of indiscriminate effects.

The objective of this meeting of experts was to facilitate a facts-based discussion and exchange of views among government and independent experts and the ICRC on the use of explosive weapons in populated areas. The meeting brought together government experts from 17 States and 11 individual experts. Discussions focused on the humanitarian, legal, technical, and military policy issues raised by the use of explosive weapons against legitimate targets located in populated areas, in view of their incidental (collateral) effects on civilians and civilian objects. Some of the key points made by speakers and participants at the meeting are provided below, but they do not necessarily reflect a convergence of views. It should be stressed that each of the experts did not express their views on all of the key issues raised in the meeting and outlined below.

Today's armed conflicts are increasingly being fought in populated areas, and this trend is likely to grow in the future, thereby exposing civilians to further risk of harm. It is compounded by the fact that belligerents, and non-State armed groups in particular, often avoid facing their enemy in the open, intermingling instead with the civilian population.

The humanitarian concerns arising from the use of explosive weapons in populated areas include the immediate and long-term effects on civilian lives and health, and the effects on civilian infrastructure and essential services such as health care, energy and water supply and waste management systems. The consequences for people's health are not limited to death, physical injury, and long-term disability, but also include long-term impact on mental well-being. The ability of health-care facilities and services to operate, to cope with the influx of numerous wounded people and the injuries they present, and to provide adequate care is also significantly affected.

The vulnerability of critical civilian infrastructure and the interdependence of essential services mean that the initial effects of the use of explosive weapons in populated areas can trigger humanitarian consequences affecting a much larger part of the population than those in the immediate vicinity of the impact area. Such effects are accentuated where there is protracted use of explosive weapons in populated areas, with consequent decline of essential services over time and serious risks for public health. For militaries planning operations in populated areas, the ability to access information on the location and function of essential infrastructure and services vary, depending on the context.

There are methodological challenges in documenting patterns of harm from the use of explosive weapons in populated areas, and in verifying and analysing relevant data and information, notably in relation to identifying the types of weapon used in an attack and to determining the scope of incidental civilian harm. There is a need to improve field research in this regard. Militaries face their own challenges in assessing the incidental effects on civilians of their use of explosive weapons in populated areas, including long-term effects, and in incorporating lessons learnt in future planning.

Although the use of explosive weapons in populated areas is not expressly regulated by international humanitarian law (IHL), it is not disputed that any such use must comply with IHL rules, in particular the prohibition of direct attacks at civilians or civilian objects, the prohibition of indiscriminate attacks, the rule of proportionality in attack and the obligation to

take all feasible precautions in attack. However, there are divergent views on whether existing IHL rules sufficiently regulate the use of explosive weapons in populated areas or whether there is a need to clarify their interpretation or to develop new standards or rules. Based on the effects of explosive weapons in populated areas being witnessed today, there are serious questions regarding how parties to armed conflicts are interpreting and applying the relevant IHL rules. Divergence in the practice of militaries, and in experts' views and in the case law of international criminal tribunals regarding what is or is not legally acceptable in populated areas, may point to ambiguities in IHL rules and the need for States to clarify their interpretation of these rules or to develop clearer standards to protect civilians more effectively. Areas for clarification would include the degree of accuracy of a weapon that is acceptable under the prohibition of indiscriminate attacks in a given operational situation or more generally. Ambiguities in the interpretation of IHL rules must be resolved in accordance with their overarching objective of general protection of civilians and civilian objects.

The “reverberating” (“knock-on” or indirect) effects of an attack describe notably its long-term consequences, for example, loss of life or injury resulting from incidental damage to civilian objects such as critical civilian infrastructure. While there is support for the view that commanders must take into account the foreseeable reverberating effects of an attack when applying the rules of proportionality and precaution, the scope of this requirement is unclear and there are challenges in complying with it, notably the difficulty of quantifying the long-term effects of an attack. Reverberating effects that are reasonably foreseeable in the circumstances ruling at the time of an attack would include those based on knowledge gained and lessons learnt from past experience of use of explosive weapons in populated areas. Some militaries incorporate relevant technical expertise in the planning of an attack against a military objective located in a populated area, to help anticipate its reverberating effects.

The fact that the enemy intermingles with the civilian population, even deliberately in order to shield its military activities in violation of its obligations under IHL, does not suspend the obligation to respect IHL when attacking military objectives in populated areas. In the experience of some militaries, civilian casualties generally work to the detriment of military campaigns, and should therefore be avoided as a matter of policy.

The nature and extent of the incidental effects of explosive weapons in a given populated area are determined by a range of factors related to the environment around the target, the vulnerability of the population, and the technical characteristics of the chosen weapons. While the specific effects of an explosive weapon depend on the circumstances, militaries may manipulate a number of variables to avoid or minimize incidental civilian harm, in particular those relating to the choice and use of the weapon. These variables include the warhead type and size, the type of fuze, the delivery system, the distance from which the weapon is launched, as well as the angle and timing of the attack. Even after making such choices and taking all feasible precautions, some weapons, by design, may foreseeably have significant effects beyond the target when used in populated areas. Such effects are not necessarily unlawful, depending on the circumstances.

Explosive weapons may have a wide impact area (or wide area effects) when used in populated areas because of the large blast and fragmentation range of the individual munition used, the inaccuracy of the delivery system, and/or the delivery of multiple munitions over a wide area. These categories of explosive weapon system may include large or unguided air-delivered bombs, missiles and rockets, unguided indirect fire weapons such as artillery and mortars, and multiple rocket launchers. Increasing the accuracy of certain weapon systems would help to reduce their wide area effects, but the use of large warheads could obviate accuracy in populated areas because of their considerable blast and

fragmentation radius. Despite technological improvements, the majority of artillery and mortar systems in use today have inherent inaccuracies. As for multiple launch rocket systems, which fire multiple artillery rockets near-simultaneously, they generally have low accuracy and a large dispersion area. Thorough training of armed forces in the selection and use of means and methods of warfare in populated areas, including in the technical capabilities of the weapons at their disposal, is critical to avoiding or minimizing incidental harm to civilians.

The trend in the development of conventional weapon systems has been towards greater precision and efficiency, for reasons of military utility but also to reduce the risk of incidental civilian harm. Although not all militaries have access to precision weapons, decreasing costs of precision technology and savings gained from lower ammunition consumption are making this technology more accessible. Regardless of the kinds of weapon at their disposal, armed forces remain bound by the prohibition against indiscriminate attacks and the rules of proportionality and precaution in attack when targeting military objectives in populated areas.

Collateral damage estimate (CDE) methodologies can assist commanders in foreseeing incidental civilian harm in their targeting decisions, and in minimizing such harm by altering manipulable variables such as the choice of weapon, warhead and munition fuze, and the timing and angle of the attack. Information about the target and its surroundings that are taken into consideration in carrying out a CDE include population density and secondary fragmentation (including type of building material). The availability, range and quality of information used for the CDE depend on the context, while the depth of the CDE analysis will depend on whether targets are time-sensitive.

While primarily motivated by military needs, policies and practices such as “minimum safe distances,” which determine how close to friendly forces explosive weapons can be used and which are calculated based on the weapon’s accuracy and munition effects, and “battle damage assessments” and “after action reviews,” which enable lessons learnt to be incorporated in future targeting decisions and policy, can also serve to minimize civilian harm. Some multinational forces also apply civilian casualty tracking mechanisms for this purpose.

It appears that there is little existing military policy (doctrine; tactics, techniques and procedures; operational orders and directives; rules of engagement) applying specific limits to the choice and use of explosive weapons in populated areas. The policy and practice of some armed forces is to avoid the use of indirect fire, including artillery and rockets, in populated areas owing to accuracy problems, permitting such use only with high-level authorization. There are also policies restraining attacks on enemy targets in populated areas using air-delivered munitions when there is no immediate need to do so, even in cases where such attacks may be lawful. Some armed forces receive dedicated training in the conduct of hostilities in populated areas, in particular to minimize civilian casualties through the proper choice of means and methods of warfare in such environments.

The practice of some militaries is to select weapons that have the minimum effects necessary to avoid or minimize incidental civilian harm while achieving the military aim. This can be a challenge for militaries that have a limited range of weapons at their disposal, but it remains possible for them to reduce the impact of warfare in populated areas through careful choice of means and methods.

While a government expert specifically rejected the position that the use of explosive weapons that have a wide impact area should be avoided in densely populated areas, others were of the view that, depending on the target and the circumstances, it may be possible to use such weapons in populated areas in accordance with the relevant rules of IHL. Another

government expert called for the use of explosive weapons with a wide impact area in populated areas to cease, owing to their humanitarian consequences and in light of the general obligation to protect civilians from the effects of hostilities. Still other government experts, while not directly opining on this position, stated that the humanitarian issues raised by the use of explosive weapons in populated areas would be effectively mitigated if belligerents fully respected IHL.

SECTION 2. BACKGROUND AND SCOPE OF THE ISSUE

This section is based on the opening statement of Helen Durham, Director of International Law and Policy at the ICRC, delivered during the opening session of the meeting. It provides a summary of the background of the issue of explosive weapons in populated areas from the ICRC's perspective, and an explanation of the scope of the issue for the purposes of the meeting.

BACKGROUND OF THE ISSUE OF EXPLOSIVE WEAPONS IN POPULATED AREAS

Global awareness of the humanitarian issues raised by the use of explosive weapons in populated areas is growing. Every day, it seems, media reports show the tremendous suffering of civilian populations caused by hostilities carried out in cities, towns and villages, using heavy explosive weapons.

The ICRC has been a direct witness of this suffering in contexts such as Afghanistan, Libya, Syria, Ukraine, Yemen and many others, and is every day attempting to alleviate it. It has observed that the use of explosive weapons that have wide area effects exposes the civilian population to a high risk of incidental or indiscriminate death and injury. It talks to all parties to armed conflicts to remind them of their obligations to respect and protect civilians, including through respect for international humanitarian law (IHL) rules governing the choice of means and methods of warfare.

A very important, though sometimes neglected, problem is the effects of explosive weapons on the homes of civilians and on infrastructure essential for their survival, such as water and sewage systems, and underground electricity networks. News reports often show images of blown-out windows and damaged buildings, but seldom draw attention to the less visible destruction of this essential infrastructure, which has ripple effects, from the malfunctioning of health-care facilities to the spread of diseases.

Simply put, when armed conflicts are fought in populated areas, every civilian home destroyed means a family left homeless; every neighbourhood reduced to rubble means livelihoods lost; every dry water tap and power cut threatens people's health and lives. In the face of this devastation, surviving civilians often have no choice but to leave, and their displacement is often long-lasting.

Years of directly witnessing the humanitarian consequences of the use of explosive weapons in populated areas led the ICRC, in the late 2000s, to begin to publicly state its concerns in these terms. And in its 2011 report, *International Humanitarian Law and the Challenges of Contemporary Armed Conflicts*, the ICRC stated the following:

“... due to the significant likelihood of indiscriminate effects and despite the absence of an express legal prohibition for specific types of weapons, the ICRC considers that explosive weapons with a wide impact area should be avoided in densely populated areas.”

Warfare in densely populated areas, where military objectives are intermingled with protected persons and objects, represents an important operational challenge for armed forces. A military commander has a responsibility to prevent direct attacks on civilians and civilian objects, and to minimize the incidental effects on civilians of an attack against military objectives. Such a responsibility is heightened in an environment where civilians and civilian infrastructure are the main features of the theatre of operations. This is equally so when the opposing party deliberately intermingles with civilians in order to shield its military activities.

Urban warfare thus entails a more demanding analytical process during the planning phase, as well as complex decision-making in real-time situations. The military commander has a larger number of factors to take into account than when conducting hostilities in open areas. The choice of a weapon, in view of its foreseeable effects on the given environment, is one of these factors and is a particularly crucial one.

Since 2009, the issue of explosive weapons in populated areas has featured prominently in the reports of the UN Secretary-General on the protection of civilians in armed conflict,⁵ and in the work of the UN Office for the Coordination of Humanitarian Affairs (UNOCHA). Non-governmental organizations, including those active under the umbrella of the International Network on Explosive Weapons (INEW), have also played a significant role in raising awareness of the human costs of the use of explosive weapons in populated areas. While recognizing these actors' efforts, it must be stressed that the ICRC's work is independent of them.

SCOPE OF THE DISCUSSION ON EXPLOSIVE WEAPONS IN POPULATED AREAS

For the purposes of the discussions, the scope of the issue of explosive weapons in populated areas was described as follows:

1. The focus is on 'explosive weapons', i.e. weapons activated by the detonation of a high-explosive substance creating a blast and fragmentation effect. Weapons that injure or damage with means other than explosive force (for example, incendiary weapons or chemical weapons) are excluded from the discussion.
2. Explosive weapons that raise particular concerns when used in a populated area are those that have a 'wide impact area' in such an environment. For the purposes of the discussion, the ICRC has broken down this concept into three broad categories of explosive weapon:
 - 1) those that have a wide impact area because of the large destructive radius of the individual munition used, i.e. its large blast and fragmentation range or effect (such as large bombs or missiles);
 - 2) those that have a wide impact area because of the lack of accuracy of the delivery system (such as unguided indirect fire weapons, including artillery and mortars); and
 - 3) those that have a wide impact area because the weapon system is designed to deliver multiple munitions over a wide area (such as multi-launch rocket systems).
3. The focus is on the use of such weapons in 'populated areas,' meaning any 'concentrations of civilians,'⁶ be it a city, a town, a village; be it permanent or temporary, such as camps for internally displaced persons (IDPs).
4. Outside of the scope of the discussion are explosive weapons that are already prohibited or otherwise limited as such by IHL treaties, such as anti-personnel mines or cluster munitions. Also excluded in this respect are issues related to explosive remnants of war

⁵ UN Security Council, *Reports of the Secretary-General on the Protection of Civilians in Armed Conflict* (2009) (S/2009/277), (2010) (S/2010/579), (2012) (S/2012/376), (2013) (S/2013/689) and (2015) (forthcoming).

⁶ Protocol Additional to the Geneva Conventions of 1949 and Relating to the Protection of Victims of International Armed Conflicts, Geneva, 8 June 1977, in force 7 December 1978, 1125 UNTS 3, Article 51(5)(a) and Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons, 10 October 1980, in force 2 December 1983, 1342 UNTS 171, Article 1(2).

(ERW), which, although they pose a significant threat to civilians and result from the decision to use explosive weapons, are governed by a specific treaty.⁷

5. The discussion excludes direct attacks against civilians, which are clearly unlawful under IHL. The focus is rather on the use of explosive weapons in attacks against military objectives, the core issue being the humanitarian impact of the use of explosive weapons with a wide impact area against military objectives located in populated areas.

6. Improvised explosive devices (IEDs) are a particular case in this regard: they are included in the scope of the discussion only insofar as they may fall into one of the three categories of explosive weapon with a wide impact area (referred to in point 2 above), and when they are not used as part of direct attacks against civilians.

7. The discussion is not putting into question the legitimacy of attacks directed against enemy targets located in populated areas. Rather it is framed in terms of the choices of means and methods used to attack a legitimate target, with a view to minimizing the risk of incidental civilian casualties and damage to civilian objects. Such choices should be discussed in humanitarian, legal, technical and policy terms.

8. The focus of the discussion is on the use of explosive weapons in armed conflicts, and therefore excludes the use of explosive weapons in situations of violence other than armed conflicts. The applicable legal framework is therefore IHL, the body of international law that seeks, for humanitarian reasons, to limit the effects of armed conflicts.

⁷ See Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction, Oslo, 18 September 1997, in force 1 March 1999, 2056 UNTS 211; Convention on Cluster Munitions, Dublin, 30 May 2008, in force 1 August 2010, 2688 UNTS 39; Protocol on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices as amended on 3 May 1996, Geneva, in force 3 December 1998, 2048 UNTS 93; Protocol on Explosive Remnants of War, Geneva, 28 November 2003, in force 12 November 2006, 2399 UNTS 100.

SECTION 3. SUMMARY OF PRESENTATIONS AND DISCUSSIONS

This section provides a summary of the presentations and discussions. It is not intended to be exhaustive; it reflects the key points made by speakers and participants. Where agreement or disagreement on certain points is indicated in the text, it reflects only a sense of the views among those who spoke.

OPENING SESSION

Following the opening remarks of the Director of International Law and Policy at the ICRC, which are largely summarized in Section 2 of this report, a scene-setting presentation was made on the basis of the ICRC's 'Trinity Model', which aims to explain the factors that determine the effects of the use of explosive weapons in populated areas.

The 'Trinity Model': Factors to consider regarding the use of explosive weapons in populated areas: Erik Tollesen (Head of Weapon Contamination Unit, ICRC)

There are three factors that influence the extent of incidental civilian casualties and damage to civilian objects in a given case of use of explosive weapons in populated areas. These three factors are: (1) the environment around the target; (2) the vulnerability of the population; and (3) the kinetic effects of the weapon or weapon system. These factors should be considered together in order to understand, in a comprehensive manner, the potential harm to the civilian population when such weapons are used in populated areas.

Regarding the environment, it is important to consider both the natural and the built environment in the vicinity of the target. In populated areas, the built environment is particularly important for foreseeing the impact of the use of explosive weapons, as buildings and other objects create a higher level of secondary fragmentation. For example, gravel, cement, wood, rocks, glass and metal may be projected out by the blast wave and create additional fragments that can injure or kill civilians located in the vicinity of the explosion. In addition, civilians seeking shelter inside buildings may be trapped or killed if the building they are in collapses. Knowledge of the construction materials and construction quality is an important sub-factor in understanding the effects of an attack.

In assessing the vulnerability of civilians, it is important to consider, among other variables, how many people are in the vicinity of the target (which will be affected by the time of day), the actual use of the area at the time of the proposed attack (e.g. whether civilians are indoors or outside), whether civilians have access to cover, and whether they are in a position to evacuate an area, either permanently or temporarily. These variables are influenced by social and cultural habits. In the military, this assessment is often referred to as a 'pattern of life' analysis.

As for the kinetic factors, these relate to the selection and use of explosive weapons. The sub-factors can be divided into two categories: mission and ballistics. 'Mission' refers to the weapon used, its 'design intent', the quality of intelligence, casualty rates, and the fire mission quality. With regard to 'ballistics', it will be important to consider the characteristics of the weapon, as well as user competence, the condition of the weapon system, and the ammunition. User competence should be based not only on the performance of personnel in optimal conditions, but also on their performance in more challenging situations, for example, when taking fire. Likewise, the performance of a weapon in a particular situation may be affected by other circumstances, such as poor storage of ammunition, which will affect the accuracy of the weapon system.

SESSION 1: Impact on civilians of the use of explosive weapons in populated areas

The first session provided an overview of the effects, in humanitarian terms, of the use of explosive weapons in populated areas, including the ICRC's own observations of such effects. The session began with an examination of methodologies for assessing patterns of harm caused by the use of explosive weapons in populated areas, and identified some of the key challenges in information and data collection. The session also described the immediate and long-term effects on civilian lives and health, and on essential services, such as health, energy, water supply, and on waste management infrastructure and systems.

1.1 Assessing patterns of harm: Pilar Gimeno Sinciada (Adviser, Protection Unit, ICRC)

The speaker discussed the ICRC's methodology for protection work, which includes documentation of the use of explosive weapons in populated areas.

The ICRC carries out a range of protection activities, which aim to ensure that authorities and other actors respect their obligations and the rights of individuals, in order to preserve the lives, security, physical and moral integrity, and dignity of those affected, notably, by armed conflict. The ICRC's protection methodology combines three aspects: documentation of single incidents or patterns of harm (trends) on the ground; analysis of military policies and humanitarian consequences of certain practices; and confidential dialogue with authorities and other actors in order to prevent or put an end to violations of legal obligations.

Regarding documentation of single incidents and patterns of harm, the ICRC uses a situation-based approach. The ICRC does not aim to document every single event but to assess general patterns of harm to civilians and civilian infrastructure resulting from the use of explosive weapons in populated areas, based on information and cases collected. Cases are documented using information from a range of sources including victims' accounts and direct observations. Other sources are used to corroborate these primary sources of information, such as satellite imagery, media reports, information from other organizations, and social media. Documentation of the use of explosive weapons in populated areas is carried out using multidisciplinary teams composed of weapons experts, health professionals, engineers, armed forces' delegates and lawyers.

On the basis of documented cases and trends, the ICRC submits confidential representations to the parties to the armed conflict. In addition, the ICRC engages in numerous other protection activities, including: reminding and promoting knowledge of the law; neutral intermediary activities; registering and following up individuals; self-protection capacity-building; risk education and awareness; and assistance aimed at reducing risk exposure. These activities are carried out in conformity with the ICRC's professional standards for protection, which were first developed in 2009 and revised in 2013.⁸

The key challenge facing the ICRC in its protection work is gaining timely access to affected areas in order to document incidents involving the use of explosive weapons in populated areas. Another challenge is the fact that victims of the use of explosive weapons in populated areas will generally not know what kind of weapon was used. In response, the ICRC has developed tools to help its teams determine the specific weapon used, linked to its effects on civilians and civilian infrastructure when used in populated areas. However, even with the help of these tools – and even where additional weapons expertise is available – the ICRC

⁸ ICRC, *Professional Standards for Protection Work Carried Out by Humanitarian and Human Rights Actors in Armed Conflict and Other Situations of Violence* (2nd ed., 2013). Available at <https://www.icrc.org/eng/resources/documents/publication/p0999.htm>.

faces challenges in gaining precise information on the weapon used, how it was used, and what its effects were, as often scenes are contaminated or cleaned up quickly following incidents.

1.2 Assessing patterns of harm: Richard Moyes (Managing Partner, Article 36)

The speaker provided an overview of the information-gathering work of several NGOs on the impact of explosive weapons use in populated areas, including Landmine Action, Action on Armed Violence (AOAV), Human Rights Watch (HRW) and Handicap International. The speaker discussed the key findings of these organizations, as well as the challenges in gathering data and the limitations arising from particular methodologies.

Landmine Action was one of the first NGOs to examine the impact of the use of explosive weapons in populated areas. In 2006, it gathered data on over 1,800 incidents that occurred within a six-month period. The data indicated that there were a significantly higher number of civilian casualties in populated areas than elsewhere. In addition, in populated areas explosive weapons killed significantly more civilians than combatants.⁹

More recently, AOAV has published a number of reports based on data gathered from English-language newswire sources between 2011 and 2013.¹⁰ Taken together, these reports catalogue more than 100,000 people reported killed or injured, with approximately 35,000 of those people reported as killed or injured in incidents involving the use of manufactured explosive ordnance. As in the 2006 report by Landmine Action, the data indicate that significantly more civilian casualties were caused by incidents that occurred in populated areas. The highest number of casualties resulted from incidents described in broad terms, such as 'shelling'. The data also highlighted a significant number of incidents involving attacks around markets. In this data set, there were more reported incidents of the use of manufactured explosive weapons involving air-launched systems than ground-launched systems, but according to the speaker this is likely to be a result of biases in the methodology.

The speaker acknowledged a number of limitations in data based on newswire reports of incidents. The patterns are identified from a data sample and not from an exhaustive record of the phenomenon. Because the analysis is based on 'incidents', it does not capture situations where violence is so extensive that it is not reported in terms of a specific time, location and effect. This means that events in situations of armed conflict are very significantly under-reported. There is a geographical bias because the data are drawn only from English-language newswire reports, and incidents in some countries are more reported than those in others. In addition, it is difficult to obtain details about each incident, including whether the attack targeted a military objective and what type(s) of explosive weapon were used. In this regard, the speaker referred to the approach of HRW, which uses investigations on the ground, and analysis of satellite imagery and of social media, to build a detailed analysis of specific attacks, and noted that a number of recent investigations of this kind had highlighted the impact of explosive weapons with wide area effects in populated areas. However, the speaker noted that such an approach is also resource-intensive and can require work in very challenging environments.

Whilst acknowledging the limitations in the data, the speaker emphasized that the work of NGOs has revealed clear humanitarian concerns arising from the use of explosive weapons

⁹ See Landmine Action, *Explosive Violence: The Problem of Explosive Weapons* (August 2009). Available at <http://www.inew.org/learn-more-about-inew>.

¹⁰ See e.g. AOAV, *Explosive Violence Monitor 2011: Explosive Harm* (March 2012), *Explosive Violence Monitor 2012: An Explosive Situation* (March 2013) and *Explosive Violence Monitor 2013: Explosive Events* (April 2014). Available at <http://aoav.org.uk/category/publications>.

in populated areas, in particular from weapons with wide area effects. In responding to these concerns, there is a need for further first-hand documentation of the patterns of harm.

1.3 Effects on civilian lives and health: Dr Robin Coupland (Medical Adviser, ICRC)

The speaker provided an overview of the impact of using explosive weapons in populated areas on civilian lives and health. According to the World Health Organization (WHO), “health is a state of complete physical, mental and social well-being, not merely the absence of disease or infirmity.”¹¹ On this basis, the speaker expressed the view that public health provides a common currency for discussing the human costs of the use of explosive weapons in populated areas.

The speaker briefly examined the physical effects of the use of explosive weapons in populated areas; death, physical injury and long-term disability. Death or physical injury can be caused in a number of ways: by the blast wave; by fragments from the weapon or secondary fragments; by collapsed buildings; or by burns. The nature of injuries will depend on the nature of the weapon, the proximity of the person to the detonation, and the part of the body that is affected. The lethality of injuries caused by explosive weapons is well documented and is usually between 15 and 25% of those injured. In many cases, victims survive but are left with life-long disabilities.

Although the most obvious impact on health relates to physical health, the speaker also underlined the tremendous impact of explosive weapons on mental health. These effects are documented to some extent in the medical literature, but go far beyond what has been recorded.

The use of explosive weapons in populated areas also has a significant impact on health care, which indirectly affects the lives and well-being of civilians. For example, health-care facilities may be directly affected by the blast or fragmentation effects of explosive weapons; electricity and water supplies may be cut off; health-care staff may be killed, injured or unable to get to work; and blood stocks may decrease because regular blood donors are unable to access health-care facilities. One or a combination of these factors usually means that the capacity of health-care facilities is weakened at precisely the time that they are most needed – that is, in the aftermath of an attack when hospitals are faced with multiple patients, often with multiple injuries.

In closing, the speaker emphasized the need to understand the effects of explosive weapons in populated areas from a multidisciplinary perspective that takes into account not only death and injury, but also broader concerns such as psychological harm, deprivation, and impact on social well-being.

1.4 Effects on essential services: Michael Talhami (Water and Habitat Engineer, ICRC)

The speaker presented an overview of the ICRC’s extensive experience in documenting and responding to the effects of explosive weapons on essential services in populated areas, including water supply, sanitation, energy supply, and solid waste management.¹² Although the effects of explosive weapons are context-dependent – particularly as the quality of essential service delivery is at different stages of development in different contexts – it is

¹¹ World Health Organization, *Health Promotion Glossary* (1998) (WHO/HPR/HEP/98.1), p. 2. Available at <http://www.who.int/healthpromotion/about/HPG/en/>.

¹² ICRC-WSRG 2015, *Urban Services During Protracted Armed Conflict: A Call for a Better Approach to Assisting Affected People*, Geneva: International Committee of the Red Cross, and the Water Security Research Centre of the University of East Anglia (forthcoming).

clear that lack of access to services over an extended period of time poses serious risks for public health.

The speaker began by describing the structure of essential services, which operate through a complex and fragile web of infrastructure, hardware, people and consumables. Infrastructure can be divided into primary, secondary and tertiary, according to the size of the serviced area: primary infrastructure serves the largest service area and the largest population; tertiary infrastructure serves the smallest area. For example, when a primary water supply line, such as a main transmission line, is damaged, thousands if not millions of people can be affected. In contrast, secondary water supply lines typically affect a more localized area; as a result, the consequences of their damage or destruction are of a lesser magnitude. Water supply services are delivered through production and treatment facilities, and storage and distribution infrastructure. Whilst primary infrastructure, such as production facilities, is usually (but not always) located on the periphery of populated areas, secondary (reservoirs and pumping stations) and tertiary infrastructure (distribution networks) are located within populated areas.

In addition, essential service infrastructure can be located above ground, below ground, and at ground level. Primary and secondary infrastructure typically exist at ground level (with the exception of the main transmission lines), which means that they are visible, whereas tertiary infrastructure is typically either above ground (e.g. power lines) or below ground (e.g. water supply and sanitation networks).

The vulnerability of essential services is compounded by their interconnectedness. In effect, damage to one service will have knock-on effects for other services. For example, if the energy supply is cut, the ability to ensure the continuity of the water supply service and the evacuation and treatment of wastewater out of a populated area diminishes. For this reason, essential services are vulnerable to a 'domino effect', whereby damage to one particular service can take down the delivery of multiple services. Moreover, essential service infrastructure is physically fragile and thus extremely vulnerable to the effects of explosive weapons. Thus, the initial effect of the use of explosive weapons in populated areas can trigger humanitarian consequences that affect a greater number of civilians than those in the immediate vicinity of the impact zone.

The speaker identified additional vulnerabilities arising from the technical, managerial and administrative human capacity required to ensure service delivery. For example, staff may be unable to access affected areas to carry out the necessary infrastructure operation, maintenance and repairs, owing to bombardment or the presence of unexploded ordnance. Additional obstacles to carrying out emergency repair works by humanitarian workers, municipal technicians or contractors include damage to or destruction of storage facilities for spare parts and consumables (energy, water supply and sanitation), service provider offices and vehicles, and transport routes.

Finally, the speaker stressed that the effects of explosive weapons on critical infrastructure and essential services are accentuated in protracted armed conflicts. In such situations, essential services decline over time as infrastructure deteriorates and as resources are depleted. For example, accessible water resources become scarcer, and those remaining or alternative sources found can become contaminated and/or over-pumped, particularly if the population increases owing to the arrival of internally displaced persons. In such situations, there is usually a shortage of spare parts and consumables, and the number of maintenance and repair staff may also be reduced. As the conflict becomes more protracted, the overall capacity to repair or rehabilitate essential services diminishes owing to such factors as lack of qualified human resources, deterioration of physical infrastructure, and lack of access to the necessary materials and equipment, feeding into a vicious cycle of service decline. Service decline is therefore most commonly the result of both physical damage and long-

term neglect. In particular, restoring a service where critical infrastructure (primary or secondary) has been damaged can take a long time, regardless of whether the conflict has ended or not.

In sum, the speaker stressed that the humanitarian consequences of a disruption of essential services are typically borne by the civilian population. For this reason, the specific characteristics and vulnerabilities of essential civilian infrastructure and services in populated areas deserve particular attention and care during the conduct of hostilities, including with regard to the choice of methods and means of warfare. Critical infrastructure and the interdependencies between services must be properly understood if the prolonged disruption of an essential service (or essential services) is to be avoided.

1.5 Summary of discussion

The discussion addressed possible ways of reducing the vulnerability of critical infrastructure and essential services. According to one speaker, it may be possible to increase preparedness prior to the outbreak of hostilities or during ceasefires, for example by ensuring access to repair materials and contingency stocks, and by putting in place emergency response plans. Further, it was noted that experience of protracted conflict may provide lessons learnt in reducing the vulnerability of essential services.

Participants also discussed how militaries planning operations in populated areas can have access to information regarding the location of critical infrastructure and the operation of essential services. It was noted that the ability of militaries to access such information will depend on the context: in some cities, the layout of the delivery routes of essential services is publicly available – for example, through water or utility boards – while in other cities this information is not accessible.

According to one speaker, critical infrastructure that is located at ground level or above ground (primary and secondary infrastructure) is generally visible to militaries and should be factored into targeting assessments to avoid or minimize incidental damage to such infrastructure. In assessing the expected impact of a particular attack on essential service delivery, it would be necessary to consider not only the location of infrastructure, but other factors, including the effects of potential damage to critical infrastructure on service delivery, the number of people who would be affected by disruption of an essential service, the potential disruption of multiple services (i.e. domino effect), and the amount of time that would be required to restore the service if it were damaged. In carrying out such assessments it may be necessary to incorporate specific technical expertise.

To supplement the presentations, one participant highlighted the impact of the use of explosive weapons in populated areas on children. In particular, the participant outlined the links between the use of explosive weapons in populated areas and the grave violations identified in United Nations Security Council Resolution 1612 on protection of children in armed conflict, including the killing and maiming of children, as well as the psychological impact of exposure to the use of explosive weapons in populated areas. Further, schools are often damaged or destroyed by explosive weapons, which prevents children from accessing education and increases their risk of exposure to other violations of the law.

A number of participants underlined the importance of presenting data in a clear and accurate manner with a selection of reliable sources; otherwise, wrong conclusions might be drawn. In particular, one participant questioned whether, in some of the data presented, increases in casualties were because of the nature of the conflict, or because of the type of weapon used. The participant also questioned how certain methodologies presented were defining ‘civilians’ for the purposes of data collection. One speaker acknowledged that for data collection purposes, it is impractical to apply the legal definition and that, instead,

civilians are considered as all persons who are not security personnel or police. Another participant emphasized that it is important to have a clear idea of who was responsible for each incident: Was it conventional forces or non-State armed groups? There was some further discussion of the limitations inherent in some of the data that has been collected; however, it was stressed that, despite these limitations, the data collected from English-language media still provide an important indication of the scale of the issue. In this respect, one of the speakers invited States to share their own challenges in gathering information and data to assess the impact of their use of explosive weapons in populated areas, and to incorporate lessons learnt in future planning. Several speakers and participants agreed that there is a need to conduct more quantitative field research and to improve monitoring and reporting mechanisms, so as to better map patterns of harm from the use of explosive weapons in populated areas.

SESSION 2: Rules of international humanitarian law relevant to the use of explosive weapons in populated areas

The second session reminded the IHL rules relevant to the choice of means and methods of warfare in populated areas, including: the prohibition of indiscriminate attacks; the rule on proportionality in attack; and the obligation to take all feasible precautions to minimize incidental loss of civilian life, injury to civilians and damage to civilian objects. The presentations and discussions addressed the interpretation of these rules as they apply to the use of explosive weapons in populated areas.

In introducing the session, the Chair reminded participants that the rules on conduct of hostilities were developed by States with the overarching objective of protecting civilians against the effects of hostilities. Each rule strikes a careful balance between considerations of military necessity and of humanity. While the rules prohibiting indiscriminate attacks and requiring attacks to respect proportionality are absolute, the requirement to take precautions is relative, based on what is feasible. While the session focused on the obligations of the attacking party, the Chair reminded that the party that is subject to attack is also obliged to take precautions to protect civilians from the effects of attack, for example by avoiding locating military objectives within or near densely populated areas. He also referred to the prohibition on the use of human shields. While acknowledging that violations of these rules are unfortunately frequent features of armed conflicts today, the Chair emphasized that such violations do not release the attacking party from its own obligations, in other words, that respect for IHL does not depend on reciprocity.

2.1 The prohibition on indiscriminate attacks: Laurent Gisel (Legal Adviser, ICRC)

The speaker outlined the prohibition on indiscriminate attacks and identified several questions regarding the interpretation of this rule.

The prohibition on indiscriminate attacks flows from the principle of distinction, which prohibits attacks directed against civilians and civilian objects.¹³ It seeks to ensure that attacks are directed at military objectives and are not of a nature to strike military objectives and civilians or civilian objects without distinction. Article 51 of AP I specifies three types of indiscriminate attack and gives two examples.

First, Article 51(4)(a) of AP I prohibits attacks which are not directed at a specific military objective. This type of attack does not depend on the weapon used, but on the manner in which it is used, and was identified as the least relevant for the meeting's discussions. Second, Article 51(4)(b) of AP I prohibits attacks which employ a method or means of combat which cannot be directed at a specific military objective. This includes the use of weapons that strike blindly, and weapons that are not accurate enough to strike a specific military objective in the circumstances. Third, Article 51(4)(c) of AP I prohibits attacks which employ a method or means of combat the effects of which cannot be limited as required by IHL. This third type of attack includes the employment of methods or means of warfare whose effects cannot be controlled in time and space.

In addition, Article 51(5) of AP I prohibits disproportionate attacks, which are discussed in greater detail by the last speaker of the panel (see below), as well as area bombardment, which is defined as an attack which treats as a single military objective a number of clearly separated and distinct military objectives located in a city, town, village or other area containing a similar concentration of civilians and civilian objects.

¹³ It was first codified in Article 51(4) of Protocol I of 8 June 1977 additional to the 1949 Geneva Conventions (AP I), and is today a rule of customary IHL applicable in all armed conflicts.

Regarding the definition of indiscriminate attacks, the speaker noted three important points. First, the assessment of whether an attack is indiscriminate must be conducted from the perspective of the commander, based on the information available to him/her at the time of the attack, including all the foreseeable effects of the methods or means of attack at his/her disposal, in view of the weapons' technical and other characteristics.

Second, the speaker noted that the way in which the prohibition on indiscriminate attacks is interpreted and applied may evolve with advances in precision weaponry.

Third, the speaker underlined that the prohibition on indiscriminate attacks encompasses not only the employment of methods and means of warfare that are inherently indiscriminate, but also the employment of those which, in the circumstances ruling at the time of their use, including the manner in which they are used, cannot be directed at a specific military objective or the effects of which cannot be limited as required by IHL. Warfare in populated areas is undoubtedly a situation that may render indiscriminate particular methods or means of warfare that may be lawfully used in other circumstances, such as an open battlefield. In this regard, the speaker underlined the need to have a better understanding of the requirements in terms of expected accuracy and foreseeable effects of explosive weapons when used in populated areas in view of the prohibition of attacks employing methods or means of combat that cannot be directed at a specific military objective or whose effects cannot be limited as required by IHL in the particular circumstances of their use. With regard to accuracy, some military manuals require a 'reasonable probability' that identified targets will be hit, or a 'reasonable degree of accuracy'. The speaker asked whether these standards were adequate and what 'reasonable' meant. Further, the speaker asked what could be drawn from notions such as 'circular error probable' (CEP) to help define the expected accuracy of an explosive weapon.

In conclusion, the speaker emphasized that discussions would benefit from more clarity on the restrictions that States had already put in place, with regard to the use of specific weapons or weapon systems in densely populated areas, to avoid, or at least minimize, the direct and indirect effects of an attack on civilians and civilian objects. A better knowledge of State policies and practices and a convergence of views on the notion of indiscriminate attacks would assist parties to armed conflicts who endeavour in good faith to comply with the law.

2.2 Questions of legality and acceptability of explosive weapon use in the jurisprudence of the International Criminal Tribunal for the former Yugoslavia (ICTY): Maya Brehm (Researcher, Geneva Academy of International Humanitarian Law and Human Rights)

The speaker examined the prohibition on indiscriminate attacks in light of four cases before the ICTY. The case law of the ICTY provides an indication of what has been deemed to be legal or illegal in specific circumstances, and presents the frame of reference that military and technical experts use to assess the appropriateness and acceptability of explosive weapon use in populated areas.

In the *Martić* case¹⁴, the ICTY considered the use of M-87 Orkan multiple-barrel rocket launchers (MBRLs) to fire unguided rockets containing submunitions (288 per rocket) into the city of Zagreb. In assessing whether the attack was indiscriminate, the Trial Chamber highlighted, *inter alia*, the following factors: the dispersion error of the rockets, which increased with the firing range; the 2-hectare area of dispersion of the submunitions; and the 10-metre lethal range of each of the 420 steel pellets (ball bearings) contained within each submunition. The Chamber characterized the M-87 Orkan as a "non-guided high dispersion

¹⁴ *Prosecutor v. Martić*, Case No. IT-95-11-T (ICTY, Trial Chamber), 12 June 2007.

weapon” that was incapable of hitting specific targets. Accordingly, the Chamber held that the Orkan was an “indiscriminate weapon” whose use in a densely populated area would result in a high number of civilian casualties.

According to the speaker, the Trial Chamber’s legal findings in the *Martić* case are ambiguous: it is unclear whether the M-87 Orkan was found to be indiscriminate *as such* – that is, in all circumstances – or only in specific circumstances, for example in populated areas or when launched from the extreme end of its range. In the view of the speaker, it remains open as to what the Tribunal’s finding implies for the legality of using long-range, unguided rockets or MBRLs in populated areas generally.

The speaker also examined the ICTY case of *Galić*¹⁵, which dealt with the use of 80mm and 120mm mortars to attack military objectives in Sarajevo, including an attack on the Markale market on 5 February 1994. The Chamber primarily concerned itself with the degree of accuracy of mortars, which was an important factor in determining whether civilians were directly targeted, whether they were the victims of indiscriminate attacks, or whether they could be considered incidental civilian casualties.

The Trial Chamber heard from a number of expert witnesses who expressed differing views on the accuracy of mortars: according to one expert, mortars are extremely inaccurate and their use in the circumstances was inappropriate; according to another expert, mortars are accurate to within 40 metres of the target, and it is possible to hit a military objective with the first round. Relying on the latter view, the Trial Chamber concluded that in respect of the attack on the Markale market, the market was deliberately targeted. In contrast, the Appeals Chamber¹⁶ found that an experienced mortar crew could hit only within 200 or 300 metres of their target with the first round. Even if the forces were aiming for a military objective in the vicinity of the market (and not the market itself), the Chamber held, the shelling constituted a direct attack on civilians as the forces were aiming for a target within a civilian area.

The third case discussed by the speaker was *Dragomir Milošević*¹⁷, which concerned attacks on Sarajevo using “modified air bombs” (unguided bombs filled with fuel-air explosive or high-explosive material, fitted with rocket motors) fired from improvised launch pads at ranges of 5.5 and 7.5 kilometres. According to several expert witnesses, it was unacceptable to use this weapon in a populated area because of its extremely high explosive force and its inaccuracy, which meant that the weapon could be directed only at a general area. These technical characteristics contributed to the finding that the attacks were launched with the intention to terrorize civilians.

Finally, the speaker considered the case of *Gotovina et al.*,¹⁸ which involved attacks on Knin using 122mm BM-21 Grad MBRLs and 130mm field guns. The Trial Chamber held that artillery projectiles that struck within 200 metres of a presumed military objective were deliberately fired at that target, and established a presumption that shells landing further than 200 metres from a military objective were deliberately or indiscriminately fired at civilians. On appeal, the 200-metre standard was criticized by military and legal experts: some considered that the finding was inconsistent with the science and practice of artillery and rocket fire; others considered that the incident was unlawful because the forces had not taken all (or indeed any) feasible precautions to protect civilians. The Appeals Chamber¹⁹ rejected the 200-metre standard by majority decision. Two dissenting judges criticized the majority for

¹⁵ Prosecutor v. *Galić*, Case No. IT-98-29 (ICTY, Trial Chamber), 5 December 2003.

¹⁶ Prosecutor v. *Galić*, Case No. IT-98-29-A (ICTY, Appeal Chamber), 30 November 2006.

¹⁷ Prosecutor v. *Milošević*, Case No. IT-98-29/1-T (ICTY, Trial Chamber), 12 December 2007.

¹⁸ Prosecutor v. *Gotovina et al.*, Case No. IT-06-90-T (ICTY, Trial Chamber), 15 April 2011.

¹⁹ Prosecutor v. *Gotovina et al.*, Case No. IT-06-90-A (ICTY, Appeal Chamber), 16 November 2012.

failing to indicate the correct standard or the grounds on which such a standard should be developed.²⁰

The speaker concluded that the contrasting views amongst military and legal experts about how to assess, characterize and reduce to an acceptable level the risk of harm to civilians from the use of explosive weapons in populated areas demonstrates that there is a need for clearer standards, particularly if IHL rules are expected to effectively protect civilians in conflicts that are increasingly fought in populated areas.

2.3 The obligation to take into account reverberating effects: Proportionality and precautions in attack: Isabel Robinson (Legal Adviser, ICRC)

The presentation examined the obligation to take into account the reverberating effects of an attack, as derived from the rule on proportionality and the obligation to take feasible precautions. Reverberating effects – also referred to as ‘indirect’ or ‘knock-on’ effects – are the effects that are not directly or immediately caused by attack, but are nonetheless a consequence of it.

According to the speaker, there is strong support for the view that attackers must take into account the foreseeable reverberating effects of an attack when interpreting and applying the rules on proportionality and precautions. For instance, States party to the Convention on Certain Conventional Weapons (CCW) have accepted the relevance of foreseeable reverberating effects in relation to explosive remnants of war.²¹ Furthermore, nothing in the text precludes such interpretation: while the relevant IHL rule of proportionality limits the military advantage to ‘concrete’ and ‘direct’, it does not place an equivalent limitation on incidental loss of civilian life, injury and damage.

That said, the extent to which commanders consider the reverberating effects of an attack, and the relevant standard for assessing whether this obligation has been fulfilled, are unclear. Acknowledging that it is both impractical and impossible for commanders to consider *all* possible effects resulting from an attack, the ICRC’s position is that it is only those effects that are foreseeable that must be taken into account. In clarifying what is meant by ‘foreseeable’, the speaker identified four key aspects.

Regarding the temporal scope, the speaker noted that there is no direct correlation between the foreseeability of an effect and when it takes place. For example, some effects may be foreseeable, but may take place months or years after the attack. Thus, it would seem preferable to focus on the notion of foreseeability and not to impose a strict time line.

In relation to the material scope of what is foreseeable, the law refers to loss of civilian life, injury to civilians and damage to civilian objects. In light of the overarching protection afforded to civilians against the dangers arising from military operations, ‘injury’ should be interpreted broadly so as to include not only infliction of wounds, but also illness and disease. Although it is impossible to set clear parameters in the abstract, it appears that most reverberating effects relate to loss of life or injury resulting from damage to civilian objects. For example, an attack against a military objective that is in the vicinity of an electrical system that ensures the running of a hospital may foreseeably disrupt the functioning of the hospital and lead to loss of civilian life or injury to civilians.

²⁰ For further details on the criticisms of the Trial Chamber’s approach, see M. Brehm, *Unacceptable Risk: Use of Explosive Weapons in Populated Areas through the Lens of Three Cases at the ICTY* (Pax, November 2014) p. 70. Available at <http://www.paxvoorrede.nl/media/files/pax-rapport-unacceptable-risk.pdf>.

²¹ Third Review Conference of the High Contracting Parties to the 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: Part II (2006) (CCW/CONF.III/11) p. 4.

The speaker also examined whether commanders are obliged to consider reverberating effects that are objectively foreseeable, meaning effects that are well known, based on previous experience or lessons learnt. In this regard, while an assessment of the foreseeable reverberating effects of an attack will always be context-specific, it also incorporates an objective element, based on the standard of a “reasonably well-informed person in the circumstances of the actual perpetrator, making reasonable use of the information available to him or her.”²² According to the speaker, commanders are arguably on notice regarding objectively foreseeable reverberating effects and are obliged to assess, to the fullest extent possible, what those effects will be in any specific circumstance.

Finally, the speaker examined the obligation to take “feasible” precautions, meaning those that are “practicable or practically possible taking into account all circumstances ruling at the time, including humanitarian and military considerations.”²³ According to the speaker, two types of precaution are relevant: on the one hand, those who plan or decide upon an attack must do everything feasible to assess whether the attack may be expected to be disproportionate;²⁴ on the other hand, they must take all feasible precautions in the choice of means and methods of warfare with a view to avoiding, and in any event minimizing, incidental loss of civilian life, injury to civilians and damage to civilian objects.²⁵

Regarding the first type of precaution, the speaker asked States to provide input on the extent to which ‘collateral damage estimates’ (CDEs) take into account the reverberating effects of damage to civilian objects and whether such estimates incorporate technical expertise. Regarding the second type, the speaker gave examples of measures that could be taken to minimize reverberating effects, including: the selection of fuzes and explosive fill of munitions; choices regarding location, timing or angle of attack; and the choice of the most precise weapon available or alternative means and methods of warfare.

2.4 Summary of discussion

On the basis of the presentations, a number of participants questioned whether the use of explosive weapons that have a wide impact area in populated areas is not already adequately covered by existing IHL, or whether more clearly defined legal norms are required. One participant in particular questioned why today the use of explosive weapons in populated areas is problematic, whereas historically such use has been more indiscriminate and its effects far worse. In response, a speaker stressed that this is precisely why the prohibition on indiscriminate attacks identifies some past practices (e.g. area bombardment) as unlawful, and noted that there is more attention today on the use of explosive weapons in populated areas because hostilities are increasingly carried out in such environments. It was also stated that this session was an opportunity for government experts to share how they understand and apply the prohibition on indiscriminate attacks and the rule on proportionality in attack to the use of explosive weapons in populated areas, and to share their views on whether there is a need to clarify what the law requires. In this respect, the Chair said that it is important for States to make clear how they see ‘feasible’ precautions; if the rules of IHL are to serve their purpose, there are today serious questions regarding how they are being interpreted and applied to the use of explosive weapons, based on the effects that are being seen in populated areas. According to one speaker, case law and, more generally, the divergent practices and views of militaries regarding what is legally acceptable or not in populated areas clearly show that the law is ambiguous, and that there is a need to reach common understanding.

²² *Prosecutor v. Galić*, Case No. IT-98-29 (ICTY, Trial Chamber), 5 December 2003, § 58.

²³ See the ICRC’s Customary International Humanitarian Law Database: Practice Relating to Rule 15: The Principle of Precautions in Attack. Available at https://www.icrc.org/customary-ihl/eng/docs/v2_rul_rule15.

²⁴ *Ibid*, Rule 18; AP I, Article 57(2)(a)(iii).

²⁵ ICRC, *Customary International Humanitarian Law Study*, Rule 17; AP I, Article 57(2)(a)(ii).

Several participants expressed support for the view that commanders must take into account the foreseeable reverberating effects of an attack, but noted the practical challenges in complying with this obligation, particularly the difficulty of quantifying the long-term effects of an attack. In this respect, one participant cautioned against setting a single standard that would apply in all circumstances. While agreeing that what is foreseeable is not limited in time or space, another participant stressed that it is limited to what is practically foreseeable in the circumstances ruling at the time of the attack.

Two participants expressed concern regarding the notion of objectively foreseeable effects and cautioned against using past practices to inform future proportionality assessments. In response, a speaker emphasized that militaries already take this approach in carrying out CDEs, which rely on statistical data to better predict the effects of an attack. As understandings of the reverberating effects of using explosive weapons in populated areas develops, this knowledge should also inform future targeting decisions.

A participant also asked about the relationship between repeated attacks – which, as discussed in the ICTY case of *Kupreskic*, may not individually violate the rule of proportionality – and the foreseeable reverberating effects of an attack. In response, a speaker noted that if an attacker is responsible for multiple attacks over a period of time, the attacker should foresee that civilian infrastructure will be degraded and will deteriorate as a result of the cumulative effects of the attacks, and that this should be taken into account in assessing the foreseeable reverberating effects of any further planned attack.

Regarding indirect fire – i.e. fire directed at a target that is not visible within a direct line of sight – one participant expressed the view that avoiding the use of indirect fire in populated areas makes sense if a specific military objective is being targeted in a populated area. But the participant stressed that normally indirect fire is not used in this way, but instead for self-defence purposes, to obstruct enemy activity while ground troops are manoeuvring. In such cases, the participant underlined, an alternative means of attack may not be available, or may pose a greater risk for civilians in the area. In response, one speaker reiterated that the concern was with weapons that have a wide impact area when used in populated areas, notably because such weapons may pose problems as a matter of law under the prohibition on indiscriminate attacks and the rule of proportionality in attack, which must be respected even if alternative means or methods are not available.

SESSION 3: The technology of explosive weapons

The third session provided an overview of the evolution of explosive weapons technology and examined the technical characteristics of explosive weapons, including the factors and variables that determine their effects. The session examined types of weapon that may fall within the three categories of explosive weapon, described at the outset of the meeting, that are likely to have a wide impact area when used in populated areas.

In introducing the session, the Chair reminded that the focus of discussions is on conventional explosive weapons that may foreseeably cause significant civilian harm when used against a military objective located in a populated area owing to their wide area effects. Referring to the ‘Trinity Model’ presented earlier in the meeting, she underlined that the chosen weapon is one of three factors that will determine the effects of an attack in a populated area, the other two being the physical environment and the vulnerability of the population. She posited that, of the three factors, the choice of weapon is the one over which commanders have most control, and therefore most influence in terms of the effects of an attack. It is therefore important that armed forces master the technical capabilities of the weapons at their disposal, to foresee their design-dependent effects. Accordingly, the session would examine the technical features of explosive weapons that can be manipulated to achieve a desired effect.

3.1 The evolution of warfare and explosive weapons technology from a modern historical perspective: Dr Alexandre J. Vautravers (Professor, Webster University)

The presentation provided a historical perspective on explosive weapons that are currently in use and the direction in which technology is evolving.

While it is often said that the use of explosive weapons in populated areas represents a paradigm shift in contemporary conflicts, the speaker noted that the phenomenon of siege warfare has recurred throughout the centuries. That said, contemporary warfare in populated areas differs in a number of ways. One important event in this regard was the 1982 conflict in Lebanon, during which weapons developed for high intensity warfare were used in a dense urban environment. The result was devastating damage to comparatively fragile modern high-rise buildings. Since 1982, many explosive weapons have remained over-calibrated for the contexts in which they are used.

The speaker outlined the development of explosive weapons following World War I, when many 19th-century technologies matured. Examples include: high-explosive TNT and shrapnel weapons; impact and delayed-impact fuzes; and long range or “stratospheric cannons” developed to bomb capital cities. World War II saw the development of another series of technologies, including hollow charges (which comprise up to 50% of modern explosive devices) and proximity fuzes (which double the effectiveness of explosive/fragmentation artillery munitions). The Cold War prompted further advances, including the development of different types of guided weapon, cluster munitions, and multi-launch rocket (saturation) systems. However, this period also saw the introduction of low-yield precision-guided munitions, marking the beginning of a gradual shift from surface to point targets.

In terms of current developments, projectiles are increasingly guided or directed so closely that the probability of hitting targets is steadily increasing. That said, not all indirect fire can be observed or is directed against precise targets. Programmable fuzes, used to tailor the effects of an attack to a specific target, may increase the effectiveness of a chosen weapon while reducing collateral damage. These changes are not occurring at a uniform pace –

largely due to differences in available resources – but they are likely to shape the evolution of explosive weapons technology in the future.

3.2 The technology of explosive weapons and their design-dependent effects: Marc Garlasco (Independent Expert)

The speaker provided an overview of the effects of explosive weapons, and the primary technical factors that influence these effects. He began with two preliminary remarks. First, many of the concerns raised by the use of explosive weapons in populated areas arise from the fact that these weapons were originally designed for use in open battlefields. Second, although military utility is the primary determinant of weapons design, humanitarian considerations are increasingly prominent. For example, some existing weapons include features such as plastic casing or low explosive yields designed specifically to minimize collateral effects.

The speaker explained a number of effects created by explosive weapons, including blast, fragmentation, thermal, cratering, and penetration. The first two of these tend to be particularly harmful to civilians, especially in built-up areas. The precise effects of a particular attack are determined by a range of factors, including: the characteristics of the weapon used (notably the warhead type and size, the fuze setting, and the accuracy of the weapon system); the angle and timing of the attack; the training of the operator(s); the launching platform; the population density; the weather and environment; and the characteristics of the target (including its construction and location).

One particularly important consideration is fusing, which determines when the explosive detonates. There are three main types of fuze: point-detonating or contact fuzes; time-delay fuzes, which may result in sub-surface detonation or detonation within a target or structure; and airburst fuzes, which detonate above the target. Time-delay fuzes may be used to minimize collateral effects by minimizing blast and fragmentation damage through sub-surface detonation, whereas airburst fuzes are usually employed to cause wide-area blast and fragmentation effects.

A second important consideration is accuracy, which can be measured using standards such as circular error probable (CEP, or the area around the target in which 50% of rounds fired are expected to land). Accuracy is also influenced by guidance mechanisms, whether electro-optical, laser, GPS, or multi-mode. This said, unguided weapons are not necessarily inaccurate: it depends on how they are employed and their effective range, taking into account the location of the target, the delivery system used, and other variables. The key question is perhaps not what *kind* of explosive weapon should be used in populated areas, but what *degree of accuracy* is needed in these contexts. Having said this, the speaker also emphasized that accuracy alone is not enough to prevent wide-area effects, which will also depend on the size of the warhead and the relevant “miss distance.” Very large warheads may obviate accuracy in populated areas owing to their considerable blast and fragmentation radius.

A final set of considerations relate to the targeting process. Collateral damage estimates (CDEs) are used by commanders to try to predict civilian casualties and damage to civilian objects. Some use a computer-based model that incorporates information on population density and the characteristics of the relevant munitions. CDEs provide an opportunity to mitigate anticipated incidental damage by altering weaponry and other manipulable variables of the attack. In cases of time-sensitive targeting, potential collateral effects will still be considered, but it may not be possible to go through all of the steps in the CDE process.

The speaker stressed that although weapons effects are contextual, some weapons, owing to their technical characteristics, may foreseeably cause significant harm beyond a specific target when used in populated areas, even after factoring in all feasible precautions. The speaker reminded the three categories of explosive weapon of concern, described at the outset of the meeting, that may have a wide impact area because of: (1) the large blast and fragmentation range of the individual munition used; (2) the lack of accuracy of the delivery system; or (3) the delivery of multiple munitions over a wide area. He stressed that when a weapon system combines two or more of these features, its effects will be especially devastating.

3.3 Air-delivered munitions: Marc Garlasco (Independent Expert)

The presentation outlined three categories of air-delivered weapon: bombs, both guided and unguided; missiles, including both air-to-surface and cruise missiles; and air-delivered rockets.

Regarding air-delivered bombs, the speaker noted that there are various types: armour-piercing; fragmentation; general-purpose; high-capacity; and semi-armour-piercing/concrete-piercing. The speaker gave an indication of the charge-to-weight ratio for each of the categories as well as the intended use for each type of bomb.

The speaker also discussed anti-tank and cruise missiles. Anti-tank missiles are typically precision-guided and carry a relatively small warhead, but are often fitted with a fragmentation sleeve, which increases the fragmentation effects. Cruise missiles are 'stand-off weapons' that can be fired from a long range with a high degree of accuracy, thus allowing aircraft to remain at a safe distance from any potential threats. The blast and fragmentation effects of anti-tank and cruise missiles will depend on the specific warhead.

Finally, the speaker noted that air-delivered rockets are typically unguided, and can raise significant dispersion accuracy issues, particularly older rockets. Air-delivered rockets are usually fired in salvos to make up for lack of accuracy. As both accuracy and dispersion depend on range, the effects may cover a wide area. For example, the speaker mentioned an attack using S-8 rockets in a populated area: while some rockets hit military targets, many others struck houses and killed civilians.

The speaker referred to the decision of a military alliance to limit the use of air-delivered munitions against military objectives located in populated areas, which led to a significant decrease in civilian casualties from air strikes.

3.4 Artillery and mortars: Col. (retd) Colin Brundle (Independent Expert)

The presentation covered three issues: current trends in the use of artillery and mortars; the technological aspects of artillery and mortar systems; and the challenges of operating these weapons in complex terrains.

From a technological perspective, there has been a shift in the platform design of artillery from heavy and self-propelled systems to lighter, towed equipment. The quest for greater accuracy and lethality is motivated by the desire to increase the efficiency and reduce the logistical burden of artillery and mortar systems. Technology is also being used to modify some free-flight artillery rockets to allow for trajectory correction systems during flight. The speaker also noted that the technology for fixing the location of targets has become more accurate.

Despite this, there are a number of aspects of artillery and mortar systems that have the cumulative effect of degrading accuracy. These include propellant storage, barrel wear, computation of ballistic data, and the physical laying and preparation of the platform. To some extent, these factors can be countered through effective training. A skilled observer should always carry out a CDE before calling for fire, and should take into account the specific factors that arise when operating in populated areas. Further, artillery and mortar crews should always consider both the angle of attack and the fuze selection. This is particularly important in built-up areas where the use of delayed fuzes, combined with errors in calculating the angle of attack, may result in ricochet, with lethal consequences for civilians.

In addition, the speaker noted the ease with which mortars can be self-manufactured, and that many attackers using artillery and mortars in contemporary environments have little concern for incidental loss of civilian life, injury to civilians or damage to civilian objects. Furthermore, positive identification of targets is much harder in populated areas, particularly when adversaries do not distinguish themselves.

In sum, the speaker emphasized that, despite technological improvements, the majority of artillery and mortars are area weapons and their inherent inaccuracies remain. This means that collateral damage is inevitable, particularly in complex terrain. Despite this, the speaker emphasized, proper training and the ability of skilled artillery and mortar crews to achieve relative accuracy remain very important.

3.5 Artillery rockets: Mark Hiznay (Senior Arms Researcher, Human Rights Watch)

The speaker shared the experience of Human Rights Watch (HRW) in documenting the use of artillery rockets in populated areas. The presentation examined the historical development of artillery rockets, as well as the intended use of multi-barrel rocket launchers (MBRLs) and the factors that influence their effects.

From a historical perspective, rocket artillery advanced significantly following World War II, when militaries developed multiple approaches to the delivery of rockets. The most common delivery system used today is the MBRL; most MBRLs are vehicle-mounted. In addition to commercially produced MBRLs, there are also less sophisticated improvised rocket systems. MBRLs are commonly used for destruction, neutralization, suppression and harassment missions. In the last decade, GPS-guided artillery rocket systems have also been developed.

The speaker gave the example of the Type 63 107mm MBRL: this fires projectiles, each of which contains 1.3 kilograms of explosives, to a maximum range of 8 kilometres. If point-detonated, the lethal area of each projectile is approximately 450 square metres; if airburst-fuzed, the lethal radius increases to 500 square metres. The speaker referred to an example involving use of these rockets by a commander with a rudimentary understanding of how to use the weapon system: the MBRL was mounted on the back of a pick-up truck, the launcher was elevated to what was thought to be the appropriate range to hit the target, and barrages of rockets were fired into a city.

As the majority of MBRLs are vehicle-mounted, they are extremely mobile. Mobility is essential for avoiding counter-battery fire: as MBRLs create a large smoke signature, they are easily identified and targeted. An additional advantage of MBRLs is the high volume of fire and enormous shock effect created by firing multiple rockets at the same time. Rocket artillery is less accurate than tube artillery and harder to correct, but these characteristics are offset by the large dispersion area. The dispersion area is dependent on a lot of factors, such as the weather and technical characteristics, including if the rockets are spin stabilized.

The blast and fragmentation effects of MBRLs are also influenced by the type of warhead, which may include high-explosive fragmentation warheads, explosive submunitions, anti-tank mines, incendiary capsules, or fuel air explosives. Submunition variants were developed to compensate for the relatively small amount of explosive in each warhead and to spread effects over a wider area.

The speaker provided recent examples, documented by HRW, of use of MBRLs in residential areas with consequential civilian casualties and damage to civilian buildings. The speaker also noted the difficulties experienced by HRW in obtaining information about the use of MBRLs in specific circumstances, including the extent to which the commander knew about the characteristics of the military objective and about the risks to the civilian population, and the nature and extent of any precautions taken.

3.6 Conversion of conventional unguided munitions to precision-guided munitions: Nic Jenzen-Jones (Director, Armament Research Services)

The speaker gave an overview of existing methods for converting conventional munitions to precision-guided munitions (PGMs), with a particular focus on ‘bolt-on’ kits, which can be used to convert conventional munitions to PGMs without having to return them to the manufacturer.

The speaker discussed one conversion kit that can convert an unguided bomb into a unit with a circular error probable (CEP) of as little as 5 metres. The kit was developed primarily to increase accuracy and reduce collateral damage. While many earlier models were purpose-designed and relatively expensive, the development of conversion kits has reduced the cost considerably, and allows for conversion of in-service munitions and systems. Artillery projectiles can also be converted into PGMs, mainly using modified nose fuzes, as can guided mortar projectiles, which have comparatively low unit costs compared to many other PGMs.

The speaker also highlighted some of the additional benefits of PGMs. Importantly, they offer multiple fusing options, which can be adapted so as to minimize collateral effects. Further, the increased probability of striking a target on the first attempt reduces the need for further rounds to be fired. As well as minimizing the potential for collateral damage, this also results in lower ammunition consumption, which in turn allows for increased mobility and reduces the logistical burden in terms of resupply and forward storage. Finally, certain PGMs can engage moving targets more effectively than unguided munitions.

The speaker identified the perceived challenges to the use of PGMs as cost, command and control networks, availability, and user competence. In his view, the main challenges are user competence, including in relation to use, maintenance, and storage, as well as the integration of PGMs with existing command-and-control networks and their incorporation in user doctrine. Although cost is the issue most frequently raised by militaries that have elected not to acquire PGMs in notable quantities, this is a less significant obstacle than it used to be, given that the price of PGMs has decreased considerably in recent years. In addition, the cost is partially offset by savings from decreased ammunition consumption and, particularly, by reduced logistical burdens.

3.7 Summary of discussion

Regarding CDEs, one participant asked about the quality and source of information on, among other things, population density and secondary fragmentation (including type of building material). In response, one speaker referred to the US joint munitions effects manual, which ‘pre-models’ weapons’ effects. In terms of foreseeing secondary effects, some tests and computer modelling are done, based on variables such as building material. But it was stressed that data for CDE assessments vary between contexts: in some cases the information may be accurate; in other cases it may not be accessible. Lack of accurate information was identified as a key challenge that will affect CDEs. However, in terms of analysing the data that are available, in particular as regards foreseeing secondary fragmentation, some militaries routinely incorporate the technical expertise of a structural engineer. In addition, one participant stressed the difficulties in predicting civilian patterns of life, which are particularly dynamic during armed conflict. One speaker responded that while not everything can be foreseen, when operating in a given context, civilian movements can be predicted reasonably well over time, for example the likelihood of people not wanting to leave their possessions behind. It was also noted that the complexity of the CDE will depend on time constraints: the assessment may range from in-depth analysis for pre-selected targets to on-the-spot analysis for dynamic or time-sensitive targets.

In relation to CEP, one participant clarified that there are several layers of CEP: while 50% of munitions can be expected to fall within 1CEP, 98% will fall within 2CEP and 100% will fall within 3CEP (each CEP describing concentric circles around the target). For artillery, the participant stated that NATO forces and those of certain countries are able to routinely predict where 82% of their rounds will land, and for attacks that are expected to result in collateral damage, they can routinely predict where 100% of the rounds will land.

In response to questions about ‘low collateral damage weapons’, a speaker stated that these are weapons intended to create effects that are limited to the target. Such weapons are already being developed and used by some militaries, for example, carbon-fibre weapons with low-fill warheads. For the most part, such developments are driven by considerations of military effectiveness and efficiency, and force protection concerns, rather than humanitarian concerns.

Concerning the accuracy of unguided artillery, it was underlined that although a highly skilled team may be able to achieve a high degree of accuracy, this would not necessarily be achieved in the first round of fire. In response, it was highlighted that burst-fire technology may be used for the initial rounds.

One participant stressed that most militaries are not in a position to access highly sophisticated weapons, particularly owing to costs. For these militaries, there is a need for more realistic, home-grown solutions than precision weapons. However, several speakers reminded that the issue was the wide-area effects of certain explosive weapons and whether these weapons should be used in populated areas, regardless of their sophistication. In addition, it was emphasized that the systems and associated costs for converting conventional weapons into guided weapons are not out of reach of militaries with modest budgets. The importance of thorough training in the selection and use of weapons, particularly in manipulating their effects, was repeatedly stressed.

One participant raised the issue of fuel air explosive bombs or thermobaric weapons, which are designed to target personnel located in buildings or underground, with minimal damage to civilian objects. In the view of one of the speakers, these weapons can be categorized as enhanced blast weapons and thus fall within the scope of the discussion on explosive weapons in populated areas. While they offer a technical advantage, their effects are less

predictable than those of other explosive weapons and the radius of these effects cannot be calculated in the same way.

One participant made a plea for precision of language and common understanding across disciplines when discussing the use of explosive weapons in populated areas. The participant emphasized that fragmentation, blast and burn are not ‘effects’ *per se*, but are instead mechanisms by which effects are delivered to the target, i.e. harm to persons and damage to objects.

SESSION 4: Policy and practice regarding the use of explosive weapons in populated areas

The aim of the fourth session was to gain a better understanding of how existing military policy and practice limit the use of explosive weapons, including specific types of weapon systems, in populated areas. To facilitate preparations for and discussions during this session, the questions set out in Annex 1 were sent to the participants in advance of the meeting. The session commenced with an introduction by retired Brigadier General Abdallah Alhabarnah, followed by presentations from four State representatives. In addition, ten government experts briefly presented their respective States' policies, practices and/or views during the discussion.

4.1 Introductory presentation by Brig. Gen. (retd) Abdallah Alhabarnah

The speaker noted that the destructive capabilities of explosive weapons are exacerbated in populated areas: as well as causing death and injury to civilians, the use of explosive weapons in populated areas poses a serious threat to the social and economic infrastructure. The speaker also noted that commanders operating in populated areas tend to overestimate the level of explosive force required to carry out their mission. Inadequate training and ignorance of IHL increases the likelihood of excessive or unjustified use of explosive weapons in populated areas. In this regard, the speaker highlighted the crucial role of training, and strongly recommended that the use of explosive weapons in populated areas be incorporated in basic and advanced training courses, and that problems relating to the choice of means and methods of warfare in populated areas be included in military exercises.

The speaker reminded the fundamental IHL rules on conduct of hostilities (distinction, proportionality and precautions in attack) that constrain the use of explosive weapons in populated areas. Respect for these rules in populated areas requires that commanders carefully consider the choice of weapon systems in view of their potential destructive effects in such an environment, including their effects on the water and energy infrastructure.

In terms of how policy can regulate the use of explosive weapons in populated areas, the speaker stated that such limits are generally not found in existing doctrine. As for tactics, techniques and procedures, which translate into operational orders delivered by the commander to subordinate units, they usually focus on mission success and force safety, not on the incidental effects on civilians of weapon systems. Operational orders and rules of engagement frame the use of force and the weapons used, including the kind, size and desired effect of a weapon system.

The speaker concluded that specific references to the use of explosive weapons in populated areas are generally absent from existing military policy, and recommended that this situation be remedied. The speaker advocated the adoption of tools such as 'minimum safe distances' (MSDs)²⁶ and 'battle damage assessments' (BDAs) as means of monitoring and minimizing civilian harm. Finally, the speaker called for effective investigation and prosecution of IHL violations arising from the use of explosive weapons in populated areas, and stressed the importance of ongoing cooperation, in this issue, between States, international agencies and NGOs.

²⁶ "Minimum Safe Distances" can be defined as "the distance in meters from the intended center of impact at which a specific degree of risk and vulnerability will not be exceeded with a 99% assurance": see Federation of American Scientists, *Indirect Fire*, 6 February 2000. Available at <http://fas.org/man/dod-101/sys/land/indirect.htm>.

4.2 China

The speaker addressed three main topics: China's doctrine, policy and practice; the principles of IHL applicable to the use of explosive weapons in populated areas; and improvised explosive devices (IEDs).

The speaker noted that China attaches great importance to the principles of IHL, and described some of the measures that China has taken to implement its obligations in this regard. These include: China's accession to the Convention on Certain Conventional Weapons (CCW) and its five Protocols; the inclusion of dedicated IHL courses in military training; the establishment of legal advisory services as an integral part of Chinese military structures; China's efforts to develop 'limited-injury' munitions; and the establishment of teams tasked with reviewing the legality of new means and methods of warfare.

In relation to explosive weapons, China takes the view that although IHL does not include specific provisions governing the use of these weapons, basic IHL principles are broadly applicable. Of particular relevance are the principles of humanity, military necessity, proportionality, and distinction, as well as the Martens Clause. In the view of China, the humanitarian problems raised by the use of explosive weapons in populated areas will be effectively mitigated if belligerents fully respect and comply with these principles.

Finally, the speaker noted that the international security situation is becoming increasingly volatile, with IEDs widely used by terrorists to conduct attacks against civilians. When terrorists operate under the shelter of civilian buildings and populations, this presents a moral dilemma for those fighting terrorism. China stressed that the principles of non-interference in States' internal affairs and avoiding transferring weapons to non-State actors are of great importance in maintaining peace and stability, and in mitigating the humanitarian concerns raised by the use of explosive weapons in populated areas. In the view of China, as far as IEDs are concerned, the international community's first priority should be to enhance universalization of the CCW and implementation of Amended Protocol II.

4.3 The Netherlands

The speaker first stressed that IHL regulates the use of explosive weapons in populated areas through the delicate balance between military necessity and humanitarian concerns that is enshrined in IHL rules. The Netherlands ensures an appropriate balance between these two factors by providing extensive training for military personnel, by employing legal advisers within the armed forces, and through various checks and balances prior to weapon use.

While some IHL rules are not specific and therefore leave room for interpretation, this makes them adaptable to different situations, and they can be supplemented by more detailed policy. In this regard, the Netherlands uses a number of NATO policy documents, including the NATO collateral damage estimate (CDE) methodology, that facilitate interoperability in coalition operations. In many cases, Dutch military policy is more restrictive than IHL. For example, pilots in the Royal Netherlands Air Force may adjust weaponeering decisions to employ a more restrictive weapon setting than that required by the CDE. That said, the representative from the Netherlands cautioned against adopting policies that are too restrictive, noting in particular the potential negative impact on the safety of Dutch or coalition forces.

The Netherlands also uses a multi-layered lessons-learnt process, based on the reporting cycle as set out in Directive 301 from the Chief of Defence. This directive requires ground forces to report 'troops in contact' (TIC) situations, and pilots to report situations in which weapons are released from the air. If necessary and possible, the ground forces or pilots also conduct BDAs. Following the TIC/mission report, an 'after action report' (AAR) will be composed by the military commander, which contains a broader analysis, and sent to the Ministry of Defence and the Royal Military Police in the Netherlands.

At the level of the Ministry of Defence, the AAR can be followed by additional assessments. In cases where the Royal Military Police is under the impression that events mentioned in the AAR might need further criminal investigation, the AAR is sent to the Public Prosecutor's office for further review. The AARs are discussed in the daily Morning Council in the presence of the Minister of Defence, the Secretary-General, the Chief of Defence and relevant Directors. Reports can lead to lessons identified and lessons learnt, which can in turn lead to adjustments in training, combat and (weaponeering) practices, and – ultimately – adjustments to military doctrine.

4.4 Uganda

The presentation by Uganda addressed artillery responsibilities, as well as limits on the use of some explosive weapons, the notion of MSDs, BDAs, and the lessons-learnt process.

To begin, the speaker reminded that artillery was developed as a means for armed forces to project fire from a safe position against opposing forces, so as to solve the stalemate of 'equal force – equal range'. For the Ugandan People's Defence Force (UPDF), the primary tactical role of artillery is to support other arms and services in missions by establishing fire supremacy.

Regarding limits on the use of explosive weapons, in the UPDF the use of artillery must be approved by the highest commander in the operation. Pre-mission training and rehearsal include these limits and remind IHL rules. All artillery fire application is done under observation. Artillery is rarely used in populated areas. In addition, weapon systems designed to deliver multiple munitions – for example, cluster munitions or airburst bombs – are prohibited. In recent years, there has also been a trend towards not employing rockets, particularly as these weapons are less accurate and most operations take place in populated areas.

All decisions relating to the selection of weapons incorporate reconnaissance, which involves identification, registration, and determination of the relative location of the target in relation to the surrounding environment. These factors will influence the choice of fuze and warhead.

The UPDF also carries out BDAs, which involve intelligence analysts, field engineers, weapon experts and target analysts. In current contexts, the UPDF is using a process of "bracketing off of targets": if forces are sure that a town is of target interest, they shoot at a distance to encourage civilians to leave and Special Forces are used in order to prevent damage to infrastructure and civilian casualties. Finally, the UPDF uses MSDs to determine how close explosive weapons should be used in relation to friendly forces. This is considered during planning.

4.5 United States of America

The speaker began by thanking the ICRC for its work on protection of civilians during armed conflict. In the experience of the US military, civilian casualties generally work to the detriment of military campaigns, and should therefore be avoided as a matter of both law and policy.

Regarding the law, the speaker noted that although IHL does not contain a general prohibition on the use of explosive weapons, it does regulate the use of such weapons during armed conflict. In particular, the US stressed the importance of military necessity, which is the starting point for all military operations.

According to the speaker, the increasing precision of certain weapons does not mean that less precise weapons have no utility on the battlefield. Weapons are developed and used for multiple purposes – including to manoeuvre or gain control of territory – and some explosive weapons are designed to have wide-area effects because that is their intended use. Even in populated areas, it may be necessary to create lethal effects over wide areas, for example, to

target a large group of positively identified combatants. In such circumstances, the use of explosive weapons with wide-area effects may be lawful if the attack is not expected to cause collateral damage, or if the expected collateral damage is outweighed by the concrete and direct military advantage anticipated. The lawful use of any particular weapon will necessarily require fact-specific analysis of the circumstances and the manner in which the weapon is used.

The US reminded the participants that the rule of proportionality in attack is clearly established in IHL. The speaker urged caution before accepting that commanders should be required, whether as a matter of law or policy, to balance military necessity against possible effects that may not be practically foreseeable. Even if militaries were able to project "well known and objectively foreseeable reverberating effects," the US representative emphasized, the foreseeable effects of an attack are not necessarily legally prohibited; the concrete and direct military advantage anticipated may still outweigh the expected incidental civilian casualties and damage to civilian objects.

Noting the importance of taking precautions, the US representative strongly encouraged States and non-State actors to consider which precautions they can put in place to protect civilians, based on their own political, strategic, operational and tactical considerations.

To supplement IHL, the US has adopted numerous policy measures to limit incidental loss of civilian life, injury to civilians and damage to civilian objects. The US presentation outlined a number of these measures, including: target nomination; review and approval processes, including in relation to the use of specific types of joint fire; development and maintenance of no-strike lists; carrying out CDEs for all proposed strikes; BDAs; and AARs. BDAs provide an initial snapshot of the effects of an attack, which is then informed by further monitoring of multi-source intelligence in order to develop a more comprehensive understanding of the consequences of a particular action. Importantly, this process can lead to the identification of lessons learnt that help to refine future practice.

Furthermore, the US conducts training before, during and after deployment, which is a critical way of mitigating harm to civilians. US forces also maintain formal reporting and investigation requirements, and benefit from legal advice. Finally, the speaker emphasized the critical role of legal advisers, who are embedded at various points along the US chain of command.

In sum, the US underlined its view that the problems associated with using explosive weapons in populated areas will not be solved through more detailed rules or new interpretations of rules; rather, the problem lies in compliance with existing rules.

4.6 Summary of discussion

Ten government experts took part in the discussions to share the policy, practice and/or views of their respective States relevant to the conduct of hostilities, and the use of explosive weapons, in populated areas.

A number of government experts remarked that today's armed conflicts are mostly fought in populated areas, and that this trend is likely to increase in the future. A number of experts expressed concern regarding the consequent increased risk to civilian lives and health, including through the long-term effects on essential civilian infrastructure. While some emphasized that this is an inevitable consequence of conflicts fought in populated areas, several government experts stressed that failure to minimize incidental civilian harm, including through the choice of means of warfare, is likely to result in the attacker losing the 'hearts and minds' of the civilian population, with all the negative consequences this implies from a strategic point of view. In this respect, some government experts referred to existing policy calling for restraint in attacking enemy targets in populated areas when there is no immediate need to do so, even in cases where such attack may be lawful. One government expert also stressed that failure to minimize collateral damage can make post-conflict reconstruction even more difficult.

Each government expert who spoke reaffirmed his/her State's legal obligation and commitment to respect IHL when attacking military objectives located in populated areas. Regarding, in particular, the use of explosive weapons, many government experts emphasized the importance of the rules of proportionality and precaution in attack, and their armed forces' efforts to minimize as far as possible incidental civilian casualties and damage to civilian objects. In this respect, it was reminded that collateral damage is not unlawful *per se*, provided it is proportionate and that feasible precautions are taken. Referring to the principle of military necessity, a number of government experts stressed that a commander is constantly seeking to strike a balance between the military mission to be realized, avoiding collateral damage, and protecting his/her own forces, and that seeking this balance is what underlies the methodologies used in the targeting process.

A number of government experts elaborated on the precautionary measures taken by their armed forces during the targeting process, including the use of CDE methodologies and of MSDs. One government expert explained that CDEs are used as support tools to guide the commander's decision-making process prior to launching an attack. The greater the collateral damage concerns, the greater the consideration given to mitigating measures such as the use of specific precision-guided munitions, changes to the timing or angle of an attack, and changes to the fuze of the munition. But the deselection of weapons can only go so far without counteracting the military aim. For particularly sensitive targets – including those that may result in many civilian casualties – authorization must be obtained at the highest level.

Some experts said that MSDs are designed to protect friendly forces while others stated that they apply equally to protection of friendly forces and civilians. A few government experts specified that the MSD was determined based on a weapon's precision, calculated, notably, using the CEP measure, and on the effects of the munition used. A government expert mentioned that MSDs appear in the relevant technical and field manuals, as well as in the relevant rules of engagement.

Some government experts noted that they regularly undertake BDAs and prepare AARs, and that lessons learnt are incorporated in military doctrine at tactical, operational and strategic levels.

A non-government expert referred to the recording and sharing of data pursuant to Protocol V of the CCW on explosive remnants of war, and suggested that sharing such information on the weapons used would help to inform understanding of the impact of attacks and patterns of harm ensuing from the use of explosive weapons in populated areas. In response, one government expert described his country's access-to-information procedure, with regard to the public release of restricted information. While this process aims to facilitate the greatest degree of transparency, it is not always possible to release all of the information that is requested, owing particularly to national security requirements. Another non-government expert recalled that civilian casualty tracking mechanisms had been set up by multinational forces operating in certain armed conflicts, within directives limiting recourse to air strikes and to indirect fire, but that it was unclear whether such mechanisms were also included in national military policies.

Regarding the choice of means and methods of warfare, one government expert stressed that as part of the weaponeering process, her armed forces selected weapons that have the minimum effects necessary to achieve the military aim. Another government expert indicated that in some cases, alternative, lighter weapons are employed against insurgents in populated areas in order to avoid causing a great deal of collateral damage. In addition, two government experts indicated that preference is given to the weapon that will cause the least incidental civilian death and injury or damage to civilian objects, but will still achieve the military objective. If more precise weapons are available and would offer the same military advantage, such weapons should be used. However, another government expert noted that many militaries do not have access to precision technology and instead use the weapons at their disposal, including explosive weapons that may have wide-area effects. In this regard,

the government expert noted that it may be possible to reduce the impact of these weapons, but it would not be possible to deny their use entirely.

Another government expert indicated that her country's military policy already provided limits on the use of explosive weapons in populated areas, but no details were provided. Some government experts stated that their armed forces received specific training for warfare in populated areas, notably with a view to minimizing civilian casualties. One government expert noted in particular that his armed forces had adopted policy guidance that addresses the use of military force in urban environments and that the operational rules and rules of engagement for particular operations have been changed to reflect this policy. Another government expert explained that his country's armed forces were currently reforming their military doctrine and training to take into account urban warfare and the protection of civilians in such contexts. More generally, the crucial importance of training in IHL and the use of weapons was stressed by a number of experts.

A government expert called into question the ICRC's position that the use of explosive weapons with a wide impact area should be avoided in densely populated areas, expressing the view that such weapons can be used for carrying out lawful attacks on legitimate targets even in populated areas. In some cases the use of such weapons may be the only means of achieving the military aim, though in any case the user must always respect IHL requirements of proportionality and precaution in attack. In contrast, another government expert called for the use of explosive weapons with a wide impact area in populated areas to cease, owing to their humanitarian consequences and in light of the general obligation to protect civilians from the effects of hostilities.

Finally, one government expert reminded that, in addition to the obligation to take precautions in attack, IHL equally requires the parties to armed conflicts to take precautions to protect civilians in the areas they control against the effects of enemy attacks, including by refraining from locating their military installations and armed forces within or near civilian areas.

Annex 1

ICRC Questionnaire sent to the participants in advance of the meeting:

- (a) Does your military policy (doctrine; tactics, techniques and procedures; operational orders and directives; rules of engagement (RoEs); etc.) apply limitations to the use of explosive weapons (i.e. those activated by the detonation of a high-explosive substance creating a blast and/or fragmentation effect) in populated areas?

In particular, are there restrictions on the use in populated areas of: (1) munitions with a large blast and fragmentation range, such as large bombs, large calibre mortars and rockets, guided missiles, heavy artillery projectiles and thermobaric weapons; (2) munitions of which the exact point of detonation is difficult to predict, including unguided air-delivered bombs, and indirect fire weapons systems such as mortars, rockets and artillery; and (3) weapon systems designed to deliver multiple munitions over a wide area, e.g artillery barrage systems such as multiple rocket launchers ?

- (b) When planning and conducting combat operations in populated areas, how is the selection of the weapon (including the warhead and fuze setting) to match the target (also known as “weaponeering”) incorporated into the proportionality and precautions assessments to limit anticipated civilian casualties and damage to civilian objects, including essential infrastructure and services, prior to executing an attack? For example, please describe if and how such information is included in “collateral damage estimates” conducted prior to executing an attack.
- (c) Many militaries use “Minimum Safe Distance” (MSD) to determine how close to friendly forces a weapon may be used, particularly with explosive weapons. Does your military use MSD (or some other formulation / concept) to determine how close explosive weapons should be used in relation to friendly forces? If so, how is this determined? For example, does the MSD correspond to the estimated “margin of error” or CEP (circular error probable) for the type of weapon used?
- (d) Does your military policy require, when feasible, a battle damage assessment (BDA) after each engagement using explosive weapons in populated areas, including the assessment of civilian casualties and damage? How are lessons learned about such effects fed back into doctrine and training? Can you share examples of lessons learned regarding the use of explosive weapons with a wide impact area in populated areas, including instances where these may have led to the use of alternative means of warfare and/or tactics in subsequent operations?

Annex 2

Expert Meeting on Explosive Weapons in Populated Areas: Humanitarian, Legal, Technical and Military Aspects

Chavannes-de-Bogis, Switzerland, 24–25 February 2015

PROGRAMME

DAY ONE – 24 FEBRUARY 2015

8:30 – 9:00 Registration and coffee

N.B.: Unless otherwise indicated, the times include questions and discussion.

OPENING

9:00 – 10:00 Introduction and scope of the meeting
Dr. Helen Durham, Director for International Law and Policy, ICRC

The “Trinity Model”: factors to consider regarding the use of explosive weapons in populated areas
Erik Tollefsen, Head of Weapon Contamination Unit, Assistance Division, ICRC

SESSION 1 IMPACT ON CIVILIANS OF THE USE OF EXPLOSIVE WEAPONS IN POPULATED AREAS

Chair: Dr. Helen Durham, Director for International Law and Policy, ICRC

Session Objective:

Provide an overview of the effects of the use of explosive weapons in populated areas in armed conflicts, including the immediate and long-term effects on civilian lives and health and on essential civilian infrastructure, and of issues related to identification of patterns of harm.

10:00 – 10:45 Assessing patterns of harm
Pilar Gimeno Sarciada, Adviser, Unit for the Protection of the Civilian Population, Protection Division, ICRC

Richard Moyes, Managing Partner, Article 36

10:45 – 11:15 Coffee break

11:15 – 12:30 Effects on civilian lives and health
Dr. Robin Coupland, Medical Adviser to the Head of the Assistance Division, ICRC

Effects on critical infrastructure

Michael Talhami, Regional Water and Habitat Adviser (Near and Middle East), ICRC Amman

12:30 – 14:00 Lunch hosted by the ICRC

SESSION 2**RULES OF INTERNATIONAL HUMANITARIAN LAW RELEVANT TO THE USE OF EXPLOSIVE WEAPONS IN POPULATED AREAS**

Chair: Dr. Knut Dörmann, Head of the Legal Division, Chief Legal Officer, ICRC

Session Objective:

Recall and discuss the key rules of international humanitarian law (IHL) relevant to the choice of means and methods of warfare in populated areas.

14:00 – 14:10

Introductory remarks by the chair

14:10 – 15:00

The prohibition of indiscriminate attacks

Laurent Gisel, Legal Adviser, Thematic Legal Advisers Unit, Legal Division, ICRC

Reverberating effects and proportionality in attack

Isabel Robinson, Legal Adviser, Arms Unit, Legal Division, ICRC

Questions of legality and acceptability of explosive weapon use in the jurisprudence of the ICTY

Maya Brehm, Geneva Academy of International Humanitarian Law and Human Rights

15:00 – 16:00

Questions and discussion

16:00 – 16:30

Coffee break

SESSION 3**THE TECHNOLOGY OF EXPLOSIVE WEAPONS**

Chair: Kathleen Lawand, Head of Arms Unit, Legal Division, ICRC

Session Objective:

Provide an overview of: the evolution of explosive weapons technology; the technical characteristics of explosive weapons, in particular the factors and variables that determine a weapon's effects, including those controllable by the attacker such as warhead / damage mechanism and fuze setting; accuracy in delivery systems; categories of explosive weapons prone to wide-area effects when used in populated areas.

16:30 – 17:30

The evolution of warfare and explosive weapons technology in modern historical perspective

Dr. Alexandre J. Vautravers, Associate Professor, Webster University

19:00

Departure from hotel for dinner hosted by the ICRC

DAY TWO – 25 FEBRUARY 2015

SESSION 3	(CONTINUED)
9:00 – 9:30	The technology of explosive weapons and their design-dependent effects <i>Marc Garlasco, Weapons Adviser</i>
9:30 – 10:00	Air-delivered munitions <i>Marc Garlasco, Weapons Adviser</i>
10:00 – 10:30	Artillery & Mortars <i>Colonel (Retired) Colin Brundle</i>
10:30 – 11:00	Coffee break
11:00 – 11:30	Artillery rockets <i>Mark Hiznay, Senior Researcher, Arms Division, Human Rights Watch</i>
11:30 – 12:00	Conversion of conventional unguided munitions to precision-guided munitions <i>Nic Jenzen-Jones, Director, Armament Research Services</i>
12:00 – 13:30	Lunch hosted by the ICRC

SESSION 4	POLICY AND PRACTICE REGARDING THE USE OF EXPLOSIVE WEAPONS IN POPULATED AREAS
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Chair: Jamie Williamson, Head of Unit for Relations with Arms Carriers, ICRC

Session Objective:

Gain a better understanding of how existing military policy (doctrine, tactics, techniques and procedures, operational orders and directives, rules of engagement, etc.) limits the use of explosive weapons in populated areas, including the use of specific types of weapon systems, as the case may be. Provide examples of operational lessons learnt affecting changes in policy.

13:30 – 15:00	Opening presentations <i>Brigadier General (Retired) Abdallah Alhabaraneh</i> <i>China</i> <i>The Netherlands</i> <i>Uganda</i> <i>United States of America</i>
15:00 – 15:30	Coffee break
15:30 – 17:00	Presentations by other participants
17:00 – 17:30	Concluding remarks by the ICRC and close of meeting

Annex 3

ICRC Meeting of Experts on Explosive Weapons in Populated Areas

Chavannes-de-Bogis, Switzerland, 24–25 February 2015

List of participants

Government experts

Afghanistan	Mr Berhoz MOHAQEIQ First Secretary of Embassy and Representative of the I. R. of Afghanistan at UNOG Mr Nazir Ahmad FOSHANJI Third Secretary of Embassy and Representative of the I. R. of Afghanistan at UNOG
Austria	Mr Robert GERSHNER Head of Unit, Disarmament Department Ministry of Europe, Integration and Foreign Affairs Mr Peter STEINER Adviser, Military Affairs Permanent Mission of Austria to the Conference on Disarmament
China	Mr Hoajun JI Deputy Division Director Ministry of Foreign Affairs Ms Weiwei JI Ministry of Foreign Affairs Mr Quanjun XU Professor PLA University of Science & Technology General Staff of the Foreign Affairs Office
Colombia	Ms Maria Ximena ESPITIA MEZA Colombian Army Ministry of National Defence Mr Juan VASQUEZ Ministry of Foreign Affairs

Israel	<p>Lt-Col. Tsach MOSHE Military Expert Israel Defence Forces</p> <p>Cpt. Guy KEINAN Legal Adviser Israel Defence Forces</p>
Lebanon	<p>General Habib ABOU RJEILY Chief of Office of International Humanitarian Law Lebanese Armed Forces</p> <p>Brigadier General Rifaat RAMADAN Officer in the Directorate of Operations Lebanese Armed Forces</p>
Mexico	<p>Col. Juan TORRE TORRES Coronel de Infanteria D.E.M. Agregado Militar Secretaria de la Defensa Nacional</p> <p>Ms Sandra Paola RAMIREZ VALENZUELA Second Secretary Disarmament Affairs Permanent Mission of Mexico</p>
Netherlands	<p>Mr Martijn ANTZOULATOS-BORGSTEIN Senior Legal & Policy Affairs Adviser Ministry of Defence</p> <p>Cpt. Boudewijn STEVENS Weapons Instructor RNLAf/Pilot in Command Royal Netherlands Air Force</p>
Nigeria	<p>Lt-Col. Beyidi MARTINS Defence Headquarters Ministry of Defence</p> <p>Ms Oluwakemi EGBEOGU Counselor Minsitry of Foreign Affairs</p>
Norway	<p>Ms Annette BJORSETH Senior Adviser, Department of Legal Affairs Norwegian Ministry of Foreign Affairs</p> <p>Ms Marie-Astrid MATLARY Legal Adviser Norwegian Ministry of Defence</p>

Philippines	Mr Patrick VELEZ Assistant Secretary Ministry of Defence
Russian Federation	Mr Andrey GREBENSHCHIKOV Division for Nonproliferation & Arms Control Russian Ministry of Foreign Affairs Mr Andrey MALOV Senior Counsellor Permanent Mission of Russian Federation to the Conference on Disarmament
Serbia	Lt-Col. Mario ARBUTINA Military Officer Serbian Armed Forces
Switzerland	Mr Vincent CHOFFAT Military Adviser Swiss Armed Forces Mr Michael SIEGRIST Legal Officer Federal Department of Foreign Affairs
Uganda	Colonel Daniel KAKONO Brigade Commander Artillery UPDF Ministry of Defence Lt-Col. Moses WANDERA UPDF Ministry of Defence
United Kingdom	Lt-Col. John STROUD-TURP SO1 Conventional Weapons Policy & IHL Ministry of Defence Mr Jeremy WILMSHURST Conventional Arms Policy Officer Foreign & Commonwealth Office

<p>United States</p>	<p>Ms Katherine BAKER Policy Adviser U. S. Department of State</p> <p>Mr Brian FINUCANE Legal Adviser U. S. Department of State</p> <p>Mr Michael ADAMS Deputy Legal Counsel to the Chairman Joint Chief of Staff U. S. Department of Defense</p>
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Non-Governmental Experts

<p>Armament Research Services (ARES)</p>	<p>Mr Nicholas JENZEN-JONES Director</p>
<p>Article 36</p>	<p>Mr Richard MOYES Managing Partner</p>
<p>Geneva Academy of International Humanitarian Law and Human Rights</p>	<p>Ms Maya BREHM Researcher</p>
<p>Human Rights Watch (HRW)</p>	<p>Mr Mark HIZNAY Senior Arms Researcher</p>
<p>Save the Children UK</p>	<p>Ms Kimberly BROWN</p>
<p>United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA)</p>	<p>Mr Simon BAGSHAW Humanitarian Affairs Officer Policy Development & Studies Branch</p>
<p>United Nations Office for Disarmament Affairs (UNODA)</p>	<p>Mr Michael SPIES Political Affairs Officer</p>
<p>Webster University Geneva</p>	<p>Mr Alexandre VAUTRAVERS Professor</p>
<p>Independent Experts</p>	<p>Brig. Gen. (retired) Abdallah ALHABARNAH Col. (retired) Colin BRUNDEL Mr Marc GARLASCO Weapons Adviser</p>

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Ms Helen DURHAM
Director of International Law & Policy

Mr Knut DÖRMANN
Chief Legal Officer & Head of the Legal Division

Ms Kathleen LAWAND
Head of the Arms Unit

Mr Thomas DE SAINT MAURICE
Legal Adviser, Arms Unit

Mr Laurent GISEL
Thematic Legal Adviser

Mr Jamie WILLIAMSON
Head of Unit for Relations with Arms Carriers

Mr Robin COUPLAND
Medical Adviser

Mr Erik TOLLEFSEN
Head of the Weapon Contamination Unit

Ms Pilar GIMENO SARCIADA
Adviser, Protection Unit

Mr Michael TALHAMI
Water & Habitat Engineer

Ms Isabel ROBINSON
Legal Adviser, Arms Unit

Ms Eleanor MITCHELL
Legal Trainee

Ms Melanie SCHWEIZER
Assistant

MISSION

The International Committee of the Red Cross (ICRC) is an impartial, neutral and independent organization whose exclusively humanitarian mission is to protect the lives and dignity of victims of armed conflict and other situations of violence and to provide them with assistance. The ICRC also endeavours to prevent suffering by promoting and strengthening humanitarian law and universal humanitarian principles. Established in 1863, the ICRC is at the origin of the Geneva Conventions and the International Red Cross and Red Crescent Movement. It directs and coordinates the international activities conducted by the Movement in armed conflicts and other situations of violence.



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