

**CCW Informal Meeting of Experts on
Lethal Autonomous Weapon Systems (LAWS)
Geneva 13-16 May 2014**

**Operational and Military Aspects
*Utility and Limitations of the Use of L/AWS
in Military Operations***

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Utility and Limitations of the Use of L/AWS in Military Operations

Terminology (1): Automation versus Autonomy

➤ **Automated systems**

- **simple/less complex functions – simple environment**
- **predefined mode of action**
- **in existence**

➤ **Autonomous systems**

- **more complex functions – complex environment**
- **adaptation capability – range of possible action**
- **not (yet?) existing; expectations only**

- ### ➤ **Gradual development from automation towards autonomy**
- **Reliability, safety, resilience, predictability, control –**

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**Terminology (2): Carriers, weapons, guidance
systems**

➤ Autonomous cruise control of **weapon carriers**
versus
autonomous targeting and weapon release

➤ Methods of **system operation** and guiding techniques
versus
**weapons which have indiscriminate effects or
cause excessive injuries & unnecessary suffering**

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Terminology (3): Targets

➤ **Use of automated / autonomous systems against
military hardware**

➤ **Use of automated / autonomous systems against
individuals and groups of persons**

Utility and Limitations of the Use of L/AWS in Military Operations

Military Utility

- Improving survivability under time pressure
- Coping with complex tasks under threat
- Reducing risks for own personnel
- Optimizing reconnaissance-impact-network
- Sustaining monitoring-strike operations
- Shortening reconnaissance-strike gap
- Improving penetration capability
- Optimizing technical system control

Utility and Limitations of the Use of L/AWS in Military Operations

Command and Control (1)

- **Responsibility of commanders**
 - success and constraints of operations
 - control at any stage

- **Control of operations requires**
 - *predictability* of effects
 - *flexibility* to adapt

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Command and Control (2)

➤ **Command and control hierarchy:**

- **strategic level**
- **operative level**

net-centric operations

No stand-alone role
of AWS in
conventional warfare

- **tactical level**
combined arms battle
- **combat team level**

**Integration
of AWS at
tactical / combat
level**

Commanders design concept of operation and control its execution

Utility and Limitations of the Use of L/AWS in Military Operations

Constraints and Limitations (1)

Legal, political & military constraints of operations:

- Distinction, Proportionality, Precaution
 - Restraint
 - Rules of Engagement

Factors to be considered for ensuring compliance:

- Military situation, terrain, sea/air space
 - Situation of civil population

➤ Concept of operations

➤ *Parameters of weapon systems* within ops concept

➤ During conduct of operations: **control & flexibility**

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Constraints and Limitations (2)

**Precautionary measures in
populated areas / asymmetric warfare**

- **Difficult distinction**
- **Risk of non-proportional damage**

- **High standards of thorough scrutiny & tight control !**
- **No automatic/autonomous targeting of
individuals or groups of persons !**

- **No military need for autonomous targeted killing**
- **Killing of suspects in gray zone of international law
is no military operation**

Utility and Limitations of the Use of L/AWS in Military Operations

International Security and Stability (1)

- Introduction of robotics driven by civil development
- AWS are part of *Revolution in Military Affairs*
- Utility in combined arms operations
- No elimination of political, military and individual risks of war

- Qualitative improvement of force capabilities globally
- Parallel developments and counter-measures
might offset gains
- Command and control problem
- So far little experience

Utility and Limitations of the Use of L/AWS in Military Operations

International Security and Stability (2)

- AWS might generate new military options
 - AWS might replace weapon systems limited by arms control treaties
 - Potential to change perception of stability
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- Increased transparency and adaptation of existing instruments required, e.g.
 - UN Register of Conventional Arms
 - Vienna Document
 - Conventional arms control in Europe

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Thank you for your attention

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AWS - Challenges to Arms Control

Purposes and Instruments

➤ **Conventional arms control and CSBM:
Military stability**

➤ **Global arms restrictions and prohibitions:
Humanitarian concerns**

UN Register of Conventional Arms

Categories for reporting international transfers of conventional Arms

- I. Battle tanks**
- II. Armoured combat vehicles**
- III. Large-calibre artillery systems**
- IV. Combat aircraft**
- V. Attack helicopters**

- VI. Warships**
- VII. a) Missiles and missile launchers**
b) MANPADS

- VIII. Small arms & light weapons**

CFE Treaty Conventional Armament and Equipment

Treaty-limited



Battle Tanks



Armoured
Combat Vehicles



Artillery



Combat Aircraft



Attack Helicopters

Subject to the Treaty, but not limited



APC / AIFV Look-alikes



Armoured Ambulances

*



Armoured Vehicle
Launched Bridges



Primary Trainer
Aircraft



Combat Support
Helicopters

* adapted CFE Treaty

Global Prohibitions or Restrictions of Arms for Humanitarian Purposes

**Basic requirements for weapons and warfare methods
(Art. 35, 36, 87 AP I Geneva Conventions)**

- **Distinction**
- **Proportionality**
- **No superfluous injury or unnecessary suffering**
- **No widespread, long-term and severe damage to natural environment**
- **Accountability of commanders**

Global Prohibitions or Restrictions of Arms for Humanitarian Purposes

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➤ **Bacteriological (Biological) and Toxin Weapons Convention (BTWC 1972)**

➤ **Chemical Weapons Convention (CWC 1993)**

➤ **UN (Inhumane) Weapons Convention (CCW 1980) with 5 Protocols (1980 – 2003)**

➤ **Anti-Personnel Mines Convention („Ottawa Convention“ 1993)**

➤ **Convention on Cluster Munitions (2008)**

Global Prohibitions or Restrictions of Arms for Humanitarian Purposes

➤ UN (Inhumane) Weapons Convention (CCW 1980) with 5 Protocols (1980 – 2003)

I. Non-Detectable Fragments

II. Mines, Booby-Traps and other Devices

III. Incendiary Weapons

IV. Blinding Laser Weapons

V. Explosive Remnants of War

➤ Anti-Personnel Mines Convention („Ottawa Convention“ 1993)

➤ Convention on Cluster Munitions (2008)