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

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

- No stand-alone role of AWS in conventional warfare
- Integration of AWS at tactical / combat level
- Commanders design concept of operation and control its execution
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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
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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
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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

- 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
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
- Artillery
- Combat Aircraft
- Attack Helicopters
- Armoured Combat Vehicles
- Armoured Ambulances
- Combat Support Helicopters
- Primary Trainer Aircraft
- Armoured Vehicle Launched Bridges

Subject to the Treaty, but not limited
- APC / AIFV Look-alikes
- * 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

- Bacteriological (Biological) and Toxin Weapons Convention (BTWC 1972)
- Chemical Weapons Convention (CWC 1993)
Global Prohibitions or Restrictions of Arms for Humanitarian Purposes

  - I. Non-Detectable Fragments
  - II. Mines, Booby-Traps and other Devices
  - III. Incendiary Weapons
  - IV. Blinding Laser Weapons
  - V. Explosive Remnants of War
