Quo Vadis after Cluster Munitions

GMLRS SMArt

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Content

- DPICM Background
- Requirements for Replacement
- Increasing Target Protection
- GMLRS-SMArt
- Effectiveness
### Background

The Oslo process on cluster munitions

### Draft Cluster Munition Convention

**Draft Cluster Munitions Convention**

This text will be the basic proposal for the Dublin Diplomatic Conference. It is identical to the Wellington Discussion text.

**PDF versions:**

- English
- French
- Spanish

**Draft Cluster Munitions Convention**

The States Parties to this Convention,

Deeply concerned that civilian populations and individual civilians
Target Scenarios

- No longer
  - huge Dimensions ("Grids") and
  - literally countless Target Elements of "Cold War"
- But
  - small Area
  - few Target Elements
  - individual Target Coordinates not to be known
  - Target Elements are
    - unprotected
    - protected
    - lightly armoured
    - armoured

Area Targets still do exist!
Area Coverage of Munitions

- **TLE**
  - "increases Target Area"

- **WH lethal Area**

- **CEP**
  - "increases Number of Rounds"
Area Coverage of Munitions

TLE
“increases Target Area”

WH lethal Area

CEP
“increases Number of Rounds”

Area Effects required! Precision is not a Replacement for Target Acquisition
A Trend towards more Target Protection

- Increased Protection for all Classes of Target Elements
- STANAG 4569 defines Requirements
- Some very recent Examples

<table>
<thead>
<tr>
<th>Threat Level</th>
<th>Ammunition</th>
<th>Velocity (m/s)</th>
<th>Threat Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>25 mm x 137 APDS-T, PMB 073</td>
<td>1258</td>
<td>Automatic Cannon, APDS Ammunition</td>
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<tr>
<td>4</td>
<td>14.5 mm x 114 API/B32</td>
<td>911</td>
<td>Heavy Machine Gun, AP Ammunition</td>
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<tr>
<td>3</td>
<td>7.62 mm x 51 AP (WC core)</td>
<td>930</td>
<td>Assault and Sniper Rifle, AP WC Core</td>
</tr>
<tr>
<td>3</td>
<td>7.62 mm x 54R B32 API</td>
<td>854</td>
<td>Assault and Sniper Rifle, AP WC Core</td>
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<td>2</td>
<td>7.62 mm x 39 API BZ</td>
<td>695</td>
<td>Assault Rifles/ AP Steel Core</td>
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<td>7.62 mm x 51 NATO ball</td>
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<td>Assault Rifles/ Ball Round</td>
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<tr>
<td>1</td>
<td>5.56 mm x 45 NATO ball</td>
<td>900</td>
<td>Assault Rifles/ Ball Round</td>
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<tr>
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<td>5.56 mm x 45 M193</td>
<td>937</td>
<td>Assault Rifles/ Ball Round</td>
</tr>
</tbody>
</table>
A Trend towards more Target Protection

Increased Protection for all Classes of Target Elements

STANAG 4569 defines Requirements

Some very recent Examples

NBC

Artillery Fragments (all around)

RPGs (Front Sector)

Directed Anti Personnel Mine

Medium Calibre Machine-gun (Front Sector)

Anti Tank Mine Under Wheel and under Hull

Heavy Machine-gun (all around)

More “Punch” needed to counter improved Protection!
Characteristics

- **Tri mode**
  - passive Infrared (IR)
  - passive 94 GHz Millimetre Wave (Radiometer)
  - active 94 GHz Millimetre Wave (Radar)

- High sophisticated Sensor Fusion

- High Performance **Tantalum Liner Warhead**

- IR/mmW Sensor, bore sighted with Warhead (apart from small lead angle)

- **Single (first) pass Detection**
  and Warhead Initiation

- **Redundant** built-in **Self-Destruct** Function
  - Altitude (Slant Range) commanded through Radar Channel
  - Battery burn-out initiates Self-Destruct

More than 20,000 SMArt® Sub-Munitions produced up to now!
SMArt Principle of Function

**MAIN PERFORMANCE DATA**

- Target detection and tracking
- Operational mode: automatic
- Engagement envelope
- Radar
- Staring Height 150 m AGL
- Very short Detection Range (SLR)
- Large Scan Area enclosed ≈ 35,000 sq m
- High probability of Target in Footprint
- Top Attack: most vulnerable area on Target
- Sub-Munition Descent immune to DAS
- and very high Speed SF Attack immune to ERA and other type of protection
- SMArt's Sensors are simple and the Kill Mechanism is very robust!

SMArt Principle of Function

- Patent pending
- Angled lowers and blast skirts resist RPG & IED attacks.
Sensor Fuzed GMLRS-SMArt

GMLRS M30
- international Development
- in Production
- leverages on Future Improvements (Nav, GPS, Motor)

SMArt® DM 702
- in Service in DE, CH, GR
- selected in UK, AU
- continuing Improvements (Signal Processing, insensitive, ...)

GMLRS M32 (GMLRS-SMArt)
- all GMLRS-Performance will be met or exceeded
- all SMArt®-Performance will be met or exceeded
- Sub Munition Pattern programmable
- Software-/Algorithms can be loaded (e.g. in Depot or on Launcher)
- can be fired by all future GMLRS Users

GMLRS is the perfect Carrier for the Sensor Fuzed Sub-Munition!
SMArt Adaptation to GMLRS

Battery Activation under Rocket Control

No Change on Sub-Munition Descend, Search and Detect and Self Forging Fragment Function

S&A Acceleration Environment changed to Rocket ESAD Control

Ballute changed to High Speed Drag Chute

Umbilical added for Sub-Munition Parameter and SW Download

Minor Modifications only to SMArt Sub-Munition!
G-SMArt Sub-Munition Dispense System provides for optimum SMArt Distribution
G-SMAArt Firings on M26

4 SMArt Sub Munitions

G-SMArt is ready for the first Flight on GMLRS
The “protected and lightly armoured” Targets

- That’s what you know about SMArt

Big Holes in thick Armour!
combined with dramatic behind Armour Effect
The “protected and lightly armoured” Targets

- That’s what you know about SMArt
  Overwhelming Armour Penetration
- This is new: we have to learn about SMArt’s light Armour Penetration

10 mm RHA

1.5 mm St 37

SMArt’s Penetrator provides for significant Effect in light Armour!
SMArt’s full Spectrum Capability

SMArt engages a large Target Set for DPICM Replacement!

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System MLRS\Symposia\NDIA 2008\Guns and Missiles Quo Vadis April 2008s.ppt April 2008
DPICM Replacement Effectiveness

Mech Infantry
- M26
- KE-Rod
- SMArt

Command Post
- M26
- KE-Rod
- SMArt

Artillery
- M26
- KE-Rod
- SMArt

DPICMs can be effectively replaced by SMArt together with KE-Rod!

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G-SMArt Summary

- Quick Solution based on “In Production” SMArt® and GMLRS
  - low Cost
  - low Risk
- Effective against **protected, semi-hard and hard** Targets
  - robust against passive Protection and reactive Armour
  - robust against DAS Countermeasures
  - robust against Decoys
- Wide Attack Footprint
- Minimized Collateral Damage
- Clean battlefield operation due to redundant self-destruct

G-SMArt will take care of all Future Needs attacking protected Targets!
Thank you for your Attention!

Any Questions?

Lance Corporal Klöbke is currently our only operational Rocket Launcher Colonel!