Recent Developments in Small Arms and Light Weapons Manufacturing, Technology, and Design: Opportunities and Challenges

Informal Consultations towards BMS7
UN PoA
Manufacture & Design: Polymer

Main challenges:

1. Difficulty to mark polymer parts durably (ITI para. 7)
2. Recover markings
3. Post-manufacture markings
4. Easier to conceal in parcels/shipments

Image: Small Arms Survey
Manufacture & Design: Polymer

[Diagram of a gun with labeled parts like Slide, Spring, Barrel, Frame, Magazine, No penetration, Metals, Non-organic materials and coverage of different materials, Organic materials.]

Image: UNLIREC
Manufacture & Design: Polymer-markings

Opportunities:

1. Depth and placement of markings
2. Use of visible markings & hidden markings, metal plates
3. Development of recovery techniques
4. Increase identification capacity
Manufacture & Design: Modular Weapons

Main challenges:

1. Tracking throughout lifecycle - changes in configuration
2. Conflicting serial numbers in tracing requests
3. Defining how to mark modular weapons
4. Easier to conceal in parcels/shipments
Opportunities:

1. Marking content (inclusion of calibre, type, duplication)

2. Accounting for possible configurations (control component, record-keeping)

3. Training on identification and tracing
Main challenges:

1. Combination of 3D printed + pressure-bearing factory made parts (CNC milling machines: high risk)

2. Increasing membership, online presence, and platforms

3. Controlling unlicensed production and illicit flows
Sample e-book listing (the first 10 of 35 named parts and components)

This pack is a collection of the newest FOSSCAD CAD files:

Rifles/AK-47_Stock-Shanrilivan
Rifles/AKM_75_Round_Drum_Magazine_Yee_v0.2-nils
Rifles/AR-10_Nephilim_Reinforced_Lower_Receiver_v1.1-Warfairy
Rifles/AR-15_Bumpfire_Stock_v2-Disruptive_Solutions
Rifles/AR-15_Carbine_Handguards-Warfairy
Rifles/AR-15_CMA_Stock_v1.1.1-shadowfall
Rifles/AR-15_FOSSCAD_Israel_75rd_Drum_Magazine-nils
Rifles/AR-15_Hanuman_Bullpup_v1.0-Warfairy
Rifles/AR-15_Minimalist_Stock-Warfairy
Rifles/AR-15_Orion_PDW_Stock-Warfairy
Opportunities:

Accounting of additive manufacturing controls at several stages: Legal frameworks, manufacturing, transfer, marking, record-keeping, tracing
New Technology Applications

Automatic information and data collection

• **QR/data matrix or bar codes in crates:** each weapon crate has a code that could be easily readable.

• **Distributed ledger technologies**

• **RFID tags**
New Technology Applications

X-ray identification trainings: responding to challenges posed by polymers, modularity, and additive manufacturing

1. Rotation
2. Superposition & complexity of the package
3. Focus on modularity & parts and components
Superposition & Complexity of the Package
Superposition & Complexity of the Package

Image: UNLIREC
Focus on modularity & parts and components
Recommendations

1. Establish a technical group to inform on developments related to technological challenges and opportunities
2. Enhance dialogue with industry
3. Explore marking standards for modular weapons
4. Examine the issue of additive manufacturing in detail
5. Examine technical methods to recover obliterated markings
6. Promote targeted capacity-building and training on accurate identification of weapons
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