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Swiss Armed Forces

Law of Air and Missile Warfare

INSTRUCTOR'S
MANUAL

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ABBREVIATIONS

AAR	Air to air refuelling
AMW	Air and Missile Warfare
AMW, Rxy	HPCR, AMW Manual, Rule xy
AP I	Additional Protocol I to the Geneva Conventions
AP II	Additional Protocol II to the Geneva Conventions
ATC	Air Traffic Control
AWAC	Airborne warning and control systems
CCW	Convention on Certain Conventional Weapons
CEP	Circular error probable
CWC	Chemical Weapons Convention
EO	Electro-Optical
GC	Geneva Conventions
GPS	Global Positioning System
IAC	International armed conflict
IFF	Identification, friend or foe
IHL	International humanitarian law
IR	Infrared
ISTAR	Information, surveillance, target acquisition, and reconnaissance
LEGAD	Legal Advisor
LOAC	Law of Armed Conflict
NGO	Nongovernmental Organization
NIAC	Non-international armed conflict
NOTAM	Notice to Airmen
OAG	Organized armed group
Recce	Reconnaissance
ROE	Rules of engagement
UAV	Unmanned Aerial Vehicle
UCAV	Unmanned Combat Aerial Vehicle
UN	United Nations

OVERVIEW

I. Rationale of the Instructor's Manual

In the operational reality of contemporary armed conflicts, air and missile operations have attained overwhelming practical importance. Therefore, the international law governing air and missile warfare has become one of the most relevant regulatory areas for current and future military and security operations, including those involving new weapon technologies such as drones, automatic and autonomous systems.

Despite its practical importance, the international law governing air and missile warfare has never been comprehensively codified and still is of predominantly customary nature. The “Air and Missile Warfare Manual” (2010), which is the result of a six-year expert process conducted by the Program on Humanitarian Policy and Conflict Research at Harvard University (HPCR) with the generous support of the Government of Switzerland, aims to identify and restate international law as far as it relates to air and missile warfare (hereafter: “AMW Manual”).

The content of the AMW Manual has been taught to Air Force personnel of various States around the world by a team of international experts in specialized 3–4 day face-to-face seminars. The present **Instructor's Manual** is a follow-on product, which aims to provide military instructors with practical guidance as to the translation of the HPCR's AMW Manual and the accompanying Commentary into a course curriculum with case studies and exercises tailored to the specific needs of the armed forces, units or individuals in question.

The **Instructor's Manual** offers four categories of resources:

1. First, it structures the substantive content of the Air and Missile Warfare Manual into five thematic modules, provides **model lectures with speaking notes** covering that content and adds a sixth lecture which addresses new technologies of general relevance to air and missile operations.
2. Second, it offers **model content for power-point slides** supporting each lecture, which may be used by instructors as a basis for their own presentations, and which may be adapted, contextualized and illustrated with photographic material as required.

3. Third, at the end of each thematic module, it provides a series of **exercises and model answers** (case studies, tasks and questions for discussion) allowing participants to deepen their knowledge through direct application in group work exercises.
4. Fourth it provides scenario problems and model solutions to support an **end-of-course exercise** that will conclude the course and which is designed to reinforce the knowledge gained from the preceding six modules.

The Instructor's Manual is available for download at www.loac.ch.

II. Target Users of the Instructor's Manual

- Air Force instructors, legal advisors, and other personnel with training responsibilities.
- Concerned civilians with relevant academic or professional training responsibilities.

III. Methodology

Methodological elements: The Instructor's Manual is based on the following methodological elements:

- Guidance through model lectures / presentations and case studies with model answers.
- Principle-based, practice-oriented knowledge transfer.
- Separate thematic modules.
- Verification and consolidation of knowledge transfer through group work exercises (case studies, tasks and questions for discussion).

Recommendations: The model resources offered in the Instructor's Manual:

- **are designed to be used in conjunction with the AMW Manual and its Commentary** providing the background and legal references for each rule.
- **should be adapted, contextualized and illustrated** with images or video sequences in order to customize the resulting course and render it more useful and attractive to the relevant audience.

IV. Course Structure and Work-Through Time

Course Structure: The Instructor's Manual structures the course material as follows:

Module 1 – Introduction

Module 2 – The Operational Context

Module 3 – Targeting from the Air

Module 4 – Means and Methods of Air Warfare

Module 5 – Specially Protected Persons and Objects

Module 6 – Legal Challenges of New Technologies

Module 7 – End of Course Exercise

Total work-through time: 2 – 5 days, depending on needs and design. Recommended: 4 days.

Recommendation: For courses covering the entire course material, it is recommended to allow a work-through time of 4 days and to structure the schedule as follows:

- Day 1 (am): Module 1
- Day 1 (pm): Module 2
- Day 2 (am): Module 3
- Day 2 (pm): Module 4
- Day 3 (am): Module 5
- Day 3 (pm): Module 6
- Day 4 (am): Preparation for end of course exercise (Module 7)
- Day 4 (pm): Plenary discussion of conclusions in end of course exercise (Module 7)
- Course debrief and closure of course

MODULE 1 – INTRODUCTION

I. Lecture

(TITLE): INTRODUCTION

SLIDE 1

PURPOSES OF THE COURSE

SLIDE 2

- Put AMW law into context
- Understand the operational context
- Air targeting law
- Air weapons law
- Special protections
- Legal challenges of new technologies

Speaking notes: This course does not presuppose any level of legal expertise. While lawyers will benefit from attending the course, it is aimed at all who want to develop a reasonable understanding of the law governing the conduct of air and missile operations in warfare. No prior understanding or experience of air operations is required, and specialized technical and legal terminology will be either avoided or explained.

On Slide 2 you see the topics that will be covered in this course. In Module 1, we start by explaining how the law of air and missile warfare fits into the wider landscape of international law. In Module 2 we then introduce you to the operational context in which air and missile operations take place. Having set that background, Module 3 will examine the law that regulates targeting, whereas Modules 4 and 5 discuss the rules prohibiting or restricting air weapons, as well as those protecting certain categories of persons and objects. Last but not least, Module 6 focuses on the legal challenges arising from emerging technologies in the area of air and missile operations.

SLIDE 3

THE “AIR AND MISSILE WARFARE MANUAL”

- What is it?
- Who wrote it?
- What is its authority?

Speaking notes: A core text we will refer to throughout the course is the “Manual on the International Law Applicable to Air and Missile Warfare” (AMW-Manual). The Manual was drafted by a Group of Experts convened by the Harvard Program on Humanitarian Policy and Conflict Research from 2004 to 2009 with the generous support of the Government of Switzerland. It was completed and published by the Harvard Program in 2010.

The Manual aims to present the international law that governs warfare in, to and from the air using aircraft and missiles. It contains 175 “black letter rules”, printed in bold script, which express the collective consensus of the Group of Experts as to the current state of the law. The Commentaries accompanying each “black letter rule” explain its source, meaning and practical application in the air domain. They also point out divergences of opinion among the experts and provide other important clarifications.

The Manual is not a treaty or other source of the law and, therefore, is not binding. Instead, the Manual derives its authority from the fact that it represents a systematic re-statement of the law by internationally recognized subject matter experts, including representatives of the military, of academia, and of the International Committee of the Red Cross. Its black letter rules are considered by the Group of Experts to represent the consistent and general practice of States, as well as their legal opinion, and thus to reflect customary law binding on all States irrespective of their treaty obligations.

SLIDE 4

VALUE OF THE AMW-MANUAL

- Restatement of customary law
- Shows where treaty law is not customary
- Highlights interoperability issues
- Rules apply to all parties equally

Speaking notes: The AMW-Manual aims to assist operators and lawyers at all levels of command. Its value lies in bringing together in a single document the various rules of treaty and customary law governing the use of air power during armed conflict. In doing so, the Manual offers a comprehensive compilation of customary rules, which are considered to be binding not only on all States, irrespective of their treaty obligations, but also on all other parties to the conflict, irrespective of their recognition as States, and regardless of whether they are considered to be the aggressor or the victim of aggression in the relevant conflict. Its rules are equally relevant to a party undertaking an air attack, to a party that is the subject of an air attack, and even to neutrals that are not directly involved in the conflict but that may be affected by the conflict’s air operations in some way.

The Manual frequently refers to the First Additional Protocol to the Geneva Conventions of 1977 (AP I) which records, inter alia, the rules governing the conduct of hostilities in armed conflicts between States. While the Protocol has been widely ratified, some influential States have not done so due to their diverging positions on a number of specific provisions. The Manual shows which treaty provisions, as a consequence of these discrepancies, are not regarded as reflecting customary law and highlights potential areas where States party to AP I may experience interoperability challenges with States that are not party to that treaty. The Manual also goes beyond the confines of the law of armed conflict, drawing in relevant provisions of other treaties, such as the Law of the Sea Convention, the Chicago Convention and the Rome Statute of the International Criminal Court.

OPERATIONAL SPECTRUM

- “Warfare” and “armed conflict”
- IACs: Declared war or occurrence of hostilities between States
- NIAC: Protracted armed violence between State and OAG or between OAGs
- Not warfare: internal disturbances, crimes, riots, tensions etc.
- Focus: Law governing AMW in IACs

SLIDE 5

Speaking notes: In practice, air and missile operations can occur across the entire operational spectrum, not all of which amounts to “warfare” within the meaning of international law. In legal terms, “warfare” comprises only two types of conflict, namely international armed conflict (IAC) and non-international armed conflict (NIAC).

An IAC arises any time there is a declared war or actual occurrence of hostilities between two or more States (Article 2 Geneva Conventions). Conversely, NIACs comprise all armed conflicts that are not of an international character. They arise when there is protracted armed violence between a State and an organized armed group, or between such groups (Article 3 Geneva Conventions). It should be noted that armed conflicts starting out as NIACs may become international in nature, for example due to the intervention of a third State in support of the rebels and against the territorial State. Similarly an IAC may evolve into a NIAC.

Finally, the operational spectrum may extend to situations that do not rise to the level of an “armed conflict” and, therefore, cannot be described as “warfare” in a legal sense. This may include criminal activities, acts of terrorism, internal disturbances, riots, tensions and other occurrences of a similar nature. In essence, these are law enforcement situations governed by the applicable domestic criminal laws supplemented by human rights law.

In line with the AMW-Manual, the present course focuses on the law governing air and missile operations carried out in warfare between States (IACs). The law relating to NIACs is less developed but, as we go through the individual Modules, it will become clear which rules also apply in situations of NIAC.

SLIDE 6

SOVEREIGNTY

Sovereignty denotes the independent right of a State, in relation to a geographical area on Earth, to exercise the functions of a State to the exclusion of any other State.

Speaking notes: Sovereignty denotes the independent right of a State, in relation to a geographical area on Earth, to exercise the functions of a State to the exclusion of any other State. Sovereignty gives the State the exclusive right to exercise jurisdiction and authority on its territory, including the right to control the entry of persons, ships, aircraft etc. into its territory, territorial waters or airspace. Subject to over-riding obligations under international law, therefore, States have the exclusive right to regulate activities and to enforce their laws within their territory, territorial waters and airspace. Sovereignty attaches not only to territory, but also to aircraft and other objects (such as satellites) belonging to or registered by a State. As a result, interference by a third State with, for example, the aircraft belonging to a State constitutes a breach of that State's sovereign rights.

Peacetime airspace security operations are undertaken in exercise of those sovereign rights, and their lawfulness will generally be determined by applicable domestic and human rights law.

If operations conducted by one State involve an unlawful use of force against another State as prohibited by Art. 2(4) UN Charter, the victim State may decide to respond by employing countermeasures not involving the use of force. The right to use force in individual or collective self-defence as recognized in Art. 51 UN Charter arises only when an "armed attack" occurs, which is a higher threshold of force than that prohibited by Art. 2 (4) UN Charter. Intrusions by foreign military aircraft into national airspace without permission, though not infrequent in practice, constitute a breach of territorial sovereignty but, without more, do not amount to an armed attack justifying a military response. By contrast, in situations of on-going IAC, the sovereign rights of the parties to the conflict are routinely breached as part of the hostilities, and the permissibility of a military response now depends on the law of targeting (Module 3).

SLIDE 7

AIRSPACE (R1A AMW)

- **Vertical extent of airspace**
- **Definition of aircraft**
- **Sovereignty in airspace but not in outer space**

Speaking notes: "Airspace" means the air up to the highest altitude at which an aircraft can fly and below the lowest possible perigee of an earth satellite in orbit (Rule 1a AMW Manual).

There is an obvious link between the idea of airspace and the notion of an "aircraft", which is defined as any vehicle, manned or otherwise, that can derive support in the atmosphere from the reactions of the air (other than the reactions of the air against the earth's surface), including vehicles with either fixed or rotary wings (Rule 1d AMW Manual).

The effective altitude limit for jet aircraft is 25 km or 82,000 feet, while balloons can reach 35 km or 115,000 feet. At 100km altitude an aircraft would have to fly at an equivalent to orbital velocity to maintain altitude, so 100 km is frequently referred to as an approximate boundary between airspace and outer space.

This dividing concept matters because States have sovereign rights over their national airspace but there are no sovereign rights over outer space. The AMW-Manual only covers activities taking place in airspace and does not address action taken in outer space.

NATIONAL AND INTERNATIONAL AIRSPACE (R1A AMW)

SLIDE 8

- **National airspace: Airspace above national territory, internal, archipelagic and territorial waters.**
- **International airspace: Airspace over contiguous zones, exclusive economic zones, the high seas and territory not subject to State sovereignty.**
- **No right of “innocent passage” in airspace.**

Speaking notes: Under international law, airspace is classified as either national or international airspace. National airspace consists of the airspace above national territory, internal, archipelagic and territorial waters of a State.

International airspace consists of airspace over contiguous zones, exclusive economic zones, the high seas and territory that is not subject to a State’s sovereignty, such as parts of Antarctica (AMW, R 1a).

It should be noted that the rights of “innocent passage” that naval vessels enjoy in territorial seas do not extend to air movements in the airspace above territorial seas or land.

AIR POWER IN ARMED CONFLICT.

SLIDE 9

Speaking notes: There can be little doubt that air power is now a critical aspect of the conduct of hostilities during modern armed conflicts involving sophisticated military forces. In Module 2 we will examine the characteristics of air power and will review the manner in which it is employed and some of the doctrinal concepts associated with it. But before we do that let us consider where the law of armed conflict sits in the legal landscape as a whole.

LAW, INTERNATIONAL LAW AND THE LAW OF ARMED CONFLICT

SLIDE 10

Speaking notes: Law, in very general terms, consists of the rules that are generally accepted as regulating how States, corporations, other entities and individuals may lawfully behave.

Law may be passed at the local, the national, or the international level. International law comprises rules agreed between States as regulating how States, non-State actors, corporations and individuals should interact.

Public international law is a part of international law and contains rules that bind States, and certain others engaged in public activities at the international level.

The law of armed conflict (LOAC), also referred to as international humanitarian law (IHL), is that area of public international law that specifically addresses what actions are permitted and, respectively, prohibited in an armed conflict. It is this body of law that governs, inter alia, the conduct of air and missile warfare. LOAC applies to all those involved in an armed conflict, and it also creates certain obligations for States and individuals that are not, or not yet, involved in an armed conflict.

SLIDE 11

SOURCES OF INTERNATIONAL LAW

- **Treaty: Written agreement between two or more States governed by international law.**
- **Custom: Generally consistent practice of States based on corresponding legal opinion.**
- **General principles of law: Principles recognized by all States in their domestic law.**

Speaking notes: There are two principal sources of international law, namely treaties and customary law. A treaty is any written agreement between two or more States governed by international law. Treaties may also be referred to in other terms, such as “convention”, “protocol”, “regulations”, “declaration”, “statute” etc.

The treaty text records the obligations that have been accepted by the signatory States in the circumstances reflected in the treaty. If a State decides to become a party to a treaty it will generally have to deposit a formal statement to that effect and, when doing so, may decide to make statements setting out its understanding of the obligations it is entering into. If such a statement alters the legal effect of the treaty it is called a “reservation”. Certain treaties prohibit reservations, such as the Ottawa Convention on Anti-personnel Landmines (1997). Statements that do not alter the legal effect of a treaty but merely set out a State’s understanding of particular terms are known as “interpretive statements”.

The meaning of a treaty’s terms must be interpreted “in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose” (Art. 31 (1) Vienna Convention on the Law of Treaties).

If the ordinary meaning of the treaty text does not provide the required clarity, reference may then be made to the preparatory work that led to the treaty or to other supplementary means of interpretation.

The second source of international law is custom. Customary law is what States in general do or abstain from doing (State practice) in the belief that they are legally obliged so to act, or refrain from acting (legal opinion). Customary law is a critically important source of international law. States are central to the formation of customary law because their practice and legal opinion are the constitutive elements of customary law. The recognition of a rule of customary law requires a generally consistent – but not necessarily universal – practice among States. The acid test is whether the practice is sufficiently wide, or extensive, and convincing.

There is also a third source of international law, namely general principles of law. These are legal principles which are recognized in virtually all national legal systems, such as the principle of good faith, or what the International Court of Justice refers to as “elementary consider-

ations of humanity”. In the absence of a clear provision of treaty or customary law, an internationally binding rule can also be derived from such principles. Such determinations require a large amount of research, however, and therefore are more a matter for Courts and Tribunals than for the military practitioner.

Having considered the status of the AMW-Manual, and the constituent elements of the law that it addresses, we should now turn our minds to the main kinds of equipment used in this air and missile warfare, namely aircraft and missiles.

AIRCRAFT (AMW, R1D, G, H, I, U, X)

- State, civil and military aircraft (Chicago Convention)
- Civilian and military aircraft (LOAC)
- Definition of military aircraft

Speaking notes: We considered the definition of aircraft when we considered the notion of air-space, but now is the time to look more specifically at the various classifications into which aircraft may be grouped.

The Chicago Convention of 1944, which is mainly concerned with regulating civil aircraft, nevertheless talks about State aircraft, which it defines as aircraft exclusively serving non-commercial governmental functions, such as police, customs and the military. So immediately we notice that State aircraft can include, but are by no means limited to, military aircraft.

Customs aircraft, as we saw, are regarded as State aircraft, but in the law of armed conflict sense they would normally rank as civilian aircraft.

Where the conduct of hostilities is concerned, the vital distinction is between military and civilian aircraft.

MILITARY AIRCRAFT (AMW, R1X)

Military aircraft are any aircraft that are, cumulatively:

- (i) operated by the armed forces of a State,
- (ii) bearing the military markings of that State,
- (iii) commanded by a member of the armed forces, and
- (iv) controlled, manned or pre-programmed by a crew subject to regular armed forces discipline

Speaking notes: Military aircraft are defined by the Manual as any aircraft that is, cumulatively: (i) operated by the armed forces of a State, (ii) bearing the military markings of that State, (iii) commanded by a member of the armed forces, and (iv) controlled, manned or pre-programmed by a crew subject to regular armed forces discipline.

Aircraft that are military aircraft have the right to exercise belligerent rights, such as the right to attack enemy targets. An aircraft that does not fulfil all of the four stipulations is not a military aircraft and does not therefore have those rights.

SLIDE 12

SLIDE 13

SLIDE 14

CIVILIAN AIRCRAFT

- **Civilian aircraft (AMW, R1h)**
- **Civilian airliner (AMW, R1i)**
- **Medical aircraft (AMW, R1u)**
- **Cartel aircraft (AMW, R1g)**

Speaking notes: A **civilian aircraft** is defined in the Manual as any aircraft other than military or other State aircraft. This is a bit of a contextual issue. Certainly, for Chicago Convention purposes, there is indeed a distinction between civil and State aircraft as we have just seen. However, in relation to the law of armed conflict, the distinction of most frequent importance is that between civilian and military aircraft and the preferred definition of a civilian aircraft for these purposes is ‘any aircraft that is not a military aircraft’.

The Manual then defines **civilian airliners** as civilian aircraft identifiable as such and engaged in carrying civilian passengers in scheduled or non-scheduled service. Clearly civilian airliners on the ground may be empty but awaiting employment for such purposes. Specific protections for such aircraft are discussed in Module 5.

Another class of aircraft that receives specific protections under the law of armed conflict comprises **medical aircraft**. They are defined, and their protections are also described, in Module 5.

Cartel aircraft are aircraft which have been granted safe conduct by virtue of an agreement between the belligerent parties. They are used to perform specific functions, such as the transportation of parlementaires, or of prisoners of war. Parlementaires are persons who have been authorized to enter into negotiations with the enemy (Art. 32 Hague Regulations). It is vitally important that agreements between the parties to an armed conflict are carefully adhered to as a matter of good faith. The importance of the protection to be afforded to cartel aircraft should therefore be understood in that light.

SLIDE 15

MISSILES

- **Missiles (AMW, R1z) distinguished from unmanned aerial vehicles (AMW, R1z(dd), (ee))**
- **Civilian aircraft (AMW, R1h)**
- **Civilian airliner (AMW, R1i)**
- **Medical aircraft (AMW, R1u)**

Speaking notes: Missiles are self-propelled unmanned weapons that are launched from an aircraft, warship or land-based launcher and that may be either guided or ballistic. They may be either rocket- or jet-powered. Cruise missiles, for example, tend to be jet-powered. Usually missiles are guided in some way. Guidance may involve a homing mechanism, such as when a missile homes in on the infra-red signature of a target or on the laser designation of the intended target. Televisual guidance may be used in order to assist an operator to guide the missile to the target whether with the benefit of daylight or e.g. in association with infra-red technology. Alternatively, guidance may be provided by inertial navigation or by satellite navigation, e.g. using Global Positioning System technology.

A ballistic missile, whether inter-continental or otherwise, follows a ballistic trajectory towards its target. Missiles may be designed for use in air to air, air to surface (land or sea) or surface (land or sea) to air attack roles, and different missiles may be fitted with different warheads or a selection of warheads may be employed.

There is an important distinction between missiles and unmanned combat aerial vehicles (UCAV) in that the former generally do not fly conventionally in the sense of deriving support in the atmosphere from interactions with the air but, rather, are propelled through the air towards a target; also, missiles are usually designed to detonate at the target and thus are on a one-way mission, whereas a UCAV is designed to deploy a weapon, which itself may be a missile or a bomb, with the intention that after this has been done the UCAV will be recovered at the end of the sortie.

Having considered the significance of the Manual that lies at the core of our course, and the ingredients of the law that we shall be learning about and some aspects of aircraft and of missiles, the next topic that we should address is the operational context in which air power is employed, and that will be the subject of the next Module.

II. Exercises (Introduction)

Instructions: Participants are divided into work groups numbering up to 5 or 6 students. Each work-group should discuss all of the following questions and should refer to the AMW-Manual as an aid to resolving any legal issues that arise during the discussions. Each group should elect a spokesperson who will present the group's response to the questions. Spokespersons of other groups may comment and present their own solutions. Members of each work group should take turns to present, and respectively comment on, solutions to the plenary course members.

Statements:

- A. Because the AMW Manual has been written by experts acting in their personal capacity, and although it is not a source of law as such, it should be relied upon by all States as an accurate reflection of the law that binds them.
- B. The AMW Manual is unlikely to accurately reflect all of the law that applies to air and missile operations for a particular State.

Question: Which of the above statements accurately reflects the legal position and why?

EXERCISE 1

Answer: B most accurately reflects the position because the AMW Manual is based on the opinions of the experts as to the customary law that binds all States. Individual States may well be bound by additional treaty rules that may not have achieved customary status and must therefore take those additional rules into account when determining what is required of them in relevant circumstances.

EXERCISE 2

Question: What steps do you think a State should take in order to derive maximum actual benefit from the AMW Manual given that it presents in accessible form the customary law binding on all States?

Answer: States should instruct national legal specialists to assess where the customary legal rules reflected in the AMW Manual are supplemented by treaty rules to which the State is subject, as well as relevant national legislation, and produce relevant supplementary guidance. Based on such guidance, States should then initiate training at the legal officer, operator and commander level that incorporates the customary rules in the AMW Manual, the national treaty obligations and relevant national legislation.

EXERCISE 3

Scenario: State A is involved in a political dispute with State B. The armed forces of both have been moved towards the border but no hostilities have yet taken place. Individuals who are believed not to be members of the armed forces of State A and who are believed to have civilian status have started to undertake sporadic bomb attacks in State B.

Question: Is an armed conflict under way?

Answer: Probably not. Unless there is sufficient evidence that the bomb attacks in State B have been carried out by the armed forces or other agents acting on behalf of State A, no direct hostilities seem to have taken place between State A and State B, which could have triggered an IAC. Given that the attacks remain of sporadic nature, they also do not reach the level of intensity required for a NIAC. For the time being, therefore, the events in question appear to be criminal in nature and law enforcement arrangements should be applied.

EXERCISE 4

Scenario: The situation between States A and B has not developed much. The sporadic bomb attacks continue. Now however there have been statements by the leadership of State A expressing the view that “State B needs to be brought to heel” and a bomber has been arrested by State B authorities within State B territory in the act of preparing a bomb. When searched, he was found to be in possession of an identity card of the sort issued by State A’s armed forces.

Question: How would you classify the situation between States A and B now?

Answer: The bombing activity undertaken by a member of the armed forces of State A in State B seems to lead to the conclusion that there are hostilities under way involving the armed forces such as to amount potentially to an IAC. This conclusion may not apply if it is clear for all involved parties that the bomber was acting beyond his authority as a member of the armed forces and that his action could not be regarded as expressing his State's belligerent intent.

Question: Would it make a difference if the identity card (see above Exercise 4) is found to be a forgery?

Answer: Yes, because the act could not be shown to be by a member of State A's armed forces and therefore it could not be demonstrated that the IAC requirement for hostilities between armed forces has been met (unless the act can otherwise be attributed to State A, but the complexities of attribution lie outside the intended scope of this course).

EXERCISE 5

Scenario: State A has decided to find out more about the military structure, plans and capabilities of State B. It is flying missions using its military reconnaissance aircraft outside the territorial airspace of State B and is using on-board listening devices to gather information from within that State.

Question: Is it breaching the sovereignty of State B by virtue of the flights?

Answer: The flights themselves as described in the scenario do not breach the sovereignty of State B because they remain outside the airspace of State B. However, any kinetic, cyber or other activities from those aircraft that cause damage to physical or computer infrastructure within State B would breach that State's sovereignty.

EXERCISE 6

Question: Is your answer (see above Exercise 6) different if one of State A's aircraft by mistake intrudes into State B airspace?

Answer: Yes, any intrusion by a military aircraft into the airspace of another State without having the permission of that State is a breach of the latter State's sovereignty justifying appropriate action in response. In peacetime, however, intrusions by mistake may not be sufficient to trigger an armed conflict and the consequent applicability of LOAC, as the required belligerent intent may be missing.

EXERCISE 7

EXERCISE 8

Task: The AMW Manual explains the division between airspace and outer space in two ways. Give both explanations that the AMW Manual provides and explain the scientific relevance of the speeds that an aircraft would need to have in order to be able to maintain high altitude.

Answer: The rule and commentary refer to the lowest possible perigee of an earth satellite in orbit, to the highest attitude at which an aircraft can fly. As to the scientific aspect, refer to Commentary to Rule 1a, paragraphs 3–5.

EXERCISE 9

Question: An organized armed group cannot by definition have military aircraft. Correct or incorrect?

Answer: Correct. An aircraft used by an OAG cannot fulfill the criteria of being (i) operated by the armed forces of a State, (ii) bearing the military markings of that State, (iii) commanded by a member of the armed forces, and (iv) controlled, manned or pre-programmed by a crew subject to regular armed forces discipline. This means that no aircraft operated by the OAG has the right to undertake a belligerent act, in very much the same way as a member of an OAG in a NIAC has no legal right to directly participate in hostilities.

EXERCISE 10

Question: Civil aircraft as that term is used in the Chicago Convention and civilian aircraft in the law of armed conflict mean the same thing. Correct or incorrect?

Answer: Incorrect. There are classes of aircraft that would be classified as civilian aircraft for law of armed conflict purposes whereas they would be State aircraft under the Chicago Convention. Customs and police aircraft are examples. Aircraft used by the customs services are regarded by the Chicago Convention as State aircraft. They are, however, not military aircraft. Customs aircraft are civilian aircraft in the law of armed conflict in the same way as any other aircraft that is not a military aircraft,

EXERCISE 11

Scenario: State A has filed a flight plan describing a flight as “medical only”. The aircraft is marked with the Red Cross and, because the flight will cross some airspace the control of which is disputed, it has reached an agreement with State B to allow the flight to proceed. The aircraft develops engine trouble and is permitted to land at a State B airbase. The State B authorities take the opportunity to inspect the aircraft and find approximately 20 wounded and sick armed forces personnel on board. Also on board are a large number of personal weapons, about 100 in number, and several boxes of ammunition. State A explains these were taken from the wounded and sick during recent medical flights and they haven’t yet had time to return them to the armoury.

Question: Is the aircraft being used in breach of its status?

Answer: See Rules 78, 80b AMW Manual, and Art. 28(3) API. Medical aircraft do not lose their protected status if they carry small arms and ammunition taken from the wounded, sick and shipwrecked **on board** and not yet handed to the proper service. The sensible interpretation is that the weapons were taken from wounded and sick who were on board when the weapons were removed from them and that the aircraft has not therefore been used in breach of its status. The inspection is in accordance with article 30(2) API, which provides that State B must ensure the condition of the wounded and sick is not adversely affected by the inspection or by any removal of the wounded and sick to facilitate inspection. Ideally, after each flight the arms taken from the wounded and sick should be removed from the aircraft if it is to continue to be used as a medical aircraft to avoid any accusation that State A is misusing its medical status.

Scenario: A State A cartel aircraft is being flown in accordance with an agreement with State B and is conveying representatives of State A's commander to discuss with State B the possibility of a prisoner exchange. During the flight a camera is being used to take photographs of military installations on State B's territory.

Question: What effect does this have on the status of the aircraft and what are State B's options?

Answer: In principle, cartel aircraft benefit from special status and protection under LOAC (AMW, R1(g) und RR64 ff.). Given that aircraft is being used in breach of the good faith that is required between belligerents it loses its protection from attack (AMW, R65). However, it may only be attacked if the criteria in AMW, RR68–70 are satisfied, i.e. diversion for landing, inspection and possible capture is not feasible, no other method is available to exercise military control, the circumstances are grave enough to justify attack, and the collateral damage will not be excessive. All feasible precautions must have been taken, the decision to attack should be taken at an appropriately senior level of command and a warning must be given where appropriate.

EXERCISE 12

MODULE 2 – THE OPERATIONAL CONTEXT

I. Lecture

SLIDE 1

THE OPERATIONAL CONTEXT

Speaking notes: We are only going to make sense of the law of air and missile operations if we understand the operational context in which they are undertaken. In order to achieve this understanding, we will do three things: (1) we will cover quite a bit of doctrine, (2) we will review some of the essential characteristics of air and missile operations, and (3) we will try to set the background for a subsequent explanation of the legal rules.

SLIDE 2

AIR POWER – PURPOSE AND CHARACTERISTICS

- Purpose
- Air power – joint and pervasive
- Speed, reach and height
- Flexible, adaptable, ubiquitous
- Cost-effective, precise

Speaking notes: In general terms, the purposes of air power are to support national security objectives by preventing conflict and threats, by protecting national territory from attack and by projecting influence and power rapidly and responsively.

Air power is the use of air capabilities to influence the behaviour of actors and the course of events. Air power is inherently **joint**, because it seeks to create effects and exert influence primarily in other domains. It is also **pervasive**, because it is not limited by natural terrain or physical barriers and thus can potentially access anywhere on Earth.

The core attributes of air power are speed, reach and height. If any location within 300 nautical miles is accessible by an aircraft at 30,000 feet within 30 minutes, this clearly has important implications for the ability to bring force to bear in a timely way. On arrival at the relevant location, the airman occupies the quintessential “high ground”, can differentiate friend from foe, can engage targets with precision and potentially with differing degrees of force, and all the while he can gather information to inform future operations. Air operations from the World War I days of the Zeppelin to modern Predator drone attacks are all about taking the fight to the enemy or, to put it another way, the offensive use of air power. Force from the air can be used alone or in close support of other assets such as ground forces, and in either context it can prove to be a ‘game changer’. Additional attributes include flexibility, adaptability, ubiquity, cost-effectiveness and precision.

In air-led campaigns the use of air power has recently proved to be most decisive when the air component is properly integrated with other levers of power rather than used in isolation. In Kosovo (1999), the desired outcome was achieved when diplomatic pressure and the threat of a land offensive were used to support the effects created by the air campaign. In Libya (2011), indigenous anti-government forces overthrew the regime under the umbrella of NATO air operations designed to protect the civilian population. Strategic attack remains an important role for air power.

However, rapidly getting to a troubled theatre to deter aggression or to keep important communications routes open and unchallenged can also be very strategically useful. Operating in land, sea or exclusively air contexts, air power’s vital attribute is its unique ability at speed to strike at the heart of the adversary’s military command and control to achieve strategic effect. It can therefore employ deep reach and rapid effect in order radically to improve outcomes on land or at sea.

But to be effective it has essential requirements, such as the intelligence that is vitally necessary to clarify what persons or objects should be engaged, how and when that engagement should be undertaken in order to deliver the required operational consequences – and yet, ironically, the air domain, through its multiple sensors, also contributes critically to the development and maintenance of an accurate picture of the battle-space. Air power is therefore both a consumer and a provider of information.

CONTROL OF THE AIR – “FAVOURABLE AIR SITUATION”

Enemy air operations cannot prevent friendly air, land and sea operations

SLIDE 3

Speaking notes: The potential of air power unfolds best when there is control of the air. There are different degrees of control of the air, and the first and least controlling of these is called a “favourable air situation”. This exists when enemy air activities cannot prevent friendly air,

land and sea operations. Note carefully: it is only the **enemy's air activities** and their ability to **prevent friendly operations** that are relevant. So you could have a favourable air situation in which you have no control of the ground and in which the enemy is therefore able to disrupt your air operations by using, for example, surface-based assets, such as anti-air artillery.

SLIDE 4

CONTROL OF THE AIR: "AIR SUPERIORITY"

Degree of dominance in the air battle which permits the conduct of land, sea and air operations at a given place and time without prohibitive interference by the opposing forces.

Speaking notes: The next level of control of the air is called "air superiority". It is restricted to a particular place, which may be a relatively small or a relatively large place and is also restricted in time, so the relevant period when air superiority is enjoyed may be short or long. Note also the definition is not saying there can be no interference by opposing forces, only that such interference will not prevent friendly forces from operating.

SLIDE 5

CONTROL OF THE AIR: "AIR SUPREMACY"

That degree of air superiority which renders the opposing air force incapable of effective interference.

Speaking notes: The greatest level of control of the air is known as "air supremacy", which prevents the opposing air force from making any effective interference. When supremacy is achieved the enemy's air assets are effectively prevented from influencing the outcome of the battle. Again, of course, this does not mean that other enemy military assets are necessarily also unable meaningfully to influence events. Indeed they may well be able to do that.

Crucial to achieving control of the air are counter air operations. These are operations directed against the enemy's air and missile capability with the purpose of achieving and maintaining a particular degree of air superiority. "Counter air" protects friendly forces from enemy air and missile attacks, seeks to deny the use of the air to the enemy and maintains the degree of freedom of action needed to conduct other missions. There is a clear and direct relationship: as control increases, the ability of the enemy to interfere diminishes, and vice versa.

So air power brings flexibility, mobility and precision to the battle-space, but does it also have limitations or drawbacks?

LIMITATIONS OF AIR POWER

- Reliance on information
- Payload
- Dependence on ground support
- Cost
- Weather
- Possibly limited endurance
- Cannot possess the ground
- Vulnerability

Speaking notes: Air power relies on information being available and accurate, and perhaps this should be listed as its first drawback. This applies irrespective of whether lethal, non-lethal or non-kinetic means are employed or whether information-gathering alone is the objective of the sortie. Payload limitations will always restrict the commander's options to a degree, as will the lack of endurance of some platforms. Clearly, the greater the endurance of an air vehicle, the longer it will be able to spend in the vicinity of the target. Indeed, certain novel unmanned technologies will be able to remain in the target area for protracted periods. Another important issue is undoubtedly cost. Modern manned attack aircraft are hugely expensive and while unit costs of some unmanned platforms may be somewhat lower, overall costs associated with the use of unmanned capabilities are likely to be increased if losses of airframes, for example due to enemy fire, prove to be greater than would be expected in the case of comparable manned aircraft operations.

The operating environment may produce drawbacks of its own. Cloud, and other bad weather may, as we note later in this Module, diminish the performance of onboard sensors. Even if a high level of control of the air is achieved, accomplishment of some strategic objectives may presuppose possession, indeed occupation, of the ground which air assets alone are unlikely to be able to achieve – consider that it was the land operations, relatively brief though they were, that brought Gulf War I to a conclusion. Air platforms are also potentially vulnerable to ground to air and air-to-air missiles, among other threats, and this also must represent a limitation, and thus a drawback.

COUNTERING THE LIMITATIONS

Establishing a “recognized air/ground picture” through:

- Presence over battlespace
- Sensors
- Human intelligence
- Other sources of information

Speaking notes: There are, however, activities that can be undertaken to address these perceived limitations. These include the use of a wide variety of sensors, and other sources of information to develop recognized appreciations of what is going on in the air and on the ground,

usually referred to as the ‘recognized air picture’ and the ‘recognized ground picture’. Maintaining a constant, or as near to constant as can be achieved, presence over the battlespace refines the understanding of who and what are active where, in what manner and with what potential tactical, operational or strategic consequences. Space, air, ground, human intelligence and other assets all contribute to these pictures that are increasingly fused and thus usable by heavily tasked aircrew, UAV/UCAV operators and others. Indeed the sensors informing a pilot in the cockpit may be located on his or another aircraft, on a satellite, on a UAV, on land or elsewhere. By achieving awareness of the threats that confront the effective use of air power, it is possible to take measures with a view to countering those threats and thus to continuing to be able to operate successfully.

SLIDE 8

SOME IMPORTANT SYSTEMS

- **AWACS**
- **Air to air refueling and engaging**
- **Deeper targets**
- **Unmanned platforms and persistence over targets**
- **Stealth/metamaterials**

Speaking notes: We have been speaking about air power in the abstract. It is now time to give the notion a little more granularity by discussing some of its elements. **Airborne warning and control systems (AWAC)**, are aircraft, hence ‘airborne’, equipped with the technology to enable those on board to manage and exercise command and control over the battle, to track platforms, to undertake surveillance and target identification tasks and to provide a near real time picture of the battle-space to the Joint Air Operations Centre. AWACs also give a not necessarily complete situational awareness of friendly, hostile and neutral activity.

Air to air refueling (AAR) enables access to targets that are deeper, meaning that the targets are located at a greater distance inside the enemy’s zone of operations. Indeed, more generally it enables the prosecution of targets that are more distant from the air base, be that on land or afloat and AAR can increase the time spent in the target area. **Novel unmanned platforms** can provide even greater persistence over the target for ISTAR (information, surveillance, target acquisition, and reconnaissance) and some attack platforms contributing to the development of a ‘pattern of life’ understanding of movement and activity in the battlespace. This can be a vital element in seeking to ensure that attacks comply with the vitally important targeting law principles and rules that we will discuss in the next Module.

Stealth technologies aim to reduce the radar signature of attack aircraft to help them to evade air defence threats. **Metamaterials** technology takes this stealth notion one stage further, as we shall see in Module 6, by causing the platform to become invisible to certain kinds of sensor.

THE PRECISION ATTACK REVOLUTION

- Laser guidance
- Infra-red guidance
- GPS guidance
- Televisual guidance
- Electro-optical guidance
- Radar guidance
- and other technologies

Speaking notes: Precision in attack has undoubtedly represented a major and positive development in the conduct of air operations. It has dramatically reduced the number of sorties required to apply an explosive munition within a given distance of a target. If earlier the best we could aim for was to hit the area near a particular target building, now the question is whether we can hit the right part of the building, with a munition fused to detonate on the right floor and with an explosive fill designed to limit destruction to the objects or persons that are the intended focus of the attack. This revolution has been enabled by the development of guidance systems using laser, infra-red, GPS, radar, and televisual or electro-optical devices, and of other technologies. We will look at some features of these technologies in a short while, but be aware that while precision munitions can be very precise, they can also go precisely wrong, e.g. because of faulty intelligence, the feeding in of erroneous data, enemy countermeasures, faulty manufacture and any number of other causes.

But let us not forget air-to-air engagements. These can employ within and beyond visual range missiles and where the latter are concerned, sensors are employed that enable a missile to be fired from a range at which the target aircraft cannot be actually seen by the pilot. The pilot fires in the known direction of the target and relies on on-board sensors to acquire, home in on and engage the intended target.

THE PRECISION ATTACK REVOLUTION

- Precision attacks facilitate accurate weaponeering
- However: 'Dumb' bombs not unlawful
- Human role in achieving precision

Speaking notes: We will discuss targeting in Module 3. But at this stage in the course we should note how weaponeering has contributed to this 'precision revolution'. It is hard to 'weaponeer' if you cannot get a munition within a sensible distance of a target. So it is the technology of precision that makes it possible to try to determine how much of which kind of weapon is needed to achieve a desired kind and / or level of damage and, thus, of effect. All sorts of factor contribute to this weaponeering activity, including the vulnerability and nature of the target, the effects the weapon normally generates, the likelihood of a target kill, the reliability of the weapon, delivery issues such as weather and cloud and so on.

But as you will discover on this course, the use of non-precision bombs is not unlawful. Against appropriate targets, the use of so-called ‘dumb’ bombs is a perfectly lawful method of warfare.

In the next series of slides we look at several of the precision attack technologies in turn noting some of the operational advantages and weaknesses of each. Always remember that technology is only part of the story. To achieve appropriately precise attacks in practice, the technology must have been correctly installed and operated, the users must have received the appropriate training, relevant data must have been accurately loaded, relevant equipment must be properly serviced and maintained, collateral risks must have been carefully evaluated by reference to the characteristics of the weapon, and if the area of blast and/ or fragmentation effect of the weapon can be adjusted, e.g. by raising or lowering the explosive fill, or if the fusing arrangement can be altered to suit the requirements of the particular attack these adjustments must have been properly made.

SLIDE 11

“PROS” AND “CONS” OF PRECISION TECHNOLOGIES

Radar guided weapon (e.g. “Storm Shadow”):

- **Pro: Sees through cloud**
- **Pro: Day/night capable**
- **Con: Can be jammed**

Speaking notes: So here we look at radar guidance, and immediately you see that if cloud is likely to be present over the target area, perhaps this sort of munition should be considered, but if radar jamming is a threat, other available methods of attack might well be preferable. An example of this type of weapon is the air-launched cruise missile “Storm Shadow” / “SCALP EG”).

SLIDE 12

INFRA RED /IMAGING INFRA-RED (E.G. GBU15)

- **Pro: IIR has high precision**
- **Con: Does not see through cloud**

Speaking notes: If cloud is likely in the target area, this precision technology will likely not be employed, but where cloud is absent it may well be the preferred option, particularly for high value targets that are relatively close to civilians or civilian objects. An example of this type of weapon is the “Guided Bomb Unit 15” (GBU 15).

SLIDE 13

LASER GUIDANCE (E.G. PAVEWAY)

- **Pro: Very precise**
- **Pro: Designation from launch aircraft, buddy aircraft or ground**
- **Con: Does not see through cloud**

Speaking notes: Again, this precision technology cannot see through cloud, and in clear conditions the precision of the ultimate attack is likely to depend on the accuracy of the target designation which is influenced by the manner in which the target designation is done. An example of this type of laser guidance system is the “Paveway”, system, which can be used to upgrade unguided systems.

ELECTRO-OPTICAL GUIDANCE (E.G. PHYTON 5)

SLIDE 14

- **Pro: Very precise with good identification capability**
- **Con: Does not see through cloud**
- **Con: Requires additional guidance if the target is beyond visual range**

Speaking notes: Here again cloud impedes the use of precision technology. An example of an electro-optical guidance system is the Israeli” air-to-air missile “Phyton 5”.

GPS-GUIDED WEAPONS (E.G. JOINT DIRECT ATTACK MUNITION)

SLIDE 15

- **Pro: Reasonable precision and no real weather effect**
- **Con: GPS can be jammed**
- **Con: No identification capability**

Speaking notes: Where weather is a problem, perhaps GPS guidance may be the answer, but not if the enemy are known to be jamming GPS. An example of this type of a GPS-guided weapon is the US Joint Direct Attack Munition (JDAM), which can be used to upgrade otherwise unguided bombs.

MILLIMETRE WAVE RADAR-GUIDED WEAPONS (E.G. BRIMSTONE)

SLIDE 16

- **Pro: Not affected by dust, smoke, chaff and flares**
- **Pro: Programmable to reduce collateral damage**
- **Pro: Self-destruct option**

Speaking notes: In case of GPS jamming and if smoke or desert dust are causing problems, perhaps millimetre wave radar-guided bombs may be the answer. An example of this type of weapon is the British air-borne anti tank missile “Brimstone”.

Of course the commander is most unlikely to have all these technologies available for use, so sub-optimal options are likely to be considered, but the weapon that is chosen and the method of using it that is selected must comply with targeting law rules that we discuss in Module 3.

SLIDE 17

MEASURING PRECISION

Circular error probable (CEP): A circle, centred at the mean, whose circumference is expected to contain 50% of impacts.

CEPs for particular munitions:

- Unguided bomb: 20 to 30 m
- Inertial navigation system bomb: 15 to 20 m
- GPS guided bomb: 10 to 15 m
- Laser guided bomb: 5 to 10 m
- EO/IR guided bomb: 3 m

Speaking notes: We have talked extensively about precision but how can that notion be measured? The Circular Error Probable is the usual measure. This is the radius of the circle, which has the mean of impacts at its center and within which 50 percent of the munitions are expected to fall.

How do the technologies we have been discussing compare? You can immediately see that the electro-optical / infra red fitted weapons perform best but remember all the other factors including contextual ones, some mentioned earlier on, that contribute to the precision of an actual attack, and the factors such as weather, dust etc., that may render particular weapon systems inappropriate to the circumstances of the relevant target.

SLIDE 18

SOME ADDITIONAL ISSUES

- Access
- Outer space
- Political priorities

Speaking notes: The limitations we mentioned earlier are not the only constraints on air operations. Obtaining **air access** to the theatre of operations may be a challenge if necessary overflight permission is not forthcoming or is only granted on conditions or subject to restrictions that impede the accomplishment of the military mission. The orbits of **critical satellites** may be such that a complete picture is not available from space assets – the theatre of operations may be invisible to the relevant satellites, or it may not be visible to them at the times that are required for planned operations. This may make it difficult to determine what is going on in particular locations, or what routinely happens there and thus it may be hard to determine what collateral risks are posed by particular attacks. **Political priorities**, as reflected in ROE, may also constrain the air commander.

ELEMENTS OF AIR OPERATIONS

- **Offensive counter-air**
- **Defensive counter-air**
- **Strategic air operations**
- **Anti-surface air operations**
- **Suppression/destruction of enemy air defences**
- **Combat air support**

Speaking notes: Irrespective of these constraints, air operations will undoubtedly include some or all of the following activities.

- **Offensive counter-air** involves operations to destroy, neutralize, disrupt or limit enemy air and/or missile power as close as possible to its source and at a time and place of the attacker's choosing. Destroying air assets on the airfield would be a classic example.
- **Defensive counter-air** involves the defence of friendly territory, airspace and air assets against hostile enemy actions – it may involve airborne or land-based measures. Rapier airfield defence missiles would be an example of the latter and air assets scrambled to defend friendly airfields would typify the former.
- **Strategic air operations** have the purpose of defeating the enemy's strategic 'centre of gravity', the objects, capabilities, personnel or other things on which his power and ability to conduct the fight are most critically based. Vital targets such as command elements, energy sources, war production and supporting infrastructure linked to that centre of gravity will tend to be the focus of these activities.
- **Anti-surface operations** include the interdiction of land targets from the air and close air support of friendly forces on the ground. Nearby enemy elements may be bombed or strafed, for example while they are actually attacking friendly forces. It follows from this that close air support is inherently reactive in nature and may well be required at very short notice. Tactical support of maritime operations may include anti-surface and anti-submarine warfare.

The suppression or destruction of enemy air defences can include destroying, neutralizing or degrading ground-based air defences, while combat air support, for example transporting troops, may take place at the strategic level, between theatres, or at the tactical level within a theatre.

THE IMPORTANT ROLE OF THE LEGAD

Speaking notes: So this is the context in which the air commander will need legal advice on a daily basis at all stages from initial planning to final execution of the air campaign.

The legal advisor (LEGAD) is a critical element in the air commander's team – he fills a vital seat at the Commander's table, and his advice will be central to the commander's decisions as to which attacks proceed and which do not. It is therefore important that the LEGAD combines a sound knowledge of the relevant law with a good appreciation of the attributes of air power some of which we have discussed. He or she must be thoroughly familiar with the military situation that the commander is addressing, must be entirely conversant with applicable

rules of engagement and with the military and political situations that inform them, and perhaps above all the LEGAD must have the confidence of the commander. The commander requires clear, concise and accurate advice from his LEGAD. The LEGAD needs from his Commander frankness, openness, and a recognition of the role of law in military operations and the role of the LEGAD in interpreting the law.

This, then, is the operational context in which the law must be applied. We must now consider what the legal rules are that must be applied in that context, and that will be the subject of the next Module.

II. Exercises (The Operational Context)

Instructions: Participants are divided into work groups numbering up to 5 or 6 students. Each work-group should discuss all of the following questions and should refer to the AMW-Manual as an aid to resolving any legal issues that arise during the discussions. Each group should elect a spokesperson who will present the group's response to the questions. Spokespersons of other groups may comment and present their own solutions. Members of each work group should take turns to present, and respectively comment on, solutions to the plenary course members.

EXERCISE 1

Task: Consider the following statement: "The advantages of airpower in modern warfare are equalled by its drawbacks." Identify what you consider to be the 5 most significant advantages and the 5 most significant drawbacks of air power and work out whether, in your opinion, the statement is right or wrong.

Answer: There is no fixed list of correct advantages or limitations of airpower, and there may be various correct answers. The purpose of this task is to provoke a discussion among the participants based on their own critical analysis and evaluation of the advantages and limitations of airpower on contemporary warfare. The discussion may well result in different sets of advantages and limitations for different contexts. Depending on the circumstances, the most common advantages and limitations of airpower may include the following:

Advantages (non-exhaustive list):

1. Speed (short reaction, attack and withdrawal time)
2. Geographical reach, ubiquity (irrespective of topography)
3. Precision
4. Flexibility, adaptability
5. Cost-effectiveness

Limitations (non-exhaustive list):

1. Dependence on ground support and accurate intelligence
2. Dependence on weather conditions
3. Limited ability to control territory or persons
4. Limited endurance and payload
5. Comparatively high (absolute) costs

Task: Consider the following alternative statements:

1. Air supremacy is decisive for the successful outcome of most, if not all, modern armed conflicts.
2. While air supremacy can be helpful, the successful outcome of most, if not all, armed conflicts still depends on the employment of ground forces (“boots on the ground”).

Question: Which of these statements most accurately describes the state of affairs in modern armed conflict?

Answer: There is no straightforward right or wrong answer for all circumstances. The purpose of this question is to generate discussion among the participants on how the advantages and limitations of air supremacy may play out in the practice of contemporary armed conflicts.

EXERCISE 2

Task: Consider the following statement:

“Air power reaches deep into enemy territory, applies force there with impressive precision, can degrade the enemy’s performance by wrecking his command structure, but irritates the opposing population into actively supporting regimes and groups that, left alone, they would be happy to hate”.

Question: In your opinion, is this statement true, false or simplistic?

Answer: There is no straightforward right or wrong answer. The purpose of this question is to generate discussion among the participants on the advantages and limitations of airpower in contemporary armed conflicts.

EXERCISE 3

Scenario: State B wants to attack a command and control facility in State A. During the day thick cloud is predicted in the area of the facility. By night the wind gets up and blows sometimes thick sandy dust in the area making it hard to see more than a few tens of meters. Radar jamming by the enemy has become frequent, even routine, in recent months, and there is some evidence that the enemy has the capacity to jam GPS. Your commander appreciates that the

EXERCISE 4

target, the command and control centre, is located in a civilian area. Many civilians have left, but not all of them. He wants to know which precision technology gives him the best hope to destroy the target while avoiding or, at least, minimizing collateral harm.

Task: Provide your commander with legal advice assuming that all options discussed in the presentation are available.

Answer: Not radar guidance, such as storm shadow, because radar jamming is likely. Not infrared, laser guided or electro-optical as they don't see through cloud. You could use GPS and take the risk of jamming. The best solution may be to use a millimetre wave radar-guided weapon such as Brimstone, given the relative immunity to countermeasures, dust, smoke, chaff and flares, and the enhanced capability to avoid collateral damage and to self-destroy.

MODULE 3

– TARGETING FROM THE AIR

I. Lecture

(TITLE): THE LAW OF AIR AND MISSILE TARGETING

SLIDE 1

WHAT IS TARGETING?

SLIDE 2

- Who and what may be attacked?
- Which attacks are prohibited?
- What precautions must be taken?

Speaking notes: We are now going to talk about targeting in air and missile operations, but before we get into the detail, we must start by considering what targeting is. In the military context, it comprises a selection of activities, including the planning and executing of attacks, deciding which persons and / or objects should be the focus of attack, getting together the information that will determine whether an attack will meet military, legal and operational requirements, deciding on which weapons are to be employed and on the timing and technique to be employed when firing those weapons, assessing the likely incidental consequences of potential attacks, conducting battle damage assessments and it also includes actually carrying out attacks. So it is obviously vitally important to know, in legal terms, who and what may be attacked, which attacks are prohibited and which precautions must be taken. All of these matters will be covered in the course of this presentation.

VITAL LEGAL PRINCIPLES

SLIDE 3

- Principle of distinction (AMW, R10a)
 - between combatants and civilians
 - between military objectives and civilian objects

- Lawful targets (AMW, R10b)
 - military objectives (AMW, R1y, R22)
 - combatants (AMW, R10b(i))
 - Directly participating civilians (AMW, Section F)

Speaking notes: Not all methods of conducting hostilities are lawful. Some objects and persons are protected from attack and that is where the principle of distinction comes in. The principle of distinction is the fundamental basis of all of the law of targeting. It is a customary legal principle that therefore binds all States. It requires that a distinction shall at all times be made between the things (called military objectives), and persons (called combatants), that may lawfully be made the object of an attack and the things (called civilian objects), and the persons (called civilians), which should be respected and protected from the effects of military operations. The AMW Manual groups military objectives and combatants together and refers to them as ‘lawful targets’, meaning things or persons that may lawfully be targeted. But you see on the slide reference to civilians who directly participate in the hostilities. So there are some circumstances in which civilians can lawfully be targeted. There are also circumstances in which combatant are “hors de combat” and, therefore may no longer be targeted. But we will discuss both of these exceptions later. In non-international armed conflicts, there is no formal combatant privilege, but the principle of distinction still applies, so the distinction that should then be made is between peaceful civilians on the one hand, and those fighting on behalf of the belligerent parties on the other, including governmental armed forces, dissident armed forces and other organized armed groups (fighters), as well as civilians directly participating in hostilities.

SLIDE 4

MILITARY OBJECTIVES

Objects whose “nature, location, purpose or use make[s] an effective contribution to military action and [whose] total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage” (AMW Manual, R1y)

Speaking notes: As we have seen, the things that may be made the object of an attack are called ‘military objectives’. Objects which are not military objectives are called ‘civilian objects’. To be a military objective an object must pass two distinct, but linked, tests. It must make an effective contribution to military action and its destruction, capture or neutralization must, in the then prevailing circumstances, offer a definite military advantage. Destroying something that is contributing to military action will, generally, offer a definite military advantage, so often in practical terms the tests will tend to merge into one, although both elements must be considered when evaluating a prospective target. The object must offer a definite military advantage, as opposed for example to a political advantage or an advantage of some other nature. The AMW Experts did not agree that war sustaining, economic targets should be included. So, for example, the cotton crop that financed the Confederate war effort during the American Civil War would not be a military objective and thus would not be a lawful target. Economic support may be effective and even indispensable for the overall war effort, but it is inherently indirect in nature and does not constitute an integral part of the hostilities.

MILITARY OBJECTIVES (CONTINUED)

- Nature = inherent character (AMW, R22a, R23)
- Location = geographical location or area (AMW, R22b)
- Purpose = intended future use (AMW, R22c)
- Use = current use (AMW, R22d)

Speaking notes: As the definition makes clear it is the nature, location, purpose or use of the object that must make an effective contribution to military action for it to be capable of being a military objective. The nature of an object refers to its inherent character. A tank, artillery piece, military fortification, fighter aircraft or weaponized drone all have an inherent military nature. A location, such as a mountain pass or elevated area of ground, may have military importance and thus be a military objective. Equally it may be the enemy's intention to use a civilian-looking object such as an apartment block for military purposes, e.g. as a military command post or they may currently be so using it. Either circumstance will also cause the object to become a military objective. When evaluating information as to intended future use, ask yourself is it reasonable to conclude that the intelligence as to intended military use is strong enough to regard this object as something that can lawfully be attacked. Dual use objects are military objectives because of the use made of them by the military.

EXAMPLES OF MILITARY OBJECTIVES BY NATURE (AMW, R23)

- Military equipment/facilities
- Defence Ministry
- Munitions factories
- Energy production serving military use
- Military POL-storage (petroleum, oil and lubricants)
- Military communication lines

Speaking notes: The slide shows examples of items that are military objectives by nature. There will usually be no difficulty in concluding that such items satisfy the 'effective contribution to military action' and 'definite military advantage' tests, but those tests must nevertheless be applied.

AIRCRAFT AS MILITARY OBJECTIVES

- Enemy military aircraft: generally by nature (AMW, R26)
- Any other aircraft: by location, purpose or use (AMW, R27), e.g.:
 - carrying out hostile acts in support of the enemy
 - supporting enemy military action, such as intelligence gathering
 - resisting interception
 - disobeying landing/inspection/capture instructions
 - otherwise making an effective contribution to military action

Speaking notes: Not all military aircraft are military objectives by nature. Medical aircraft for example and aircraft protected by an agreement between the parties to the armed conflict are not military objectives even if they are military aircraft. The slide refers to hostile acts in support of the enemy, but: what are “hostile acts” for these purposes? They certainly include interception, attacks (including unlawful attacks), electronic warfare, collecting information to support targeting, surveillance, reconnaissance (recce), transporting troops and/or military supplies. If the activities of an aircraft do not make it clear whether it is a military objective, it may be ordered to identify itself, to state what activities it is undertaking, to land for inspection, and it might be the subject of capture as prize.

SLIDE 8

MILITARY ADVANTAGE

Military advantage must be:

- **military, not political**
- **not speculative**
- **not indirect (war-sustaining)**

Speaking notes: The notion of effects-based targeting is grounded on the consideration that by attacking certain kinds of target, which may or may not come within the legal definition of ‘military objective’, the opposing leadership may be persuaded to act in a particular manner or to make decisions that are helpful to the attacking side. Such theories must not be the sole basis on which an object is attacked. The object will only be a lawful target if it satisfies the military objective definition. The advantage from the attack must be military in nature, not political and must be definite and direct, not the result of speculation as to possible responses e.g. by politicians or other leaders. Most of the AMW experts also rejected the idea that objects that are war-sustaining, such as civilian oil export industries and other economic assets, can be targeted. Similarly, it would be unlawful to attack civilian targets associated with the family of a political or military leader, even if such attack would be likely to persuade that leader to act in a particular way.

SLIDE 9

PERSONS AS LAWFUL TARGETS

- **Combatants (AMW, R10(b)(i)):**
 - **Members of armed forces (regular/irregular), except medical & religious personnel**
 - **incl. law enforcement/paramilitaries if incorporated into armed forces**
- **Civilians directly participating in hostilities (AMW, R10(b)(iii) & Section F)**

Speaking notes: Article 43(2) API binds most States in the world and explains that members of the armed forces, with the exception of medical and religious personnel, are combatants. This means that they can be targeted at all times, day and night, on and off duty. The API rule stipulates that to be an armed force, there must be a responsible command, and an internal disciplinary system that enforces compliance with LOAC. LOAC breaches do not generally deprive

a combatant of combatant status. Combatants must however distinguish themselves from the civilian population during attacks or military operations preparatory to attacks. This rule is relaxed in some difficult situations of combat provided the individuals carry their arms openly during military engagements and when visible to the enemy during military deployments preceding an attack in which the individual(s) are to take part; Art. 44 API. Combatants will also include armed law enforcement and paramilitary personnel if their force is incorporated into the armed forces by the party to the conflict to which they belong. States that do this are required to notify the adverse party of such action, but if they fail to do so, the relevant individuals can still be targeted. States that are not party to API are likely to adopt the position that only persons coming within Article 1 of the Hague Regulations 1907 have the right to participate in hostilities. The 1907 regulations refer to armies, but also to militia and volunteer corps: (1) that are commanded by a person responsible to a belligerent party for the conduct of his subordinates, (2) that wear a distinctive sign, (3) that carry their arms openly, and (4) that generally conduct their military operations in compliance with LOAC.

PROTECTION OF PERSONS *HORS DE COMBAT* (AMW, R15)

SLIDE 10

Applies to persons who would otherwise constitute legitimate military targets:

- **Combatants**
- **Civilians having taken a direct part in hostilities**

Speaking notes: Art. 41 API expresses a well-established rule of law prohibiting the denial of quarter. “Denying quarter” means ordering that there will be no survivors, threatening to do so or conducting hostilities on this basis. A related rule prohibits targeting of persons who are, or should be recognized as, hors de combat. Persons are hors de combat if they are in the power of the enemy, or clearly express an intention to surrender or are unconscious or incapacitated by sickness or wounds and incapable of defending themselves. They must, however, refrain from hostile acts and must not try to escape. So a pilot of an attacking aircraft must do all that he can to determine whether persons who are the object of his attack are hors de combat. If the attack is from high altitude or if the circumstances otherwise make it impractical for the pilot to detect e.g. that persons on the ground are seeking to surrender, he will have to rely on other sources of information, if available, in that respect. However the rule is not broken if the attacker could not reasonably have detected that the targeted individual(s) were trying to surrender.

There is no generally accepted method of indicating surrender of a military aircraft, so to make it clear that they are in fact surrendering, the surrendering crew may have to parachute from the aircraft. It is important to note that a directly participating civilian who has been rendered hors de combat is also protected by Article 41 API and may not be made the object of attack.

SLIDE 11

PROHIBITED TARGETS

- Civilian objects (AMW, R1j)
- Civilians (AMW, R11)
- Persons/objects entitled to specific protection (see Module 5)

Speaking notes: Objects that are not military objectives are called ‘civilian objects’ and must not be made the object of attack. Similarly, all persons who are not combatants, medical or religious personnel are civilians and they also must not be made the object of attack (unless they directly participate in the hostilities, as to which see below). But the important point to note here is that civilians and civilian objects are both negatively defined notions, persons who are not combatants, objects that are not military objectives. This ensures that all persons and objects fall into one category or another and are either liable to be attacked or are protected by the law. But remember, with objects, their location, intended future use or current use may at any time convert them from being civilian objects into becoming military objectives.

SLIDE 12

DIRECT PARTICIPATION IN HOSTILITIES (AMW, R28)

- Loss of civilian protection from attack
- Customary law status
- Meaning not defined in treaties
- Threshold of harm; causation and belligerent nexus

Speaking notes: Customary and treaty law applicable in both international and non-international armed conflict provides that civilians lose their legal protection from being made the object of an attack if, and for such time as, they take a direct part in hostilities (Art. 51 (3) API and Art. 13 (3) AP II). The problem is that the treaties do not explain what exactly is and is not regarded as direct participation in hostilities (DPH), nor do they say when DPH begins and ends. There are diverging views among experts, for example as to the activities that amount to DPH, as to when DPH respectively begins and ends and as to which circumstances give rise to a continuous loss of protection from attack. Most experts agree, however, that for an act to amount to direct participation in hostilities: (1) it must inflict harm reaching a certain threshold on a belligerent party, (2) there must be a direct causal link between the act and such harm, and (3) the act must be intended to benefit one belligerent party to the detriment of another (belligerent nexus). These criteria have been most prominently discussed in the ICRC’s “Interpretive Guidance on the Notion of Direct Participation in Hostilities under International Humanitarian Law” (2009), which reflects the organization’s views on this topic.

GENERAL EXAMPLES OF DPH (AMW, R29)

- Planning/deciding/executing attacks
- Target acquisition
- Defending legitimate military targets
- Conducting cyber/electronic attacks
- Communications support to combat operations

Speaking notes: There are some activities that all experts would agree amount to DPH, and here are some examples. Civilians, for example employees of security firms, whose task is to provide security to civilian facilities against criminal risks, such as theft, are not DPH, but it may be hard of course for the enemy to distinguish e.g. civilians securing a pipeline against criminal attacks (which does not qualify as DPH) from civilians defending the same pipeline against military attack (which qualifies as DPH).

EXAMPLES OF DPH IN AMW (AMW, R29)

- Controlling or operating unmanned combat aerial vehicles (UCAV)
- Loading ordnance onto strike aircraft for specific combat missions
- Servicing combat aircraft for specific combat missions
- Loading mission control data for specific combat operations
- Preparing aircrew for specific combat missions

Speaking notes: The distinction here is between general military maintenance and capacity building (which does not qualify as DPH) and actually making use of that capacity to inflict harm on the enemy (which qualifies as DPH). Thus, as soon as action is taken in preparation of the aircraft or crew for a particular combat mission (servicing, maintenance, loading ordnance or data, instructions, briefings etc.) such action already constitutes an integral part of that mission and therefore amounts to DPH. A person whose activities are limited to creating a general capacity to undertake unspecified combat missions, on the other hand, has not become an integral part of any such operation. Therefore, his participation in the hostilities remains indirect and does not entail loss of protection against attack.

“FOR SUCH TIME AS”

Three issues:

- when does direct participation begin and end?
- the ‘revolving door’ of protection
- members of OAG with continuous combat function

Speaking notes: So, when the law says that civilians lose protection ‘for such time as’ they DPH, what does that mean? For a civilian who undertakes an isolated act of DPH, it starts when he prepares for his act of hostility, and ends when he resumes normal peaceful civilian life hav-

ing completed that act. But what if this is an individual who participates directly on a regular basis? The ICRC says he only loses protection from attack on a continuous basis if he engages in DPH on an organized basis, namely by assuming a continuous combat function for State armed forces or an organized armed group. Others argue that regular participants should lose protection throughout the period spanning acts of participation, irrespective of any affiliation to a belligerent party. It will be for States and jurisprudence to provide binding guidance on these matters.

SLIDE 16

HUMAN SHIELDS (AMW, R45)

- Human shielding is a prohibited method of warfare

Speaking notes: Human shielding involves positioning civilians in order to screen or impede military operations. It often takes the form of placing civilians in the vicinity of combatants and other military objectives, or vice versa, with a view to rendering a lawful target immune from attack. Human shielding is a prohibited method of warfare (Art. 51 (7) API). However, a party to the conflict planning to attack a target protected by human shields must nevertheless continue to comply with the targeting rules we are discussing, including the principles of distinction, proportionality and precautions that will be explained shortly (Art. 51 (8) API). In some respects, the legal consequences of human shielding in the context of air and missile warfare have remained controversial. So in the next two slides we will look at the competing interpretations.

SLIDE 17

INVOLUNTARY HUMAN SHIELDS

Two interpretations:

- Immune from attack, considered in proportionality and precautions in attack; or
- Immune from attack, but proportionality value diminished

Speaking notes: Here we consider involuntary human shields, i.e. persons who are not undertaking their shielding activities voluntarily. They may have been compelled to act as a shield or, their young age may mean that they lack the capacity to be regarded as volunteers. If there is doubt either as to age or as to whether they are present with consent, they must be assumed to be involuntary human shields. The AMW-experts agreed that involuntary human shields retain immunity from attack, but disagreed about whether they should be given full or reduced value when the proportionality of the planned attack is finally determined.

VOLUNTARY HUMAN SHIELDS

Three views:

- Immune from attack, included in proportionality and precautions
- Immune from attack but proportionality value diminished
- Not immune from attack, directly participating in hostilities

Speaking notes: If the human shields are clearly volunteers, there were three views among the experts as to how they should feature in targeting decision-making. The first two views mirrored those adopted by the experts in relation to involuntary human shields. The third minority view was that voluntary human shields are really directly participating in the hostilities and therefore lose their immunity from attack, and should not be considered when proportionality and precautions rules are applied. One of the conceptual difficulties with this view is that, once deprived of their legal protection against attack, such persons could no longer be regarded as human shields. Ultimately, it will be for State practice and jurisprudence to settle this issue authoritatively.

DOUBT (AMW, R12)

- Do all you can to verify target is lawful
- If doubt remains:
 - persons presumed to be civilians
 - objects normally dedicated to civilian purposes presumed to be so used
- The reasonable commander test

Speaking notes: Targeting decisions often have to be taken based on information that is incomplete or associated with doubt.

For example, a person planning or deciding upon an attack may have doubts as to whether the person to be targeted is a civilian or not. In those circumstances, the law requires that “that person shall be considered to be a civilian”, so the individual whose status is in doubt may not be targeted (Art. 51 (1) AP I).

Similarly, if an object is usually dedicated to civilian purposes and if there is doubt about whether that object is actually being used “to make an effective contribution to military action”, the law presumes that it is not being so used (Art. 52 (3) API). If the object is not normally dedicated to civilian purposes, the presumption does not apply. Equally, if the doubt relates not to the use of the object but to whether it is a military objective by purpose or location, again no presumption applies. The attacker would, however, be required to do take all feasible precautions to verify that it is a lawful target and that the planned attack will comply with targeting law.

SLIDE 20

ATTACKS

“Acts of violence against the adversary, whether in offence or defence” (AMW, R1e)

Speaking notes: We have been talking about attacks, but what does the law mean by that word? The legal definition of attacks as provided in Art. 49 (1) API is shown on the screen. You can see from this that the term “attacks” includes not only the aggressive use of force, but also its defensive use by a belligerent party seeking to hold off the enemy. The term “act of violence” seems to include acts that have violent consequences as well as acts that are undertaken in a violent way. So a cyber operation that causes death or injury to persons or damage or destruction of property would be classed as an attack even though the act that initiated the cyber operation was not “violent” in the sense of kinetic force. On the other hand, military operations that only occasion irritation or inconvenience do not amount to attacks. Similarly, espionage or information gathering that has no injurious or damaging results will not constitute an attack within the meaning of the law.

SLIDE 21

PROTECTION OF CIVILIANS

- Making civilians the object of attack is prohibited (AMW, R11)
- Terror attacks on civilians are prohibited (AMW, R18)
- Targeting civilian morale is prohibited

Speaking notes: The protection of civilians flows from the general principle stating that they are protected from the dangers arising from military operations. Building on that, the law then prohibits making them the object of attack (unless of course they have lost their protection by directly participating in the hostilities). In addition, both acts of violence and threats of violence mainly intended to spread terror among civilians are prohibited. It follows from this that intentionally making civilian morale the object of attack would also be unlawful, but deliberately terrorizing combatants would be lawful as would otherwise lawful attacks that have an incidental effect on civilian morale.

SLIDE 22

PROHIBITION OF INDISCRIMINATE ATTACKS (AMW, R13)

- Attacks are “indiscriminate” if they are of a nature to strike military objectives and civilians or civilian objects without distinction, most notably because:
 - they are not or cannot be directed against lawful targets
 - their effects cannot be limited as required by IHL
 - they treat as single target clearly distinct targets within concentration of civilians
- Not inherently indiscriminate:
 - Beyond-visual-range attacks
 - High altitude bombing
 - Drone attacks

Speaking notes: The basic rule is simple – indiscriminate attacks are unlawful. They are attacks that are not or cannot be directed at a specific military objective, or whose effects cannot be limited as the law requires. See the full definition from Article 51(4) API. Blind strafing from the air of a crowd of people known to comprise both combatants and civilians in similar proportions, carpet bombing of an area in which distinct military objectives are located alongside civilian objects in similar concentrations and using unguided rockets against military objectives located in densely populated civilian areas would all, depending on the precise circumstances, be examples of indiscriminate attacks. However, beyond visual range attack, high altitude bombing and the use of drones are not per se indiscriminate methods of warfare.

PROPORTIONALITY RULE (AMW, R14)

Attacks that may be expected to cause collateral harm that would be excessive in relation to the concrete and direct military advantage anticipated are prohibited.

SLIDE 23

Speaking notes: Notice that this rule talks about ‘expected’ collateral harm and ‘anticipated’ military advantage (Art. 51 (5)(b) API). It is a rule that applies at the time when the decision to attack is made, that is, before the attack and not after the event. Although this is not a rule based on hindsight, the attack decision should be kept under review until the time when the attack can no longer be called off or, respectively, when its outcome can no longer be influenced. Pilots, or controllers of UCAVs, may become aware of new information that calls into question the planning assumptions on which the decision for attack was based. If this is the case, the proportionality of the planned attack should be reviewed, recognizing that the pilot may not be aware of all of the information/facts on which the original decision was based. So, for example, it may be possible for a controlling pilot to observe the approaching target using a television seeker on board a missile. If, for example, as the missile approaches its target, it becomes clear that the target is now located within a column of refugees such that the attack would likely no longer comply with the proportionality rule, the missile should if possible be diverted from the target by the controller.

The things that must be considered are the overall military advantage that the attacker anticipates from the attack as a whole, based on the information reasonably available to him, and the collateral harm he expects, again based on available information, which may be incomplete or wrong. There is an inevitable element of uncertainty involved in the practical application of the rule. The decision-maker must do all he can to get all available information, must then consider it properly and must reach a reasonable decision. Inconvenience or annoyance to civilians do not feature in the proportionality rule. It is death injury or damage that are relevant to the application of the rule.

SLIDE 24

“EXCESSIVE” COLLATERAL HARM

Speaking notes: At the core of the proportionality rule is the word ‘excessive’. The API Commentary talks about ‘extensive’ collateral harm, but extensive is the wrong word – after all, an attack expected to cause extensive collateral harm would not breach the proportionality rule if the anticipated military advantage were to be sufficiently great. We noted under the previous slide that the attack must be considered as a whole in determining anticipated military advantage. Particular small elements of an attack may yield no military advantage in themselves, but the advantage may only become clear when all elements in a composite attack are taken into account.

SLIDE 25

PRECAUTIONS IN ATTACK (AMW, R30, R34)

Constant care must be taken to spare civilians and civilian objects

Speaking notes: This is the general rule – it means that there is no stage in the planning, preparation, briefing and attack execution process when care can be dispensed with (Art. 57 (1) API). It is required all of the time. Equally, it means that there is no person involved in targeting who is excused from the obligation to take care. Those who gather and analyze intelligence, those who prepare and install mission and weapon control software and data, those who operate UCAVs or who fly attack aircraft, fighter controllers, planners, commanders indeed everyone involved in all aspects of targeting must take care all of the time to spare civilians.

SLIDE 26

PRECAUTIONS IN ATTACK (CONTINUED)

- **Verify lawfulness of target**
- **Verify that attack not otherwise prohibited by IHL**
- **Choose means, method & target of attack to minimize civilian harm (ceteris paribus)**
- **Cancel or do not launch certain attacks**
- **effective advance warning unless circumstances do not permit.**

Speaking notes: In addition to the ‘constant care’ requirement, the law as reflected in Art. 57 API requires that everything feasible be done to check that the target is a lawful one, i.e. a military objective or combatant(s) or directly participating civilians. As stated in treaty IHL, “[f] easible precautions are those precautions which are practicable or practically possible taking into account all circumstances ruling at the time, including humanitarian and military considerations” (Arts 3 [4] CCW Protocol II (1980); 1 [5] CCW Protocol III (1980); 3 [10] CCW Amended Protocol II (1996). See also the French text of Art. 57 AP I (“faire tout ce qui est pratiquement possible”). Everything feasible also must be done to check that the attack will not breach the proportionality rule, and the weapons to be used and the way the attack will be conducted must be decided so as to minimize the risk to civilians and civilian objects. If

it becomes clear that the target of an attack is no longer a lawful target the plan to attack it should be cancelled or the attack should be aborted if possible. If there is a choice of targets and if a similar military advantage is anticipated, the target that minimizes risks to civilians and civilian objects should be chosen. Finally, if the attack may cause death or injury to civilians, an effective advance warning should be given unless the circumstances do not permit, e.g. because it is intended to be a surprise attack. Any such warning must be effective, which implies that it be intelligible to the intended recipients and communicated using e.g. leaflets, mass media broadcasts, using the Internet or by whatever means will be effective in getting it into the relevant hands in the locus in quo. Warnings motivated purely by a wish to terrorize the civilian population are prohibited. There is no need to warn if the only possible consequences of the attack are inconvenience or annoyance. In determining whether particular precautions are feasible, the nature and degree of additional risk to the attacking force may be a relevant factor to be considered.

II. Exercises (The Law Targeting)

Instructions: Participants are divided into work groups numbering up to 5 or 6 students. Each work-group should discuss all of the following questions and should refer to the AMW-Manual as an aid to resolving any legal issues that arise during the discussions. Each group should elect a spokesperson who will present the group's response to the questions. Spokespersons of other groups may comment and present their own solutions. Members of each work group should take turns to present, and respectively comment on, solutions to the plenary course members.

Scenario: Your commander wishes to attack the enemy's Ministry of Defence. Attack force pilots report a crowd of approximately 100 civilians on the roof with national flags on display. Radio stations have been encouraging citizens to come to the defence of the State by gathering at potential targets. Human intelligence suggests some citizens may have been seized and taken to the target location and pilots report seeing some children there.

Questions:

- What factors do you consider in deciding whether the attack on the Ministry should proceed?
- Is the Radio station also a lawful target?
- If so, what considerations determine exactly how the radio transmission process should be targeted?

EXERCISE 1

Answer:

- The Ministry of Defence is by nature a military objective. It will be making an effective contribution to military action and its damage or destruction will offer a definite military advantage. The issue here is proportionality. Some at least of the human shields on the roof are involuntary human shields. Remember the two views of the experts – either they get protection as civilians and are given full value in the proportionality evaluation and when precautions are taken, or they get protection as civilians but a reduced value in proportionality because the adverse party placed them there deliberately to seek to prevent the attack – para. 7 of Commentary to rule 45. Remember also that where there is doubt as to whether they are voluntary or involuntary human shields, they must be taken to be involuntary – para. 8 of Commentary to rule 45. So those are the expected values of the collateral harm that you compare with the military advantage you anticipate in attacking the MOD.
- The Radio station has been inciting civilians to become involved in the conflict by acting as human shields. If you take the view that stopping or inhibiting this human shield activity will offer a definite military advantage by simplifying the proportionality evaluation of attacks on military objectives, you might want to conclude that the radio station is a potential military objective. However, remember that the broadcasting of propaganda per se will not render it a military objective. There must be a more direct involvement in the conflict. Also bear in mind Art. 51(8) API which provides that violations of Art. 51 API by one belligerent, including by using human shields, does not release opposing parties from their obligations, including the precautions in attack obligations.
- Consider all possible targets that will offer a similar military advantage and go for the option that involves least danger to civilians, the antennae perhaps, or maybe a relay station, or the cables that deliver the power. Select the available munition that will likely be most precise and involve least risk to civilians/civilian objects. And when you have done this carefully consider the proportionality of the attack, weighing anticipated military advantage against expected collateral harm.

EXERCISE 2

Scenario: Human intelligence (HUMINT) and electronic cyber intelligence indicates that the Physics and Chemistry Departments at the XX University are developing a new deep penetration bomb that the enemy plans to use to attack the YY underground military command headquarters. The scientists seem to have made great progress with the project and testing of the proposed munition is apparently about to start. Your commander emphasizes the importance of stopping the project. Attacking the buildings housing the University Departments will damage much valuable research in peaceful fields that the University is undertaking and will kill many innocent civilians. Unusually, work continues at the University at nights.

Questions:

The Commander asks whether and, if so, how he can lawfully attack:

- the University laboratories
- individual scientists identified as being involved in this research.

Answer:

- The University is an object normally dedicated to civilian use. It will be presumed not to make an effective contribution to military action – Art. 52(3) API. However, there is clear evidence that the Physics and Chemistry Departments are being so used and that will make the relevant parts of the University military objectives by use – AMW, R22d. The problems are: that the relevant departments are in use day and night; that therefore collateral harm in the form of deaths and injuries among uninvolved civilians and damage to elements of the University that are not a military objective are likely to be high. There is also the valuable civilian research to consider. First consider whether there is another potential target the attack of which will pose less danger to civilians – Art. 57(3) API. If so, then think if an alternative, perhaps limited yield missile with an appropriate form of precision technology attached should be used.
- Can the relevant personnel rather than the University be attacked? Nothing in the scenario indicates that the scientists are military personnel. Consequently, they must be presumed to be civilians. The decisive question, therefore, is whether civilian scientists working on the development of a new weapon could be regarded as directly participating in hostilities. According to the widely accepted criteria set out in the ICRC's Interpretive Guidance on the matter, a distinction must be made between activities merely building the capacity of a belligerent to carry out unspecified attacks (indirect participation), and actually using that capacity to carry out specific attacks (direct participation). According to the scenario the scientists are developing a new deep penetration bomb, which the enemy already plans to use on a particular high value target. The decisive factor, however, is that the scientists are not developing a tailor made device for a particular operation only (e.g. a booby trap), but a generic weapon category which can be used against a particular target that they already have in mind, but which will in all likelihood also be used against other, similar targets in the future. Therefore, despite the perhaps decisive military value of their work, the scientists do not become an integral part of a particular combat operation (direct participation in hostilities) but merely contribute to the enemy's war effort (indirect participation in hostilities). Direct attacks against such personnel would therefore be prohibited under LOAC.

Scenario: The XX television station regularly broadcasts patriotic programs glorifying the war, and encouraging the citizens to enlist in the armed forces. It encourages its citizens to work hard for the national good, broadcasts propaganda that suggests that its enemies have been committing atrocities and has published false reports that your political leadership finds hurtful.

Question:

- Your commander wants to know what action he can lawfully take against the TV station.

Answer:

- The lawful action would be to engage in the propaganda conflict by beaming transmissions into enemy territory that give a correct version of events and that seek to undermine the messages currently being broadcast.

EXERCISE 3

- Propaganda per se is not sufficient to cause an object like a radio station to become a military objective. However, if the enemy's propaganda breaches an international obligation, counter-measures not involving the use of force may be a viable option, for example through cyber-operations interfering with the broadcasting capability of the XX television station.

EXERCISE 4

Scenario: There are human intelligence reports that the enemy Head of State is currently located in his residence. He is the constitutional Commander in Chief of the armed forces, and approves virtually all military decisions including deployments, the commencement of military campaigns, and the strategic approach to targeting during campaigns. The day-to-day military decisions are taken by the Minister of Defence and by military commanders who approve the target lists. The wife and daughter of the Head of State live with him at the residence.

Questions:

- Is the Head of State a lawful target? Why?
- What additional information do you need to decide if the residence is a military objective?
- Your commander has been instructed to attack the Head of State. What factors determine if, and if so how, this instruction would be carried out?

Answer:

- Yes. His membership of the armed forces renders him in principle a combatant. Even if he were to be regarded as merely a titular head of the Services, his involvement in military decisions and in targeting, even if at the strategic level, would constitute a continuous combat function thus rendering him a lawful target – AMW, R29ii.
- His mere presence at the residence does not make it a military objective. If there is information to show that the residence is used in some way to undertake military activities or to perform military functions, for example to host meetings of the Command Group or for undertaking military planning activities, then the building as such becomes a lawful target, or at least that part of the building that is used in that way – AMW, R22d.
- The instruction could only be carried out if there is sufficiently reliable information demonstrating that the Head of State is a lawful target. Carrying out the instruction involves selecting the target (the individual or the relevant part of the building), then selecting the method of attack and the means used in order to achieve the military purpose while minimizing danger to peaceful civilians and to civilian objects, and finally it involves determining whether that method of attack complies with the proportionality rule. Rather than put the family at risk by targeting the residence, it might be more appropriate to target the Head of State in his transport from home to office or when he is in his office – consider AMW, Section G.

Scenario: Reliable human intelligence informs you that the enemy military leadership meets regularly and in secret at the ZZ Primary School during school opening hours. They arrive at the school after school has opened and leave before it closes. Their meetings are reported to take place in a room immediately above the main classrooms. There are 250 pupils enrolled at the school, which has a civilian staff of 25. Members of the enemy leadership travel to and from the school from different directions on different routes.

Questions:

- Which precautions seem to be most relevant to this scenario?
- What are the possible targets and what are the advantages / disadvantages of each?
- Which target would minimize civilian dangers?
- Which method of air attack would minimize civilian dangers?
- Which kind of weapon would you choose to use?

Answer:

- The duty to take constant care to spare civilians provides the context when deciding on attack options – AMW, R30. Do everything possible to verify that the school is a military objective i.e. that enemy leadership is present – AMW, R32a. Consider the proportionality of a direct attack on the school – AMW, R32c. Such an attack probably breaches proportionality, but how great is the anticipated military advantage? Is this the entire military leadership? If so they are collectively a lawful target and their removal will likely offer a great military advantage.
- Select the weapon option that minimizes dangers to civilians – Art. 57(2)(a)(ii) API. Consider limited yield weapons with precision attack capabilities. Consider fusing arrangements that might limit the detonation to the upper floor where the leadership meets. Can the explosive effect be limited in that way?
- If targeted individuals can be attacked without attacking the school, say by attacking them on the way to / from the school, with a similar military advantage (Art. 57(3) API), you must pursue the available options that minimize risk to civilians.
- Warning under article 57(2) API would likely defeat the object of the operation – and is therefore not required.
- The advantage of attacking the school during the meeting is you get all of the leadership. Disadvantage is you create maximum danger for the children / staff.
- Advantage of attacking leaders on their way to / from the meeting is you only imperil persons in vicinity of particular attacks. Disadvantage is you may not manage to attack all of the leaders, which suggests you prioritize them, and attack high priority individuals first.
- As to the method of air attack, this may well be a case in whichUCAVs may be useful as providing improved opportunity to observe the targeted individuals in transit to or from the school and as providing the possibility to attack each individual when incidental risks to civilians are minimized.

EXERCISE 6

Scenario: There are reliable reports that the enemy's stock of nerve agent, contained in drums and located in a vehicle the description of which you do not have and cannot get, is currently located somewhere in the basement of a shopping complex in AA town. It was moved there this morning and nobody knows when or if it will be moved to a fresh location. The shopping complex is open and full of civilian customers between 0900 and 1700. Adjacent to the shopping complex is a large residential area accommodating 6,000 people. There has been rhetoric from the enemy leadership threatening to use the nerve agent against your nation's civilians and you fear that your capital city with a population of two million may be at risk.

Question:

The Commander is under political pressure to destroy the nerve agent. He wants your advice.

Answer:

- This is a very difficult scenario to deal with. The general rule that constant care must be taken to protect civilians and civilian objects from the effects of military operations must be kept in mind; AMW, R30. If you have no personnel in the locality and/or that you have insufficient control of the vicinity of the shopping complex/car park to be able to undertake any kind of search or ground operation to locate the substance, air attack is the only likely option. The first and most obvious precaution is to seek to verify that the nerve agent is in fact present and to use all lawful efforts to identify precisely where; AMW, art 32a.
- Consider the danger in attacking using insufficient explosive and heat yield and thus releasing nerve agent into residential areas potentially causing mass casualties. Interestingly, note the US statement made on ratification of Protocol III to the Conventional Weapons Convention.
- Warning is almost certainly not feasible and therefore not required (AMW, R37). The issue becomes one of precaution and proportionality:
 - (a) verify the presence of the nerve agent in the shopping complex;
 - (b) verify the enemy's capability and intent to use the nerve agent;
 - (c) estimate the casualties to be expected if the nerve agent were to be used against your own civilian population;
 - (d) select the weapon and method required to neutralize the threat while minimizing civilian casualties on the (AMW, R34);
 - (e) verify whether there is a time when reduced numbers of persons are in the complex;
 - (f) evaluate the proportionality of the civilian casualties which the selected weapon, method and timing of the attack would be expected to cause in light of the military advantage anticipated. Military advantage consists of preventing the enemy use of the substance and thus avoiding the anticipated casualty count within your own civilian population. The attack cannot be carried out if the expected civilian casualties / damage from attacking the shopping complex would be excessive compared to that advantage (AMW, R35c).

EXERCISE 7

Scenario: The BB Electricity Generating Station supplies electrical power to the enemy national grid. The national grid supplies electricity to numerous enemy military facilities as well as to the civilian population, civilian businesses, critical civilian infrastructure etc.

Question: The Commander wants to know whether by supplying the grid that supplies the military, the power station has become a military objective.

Answer:

- If the power station supplies electricity to the grid, and if the grid supplies military and civilian users, the relevant question is whether the power station has become a military objective by virtue of its use for military purposes. It will be a question of fact whether the electricity provided by the power station to military facilities must be regarded as making an effective contribution to military action. If that is the case, and if the power station's destruction or neutralization in whole or in part also offers a definite military advantage, then the power station may be considered a military objective (AMW, R1y and R22d). These criteria might not be satisfied, and an attack against the power station may be unlawful, if it is only one of many electricity providers and makes only a small contribution to the grid.

EXERCISE 8

Scenario: Your army colleagues involved in ground operations in enemy territory are increasingly confronted with hostile acts from persons in police uniforms and are now requesting aerial attacks against police personnel and infrastructure in the area of operations. However, the enemy has not notified you that its police force has been incorporated into the armed forces.

Question: Are the requested air strikes lawful?

Answer:

- That will depend on whether the police force members are combatants or directly participating civilians. Former members of the police force may join the armed forces and thus become combatants. Alternatively, a party to an international armed conflict may incorporate a law enforcement agency such as a police force into its armed forces and must inform the enemy if it does so; AMW, R1ob(i), commentary para 3 and Art. 43(3) API. If it fails to notify the enemy, this does not preclude the enemy attacking the members of the incorporated agency.
- If there is no evidence that incorporation of the police force into the armed forces has taken place, the individuals who are engaging in hostile acts as part of the armed conflict are civilians who are directly participating in the armed conflict and may therefore be attacked while so participating. The police infrastructure would retain its civilian status and protection unless it is used for military purposes in the course of their hostile activities.

EXERCISE 9

Scenario: The enemy's military academy trains cadets aged from 16 to 21 years. They are formally enlisted into the Army Training Unit as a condition of attending the academy where they receive military training and general education. None of the cadets is involved in fighting.

Questions:

- Is the Military Academy a lawful target?
- Would attacking it be a wise move?

Answer:

- The Military Academy can be attacked only if it is being used so as to make an effective contribution to military action and only if its total or partial destruction, capture or neutralization in the particular circumstances offers a definite military advantage; AMW, R19 and 22. Given that none of the cadets is involved in the fighting or likely to be in the near future, the Academy is unlikely to qualify as a lawful target.
- The cadets are members of the armed forces and are thus combatants; Art. 43(1) API. However, this question raises all sorts of presentational issues. Targeting the enemy's young may render him a determined, united and vengeful adversary and securing an eventual peace may be rendered that much harder. That said, in a long and bloody conflict, targeting the leaders of tomorrow from among the members of the armed forces of today can be a useful way of weakening the enemy.

EXERCISE 10

Scenario: Mobile phone intelligence has revealed the location of an important enemy commander in a vehicle on the road to CC Town. The road is heavily used and the traffic currently on the road is dense. There are, however, stretches when the traffic thins somewhat. You want to attack the vehicle in which the Commander is travelling using air assets as you have no sniping or other relevant assets in the area.

Questions:

- What are the advantages/disadvantages of manned/unmanned aircraft for undertaking such an attack.
- What kind of platform and what kind of weapon would you choose?

Answer:

- It is difficult to think of any disadvantage of the unmanned option except, perhaps, that the distinctive noise of the UCAV may cause it to be detected before the attack can be prosecuted and thus, perhaps, might frustrate the operation. The advantage of such a method of attack is that the platform ought to be able to remain on station for a sufficient period to observe the vehicle as it proceeds and would thus be able to time the attack on the vehicle for when it is in less dense civilian traffic, thus keeping civilian death, injury and damage to a minimum. Careful use of sensors may enable the operator of the remotely piloted platform to check the continued presence of the human target in the vehicle. A pilot in a manned aircraft is unlikely to have this possibility.

- The preferred choice of platform would likely be a remotely piloted one and the weapon to be selected would use the precision technology discussed in Module 2 that best suits the prevailing circumstances but with an explosive fill and fragmentation effect that limits, to the extent feasible, the damaging effect to the targeted vehicle and its occupant(s).

Scenario: After a recent ground battle, enemy troops are retreating along the national highway and intermingled with the retreating troops are refugees.

EXERCISE 11

Questions:

- Are the retreating troops lawful targets?
- Is the highway a military objective?
- What status do the refugees have?

Answer:

- Yes. Troops that are retreating continue to be lawful targets for attack until they become *hors de combat* either by clearly expressing an intention to surrender or e.g. because they are unconscious or because their wounds or sickness incapacitate them or render them unable to defend themselves, so long as they commit no hostile act and do not try to escape; AMW, R15b and Art. 41 API. None of this applies here, so they are lawful targets.
- The fact that the retreating troops are using the national highway renders it a military objective by use; AMW, R22d.
- The refugees will usually have civilian status and thus are protected. They may not be made the object of attack and the proportionality rule must be applied if an attack may be expected to cause such people injury, death or if the attack may damage their property. In this context consider with particular care the questionable military advantage of attacking retreating troops versus the gravity of the expected collateral civilian harm. If the adverse party to the conflict is using either the presence or movement of the refugees to render the retreating troops immune from attack, or to shield their retreat from adverse party attack (AMW, R45) or in some other sense to favour the retreat, this is explicitly prohibited by Art. 51(7) API but that does not excuse the other party to the conflict from his obligations under the law of armed conflict, Art. 51(8) API.

Scenario: Troops and military supplies are deployed by the enemy through the main DD Rail Station located in the middle of the capital city. The Commander wants to attack the rail station to cut the supply of troops and supplies to the front line. The rail station is also used by many civilians and is located in a predominantly civilian residential area.

EXERCISE 12

Questions:

- Is the rail station a military objective?
- What factors should be considered when deciding whether to attack it?

Answer:

- Yes, because it is being used for the supply of troops and supplies to the front line; AMW, R22d.
- The main thing to consider is what is the main purpose of the attack and whether that purpose can be achieved by an attack that will pose substantially less danger to civilians and civilian objects. Consider for example interdicting the rail line outside the town somewhere. Art. 57(3) API only applies where alternative targets offer a similar military advantage; AMW, R33. If the target that involves increased danger to civilians or civilian objects also offers greater military benefits, the advantage to be derived from attacking the two military objectives is no longer 'similar', so the article 57(3) rule no longer applies; AMW, R33, para 3 of Commentary.

MODULE 4 – MEANS AND METHODS OF AIR WARFARE

I. Lecture

(TITLE): METHODS AND MEANS OF AIR WARFARE

SLIDE 1

Speaking notes: International law restricts the weapons that can lawfully be used in armed conflict and the techniques that can lawfully be employed in undertaking hostilities. This Module will explain what those limitations are. The first half of the Module will address the rules that prohibit weapons, or that restrict when or how they can be used. The second part will refer to the rules that regulate the manner in which hostilities can be conducted.

BASIC PRINCIPLE

SLIDE 2

The right of the belligerent Parties to choose methods or means of warfare is not unlimited (AMW Manual, R4)

Speaking notes: If there is a single cornerstone of the law that regulates weapons and how they may be employed, it is the rule reflected in Art. 35(1) API and, similarly, Art. 22 Hague Regulations. It provides that: 'In any armed conflict, the right of the parties to the conflict to choose methods or means of warfare is not unlimited'. So the law is telling us that there are limits to what is permissible and it is the law that provides those limitations. They take the form of prohibitions of certain weapons and of certain practices in hostilities, while other weapons can only be used in certain circumstances. There are two fundamental customary principles that we will consider first of all, then there are some treaty rules relating to the natural environment (considered in more detail in Module 5) and after that we will look at the customary and treaty rules that deal with particular weapon technologies and particular methods of warfare. But before we get into the detail of these principles and rules we need to clarify some of the relevant terminology.

SLIDE 3

TERMINOLOGY

- **'Weapon'** means a capability that is used, or that is intended or designed to be used, to cause harm to an adversary
- **'Means of warfare'** = weapons + weapon systems
- **'Methods of warfare'** = how hostilities are undertaken

Speaking notes: There are no treaty definitions of the terms 'weapon', 'means of warfare' and 'method of warfare'. The concept of a 'weapon' seems to involve a capability that is used, or that is intended or designed to be used, to cause harm to an adversary, such as injury, damage, or destruction. These elements are reflected also in the working definition of "weapon" proposed in AMW, R1(ff). The destructive, damaging or injurious effect of a weapon will usually – but not necessarily – result from physical (kinetic) impact. Indeed, a piece of cyber malware that is used, designed or intended to cause damage or injury to the adverse party in an armed conflict can also be regarded as a weapon. Examples of weapons can therefore include bombs, missiles, bullets, rifles, mines, booby-traps and other explosive devices, as well as chemical, biological or gaseous substances, directed energy devices, nuclear weapons and malware designed to cause damage or injury.

'Means of warfare' are weapons, weapon systems or platforms employed for the purposes of attack (AMW, R1t) whereas 'methods of warfare' are activities designed adversely to affect the enemy's military operations or military capacity (AMW, R1v). So we can take it from this that 'means of warfare' are the equipment used to cause harm to the enemy while 'methods of warfare' are the ways in which hostilities are conducted.

Based on these understandings, we should now consider the two core principles of weapons law.

SLIDE 4

SUPERFLUOUS INJURY OR UNNECESSARY SUFFERING

It is prohibited to employ weapons, projectiles and material and methods of warfare of a nature to cause superfluous injury or unnecessary suffering

(AMW Manual, R5b)

Speaking notes: This rule, which is reflected in Art. 35(2) API and Art. 23(e) Hague Regulations, has been regarded by the International Court of Justice (ICJ) in the Nuclear Weapons Advisory Opinion as a cardinal principle of IHL and a customary rule that binds all States in relation to international and non-international armed conflicts. The terms of the principle require that the wounding effect, the injury and other suffering consequent on the use of the weapon shall be considered in a comparison process. The legitimacy of a weapon, by reference to the superfluous injury and unnecessary suffering principle, must be determined by comparing the nature and scale of the generic military advantage to be anticipated from the weapon in the application for which it is designed to be used, with the pattern of injury and suffering associated with the normal intended use of the weapon.

The meaning of the superfluous injury and unnecessary suffering principle has not been clarified by agreement between States and the principle involves the assessment of phenomena such as suffering, injury and military utility that are hard to measure and difficult to compare. A weapon is not however rendered unlawful merely because it causes severe injury, suffering or loss of life. It is the injury or suffering inevitably caused by the weapon in its normal or designed circumstances of use that must be disproportionate to its military purpose or utility for the rule to be broken. Due account must be taken of comparable lawful weapons in current use when making that assessment.

The reference in the title to the Conventional Weapons Convention to the principle does not automatically imply that the use of weapons addressed by its Protocols would necessarily breach the principle. Examples of weapons that may be expected to breach the rule include lances or spears with barbed heads, serrated edge bayonets, explosive anti-personnel bullets and projectiles smeared with substances that inflame wounds.

INDISCRIMINATE WEAPONS

It is prohibited to employ weapons that are of a nature to be indiscriminate.

AMW Manual R5a.

Speaking notes: Indiscriminate attacks are prohibited by article 51(4) API and customary law and include attacks which use a method or means that cannot be directed at a specific military objective or the effects of which cannot be limited in accordance with international law and which therefore 'are of a nature to strike military objectives and civilians or civilian objects without distinction.' So this rule is derived from the principle of distinction. But the weapons law rule is all about whether the weapon, when used in its normal or designed circumstances, will inevitably be indiscriminate. Any weapon is capable of being used indiscriminately. The present rule is concerned with the inherent characteristics of the weapon, as opposed to the particular activities of its user.

The rule is customary and therefore binds all States in both international and non-international armed conflicts. It too is reflected in the title of CCW but again that does not pre-suppose that weapons referred to in CCW's Protocols would necessarily be regarded as breaching the principle. The V1 and V2 rockets used in World War II and certain Scud missiles that lack any guidance system would be examples of weapons that would breach this rule.

NATURAL ENVIRONMENT

For States party to API, it is prohibited to employ methods or means of warfare, which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment.

SLIDE 5

SLIDE 6

Speaking notes: The environmental protection rule on the slide is based on Art. 35(3) API, but its customary nature is not universally recognized. It will be considered in more detail in Module 5 where we talk about persons and objects that get specific protection under the law. The rule is mentioned here, however, because it is a criterion against which the legitimacy of weapons must be judged. A weapon that is to be expected, or that is intended, to cause such damage will be prohibited by the rule.

We now need to consider some categories of weapon or types of weapon technology that are prohibited. Usually the prohibition applies in both international and non-international armed conflicts. I will specifically say so when this is not the case.

SLIDE 7

POISON / POISONED WEAPONS (AMW, R6D)

- **Asphyxiating, poisonous or other gases**
- **All analogous liquids, materials or devices**
- **Bacteriological methods of warfare**
- **Chemical weapons**

Speaking notes: Poison and poisoned weapons are prohibited as a matter of customary and treaty IHL (Art. 23 (a) Hague Regulations). The prohibition of poison applies to weapons whose primary, or even exclusive, effect is to poison or asphyxiate. Poisoning must be the intended injuring mechanism, so smearing arrows to prevent recovery from injury, using a substance to aggravate a wound, poisoning of wells, pumps and rivers from which the enemy draws water supplies are all prohibited. As part of customary law this prohibition binds all States.

The prohibition of asphyxiating gases, analogous substances and bacteriological methods of warfare is reflected in the Geneva Gas Protocol 1925 and is a rule of customary law that binds all States. A number of States ratified the Protocol on the basis that they would not be the first to use such substances in an armed conflict but those statements have since been overtaken by the general prohibitions in the Biological and Chemical Weapons Conventions and in customary law.

The Chemical Weapons Convention 1993 prohibits use of toxic chemicals and their precursors and associated equipment and extends the prohibition to a range of other activities associated with such weapons, materials etc. So we are talking here about any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals and any chemical reactant which takes part, at any stage, in the production, by whatever method, of a toxic chemical. These prohibitions are reflected in AMW, R6b.

There is, however, an exception for such substances intended for non-prohibited purposes. These non-prohibited purposes include law enforcement, including domestic riot control purposes. The ban on use and possession of chemical weapons is now customary and thus binds all States.

Riot control agents are defined as producing rapid human sensory irritation or disabling physical effects, which disappear within a short time following termination of exposure. They may be used in law enforcement but are prohibited as a means of warfare (AMW, R6b, para 3 of Commentary).

BACTERIOLOGICAL OR BIOLOGICAL WEAPONS (AMW, R6A)

SLIDE 8

'Microbial or other biological agents or toxins whatever their origin or method of production' (Biological Weapons Convention)

Speaking notes: Article I of the Biological Weapons Convention prohibits the development, production, stockpiling, acquisition or retention of microbial or other biological agents or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes, and weapons or equipment for their use for hostile purposes or in armed conflict. The ban on possession and use are customary and bind all States. The remaining prohibitions in the Convention are also probably customary.

There is no verification mechanism for the Convention.

CERTAIN CONVENTIONAL WEAPONS

SLIDE 9

- **Exploding bullets intended for anti-personnel use are prohibited (AMW, R6e)**
- **Certain fragmentation weapons are prohibited (AMW, R6f)**
- **Certain blinding lasers are prohibited (AMW, R6c)**
- **Mines, booby-traps and other devices**

Speaking notes: In 1868, the St Petersburg Declaration prohibited the employment during international armed conflict of projectiles below 400 grams weight that are either explosive or charged with fulminating or inflammable substances. The 400 gram limit has long since been rendered obsolete and this was already appreciated when a group of experts drew up draft rules of air warfare in 1923, but explosive or incendiary bullets designed solely for use against personnel continue to be prohibited under customary law. A solid round would achieve the military purpose, so the additional injury from an explosive round would have no corresponding military utility and would therefore breach the superfluous injury principle.

States that are party to Protocol I to the Conventional Weapons Convention are prohibited from using any weapon the primary effect of which is to injure by fragments, which in the human body escape detection by x-rays. So fragmentation weapons that mainly use glass or plastics, for example, as the injuring mechanism would breach the provision, but to breach the rule, glass, plastic etc. would have to be the primary injuring mechanism – and that is why the slides notes it is only some fragmentation weapons that are prohibited.

Similarly, States that are party to Protocol IV to the same Convention are prohibited from employing laser-weapons specifically designed, as a combat function, to cause permanent blindness to unenhanced vision, meaning to the naked eye or to the eye with corrective eyesight devices such as spectacles. Lasers that may blind are not caught by the rule – lasers that are designed to blind are caught. Protocol IV also restricts the use of certain weapons that are not covered by the prohibition.

There is then a set of three treaties that set forth a complex set of rules dealing with mines, booby-traps and other devices. The detail of these rules lies well beyond the intended scope of this presentation. It is enough to say that anti-personnel landmines are prohibited to States that are party to the Ottawa Convention. Explosive booby-traps made to look like harmless portable objects or attached to or associated with a long list of objects are prohibited. Certain weapons designed to be detonated by the presence of a mine detector, mines protected by anti-handling devices that outlive the mine and mines that are not detectable in a specified way are among the weapons also prohibited by these rules. There are then additional restrictions on the circumstances when, and the ways in which, mines, booby-traps and command detonated or time-lapse detonated devices can be used and further rules that deal with further action such as marking mined areas and clean-up.

SLIDE 10

CERTAIN CONVENTIONAL WEAPONS (CONTINUED)

- Restrictions on using incendiary weapons (Commentary 2i to AMW, R7)
- Prohibition of certain cluster munitions (Commentary 2e to AMW R7)

Speaking notes: Protocol III to the Conventional Weapons Convention defines incendiary weapons as any weapon or munition which is primarily designed to set fire to objects or to cause burn injury to persons through the action of flame, heat, or a combination thereof, produced by a chemical reaction of a substance delivered on the target. The treaty lists a number of weapons that are not considered to be incendiaries, including combined effects munitions.

The Protocol prohibits making any military objective located within a concentration of civilians the object of attack by air-delivered incendiary weapons; Protocol III, Art. 2 (2). A 'concentration of civilians' may be permanent or temporary, and can include inhabited parts of cities, towns, villages, camps, columns of refugees or groups of nomads; Protocol III, Art. 1 (2). There are also restrictions on attacking similarly located military objectives using incendiary weapons that are not air-delivered; Protocol III, Art. 2.3.

States party to the Cluster Munitions Convention are prohibited from using or otherwise dealing with cluster munitions. Cluster munitions are, broadly speaking, conventional munitions with sub-munitions weighing under 20 kg. In general terms, the Convention does not concern flares, smoke, pyrotechnics or chaff, air defence; electrical or electronic effects; and munitions with less than ten explosive sub-munitions weighing over 4 kilograms designed to detect and engage a single target object and equipped with self-destruction / self-deactivating features.

The Convention addresses interoperability issues by permitting personnel from States party to engage in military cooperation and operations with States not party. A State party must not acquire, transfer or use cluster munitions and cannot ask another State to use them if the choice of munitions used is within the exclusive control of the State party. So a military planner from a State party to the Convention can allocate targets to a State contributing to the operation that is not party to the Convention even if he knows that that State will, in all likelihood, engage those targets using cluster munitions.

METHODS OF AIR WARFARE

SLIDE 11

Speaking notes: Remember we said methods of warfare are operations designed adversely to affect the enemy's military operations or capacity. So methods of air warfare become air operations undertaken for a similar purpose. And as we noted earlier, in the same way that not all weapons are permitted by the law, so also certain methods of air warfare are also prohibited, and the aim in the rest of this presentation is to identify these prohibitions.

PERFIDY (AMW, R111A)

SLIDE 12

It is prohibited to kill or injure an adversary by resort to perfidy.

Acts inviting the confidence of an adversary to lead him to believe that he is entitled to or is obliged to accord protection under LOAC with the intent to betray that confidence is perfidy.

Speaking notes: As you see from the slide the prohibited act involves both an act of perfidy and a resulting death or injury, or in the case of API States party, capture of the adversary. The perfidy element consists of deceiving the enemy either that the deceiver or the enemy is entitled to protection under the law of international armed conflict with intent to betray that confidence. The Manual and Article 37(1) API cite as examples of perfidious conduct feigning an intent to negotiate under a flag of truce or surrender, feigning incapacitation by wounds or sickness, feigning of civilian, non-combatant status and feigning protected status by using signs emblems or uniforms of the United Nations or of a neutral or of States not party to the conflict. So feigning the status of a medical, civilian or neutral aircraft, feigning some other protected status or feigning an intent to surrender in or out of an aircraft would all be perfidy; AMW, R111b and 114. But note, perfidy that, for example, only leads to damage to the adversary's objects is not prohibited by the rule – death or injury, or for most States capture, must result.

Quite apart from this perfidy rule, it is prohibited for a party to the conflict to use certain emblems, uniforms, flags or military insignia. These prohibitions act as another important constraint on what it is lawful to do when seeking to deceive the enemy. So, unauthorized use of the UN emblem, improper use of the distinctive emblem of the Red Cross, Red Crescent or Red Crystal, or of other protective emblems, signs or signals, improper use of the flag of truce,

or of the flags, military emblems, insignia or uniforms of the enemy, any use by a belligerent party of the flags or military emblems, insignia or uniforms of neutral States are all explicitly prohibited by Rule 112 of the Manual and articles 38 and 39 of API. When we talk of ‘other protective emblems’, consider some of the emblems and signs you will hear about in Module 5, such as the cultural property sign and the sign to mark works and installations containing dangerous forces. It is also prohibited to misuse distress codes or to use aircraft which are not military aircraft as a means of attack; AMW, R17a.

SLIDE 13

RUSES OF WAR (AMW, R113 AND 116)

Ruses of war are not prohibited.

Ruses are acts which do not breach a rule of international law and which do not invite the enemy’s confidence in relation to protected status.

Speaking notes: As Art. 37 (2) API clarifies, ruses of war are not prohibited. Ruses are acts which do not breach a rule of international law and which do not invite the enemy’s confidence in relation to protected status. Ruses include camouflage, decoys, mock operations, misinformation and false codes by electronic, optical or acoustic means. The important proviso, however, is that the deception must not concern protected status under the law. So for example it is allowed to camouflage a military aircraft so long as the military markings are present even though their visibility is reduced. Placing dummy aircraft and using the enemy’s IFF (“identification, friend or foe”) codes thus falsely indicating friendly status are also permissible ruses.

SLIDE 14

SPIES (AMW, R118 – 122)

A spy is a person who, acting clandestinely or on false pretenses, obtains or endeavors to obtain information of military value in territory controlled by the enemy, with the intention of communicating it to the opposing party.

Speaking notes: This definition of spies dates from the 1899 Hague Regulations. Clandestine operations are those in which the very operation itself is concealed; AMW, R118, Commentary para 1. Operations are undertaken on false pretenses if e.g. the identity of the persons undertaking them is concealed. So if an aircraft with civilian markings is being flown in enemy airspace in order to observe and subsequently report on activities, communications, military posture or other militarily relevant information, the activity will constitute spying because of the false pretense as to non-military status of the activities the aircraft is undertaking. Conversely, if a properly marked military aircraft is openly gathering militarily useful information in enemy airspace, this will not be spying because there is no concealment of the operation and no false pretense. Moreover, if an aircraft in civilian markings were to be undertaking the same activities but exclusively from outside enemy airspace, that activity would also not amount to espionage because the aircraft is not in enemy controlled territory.

International law does not prohibit espionage; AMW, R119. However, a spy who falls into enemy hands while undertaking espionage has no prisoner of war rights and can be prosecuted before the enemy's domestic courts for spying; AMW, R121.

ENVIRONMENTAL MODIFICATION

Environmental Modification Convention (1976) binds States party only.

AMW, Section M, para 4

Speaking notes: States that are party to the UN Environmental Modification Convention must not engage in military or any other hostile use of environmental modification techniques if they have widespread, long-lasting or severe effects as the way of causing damage or destruction to another State that is party to the Convention. This is therefore a rule that only binds the States that are party to the Convention and that only applies in armed conflicts between States. The rule essentially addresses the use of the natural environment as a weapon with which to cause injury or damage to the enemy State. Examples of environmental modification include causing floods or drought by increasing or reducing rainfall and environmental modification might cause earthquakes, tsunamis, a disturbance in the ecological balance of a region, changes in weather and climate patterns.

SLIDE 15

EXCLUSION AND NO-FLY ZONES (AMW, 105 – 110)

- **Exclusion Zones (AMW, Section P, II)**
- **No-fly zones (AMW Manual, Section P, III)**

Speaking notes: These zones are considered in Rules 105 to 110 of the Manual. An exclusion zone can be regarded as a three-dimensional space outside the sovereignty of any State in which a belligerent party asserts a right to restrict the freedom of aviation and / or navigation of other States. The important limitation here is that an Exclusion Zone must be limited to international airspace. A no-fly zone on the other hand is a three-dimensional airspace above its own or enemy national territory where a belligerent party restricts or prohibits aviation. So the distinction between the two becomes clear. Exclusion zones apply only to international airspace. No-fly zones apply only to territorial airspace.

SLIDE 16

Both notions, exclusion and no-fly zones, are based on State practice and doctrine. Importantly, the declaration of such a zone does not absolve the belligerent party of its obligations under the law of armed conflict. Indeed the same rules of international law apply inside and outside such a zone; AMW, R105a. Zones designated for unrestricted air or missile attacks are prohibited; AMW, R105b. An aircraft entering such a zone may only be attacked if it is a military objective, if the attack will comply with distinction, discrimination and proportionality princi-

ples and only after the precautions the law requires have been taken. The commencement, duration, location and extent of such zones must be properly notified to all concerned and the extent and duration of an exclusion zone must be limited to that which is militarily necessary.

SLIDE 17

AERIAL BLOCKADE (AMW, R147)

A belligerent operation to prevent aircraft, including UAVs/UCAVs, from entering or exiting specified airfields or coastal areas belonging to, occupied by or under the control of the enemy.

Speaking notes: An aerial blockade is a belligerent operation to prevent aircraft, including UAVs/UCAVs, from entering or leaving specified airfields or coastal areas belonging to, occupied by or under the control of the enemy; AMW, Section V, para 3 and R147. To be valid at law, such an aerial blockade must be declared and notified to all States; AMW, R148a. The declaration must set out the commencement, duration, location, and extent of the aerial blockade and the period during which neutral aircraft may leave the blockaded area; AMW, R148b. The AMW Manual suggests that wherever possible, a “Notice to Airmen” (NOTAM) should be issued by the blockading party; AMW, R148c. Termination, suspension, re-establishment, extension or any other alteration of an aerial blockade should be similarly declared and notified; AMW, R149a. The Manual sets out at Rule 55 information that such a NOTAM ought to include. The vital requirements are that an aerial blockade must not stop access to the airspace of neutrals and any aerial blockade, to be valid, must be effective; AMW, R150 and 151. It will be regarded as effective if any attempt to enter or leave the blockaded area is rendered a hazardous undertaking. Accordingly an aerial blockade must be enforced impartially in relation to aircraft of all States.

Blockades to starve the civilian population or to deny it objects essential for its survival or which cause, or may be expected to cause, it excessive suffering in relation to the anticipated military advantage are unlawful; AMW, R157.

SLIDE 18

COMBINED OPERATIONS

- **National contingents must abide by international law binding their State**
- **Interoperability issues**

Speaking notes: Combined operations between armed forces of more than one State may take place under the aegis of an institution such as the United Nations or a military alliance, or otherwise. Participation in such combined operations does not justify a State in departing from its obligations under the law of armed conflict. Similarly, a State’s legal obligations do not change when its armed forces are operating in a multinational force commanded or controlled by a military commander from another State. It follows from this that interoperability

ty issues can arise between the constituent national elements of a multinational force each of which is obliged to comply with legal interpretations that may not be consistent with one another. Such interoperability issues might be addressed by the issue of rules of engagement that accord with the most restrictive legal position represented among the State members of the alliance, coalition etc. An alternative approach involves the issuing by individual States of national caveats reflecting their national position as to particular rules of engagement. But the core point is that no matter where it is operating, the contingent supplied by a State is bound by the law of armed conflict rules that apply to that State. As to combined operations in general, see AMW Manual, Section W.

II. Exercises (Means and Methods of Air Warfare)

Instructions: Participants are divided into work groups numbering up to 5 or 6 students. Each work-group should discuss all of the following questions and should refer to the AMW-Manual as an aid to resolving any legal issues that arise during the discussions. Each group should elect a spokesperson who will present the group's response to the questions. Spokespersons of other groups may comment and present their own solutions. Members of each work group should take turns to present, and respectively comment on, solutions to the plenary course members.

Scenario: State A has developed a new air delivered flechette. The flechette is made of a kind of softened steel which on impact with the human body has been shown in tests to fold. This happens in 7 out of 10 cases and the effect of the folding is that a large entry wound is caused which significantly reduces the chance of successfully treating the resulting injury. The flechette is going to be introduced to take the place of a strafing weapon which fires bullets at targeted personnel causing standard bullet wounds.

Question: What factors will be relevant in deciding if the superfluous injury / unnecessary suffering principle is breached?

Answer: Consider the wound pattern normally associated with the use of the strafing weapon in its designed or intended circumstances of use. Then compare the wounding effect to be expected of the flechette weapon, again in its normal designed or intended circumstances of use and consider whether the flechette is generating additional injury or suffering for which there is no corresponding military purpose. If that is found to be the case, the principle is likely to be breached. If unnecessary suffering or superfluous injury are found to be caused by the flechette, consider whether it is possible to manufacture the flechette using a metal compound that does not cause the flechette to bend or distort.

EXERCISE 1

EXERCISE 2

Scenario: State A wants to use bombs that are fitted with no precision guidance mechanism to attack urban targets in populated areas.

Questions:

- 1) Are these 'dumb' bombs indiscriminate by nature?
- 2) Can they be used in the stated circumstances?
- 3) Is there any specific advice for the State A authorities?

Answer: Bombs that do not have precision guidance technology are not as a result indiscriminate by nature. Modern air platforms with appropriately trained crews are capable of directing dumb bombs at specific targets. They do not therefore breach the rule because in some circumstances they are capable of being used in conformity with the discrimination rule. However, the plan seems to be to use these bombs against urban targets in populated areas. Such use is likely to breach the discrimination rule and the State A authorities should be informed that to prosecute air attacks of ground targets in such circumstances while complying with the legal precautions required of attackers will in practice likely require the use of precision munitions.

EXERCISE 3

Scenario: State A is planning to use the following weapons during the hostilities:

- a) A chemical vapour that causes people in the vicinity to have runny noses, streaming eyes and soreness in the throat.
- b) Mines that are designed to detonate due to the presence proximity or contact of a person.
- c) Booby traps that are manufactured in the form of a book and that will be air delivered over military barracks.
- d) A bullet that in nine out of ten tests is found to expand in test gel that replicates the characteristics of human flesh.
- e) A fragmentation weapon that includes fragments that are made of plastic and that cannot therefore be detected by X-rays. The plastic fragments come from the batteries in the fusing mechanism. The casing of the weapon which provides at least 70 per cent of the fragments is made of metal and is detectable by X-ray.

Questions:

- 1) Can each of these weapons be used in international armed conflict?
- 2) Can it be used in non-international armed conflict?
- 3) Which treaty rule(s) apply to the weapon and why?

Answers:

- a) The description suggests that this is a riot control agent. The Chemical Weapons Convention prohibits the use of riot control agents as a method of warfare. The exemption for riot control agents in the Convention is limited to their use for domestic law enforcement purposes; AMW, R6b, para 3. The prohibition applies in both international and non-international armed conflicts.

- b) Such mines are prohibited by the Ottawa Convention as being anti-personnel mines; Ottawa Convention, article 1. The prohibition applies in both international and non-international armed conflicts.
- c) Booby traps that are in the form of an apparently harmless portable object which is specifically designed and constricted to contain explosive material and to detonate when it is disturbed or approached are prohibited; Protocol II to CCW, article 6.1.a. The prohibition applies in international armed conflicts and, for States bound by APII to the CCW and / or that have ratified the 2001 extension of the scope of CCW, it also applies in non-international armed conflicts.
- d) Bullets that expand or flatten easily in the human body are prohibited by both treaty and customary law in international armed conflict and, in NIAC, in most circumstances relevant to air warfare. Exceptions may apply in situations of law enforcement.
- e) The treaty prohibition is of fragmentation weapons 'the primary effect of which is to injure' by fragments that cannot be detected using X-ray. In the stated example, the primary effect of the weapon is to injure using detectable fragments. The plastic fragments cause a secondary injuring effect and therefore the rule is not broken; Protocol I to CCW. The rule applies in international armed conflicts and, for States that have ratified the 2001 extension in scope of the CCW, in non-international armed conflicts.

Scenario: State A is planning to use air-delivered incendiaries to attack a chemical plant which is located within a built-up area in a town that has been depopulated as a result of previous fighting. A group of refugees is approaching the area.

EXERCISE 4

Questions:

- 1) Can the weapon be used before the refugees get there or after they have left?
- 2) What determines the lawfulness of its use while refugees are present in the town?

Answers:

- 1) Air-delivered incendiaries can be used before the arrival of the refugees because there is no concentration of civilians present at that stage. Air-delivered incendiaries can also be used after the refugees have left for substantially the same reason. The fact that this is a built-up area is irrelevant to the analysis, as it is not the composition of the buildings that determines the lawfulness of the attack. The issue is whether there is a concentration of civilians present.
- 2) The main issue while the refugees are present in the town is whether the military objective, i.e. the chemical plant, is at that time located within the concentration of civilians. If there is a significant separation between the concentration of civilians and the chemical plant, then this provision (article 2(2) of Protocol III) is not likely to prevent the attack taking place. However, the rules of Article 57 API, as to precautions in attack will continue to apply, and must all therefore be considered before any decision to go ahead with such an attack is finally made.

EXERCISE 5

Scenario: State A is a party to the Cluster Munitions Convention and one of its personnel is a commander in an alliance with State C that is not party to the Convention. He wishes to order a squadron from State C to attack tanks in the marketplace of Sleepy Village. If he uses 2,000 lb bombs the village will be obliterated. The population has already left so he thinks it would be a good idea to order the use of cluster munitions.

Question: Can he lawfully do so?

Answer: This is a difficult problem and will depend on his nation's interpretation of its obligations under article 21 of the Cluster Munition Convention. The treaty obligation is that a State party shall not request the use of cluster munitions if the final decision as to whether in fact they will be used rests with the State party. If, therefore, the final decision rests with the State that is not party to the Convention, the State A commander can lawfully make his request. Some States will prefer, however, that their personnel make no reference to cluster munitions in such situations and are likely to give orders to their personnel to that effect.

EXERCISE 6

Scenario: A State A aircraft is flying low over State B territory. It is a military aircraft but is flying in an erratic manner. It is releasing smoke from the rear of the aircraft and the pilot is issuing 'mayday' messages on the distress frequencies saying he is surrendering and requests permission to land at a State B military airfield. On the approach to the runway escorted by State B fighter aircraft, he drops a bomb that detonates on the runway and then proceeds to bail out of the aircraft.

Question: Has he committed prohibited perfidy?

Answer: Taking the four acts together, flying low and erratically, issuing smoke, making mayday signals and saying he wants to surrender, he is asserting protected status under the law of armed conflict, Article 41 API. The mayday signals on the distress frequencies are significant but the most significant element is in fact his statement that he wishes to surrender. The acts taken together amount to a surrender of his aircraft and of himself. He has claimed protected status seemingly with the intention of betraying the confidence of State B. His dropping of the bomb breaches that confidence. Much then depends on whether the bomb causes casualties. If it does, prohibited perfidy has probably been committed. If no casualties result and if nobody is captured as a result, no prohibited perfidy has arisen.

For discussion: Consider the situation in which he has to dispose of the munition to achieve a safe landing weight. How should that situation be handled?

Answer: He should communicate that need to the aircraft escorting him, should comply with their directions on where to eject the munition, and would then seem to be safe from suggestions of perfidious conduct.

Scenario: State B declares a blockade of the port and airport of Busyplace. It allows aircraft belonging to a friendly State occasionally to cross the blockade line.

Question: Does this invalidate the blockade?

Answer: Allowing through occasional ships from friendly States means that the blockade is not being enforced effectively and is not being enforced impartially, both of which are requirements for a valid, lawful blockade. Therefore the air commander should be told to enforce the blockade properly by ensuring that the ships from the friendly State are no longer permitted to cross the blockade line.

For discussion: After 3 months of the blockade, the civilians in Busyplace are suffering serious hardship. There have been numerous deaths due to starvation and the media are suggesting that continuing with the blockade would be inhumane. What advice do you give to the air commander enforcing the blockade?

Answer: The hardship and starvation that are being caused by the blockade indicate that relief supplies to the civilian population in distress should be allowed to cross the blockade line. Moreover, if, after the relief supplies are allowed across, the suffering of the civilian population continues and is excessive in relation to the concrete and direct military advantage anticipated from the blockade, the blockade will have become unlawful; AMW, R157b.

MODULE 5 – SPECIFICALLY PROTECTED PERSONS AND OBJECTS

I. Lecture

SLIDE 1

(TITLE): MEANING OF SPECIAL PROTECTION

Speaking notes: In Module 3 we noted the general protection that civilians enjoy for so long as they do not take a direct part in hostilities and the general protection that the law also affords to civilian objects. We saw that it is prohibited to make such persons and objects the object of attack and that the law prescribes extensive precautions that must be taken by attackers and precautions that must be taken against the effects of attacks, all of which are designed to make the effective protection of civilians against the effects of military operations a reality.

Now the focus of the discussion shifts to some specific rules in the law of armed conflict that give particular protection to certain persons, activities and objects. Some of these specific rules have the effect of giving the relevant person, object or activity greater protection than that given in general to civilians or civilian objects. Some of the rules require that precautions be taken with greater care and other rules give similar protection to that given to civilians / civilian objects, but do so by making particular reference to a particular class of person or object. As the nature and degree of the specific protection differ depending on the classification of these persons and objects, we should consider them in turn in order to find out what the respective protective arrangements consist of. Let us therefore start with combatants and directly participating civilians who have been put out of the fight.

PERSONS HORS DE COMBAT (AMW, R15A AND 126)

- Link to the prohibition of denial of quarter
- Intention to surrender
- In the power of the enemy
- Unconscious/incapacitated by wounds/sickness and
- therefore incapable of defending themselves

Speaking notes: We saw in Module 3 that it is prohibited to order that there shall be no survivors, to threaten this or to conduct hostilities on that basis (Art. 40 AP I; Art. 23 (d) Hague Regulations). This is known as the rule prohibiting denial of quarter. There is an obvious link between this rule and the rule that protects persons who are hors de combat, or out of the fight Art. 41 API, AMW, R15b. Persons who are hors de combat may include combatants, fighters, civilians who have been directly participating in the hostilities and others. As Art. 41 API provides, persons are hors de combat if they have clearly expressed an intention to surrender, are in the power of an adverse party to the conflict or if they are unconscious or otherwise incapacitated by wounds or sickness and therefore incapable of defending themselves. The intention to surrender must be clearly communicated; AMW, R15b, commentary para 5. Persons hors de combat must abstain from any hostile act and must make no attempt to escape. The protection of persons hors de combat is similar to that afforded to civilians. In the air context, it is often hard to determine whether the aircraft crew are hors de combat, not least because a stricken combat aircraft can still be a potent force. Similarly it may be hard for a pilot to determine if persons on the ground fulfil the criteria of hors de combat. Surrender to aircraft by troops on the ground may be problematic. AMW, R15b, commentary paras. 6 to 11.

A person descending by parachute from an aircraft in distress is assimilated to ‘persons hors de combat’ and must not be made the object of attack during his descent. On landing he must be given the opportunity to surrender; AMW, R15b, Commentary para 13 and r 132.

WOUNDED AND SICK

- military or civilian persons +
- trauma, disease or other physical or mental disorder or disability +
- need medical assistance or care +
- refrain from any act of hostility

Speaking notes: The wounded and sick are defined in Art. 8 API to mean military or civilian persons who due to trauma, disease or other physical or mental disorder or disability, are in need of medical assistance or care and who refrain from any act of hostility. The need for medical care does not have to be attributable to the armed conflict. So maternity cases, new-born babies and the infirm are included AMW, R15b, Commentary para. 12.

All possible steps must be taken to search for and collect the wounded and sick all times and particularly after engagements; AMW, R16a. They must be respected and protected. They must be treated humanely and must receive as far as practicable and with minimum delay the medical care and attention their condition requires. Distinguishing between them is only permitted on medical grounds and medical procedures not indicated by their medical situation, mutilation and medical experiments are prohibited; AMW, R16b.

SLIDE 4

SHIPWRECKED

- **military or civilian persons +**
- **in peril at sea or in other waters +**
- **due to misfortune affecting them/vessel/aircraft +**
- **refrain from any act of hostility**

Speaking notes: This term means military or civilian persons ‘who are in peril at sea or in other waters as a result of misfortune affecting them or the vessel or aircraft carrying them and who refrain from any act of hostility’; Art. 8 API and AMW, R15b, Commentary para 12. They remain classed as shipwrecked during the rescue operation until they acquire another status.

So the concept of ‘shipwrecked’ would include aircrew who have bailed out of their aircraft over the sea. They will be classed as shipwrecked during the rescue operation, but once the rescue is complete, if their condition classifies them as ‘wounded and sick’ they must be accordingly respected and protected. If they are able-bodied members of the armed forces in the hands of the enemy, they will be classed as prisoners of war. If they are civilians in enemy hands, Geneva Convention IV will apply to them once rescue is complete. The shipwrecked must be searched for; AMW, R16a, must be respected and protected and must be treated humanely and must receive, to the fullest practicable extent, the medical care and attention their condition requires, there being no distinction between them except on medical grounds; AMW, R16b.

If, despite their perilous situation, they start to use force e.g. by firing a weapon, they will cease to be classed as shipwrecked.

SLIDE 5

MEDICAL PERSONNEL

- **persons assigned permanently or temporarily**
- **by a party to the conflict**
- **exclusively to medical purposes**
- **includes medical administration and medical transport**

Speaking notes: We should start by looking at who and what medical and religious personnel and services consist of. Medical personnel are persons assigned permanently or temporarily by a party to the conflict exclusively to medical purposes including medical administration and medical transport Art. 8 API and AMW, R71, Commentary paras. 5 and 6.

RELIGIOUS PERSONNEL

- exclusively engaged in the work of their ministry
- permanently or temporarily attached to the armed forces,
- to medical units or transports or to civil defence

Speaking notes: Religious personnel are persons exclusively engaged in the work of their ministry and may be permanently or temporarily attached to the armed forces, to medical units or transports or to civil defence; Art. 8 API, and AMW, R71, Commentary para 7. Medical and religious services is a broader notion which includes medical and religious personnel, fixed or mobile medical units including hospitals and medical transports by air, land sea or other waters.

All such medical and religious personnel, medical units and transports, whether military or civilian, must be respected and protected at all times and must not be made the object of attack; AMW, R71. The duty to protect is a duty to take appropriate action to ensure respect by non-State actors (e.g. to prevent looting) while the obligation to respect goes beyond the obligation not to harm these persons and objects and includes a duty not unnecessarily to prevent them carrying out their functions; AMW, R71, Commentary paras 12 and 13. This protection only ends if they commit, or are used to commit, outside their humanitarian function acts that are harmful to the enemy; AMW, R74a. Clearly rendering personnel fit for duty is harmful to the interests of the adverse party, but is not outside their humanitarian function and will not therefore deprive the personnel / facilities so engaged of protected status.

For medical units and transports, protection only ceases if a warning is given setting a reasonable time limit for compliance and if the warning goes unheeded; AMW, R74b. So the requirement for a warning is mandatory. The time limit must give a reasonable opportunity to cease the unlawful acts, but in some cases insisting on immediate compliance may be reasonable. Equipping medical unit personnel with light weapons for self-defence or the defence of those in their charge, guarding a medical unit with sentries, the presence in the unit of combatants for medical reasons and that arms and ammunition taken from the wounded and sick have not yet been removed do not deprive the medical unit of protected status; AMW, r 74c. These precautions, including the absolute requirement to give a warning and a reasonable time for compliance, exceed the protection afforded to civilians and therefore constitute 'special' protection as that notion was explained earlier.

SLIDE 6

SLIDE 7

PROTECTIVE EMBLEM

(insert emblems of the Red Cross, Red Crescent and Red Crystal)

Speaking notes: Medical and religious personnel should wear, and medical units and transports should be clearly marked with, the distinctive emblem of the red cross, red crescent or red crystal. For personnel, this is usually achieved by wearing an appropriately marked, water-resistant armband on the left arm. Additional means of identification may be used; AMW, R72a. The distinctive sign should be made of materials to make it as visible as possible to technical means of detection in air operations; AMW, R72b. It is important to understand, however, that the distinctive emblem and other identification means only facilitate identification and do not, as such, confer protection; AMW, R72c. This means that a medical unit or transport has protected status from the moment it is recognized as such and medical and religious personnel have protected status regardless of whether they wear the emblem.

SLIDE 8

MEDICAL AIRCRAFT

Any medical transport by air:

- **Clear marking with emblem + national colours**
- **Additional means of identification**
- **Friendly territory – no consent**
- **Enemy/disputed territory – need consent**
- **Must comply with inspection**
- **Acts harmful to enemy, liable to be attacked**

Speaking notes: Medical aircraft are entitled to special protection; AMW, R75. Any medical transport by air is a medical aircraft; Art. 8 API and AMW, R11. It must be clearly marked with the red cross / crescent / crystal, together with national colours, on its lower, upper and lateral surfaces; AMW, R76a. Annex I to API refers to additional means of identification such as a flashing blue light or radio messages associated with priority signals. Again, the emblem only facilitates identification; it does not confer protection.

How protection is secured will depend on where the medical aircraft is being flown. In areas under friendly force control, enemy consent to the flight is not a precondition for specific protection of the medical aircraft; AMW, R77. If it is flown in enemy controlled areas or in 'the contact zone', enemy consent to the flight is required in order for it to be fully protected. Absent such consent, medical aircraft operate in the contact zone at their own risk, but if their status is recognized, they must be respected; AMW, R78a. Requests for such consent must be submitted before the flight and must be accompanied by a detailed flight plan. Consent must be clear and any refusal must be on reasonable grounds if consent is conditional, the conditions must be carefully complied with and if ordered to land for inspection, the medical aircraft must comply; AMW, R78b, 79–80a. If inspection reveals it is being operated consistently with its status, the medical aircraft must be allowed to continue its flight without delay.

If inspection reveals it has been used inconsistently with its medical status or that it has been flown in breach of an agreement, it may be seized and the occupants must be treated as the law of armed conflict requires; AMW, R8ob and c. Being equipped with deflective means of defence, carrying light individual weapons for the defence of medical personnel or patients or carrying the individual weapons of the wounded or sick occupants does not result in loss of protection; AMW, R82. It may, however, be liable to be attacked if it undertakes acts harmful to the enemy; AMW, art 83.

SURRENDER

Surrender requires:

- Clear communication
- No Hostile act
- No attempt to evade capture
- No established air procedure

Speaking notes: Any surrender to an enemy must satisfy three cumulative conditions. First, in a practical sense, the intention to surrender must be communicated clearly to the enemy. Second, those offering to surrender must not engage in any hostile act, and third, no attempt must be made to evade capture; AMW, R127. Aircrews of aircraft must therefore do all they can to make clear their wish to surrender. Communication of this on a distress frequency may be one method, but there is no established procedure; AMW, R128. The party to the conflict may insist on the surrender being undertaken in a specified, reasonable way and the AMW Manual notes that the surrendering crew of an aircraft may, in certain circumstances, have to parachute from the aircraft in order to communicate their intentions; AMW, R130. Surrendering combatants and civilian members of military aircraft crews will be entitled to prisoner of war status on capture.

SLIDE 9

PARACHUTISTS IN DISTRESS

- No attack during descent
- Into sea: shipwrecked
- Must have chance to surrender before being attacked

Speaking notes: Persons, whether aircrew or passengers, who are descending by parachute from an aircraft in distress must not be made the object of attack during their descent even if that descent is in friendly territory. If their descent is into the sea, they then have shipwrecked status. If they land in enemy held territory, they must be given an opportunity to surrender before they can be made the object of attack, unless they are engaging in a hostile act or attempting to evade capture. This rule does not apply to airborne troops such as paratroopers, special forces or commando units. On the whole, see Art. 42 API; AMW, Section T.

SLIDE 10

SLIDE 11

CIVIL DEFENCE

- Civil Defence tasks listed in AMW, R1k
- Must be respected and protected
- Must be exclusively assigned to Civil Defence
- Interference with Civil Defence functions only based on imperative military necessity

Speaking notes: Civil defence refers to the performance of any one or more of a number of activities listed in AMW R1k with the intention of protecting the civilian population against the dangers, and to enable it to recover from the immediate effects of, hostilities or disasters and to provide the conditions necessary for its survival (see also Art. 61 API). Civil defence organizations and their personnel, whether civilian or military, are entitled to specific protection; in particular, only imperative military necessity may prevent them performing their civil defence tasks. Such organizations and personnel must be respected and protected. To be 'civil defence personnel' and individual must be exclusively assigned by a party to the conflict to civil defence duties. Once military personnel or units are assigned to civil defence, they are prohibited for the duration of the armed conflict from performing any other military task such as combat or combat support. See Arts 61–67 API; AMW, R90–92 and associated Commentary.

SLIDE 12

DISTINCTIVE SIGN FOR CIVIL DEFENCE

- (Add picture of the distinctive sign for civil defence)
- Buildings/material/shelters protected
- Warning/time limit/unheeded before protection can end

Speaking notes: This is the distinctive sign for civil defence as provided for in Art. 66 (4) API. The specific protection applies to buildings and material devoted to civil defence and shelters for the civilian population. Parties to the conflict should seek to ensure that civil defence organizations, personnel, buildings and materials and shelters for the civilian population are marked with the civil defence distinctive sign that you can see on the slide. Civil defence specific protection only ends if civil defence organizations, personnel, buildings, shelters or material commit or are used to commit outside their proper tasks, acts harmful to the enemy. Protection can only cease after a warning has been given setting, whenever appropriate, a reasonable time limit and after such warning has gone unheeded; AMW, R90b and 92 and associated Commentary.

SLIDE 13

CULTURAL PROPERTY

- Cultural Property defined in AMW, R1o
- Use for military purposes only in case of imperative military necessity and if emblem removed

Speaking notes: Under rule 1(o) of the AMW Manual, cultural property is defined, irrespective of origin or ownership, as movable or immovable property of great importance to the cultural heritage of every people, buildings for the preservation and exhibition of such movable property, refuges for the shelter of such property and centers containing a large amount of cultural property. Parties to the conflict must refrain from using cultural property, its immediate surroundings or appliances that protect it for purposes that will expose it to destruction or damage; Hague Cultural Property Convention 1954 (HCPC) and AMW, R42 and 93a. Cultural property or its immediate surroundings can only be used for military purposes if military necessity imperatively so requires and in that eventuality, the cultural property emblem must have been removed; HCPC, art 4 and AMW, R93b.

EMBLEM OF CULTURAL PROPERTY

Prohibition of hostile acts against Cultural Property and surroundings unless:

- imperative military necessity requires and
- effective advance warning remains unheeded

Speaking notes: Cultural property should be marked for its identification and protection with this internationally recognized emblem and the enemy should be given timely and adequate information as to its location; AMW, R94. Parties to the conflict must refrain from acts of hostility directed against cultural property and it, or its immediate surroundings, may only be attacked if military necessity imperatively so requires; AMW, R95. If military objectives in the immediate surroundings of cultural property are attacked, all feasible precautions must be taken to avoid damaging the cultural property. Any decision to attack cultural property must be taken at a suitable level of command and must take due account of its status as cultural property. An effective advance warning should be given and the attack should only go ahead if the warning remains unheeded; AMW, R95c and 96. See also Art. 53 API.

SLIDE 14

STARVATION

- Starvation of civilian population prohibited
- Starvation of combatants lawful
- Civilian relief in sieges
- Objects indispensable to the survival of the civilian population protected
- But not objects used solely to sustain enemy military

Speaking notes: The first and vital rule under this heading prohibits the use of starvation as a method of warfare (Art. 54 API; AMW, R97a). Starvation is interpreted as annihilating or weakening the civilian population by deliberately depriving it of its sources of food, drinking water or other essential supplies thus causing it to suffer hunger or otherwise affecting its subsistence; AMW, R97a, Commentary para 2. It is not however prohibited to attack supplies on

SLIDE 15

which the enemy military forces depend for sustenance, so starving enemy combatants is legitimate; *ibid* para 3. So in a siege, if the civilian population is suffering starvation, relief supplies must be permitted and in a blockade, if the blockaded area is inadequately provided with food or other objects essential for its survival, the blockading party must allow for free passage of such foodstuffs or supplies subject to certain conditions.

The law goes further than this however. Rule 97b of the AMW Manual notes it is prohibited to attack, destroy, remove or render useless objects indispensable to the survival of the civilian population, including foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies, irrigation works, for the specific purpose of denying their use to the civilian population; see also Art. 54 API. This prohibition also does not apply to such objects that are used by the enemy solely to sustain members of the armed forces or in direct support of military action; AMW, R97c. But no action against such objects can be taken if it may be expected to leave the civilian population with such inadequate food or water as to cause it starvation or to force its movement; AMW, R97cii. Even the use of such objects in direct support of military action will not justify an attack on them if these would be the consequences for the civilian population.

SLIDE 16

HUMANITARIAN AID/UN PERSONNEL

- Humanitarian aid (AMW Manual, section O)
- UN personnel (AMW Manual, R98)

Speaking notes: Impartial relief actions should be undertaken when the civilian population under control of a belligerent party is inadequately provided with food, medical supplies, clothing, bedding, means of shelter or other supplies essential to survival. Agreement of the parties is required but cannot be withheld in occupied territories. Either States or impartial humanitarian organizations may undertake such relief actions and the parties to the conflict must allow and facilitate rapid and unimpeded passage of relief consignments, equipment and personnel subject to technical arrangements. Technical arrangements may include establishing air corridors or routes, organizing airdrops, agreeing humanitarian flight details and providing for the search of humanitarian relief consignments. The humanitarian relief personnel, transports, installations and goods must be respected and protected provided they are acting or used in accordance with their humanitarian mission. Such activities can only be restricted on grounds of imperative military necessity.

UN personnel must be respected and protected so directing attacks at them is prohibited if and for so long as they are entitled to civilian protection. This will cease to be the case if they take a direct part in the hostilities or if the UN becomes a party to the armed conflict. Likewise, directing attacks at material, installations, units and vehicles of the UN is prohibited unless they are military objectives.

NATURAL ENVIRONMENT (AMW MANUAL, R88-89)

Treaty law:

Prohibition of means and methods of warfare that are intended or may be expected to cause widespread, long-term and severe damage to the natural environment (Arts 35(3) and 55 API)

Customary law:

- Wanton destruction prohibited
- Due regard obligation

Speaking notes: As we saw in Module 3, Additional Protocol I, articles 35(3) and 55, prohibit means and methods of warfare that are intended or may be expected to cause widespread, long-term and severe damage to the natural environment. The US and certain other States object persistently to this rule and the AMW Manual identifies rules that may reliably be regarded as customary and thus binding on all States, that protect the natural environment, but that do not go quite as far as the API rule. The customary rules prohibit wanton destruction of the natural environment and for these purposes destruction is 'wanton' if it is the consequence of a deliberate act undertaken maliciously i.e. it cannot be justified by imperative military necessity; AMW, R88. It therefore follows that when conducting air and missile operations, due regard should be given to the natural environment; AMW, R89. It should be kept in mind during target analysis and constant care should be taken over it. States not party to Additional Protocol I are bound by these customary rules. States party to Additional Protocol I are bound by both the customary rules and those in articles 35(3) and 55.

WORKS AND INSTALLATIONS CONTAINING DANGEROUS FORCES

- Dams
- Dykes
- Nuclear electrical generating stations, and
- Military objectives in their vicinity

Treaty law:

Prohibition of attacks which may cause the release of dangerous forces, such as water or nuclear fall-out, and consequent severe losses among the civilian population (Art. 56 API).

Customary law: "particular care" rule

(insert: emblem of works and installations containing dangerous forces)

Speaking notes: Additional Protocol I contains specific protective rules relating to works and installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations. Only these three classes of work or installation are governed by the rules. They must not be made the object of attack even if they are military objectives if the attack may

cause the release of dangerous forces, such as water or nuclear fall-out, and consequent severe losses among the civilian population; Art. 56 API. In addition, Article 56 of the treaty prohibits the attack of military objectives located in the vicinity of such works and installations but lays out limited circumstances in which these special protections are lost. While these rules bind States party to Additional Protocol I, a number of States persistently object to them including the US. The AMW Manual identifies rules that can reliably be taken as customary and thus as binding on all States. They require that if such works and installations, or installations in their vicinity, are attacked, particular care must be taken. In addition, special agreements between belligerents may include provision for such works and installations, AMW, R36 and 99, Commentary para 3.

SLIDE 19

PROTECTION OF PERSONS OR OBJECTS BY SPECIAL AGREEMENT (AMW MANUAL, R99)

Speaking notes: Belligerent parties may agree at any time to protect persons or objects not otherwise protected by international law. Such agreements should only increase, not reduce, protection. They do not require formalities such as signature and ratification but should be clearly expressed. In non-international armed conflicts, such agreements are explicitly provided for in Common Article 3 to the 1949 Geneva Conventions.

SLIDE 20

CIVILIAN AIRCRAFT AND AIRLINERS

- **Liable to interception, inspection, diversion**
- **Enemy / neutral civil aircraft and capture as prize**
- **Practical safety issues and NOTAMs**
- **Civilian airliners – particular care over precautions in attack**

Speaking notes: We considered the special protection of medical aircraft earlier. Other classes of aircraft also enjoy specific protection.

Civilian aircraft, whether enemy or neutral, are civilian objects and thus have protected status; AMW, R47a. They may only be attacked if they fulfil the criteria of a military objective and do not lose protection merely because they enter an exclusion or no-fly zone; AMW, R47b. They may, however, be intercepted, inspected or diverted from their chosen course and enemy civil aircraft are liable to be captured as prize; AMW, R48b, 49. Neutral civil aircraft are liable to capture as prize outside neutral airspace if it is determined that they are carrying contraband or if a number of other circumstances listed in rule 141 of the AMW Manual applies. Whenever an enemy or neutral civilian aircraft is being captured, the safety of the passengers and crew on board must be provided for. Documents and papers relating to the aircraft must be safeguarded.

The safety of civilian aircraft in flight in times of armed conflict requires that they file with the relevant Air Traffic Control service (ATC) required flight plans showing information as to registration, destination, passengers, cargo, identification codes and modes (including updates en route). They should not deviate from a designated air traffic service route or flight plan without ATC clearance unless unforeseen circumstances arise, e.g. distress, in which case they should give immediate appropriate notification. They should avoid areas where hazardous military operations are under way and should comply with instructions from military forces if they find themselves in the vicinity of hostilities. Notices to airmen should be issued by belligerent parties disclosing where hazardous military operations that would be hazardous to civil aviation are taking place, listing frequencies which the aircraft crew should constantly monitor, altitude, course and speed restrictions, relevant military radio communications procedures, and possible action by the military forces in the event that the NOTAM is not complied with; AMW, R53–55.

Civilian airliners are civilian objects and they are entitled to particular care when the precautions in attack, discussed in Module 3, are taken. As with any other object normally dedicated to civilian purposes, a civilian airliner, whether in the air or on the ground, is in cases of doubt presumed not to be making an effective contribution to military action and, therefore, it is assumed not to be a military objective; AMW, R59. Neutral or enemy civilian airliners should avoid entering exclusion or no-fly zones, but if they do so, they do not lose their protected status. If a civilian airliner is suspected of carrying contraband or otherwise of acting contrary to its status, it is subject to inspection by a belligerent party at an airfield safe and accessible for that type of aircraft; AMW, R60–61. Enemy civilian airliners may be taken as prize provided all passengers and crews are safely disembarked and the papers of the aircraft are preserved; AMW, R62.

A civilian airliner that makes an effective contribution to military action may become a military objective; AMW, R63.

II. Exercises (Specifically Protected Persons/ Objects)

Instructions: Participants are divided into work groups numbering up to 5 or 6 students. Each work-group should discuss all of the following questions and should refer to the AMW-Manual as an aid to resolving any legal issues that arise during the discussions. Each group should elect a spokesperson who will present the group's response to the questions. Spokespersons of other groups may comment and present their own solutions. Members of each work group should take turns to present, and respectively comment on, solutions to the plenary course members.

EXERCISE 1

Scenario: You are the pilot of an attack aircraft. You see imagery that shows enemy combatants and some civilians who are clearly using force. A bomb explodes near them and some of them can be seen to lie still. Others seem to be moving. One in particular is moving away from the area and towards what you know to be a group of his colleagues. He does not appear to have a weapon.

Question: Are you permitted to attack him?

Answer: The scenario is deliberately ambiguous. It is not clear whether all of the persons on the ground are hors de combat. The person who is moving towards a group of his colleagues may be seeking to escape. A person who is seeking to escape is not hors de combat under Art. 41 API and can therefore lawfully be made the object of an attack. Note that while there is a presumption in favour of civilian status, there is no presumption at law that a combatant is hors de combat. The legal requirement is to do everything feasible to verify that the object of the attack is a lawful target.

EXERCISE 2

Scenario: An aircraft that is overhead is evidently hit by ground fire. Persons are seen to jump from the aircraft and parachutes open. As they land they are observed concealing their parachutes, consulting a map and start to move towards where their allies are located.

Question: Can they lawfully be fired upon?

Answer: Yes. It is right that they were not fired upon during their descent by parachute. On landing they must be given the opportunity to surrender. However, once they show that they are seeking to escape towards their own lines it is legitimate to attack them, AMW, R132b, commentary para 3.

EXERCISE 3

Scenario: The medical officer in charge of the Deployed Medical Facility is coming under pressure from the Commander of the Deployed Force to prioritize treatment for the members of the force who are sick or wounded. He points out that the reason the medical facility is there is to provide medical cover for members of the Deployed Force, that he has no objection to treatment being offered to enemy personnel, but that where there is a military need for his troops to be made combat ready as soon as medically possible, he expects that medical resources will be prioritized accordingly.

Question: Can you comply with his instruction?

Answer: No. As provided for in AMW, R16b, no distinction may be made between the wounded and sick on any grounds other than medical ones. This means that medical need must be the basis on which patient care is prioritized. While the commander's arguments have a certain logic it would not be lawful to implement his instruction.

EXERCISE 4

Scenario: The Commander is irritated by your answer and says that in that case he plans to stop searching for and treating enemy wounded and sick so he can be sure that the available medical facilities will be adequate to ensure speedy care of his own troops.

Question: Is this alternative approach lawful?

Answer: The commander should be reminded (AMW, R16a) that all possible steps must be taken to search for the wounded and sick and that they must receive the medical care that they need to the extent possible. His proposal is not therefore acceptable.

EXERCISE 5

Scenario: The Radio communications facility within the Base Hospital is being used to transmit targeting data to the Combined Air Operations Centre. The Commander says he knows that the medical facility should not be used in this way, but he has no choice because the normal targeting support net has been disrupted by enemy cyber operations. He wants medical operations to continue and wants the medical facility to continue to be protected by the Red Cross flag it flies.

Question: What advice do you give him?

Answer: First point is that the medical facility is not being protected by the Red Cross flag. The Red Cross flag is merely indicative of its medical, and thus, protected status. Second point is that if the medical facility is not being used exclusively for medical purposes, as is the case in the circumstances proposed by the Commander, it is no longer entitled to show the emblem.

However, the facility can continue to be used for medical purposes. It is simply that while the non-medical activities are taking place, it must not claim for itself a medically protected status to which it is not entitled.

EXERCISE 6

Scenario: The Commander wants to use the top floor and roof of the State Museum and Cultural Centre as a military communications hub. This will involve sending military communications, including operational and tactical level orders, to all military formations and undertaking some target analysis. He explains that, while the administrative block of the local Chemical factory would have been a possible site for the military communications hub, the top floor of the museum would be somewhat more convenient from a logistical point of view.

Question: What do you advise?

Answer: The State Museum and Cultural Centre is clearly an item of cultural property which is therefore subject to specific, indeed to special, protection. Article 4 of the Hague Cultural Property Convention prohibits the use of cultural property for military purposes in the absence of imperative military necessity. The scenario suggests that the Chemical factory's administrative block, though less convenient, would have been a feasible option. This suggests that imperative military necessity does not in fact require the use of the Museum for these purposes with the result that in accordance with Article 4, the option of using the Museum in the suggested way should not be pursued.

EXERCISE 7

Scenario: Military operations have been successful and some territory has been gained. The local population is however clearly suffering from lack of food and water. You explain to the Commander that in these circumstances he must allow relief supplies. He tells you that he is happy to do this on certain conditions, namely that his personnel get to inspect each consignment carefully to ensure guns are not being carried to the enemy, and on condition that the agency bringing in the supplies is an NGO called XYZ. You check and find that XYZ would be able and willing to carry out the relief action.

Question: Are the Commander's stipulations acceptable?

Answer: If the XYZ NGO is impartial, and taking into account that they would be ready, able and willing to undertake the task, there would be no objection in principle to a requirement that that NGO in fact undertake the relief action. Equally, there is no objection to technical arrangements being required by the commander including search of the consignments provided that the provision of the relief is rapid and unimpeded; AMW, ROT.

EXERCISE 8

Scenario: The enemy is using its civil defence personnel and equipment to clear debris and casualties from the scene of an attack on an air base, specifically the air traffic control tower. Wounded and dead combatants are being recovered to the local Military Medical facility. You observe that once the debris has been cleared, a construction company is deployed to the scene to rebuild the ATC tower. When these events are reported to the Commander he says ‘Right, the civil defence outfit are now a lawful target – go after them’.

Question: What advice do you give?

Answer: Civil defence is entitled to specific protection and that protection only ceases if they are used outside their proper tasks to commit acts harmful to the adverse party. You tell the Commander that in your view, clearing of debris from the scene of an attack on a military facility and as a prelude to reconstruction of that military asset is indeed an act outside the proper tasks of civil defence and would be harmful to your own party to the conflict as it contributes to restoring the serviceability of the air base. However, you must point out that protection only ceases after a warning has been given setting where appropriate a reasonable time limit for compliance and where the warning has gone unheeded. You should discuss whether the present circumstances render a time limit appropriate, but you should explain that a warning is mandatory and that if the enemy responds to the warning by immediately complying, that an attack would likely be inappropriate.

EXERCISE 9

Scenario: An enemy civilian airliner, a Boeing 777, is detected as it flies towards territory controlled by the enemy. You are convinced that it is carrying arms to re-supply the enemy as well as the passengers travelling on the air route reflected in the flight plan that it filed. The Commander tells you that it is most important that the guns must not get into the hands of the enemy. There are three airfields within a reasonable distance of the current position of the aircraft. Airfield one consists of a grass landing strip and not much more, and airfield 2 has a runway which is 75 yards shorter than the runway at the airfield that the aircraft normally uses. A third airfield which is at the edge of the territory controlled by your party to the conflict has a lengthier runway and all necessary facilities for an aircraft of the relevant size and type, but hostilities are taking place close by and periodic attacks on aircraft landing at the airfield take place.

Question: When you instruct the airliner to divert, which airfield do you specify?

Answer: Neutral or enemy civilian airliners should avoid entering exclusion or no-fly zones, but if they do so, they do not lose their protected status. The Boeing 777 is therefore a protected object and should be treated accordingly. The first issue is whether the airliner is in fact suspected of carrying contraband or otherwise of being used in contravention of its status. According to the scenario, this seems to be the case. That suspicion renders the airliner subject to inspection by a belligerent party at an airfield safe and accessible for that type of aircraft; AMW,

R60-61. It is assumed that all three airfields are accessible. The question is therefore which of them is safe. Airfields one and three, for the reasons given in the scenario, would seem not to be. The mere fact that airfield two has a runway 75 yards shorter than the runway that the aircraft normally uses does not per se mean that the airfield is unsafe. Airfield two would therefore seem to be the preferable option, but if for some reason it also proves to be unsafe, some other option should be considered. Remember that where undertaking precautions in respect of civilian airliners is concerned, particular care is required.

MODULE 6

– LEGAL CHALLENGES OF NEW TECHNOLOGIES

I. Lecture

(TITLE): LEGAL CHALLENGES OF NEW TECHNOLOGIES

SLIDE 1

SCOPE OF THIS MODULE

SLIDE 2

- Unmanned (combat) aerial vehicles (UAV/UCAV)
- Autonomy/automation of attack and the law
- Cyber warfare and air operations
- Incapacitating chemical agents
- Biotechnology
- Nanotechnology
- Metamaterials

Speaking notes: The list of topics on the slide is at first glance rather daunting. The purpose of this presentation is to give you a flavour of some of the technological developments that are currently taking place in the weapons field, to talk about what the law has to say about them and, as a result, to give you an idea of which new technologies are likely to find their way into the battlespace in the years, or perhaps decades, to come. But we should start with a technology that is already with us and indeed that has been in use for some years. What are the LOAC issues raised by the increasing use of UAV/UCAV?

UNMANNED AERIAL VEHICLES (UAV/UCAV)

SLIDE 3

- The law does not change
- 'Man on the loop' systems
- Importance of real-time visibility of what UCAV is doing
- Importance of operator's workload (swarm technology)

Speaking notes: Since the 2002 attack in Yemen when Qaed Senyan al-Harithi was targeted by a US Predator UCAV equipped with a Hellfire missile, unmanned aerial attack operations have become a mainstream method of attack. Even non-State armed groups are acquiring such technology.

The critical factor is that a person controls the weapon system by means of a remote communications link. UAV/UCAV are now frequently used to conduct anti-insurgency operations and other military tasks. While they vary greatly in size from Global Hawk with a wingspan of 116 feet and a payload of up to 2000 pounds to the US Defense Advanced Research Projects Agency Nano Air Vehicle with a wingspan of 16 centimetres and a weight of 19 grams, they all derive lift from interaction with the air, are therefore classed as aircraft and must fulfil the criteria of military aircraft if they are lawfully to exercise belligerent rights, such as attack or interception. That means they must be operated by the armed forces, must have military markings, must be commanded by a member of the armed forces and be controlled or programmed by personnel subject to armed forces discipline.

Attack assessments by remotely located controllers may, but will not necessarily, be more reliable than, say, those of aircrew on the scene facing enemy defences and other distractions, such as the need to fly the aircraft and to maintain awareness of airborne and ground-based threats. The controller guides the UCAV, monitors the output of its sensors and of any other available sources, using the visual images transmitted to him to locate and identify individuals and/or objects of military interest and determines what action, such as attack, is to be taken. Additional specialists may be located nearby and may assist the controller with decisions that largely equate to those that the pilot of a manned aircraft would take. It is that decision-making process that seeks to ensure that any attack decisions that are taken comply with targeting law and applicable ROE. The same targeting law rules will apply to UCAV attacks as apply to attacks by manned aircraft; the same precautions in attack must be taken by the controller as are taken by a pilot in corresponding circumstances.

'Man on the loop' systems are capable of automated or autonomous attack decisions but are supervised by an operator who is equipped to enable him to intervene and over-ride such autonomous or automated attack decisions if it becomes clear, for whatever reason, that the particular attack should not proceed. It is the presence of the man, or woman, on that loop that means that such 'man on the loop' attack systems are capable of being used in accordance with targeting law rules provided that the 'man on the loop' is appropriately informed as to what is taking place in the relevant part of the battlespace. It is however important to ensure that a person fulfilling such a task is in fact able properly to supervise the decisions that the autonomous/automated attack systems are making and it is also important to ensure that this 'man on the loop' is in a practical sense realistically able to intervene if required. The care taken by, and the workload imposed on, the operator will determine whether he can ensure that targeting law requirements are complied with. This would suggest that the use of substantial numbers of unmanned aircraft in 'swarms', with all the platforms comprising the swarm being controlled by a single operator, may raise legal issues. Operating swarms of unmanned aircraft is likely to require considerable autonomy in the operation of the individual platforms, and some of the precautionary targeting law rules that were mentioned in Module 3 and to which we will refer below, may be difficult to comply with.

LEGAL CHALLENGES OF AUTONOMY/AUTOMATION IN ATTACK

SLIDE 4

- No agreed definition of autonomy/automation
- Automation: Recognition of pre-loaded target criteria + automated attack decision
- Autonomy: Apply human-type reasoning
- Is seen object lawful target?
- Would attack be lawful?
- How to attack it?

Speaking notes: Automation of aspects of attack decision-making is a reality and autonomy seems to be the ultimate further goal of contemporary research. But what do these terms mean? They have no internationally agreed legal definitions, but think of highly automated systems as constrained by algorithms that limit their ability to act independently. In simplified terms, an automated system may, for example, compare what it observes in the battlespace with algorithmic data that has been fed into the weapon control software. If by this means the weapon system is able to recognize an object as being a military object, such as a tank, artillery piece or armoured personnel carrier, the weapon system will act in accordance with pre-programmed instructions and e.g. attack the recognized object. Such technologies are not new – think of certain mines and booby-traps. Autonomous systems, by contrast, are not pre-programmed to target a specified object or person. It is the software that decides which target to prosecute, how and when. They apply human-type reasoning to determine whether an object or person they observe is a lawful target, whether in the prevailing circumstances it would be lawful to attack it and, if so, how the attack should be undertaken. Autonomous attack decision-making is unlikely for the foreseeable future to be capable of employment consistently with targeting law outside the remotest of places where civilians are absent.

IS THERE A NEED FOR A BAN OF AUTOMATED/AUTONOMOUS WEAPONS?

SLIDE 5

Speaking notes: There have been calls, notably by NGOs, for autonomous and certain highly automated weapon systems to be banned. Others have argued that artificial intelligence and sensor technology may reach a level of sophistication where machines would become better than humans at complying with IHL. A development of artificial intelligence, in which the weapon system learns and makes decisions based on what it has learned, seems likely to be the critical step that takes warfare towards autonomy. The weapon system might learn, for example, how to recognize a target or it may observe what happens over time in an area and then learn to use this information to decide whether certain attacks would be lawful. Artificial learning intelligence might for instance detect the presence of hostages in the vicinity of a target in numbers and at a proximity that would render the expected collateral harm disproportionate compared to the anticipated military advantage or it might, perhaps, simply detect whether what it sees differs from what it has been programmed to expect to see, and may be programmed to react to any difference by refraining from undertaking an attack. So should au-

tonomy be banned now or should we wait and see how the technology develops? Views differ and it suffices to say that this is one of the issues that the Conventional Weapons Convention process is currently debating.

SLIDE 6

AUTOMATED/AUTONOMOUS WEAPONS AND WEAPONS LAW

Speaking notes: We saw in Module 5 that when legally reviewing new weapons and weapon systems, States are required to apply the existing legal principles and rules that bind the relevant State. This applies also in case of automated and autonomous weapons. As far as compliance with the prohibition of superfluous injury and unnecessary suffering and with the environmental protection rules is concerned, the automated or autonomous decision-making aspect of the weapon system is unlikely to be of any particular relevance. Even the prohibition of indiscriminate weapons is only breached if the weapons system in question is indiscriminate by nature. Thus, as long as the software controlling the attack decision-making of an autonomous system is designed to recognize particular types of military objective, and as long as it performs satisfactorily in tests, the system as such cannot be regarded as an indiscriminate weapon. Therefore, in and of itself, the autonomous or highly automated attack aspect of a weapon is unlikely to breach normal weapons review criteria. However, the weapon review should not stop there.

SLIDE 7

AUTOMATED/AUTONOMOUS WEAPONS AND TARGETING LAW

The challenges of evaluative rules:

- **Hors de combat**
- **Proportionality**
- **Separate and distinct military objectives treated as one**
- **A person must be able to cancel inappropriate attack decisions**

Speaking notes: To the extent that autonomous or highly automated attack technologies are designed to carry out all or part of the targeting and attack process without human supervision, the weapons review will also have to consider whether the system in question is capable of complying with the requirements of targeting law and, in particular, with the precautions required of all attackers. While autonomous or highly automated attack platforms may be capable of identifying certain military objects, such as tanks or aircraft, how will it work when it comes to targeting people? Can artificial intelligence and sensor technology be pushed to a level of sophistication at which autonomous weapons systems can reliably distinguish between able-bodied combatants and persons hors de combat, or between peaceful civilians and civilians directly participating in hostilities? Furthermore, when it comes to complying with the proportionality rule, can the machine assess the anticipated military advantage in the cir-

cumstances as they apply at the time of the attack? Can it estimate expected civilian casualties and can it compare the two to reach a sensible proportionality assessment? Can the technology tell whether military objectives are or are not separate and distinct for the purposes of Article 51(5)(a) API? Can it reliably identify and refrain from attacking or avoid harming objects indispensable to the survival of the civilian population, cultural objects, or works or installations containing dangerous forces? Current software and sensor technology cannot do this. Indeed, it is the evaluative nature of some of the required precautions that seems to pose the greatest challenge to autonomous attack techniques.

If human operators can take the required precautions on behalf of the autonomous system, this is likely to overcome the difficulty, and that may lead States to adopt a ‘man on the loop’ approach whenever possible. So current technology is such that human operators must be in a position to cancel autonomous and some automated attack operations if the need should arise. Therefore, human operators must be so tasked, located and engaged as to be able, in actual fact, to intervene and over-ride attack decisions reached by the system whenever necessary. In conclusion, autonomous or highly automated attack technologies are not per se unlawful, but current technology of that sort still cannot be expected to comply with LOAC requirements without a human operator remaining “on the loop”, aware of what the attack decision-making mechanism is doing and able to intervene and stop attack decisions the implementation of which would breach targeting law.

CYBER WARFARE AND LOAC

- The notions of “cyber attack” and “cyber weapon”
- Applying the superfluous injury/unnecessary suffering rule in cyberspace
- Applying the prohibition of indiscriminate weapons in cyberspace

SLIDE 8

Speaking notes: Incidents such as those involving Estonia in 2007, Georgia in 2008 and Iran as reported in 2010 clearly demonstrate the potential for cyber capabilities to be employed in connection with future hostilities. While it is generally accepted that the use of cyber means or methods of warfare in situations of armed conflict would be governed by existing LOAC, its practical application would give rise to difficult questions concerning the interpretation of treaty terms such as “attack”, “violence”, “object” etc. The challenge of interpreting existing LOAC in light of the specific characteristics of cyber space was most prominently taken on by a group of experts who, upon invitation of the NATO Cooperative Cyber Defence Centre of Excellence (CCDCOE), drafted the “Tallinn Manual on the International Law applicable to Cyber Warfare” (2013).

For example, according to the Tallinn Manual, ‘attacks’ within the meaning of Article 49 (1) API should be understood to include, as a minimum, all cyber operations that have violent consequences, namely death, injury, damage or destruction. Accordingly, cyber capabilities that are used, intended or designed to cause either (i) injury to, or death of, persons, or (ii) damage to, or destruction of, objects should be regarded as cyber weapons governed by the law of weaponry. In this context, the term ‘damage’ should be understood to include not only phys-

ical damage to computer components, but also functional interference with a computer that requires its repair or the replacement of some of its components. The Tallinn Manual experts were not unanimous as to whether cyber tools causing other forms of harm, such as deletion of data, should also be regarded as cyber weapons subject to LOAC rules.

Also, applying the superfluous injury and unnecessary suffering rule to cyber weapons may require comparison of the injury and suffering to be expected from the cyber weapon with that to be expected from a non-cyber weapon that would otherwise be used for the particular sort(s) of attack. Ultimately, however, just like in the kinetic world, it is the injury and suffering that will inevitably arise when using the cyber weapon that must be assessed, and only if that injury and suffering exceeds that which is required to achieve the relevant military purpose will the rule have been broken. Accordingly, the decisive factor for the violation of the unnecessary suffering rule is unlikely to be the nature of the cyber tool triggering the damaging mechanism, but the nature of the damaging mechanism triggered by the cyber tool.

As far as the prohibition of indiscriminate weapons is concerned, a cyber weapon would not breach the rule as long as it can be directed at a particular military objective, and as long as its damaging effects can be reasonably limited to that objective. Even if malware directed against a military objective is of a nature also to infect civilian computers it will breach the prohibition of indiscriminate weapons only if such infection may be expected to actually result in civilian damage or injury that would be excessive compared to the military advantage anticipated. The infliction of mere inconvenience or annoyance on civilian users, however, would not be enough for the rule to be broken. In the grey area between the extremes it will be for State practice and jurisprudence to provide binding guidance as to the distinction of damage and inconvenience in cyberspace.

SLIDE 9

CYBER WEAPONS AND THE ENVIRONMENT

- No ad hoc rules address cyber weapons
- Taking cyber control – legal implications
- Cyber booby-traps
- Cyber ‘other devices’
- Taking control of enemy UAVs

Speaking notes: The environmental protection rules apply equally to cyber weapons so if the cyber weapon is intended or may be expected to have environmental impact, or to use the environment as a means to cause damage to the enemy, these rules should be considered carefully.

The law of armed conflict contains no ad hoc rules that either permit, prohibit, or restrict the lawful circumstances of, use of cyber weapons.

More specifically, consider a cyber tool that enables the cyber operator to take control of an enemy weapon system to which specific weapons law rules apply. Take as an example a cyber weapon that is designed to insert a kill switch into a computer system controlling a life-critical facility. The malware is so designed that the performance of some routine act by operators of the targeted computer activates the kill switch with fatal or injurious consequences. A weapon reviewer will have to consider precisely how such a cyber weapon operates in order to deter-

mine whether it is a cyber booby trap for the purposes of Protocol II and Amended Protocol II to the Conventional Weapons Convention. If delayed action or remote-control activation are involved, States should at least consider the 'other devices' provisions in the same treaties.

Of more specific relevance to the air domain, consider a cyber tool designed to take control of an unmanned enemy aircraft with a view to using its weapon against the enemy. Imagine that the aircraft is armed with anti-personnel landmines, cluster munitions or some other weapon that is prohibited or restricted by weapons law rules. The hacking State would be either prohibited or limited in its use of the weapon according to the weapons law rules that bind it. So if, for example, the aircraft is carrying anti-personnel landmines and the hacking State is party to the Ottawa Convention, it cannot use the weapons in any way.

HUMAN PERFORMANCE DEGRADATION/CHEMICAL INCAPACITATION

SLIDE 10

Speaking notes: Now we look at using neuroscience to degrade the performance of enemy personnel. We saw in Module 4 that the use of riot control agents for law enforcement purposes is permitted under the Chemical Weapons Convention. There are differences of academic view as to whether this law enforcement exemption is restricted to the use of riot control agents or is also applicable to toxic chemicals other than riot control agents. The ICRC view is the use of toxic chemicals as weapons for law enforcement purposes should be limited exclusively to riot control agents.

This is where the idea of 'incapacitating chemical agents' comes in. These are chemical agents producing temporary disabling conditions, which (unlike those caused by riot control agents) can be physical or mental and persist for hours or days after exposure to the agent has ceased. There are numerous examples, including anaesthetic agents, skeletal muscle relaxants and opioid analgesics. These substances can cause loss of consciousness, sedation, hallucination, incoherence, paralysis, disorientation or other such effects. The required dose for an operational effect will depend on the particular circumstances and may cause some deaths. These toxic substances are likely to be prohibited by the Chemical Weapons Convention and/or the Biological Weapons Convention and yet research in this field evidently continues. The ICRC has invited States to prioritize policy development on these issues.

There has been discussion of other incapacitating technologies that would act directly on the central or peripheral nervous system, including light pulsing devices that disrupt cognitive and neural processes, and directed energy weapons that produce a burning sensation, the application of ultra-sound as a brainwave interference technique and the use of pharmacological agents to create reversible immobilization. There are, however, considerable technical challenges confronting the safe operational application of such technologies and the established legal principles would be applied to determine their legality.

SLIDE 11

SYNTHETIC BIOLOGY

Speaking notes: Informed concern about the potential hostile use of biotechnology focuses on the manufacture of viruses from synthetic materials. Following the 2003 sequencing of the human genome, developments in synthetic biology indicate the capacity to create, for example, gene weapons targeted towards a specified racial group, viruses to edit the human genome and weapon possibilities arising from the combination of nanotechnology with biotechnology. There are obvious concerns raised by such developments. However, viruses, it seems, do not comprise chemicals and the effect of a virus on a life-form such as the human body will be essentially biological.

The prohibition of bacteriological methods of warfare is customary and thus binds all States. If a novel weapon were to employ bacteria as part of the method of warfare, it would therefore be unlawful. If a method of warfare is exclusively based on the use of a virus, it seems clear that this same customary rule would also apply and such a method would also be unlawful.

In addition, the Biological Weapons Convention addresses “microbial or other biological agents or toxins whatever their origin or method of production”. Biological agents include viruses so any weapon that employs a virus, for example to cause harm to persons, will also be prohibited under the Biological Weapons Convention. Virtually all biochemical substances, whether naturally or synthetically produced, are components of biological systems and thus prohibited by the Biological Weapons Convention.

SLIDE 12

NANOTECHNOLOGY

Speaking notes: With nanotechnology we are talking about arranging atoms and molecules to produce chosen substances or using nano-machines to arrange atoms and molecules in particular ways. Research focuses on both peaceful and potential military applications. Some such materials seem to have the potential to cause harm. While a legal weapon review of nanotechnology as such is unlikely and probably inappropriate, a weapon, means or method of warfare that involves materials constructed using nanotechnology processes may emerge and require review. The standard weapon review criteria must be applied.

A nanometre is one billionth of a meter. In simple terms, by grinding a substance to very small sub-particles and then re-building it, its characteristics can be altered resulting e.g. in reductions in weight and gains in durability and strength. Informed commentators have suggested that potential applications include lighter, stronger and more heat-resistant armour and clothing, bio / chemical sensors, lighter and more durable vehicles, miniaturization of communication devices, conventional missiles with reduced mass and enhanced speed, small metal-less weapons made of nanofibre composites, small missiles and artillery shells with enhanced accuracy guided by inertial navigation systems, and armour-piercing projectiles with increased penetration capability.

The rules of weapons law that we have become familiar with apply to weapons that use nanotechnology components as they do to any other weapon. As to superfluous injury / unnecessary suffering, the focus will be on whether the weapon, including its nanotechnology elements, in its normal or expected use will inevitably cause injury or suffering for which there is no corresponding military purpose. The nanotechnology element will only make a difference if it, or any fragments it produces, will have an effect on the human body such that the overall inevitable effect of the weapon is to breach the rule.

The nanotechnology components of a weapon seem unlikely to have uncontrollable effects of the sort referred to in Article 51(4)(c) API, but that might be an issue if it were designed to detonate leaving nanotechnology fragments that will harm civilians and military personnel without distinction. Similarly, the environmental impact of such fragments should be considered carefully although the high threshold of the damage that is required to breach the rule in Articles 35(3) and 55 API means that that rule is unlikely to be breached. There is some compelling scientific evidence of human and environmental toxicity in relation to certain nanomaterials and nanoparticles, so it seems that the superfluous injury / unnecessary suffering and environmental protection rules must be considered carefully when evaluating weapons that employ nanotechnology substances. There is, however, no specific law of armed conflict rule relating to nanotechnology as such.

METAMATERIALS

SLIDE 13

Speaking notes: Metamaterials, such as ‘Quantum stealth’, ‘INVISIB’ and the ‘Adaptiv’ invisibility cloak are materials that are designed to render a target invisible by bending light waves around it. ‘Adaptiv’ technology uses cameras on-board a target, such as an armoured vehicle, to pick up the infra-red readings of the background scenery. That background heat signature is projected onto a series of hexagonal ‘pixels’ mounted on the target that can change temperature very rapidly to match the surroundings. The result is that an object can be made to disappear into the background for an observer using an infrared sensor, or the infrared reading of a different vehicle can be mimicked, so a tank might appear to be another kind of vehicle.

No ad hoc law of armed conflict rules apply to such technology. Camouflaging of course is specifically listed under Article 37(2) of API as an example of a lawful ruse of war. If, however, the mimicking amounted to an assertion of protected, e.g. civilian, status and if this were to be used to deceive the enemy and thereby to cause death, injury or capture of enemy personnel, prohibited perfidy would have been committed. Similarly, if the camouflage or mimicking involves misuse of enemy, UN, protective or neutral signs, flags, emblems or indicia, Articles 38 and 39 API should be considered.

II. Exercises (Legal Challenges of New Technologies)

Instructions: Participants are divided into work groups numbering up to 5 or 6 students. Each work-group should discuss all of the following questions and should refer to the AMW-Manual as an aid to resolving any legal issues that arise during the discussions. Each group should elect a spokesperson who will present the group's response to the questions. Spokespersons of other groups may comment and present their own solutions. Members of each work group should take turns to present, and respectively comment on, solutions to the plenary course members.

EXERCISE 1

Discussion: Each work group should discuss the following two competing statements and should produce the 6 most compelling legal and / or ethical arguments they can develop in favour of each statement.

1. All autonomous weapons should be banned now. Humans not machines should decide who is to live and who is to die.
2. If machines can be made to apply the law, they would be preferable to humans where attack decisions are concerned.

EXERCISE 2

Discussion: Give 5 reasons to agree with each of the following statements:

1. Targeting law should be liberalized in order to make it easier to introduce new autonomous attack technologies; or
2. These new technologies do not justify changing the targeting rules. Only if the technologies can comply with existing targeting law norms should they be allowed.

EXERCISE 3

Scenario: Your commander has instructed the cyber weapon development department to produce a cyber tool to attack the enemy air defence co-ordination computer system using a piece of cyber malware that attacks the server on which that system depends. The other customers of the server are unknown. The malware will consist of a kill switch, which on remote activation will disable the server and will cause all service to all customers to cease. The plan is to activate the kill switch at a future date if/ when the tactical situation requires the disabling of the targeted computer system. The ICT specialists tell you that mapping of the linkages with the server will likely disclose the intended method of attack and defeat the operation. What advice do you give?

Answer: The precautionary rules apply also to cyber attacks. The rules governing attacks apply to the planned operation if death, injury, damage or destruction are likely to result from the operation as a whole. All feasible precautions must be taken to verify that the target of the attack is a military objective and not subject to special protection. Indiscriminate cyber attacks are prohibited. There is an obligation to do everything feasible to verify that the discrimination and proportionality rules will not be breached. If the compliance of the planned attack with the principle of distinction cannot be assessed in advance of the operation, an alternative way of achieving the desired military advantage must be considered and adopted.

Discussion: Incapacitating chemical agents are prohibited under the CWC and yet research in this area allegedly continues. Perhaps there is a belief that such agents are permitted for law enforcement purposes. Is this development a challenge to the international acceptance of the general ban on chemical weapons or an indication of developing State practice that might even produce a customary rule?

EXERCISE 4

MODUL 7

– END OF COURSE

EXERCISE

Instructions: Participants are divided into work groups numbering up to 5 or 6 students. Each work-group should discuss all of the following questions and should refer to the AMW-Manual as an aid to resolving any legal issues that arise during the discussions. Each group should elect a spokesperson who will present the group's response to the questions. Spokespersons of other groups may comment and present their own solutions. Members of each work group should take turns to present, and respectively comment on, solutions to the plenary course members.

BASE SCENARIO

There is an international armed conflict between States A and U. State N is neutral. The dispute concerns the F Islands the owner of which has for 300 years been State U. State A, which is the geographically nearest State to the islands, maintains that sovereignty of the islands should be theirs. Economic difficulties in A caused its leadership to divert public attention from alleged fiscal mismanagement by invading F Islands. U immediately sent forces to re-take the islands.

EXERCISE 1

Sub-Scenario: U has declared an Exclusion Zone which extends for 200 nautical miles around the islands. The zone includes part of the airspace and territorial waters of A State and of N State.

Question: Was this declaration lawful?

Answer: No. A zone should not deny access to neutral territory. Furthermore, an Exclusion Zone is only legitimate if it applies exclusively in international waters and airspace. To the extent that it applies to the airspace and territorial waters of N and of A, the declared Exclusion Zone is invalid. It would, however, have been valid to declare an Exclusion zone in relation to the relevant areas of international waters and / or airspace and to have declared a no-fly zone in relation to the relevant territorial waters and airspace of A.

EXERCISE 2

Sub-Scenario: U has declared an aerial blockade of the airport of Port S on the largest of the F Islands. It has complied with the required formalities and has issued a NOTAM. U is enforcing the blockade using the old aircraft operated by B squadron. The enforcing aircraft are known to be a bit slow, and some aircraft from Q State are getting through with mixed cargos but no guns or ammunition.

Question: Does this have any effect on the lawfulness of the blockade (give reasons)?

Answer: It is irrelevant that the aircraft getting through are not carrying arms and ammunition. To be lawful, a blockade must be effective and must be impartially enforced. The fact that some aircraft are getting through means that the blockade is not effective and the fact that those aircraft are from Q State leads to the potential suggestion that the blockade is not being enforced impartially. The references are AMW R151 and R155, Paris Declaration 1856 and London Declaration, 1909, articles 2, 3 and 5.

EXERCISE 3

Sub-Scenario: The intensity of the hostilities is increasing and U State needs to acquire some new weapons. Dodgy Munitions Ltd is offering the following weapons for sale:

1. a bullet that spins when it hits a human body causing an expanded wound.
2. a fragmentation bomb the casing of which is made of nanotechnology substances based on plastic.
3. a laser weapon that is designed to degrade the performance of optical devices such as range finders and that will cause blindness to unenhanced vision if it comes in contact with the naked eye.
4. a white phosphorus munition that is designed to create a smoke screen.

Question: Which weapons law rules do you consider most relevant to deciding whether the respective weapons should be bought? Explain the relevance of each.

Answer 1: If the bullet itself does not expand or flatten easily, the 'expanding bullet' rule does not apply, but consider the unnecessary suffering / superfluous injury rule. Is there a corresponding military utility or advantage associated with the additional injury or suffering that the bullet will cause? If so, the rule is unlikely to be breached. However, if the current way of fulfilling the military task does not involve causing this additional injury, the bullet being considered is likely to be unlawful. See AMW, R5b.

Answer 2: The fact that the casing is made of nano-technological substances does not necessarily raise major issues, although the impact of the nano-technology fragments post-detonation on the environment and on human health should be considered to determine whether they may have indiscriminate effects or breach environmental standards that the State imposes on itself. The article 35(3) and 55 API criteria are unlikely to be breached but remember the cus-

tomary requirement to have due regard in relation to the environment; AMW, R89. Note that the casing material is developed from plastic and therefore, if the resulting fragments are not detectable using X-ray, Protocol I to CCW may be breached; AMW, R6f.

Answer 3: To be prohibited by article 1 of the CCW Laser Protocol (IV) the weapon must be specifically designed, as one of its combat functions, to cause permanent blindness to the naked eye or the eye with corrective eyesight devices – e.g. spectacles. Here, the device is designed to damage optical devices like range finders and there is no indication that it is designed to cause blindness. One would wish to clarify the design purpose with the manufacturers / procurers of the weapon, but on the face of it the weapon is not prohibited. See also article 3 but remember article 2's obligation to take all feasible precautions to avoid causing blindness. Note AMW, R6c.

Answer 4: The weapon is not primarily designed to set fire to objects or cause burn injury and smoke systems are specifically excluded from the Protocol III definition of incendiaries. Moreover, the weapons does not seem to rely for its operation on the toxic properties of chemicals. Accordingly the Chemical Weapons Convention would also seem not to apply. The weapon can be lawfully acquired and used for the stated purpose; AMW, R72i.

EXERCISE 4

Sub-Scenario: The Commander of the deployed U force wishes to attack a building that is marked on the map as a school. However an informant that you have not previously used tells you the school is now being used as a command and control centre where local commanders meet to plan their military operations. Some military-looking vehicles have been observed in the vicinity of the school.

Question: Can you attack the school? Give your reasons.

Answer: The status of the school is unclear. The intelligence source has not been used before and the additional information does not conclusively support the intelligence – military vehicles in the vicinity might be there for other reasons. The building is normally dedicated to civilian purposes and therefore the doubt rule requires that it be assumed not to be making an effective contribution to military action (Art. 52(3) API). AMW, R12b explains that the object may only be attacked if based on all the information available to the Commander at the time, there are reasonable grounds to believe that the object has become and remains a military objective.

EXERCISE 5

Sub-Scenario: As a result of the removal of the school from the target list, further information was obtained. A number of civilians as well as numerous military personnel were seen attending the school. By monitoring telephone and other communications it has been established that local commanders do indeed meet at the school, but the function of the civilians has not

been clearly determined. The source, whose information about the commanders' meetings has now of course been substantiated, tells you that the civilians are being used to convey orders from the Commanders' meetings to the subordinate military groups in the F Islands.

Question: Can the civilians be targeted personally on this basis?

Answer: The Commander deciding whether to target the civilians should consider the information as a whole that is available to him. He should be guided by whether a reasonable commander would proceed to target the civilians on the basis of that information. Recognizing that there is always likely to be an element of doubt about military decisions as to the conduct of hostilities, he should consider whether it is reasonable to rely on the unsubstantiated information from a source that has once before been shown to be reliable. He should consider the precautionary requirement to do everything feasible to verify that a target is a lawful one (Art. 57 (2)(a)(i) AP I). If it is determined that the civilians are in fact conveying orders to subordinate military groups, this would amount to direct participation in the hostilities and would deprive the relevant civilians of their protection from attack (Art. 51 (3) API). Consider AMW, Section F and R28.

Sub-Scenario: A number of A State personnel have been captured by U forces. Among them are increasing numbers of policemen. A has not notified U of any incorporation of the police force into its armed forces. However, captured paperwork in the possession of one of the policemen at the time he was apprehended refers to the A Police Force 'now being absorbed into and henceforth being answerable to' the A army and its Chief of Staff. The captured policemen have heard that a Prisoner of War is the thing to be in their current, captive circumstances and claim PW status.

Question: Are they entitled to PW status and can they be put on trial as directly participating civilians?

Answer: If U is satisfied on the basis of the captured paperwork and other available information that the police force has indeed been assimilated into the armed forces, then the failure to notify the other party to the conflict of their assimilation does not stop them being treated as lawful targets; AMW, Rrobi, commentary para 3. Once captured, the policemen should be entitled to PW status and combatant immunity in respect of lawful acts of war. If the capturing State has doubts as to the status of the captured personnel, the issue should be determined by a tribunal convened in accordance with Geneva Convention III, article 5.

Sub-Scenario: One morning a lone civilian airliner enters U airspace on a heading which would lead it to the capital city 25 minutes' flying time later. U's Speedy Squadron is scrambled and intercepts the airliner. Interception, buzzing and the firing of warning shots do not cause the

EXERCISE 6

EXERCISE 7

airliner to change course. It is by now known that there are 250 passengers and crew on board and all efforts to communicate with the aircraft have failed or been ignored. You have been asked to advise the Prime Minister whose task it is, according to national emergency procedures, to decide whether to order the shooting down of the aircraft.

Questions:

1. What presumption, if any, applies?
2. Under what circumstances is it lawful to shoot the aircraft down?
3. What should be considered when deciding whether to shoot it down?

Answers:

1. The presumption that applies derives from the fact that the civilian airliner is an object normally dedicated to civilian purposes and that therefore, in case of doubt, must be presumed not to be used to make an effective contribution to military action; AMW, R12b. However, this rule only applies in the case of substantial doubt remaining after all reasonably available information has been considered.
2. If the Commander's interpretation of that information gives him reasonable grounds to believe that the airliner has become and remains a military objective, and if he considers the circumstances are such that it is reasonable for him to act on that belief, he may so act.
3. The Commander should, however, remember that a civilian airliner is entitled to particular care in relation to the taking of precautions. The circumstances that may render a civilian airliner a military objective are listed at AMW, R63.

EXERCISE 8

Sub-Scenario: The supply routes that bring weapons and other military supplies into A involve crossing areas of jungle that are liable to flood during the rainy season. The arms supply diminishes then and U force's Commander wants to extend those periods. He particularly considers the option of seeding rain clouds during periods before and after the times of greatest rainfall in order to start the flooding earlier and keep it going later.

Question: Would this option be lawful?

Answer: The definition of environmental modification is authoritatively interpreted as including any action to influence natural processes such as the climate. Therefore, manipulation of the rainfall would amount to environmental modification and would therefore potentially come within the Environmental Modification Convention. Recall also the prohibition under Art. 35(3) API on attacks that are intended or that may be expected to cause widespread, long-term and severe damage to the natural environment, although it is unlikely that the threshold of 'widespread, long-lasting and severe' damage will be reached. Consider also the prohibition under Art. 54 API on attacking, removing, destroying or rendering useless items essential to the survival of the civilian population; AMW, R97b. This would seem to be highly relevant in the current circumstances and again the Commander should be advised to find another method of achieving the desired military effect. For example, simply bombing the consignments

of weapons / military supplies on the supply routes, or attacking the vehicles or other equipment used to transport them would be lawful, subject to compliance with the targeting rules including, most notably, with the principles of distinction, proportionality and precautions.

Sub-Scenario: The U commander has been negotiating with Z State for their forces to join in an alliance to defeat A. Z State has agreed. Contrary to U State, Z State is not a State party to the Cluster Munition Convention. U forces are coming under attack from A forces in the north. There is a risk that the A forces will surround them. The increasingly anxious battalion commander is calling for close air support from the Z air force unit. He knows that use of cluster bombs will have a considerable effect on the A forces in their soft-top vehicles so he specifically asks the Z air force commander to use those weapons.

Question: Does this breach the Convention?

Answer: The critical issue under article 21 of the Convention is whether it is the State party to the Convention or the State that is not party to the Convention that makes the final decision as to whether cluster munitions will be used. In the stated example it is most likely that it is the State that is not party that will make the final decision. Indeed this will often be the case as it is the user of a munition that normally has the final say over whether that munition will indeed be used. If, however, the joint commander were an officer from a State party to the Convention and if he were to issue a specific order to use cluster munitions in terms that are binding on the State not party to the Convention, then his State will have breached its obligations under the Convention.

Sub-Scenario: The U Commander has decided that new technology will help to bring the war to a successful conclusion. He is aware of recent developments in autonomous and highly automated attack systems and wishes to procure and use autonomous attack platforms that employ the latest autonomous attack decision-making technology.

Question: What advice do you give him?

Answer: The same body of targeting law applies to the use of autonomous and highly automated attack technologies as applies to more conventional methods of attack. These rules include the Art. 57 API precautions that must be taken before an attack is undertaken, and those precautions in turn involve evaluative decision-making, such as what military advantage is to be anticipated from the attack in the prevailing circumstances, what collateral damage should be expected, whether the expected collateral damage is excessive in relation to the anticipated military advantage, whether military objectives are separate and distinct, whether they are located within a similar concentration of civilians or civilian objects and in the case of anti-personnel attack, whether the personnel are hors de combat, combatants, peaceful civilians, civilians directly participating in hostilities, etc. The commander should be advised that these are only examples of the evaluative decisions that are involved in the targeting process, and it should

EXERCISE 9

EXERCISE 10

be explained that no autonomous or highly automated decision-making process is known currently to exist that can apply such evaluative decisions. He should be advised that at the very least a human operator should be 'on the loop' so that if autonomously / automatically made decisions are unsatisfactory, they can be countermanded in a timely way. That operator therefore needs to be so tasked as to in practice be able to intervene reliably in such circumstances.

Concluding remarks

The Commander tells you that A State has capitulated before it was necessary to procure the novel technologies. He thanks you for all your advice (even though some of it was not quite what he had hoped to hear) and he wishes you all the best in your future endeavours.

