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BGT Defence

Quo Vadis after Cluster Munitions

GMLRS SMArt

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Content

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

Background

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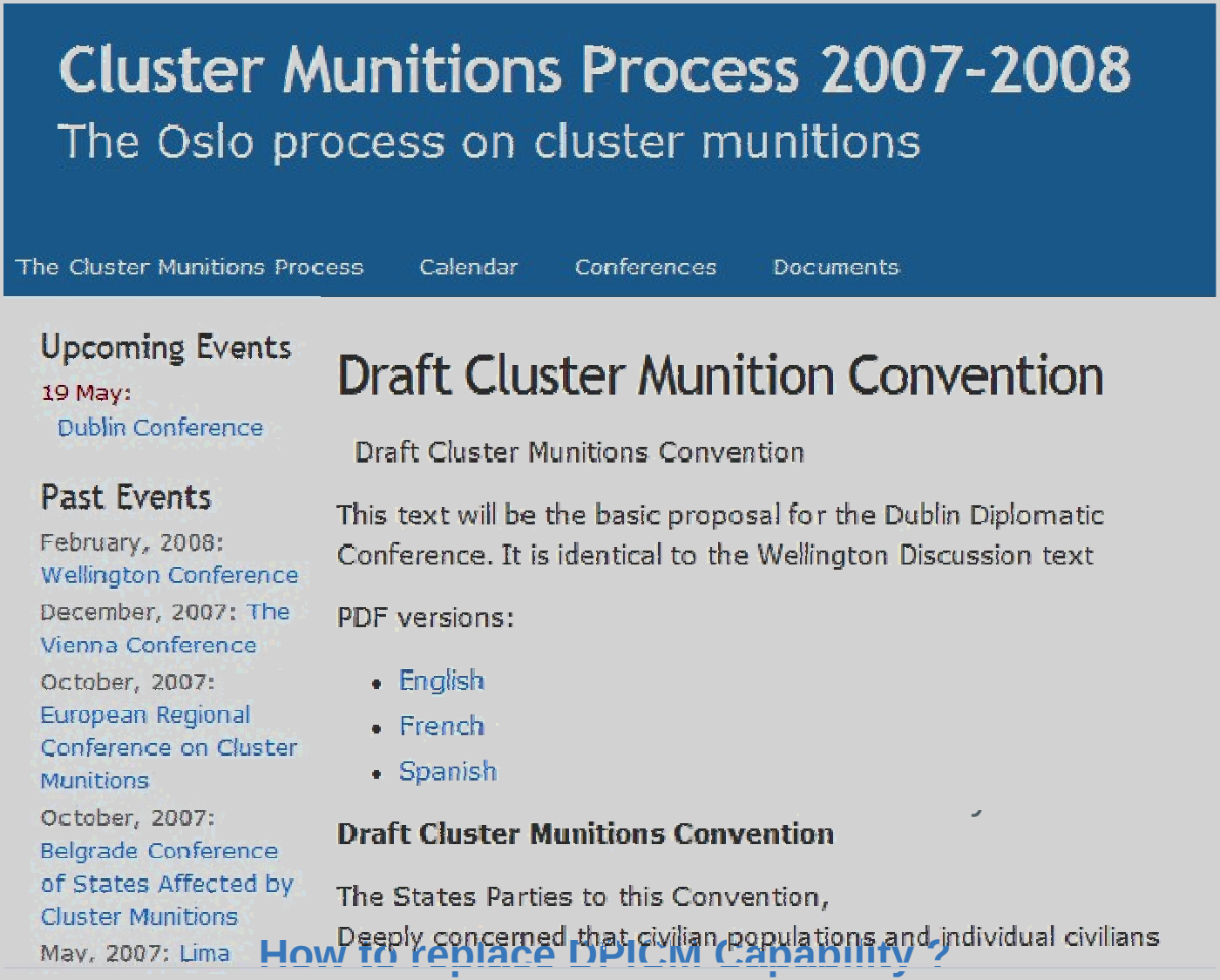

Cluster Munitions Process 2007-2008

The Oslo process on cluster munitions

The Cluster Munitions Process | Calendar | Conferences | Documents

Upcoming Events

19 May:
Dublin Conference

Past Events

February, 2008:
Wellington Conference

December, 2007: The Vienna Conference

October, 2007:
European Regional Conference on Cluster Munitions

October, 2007:
Belgrade Conference of States Affected by Cluster Munitions

May, 2007: Lima

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

How to replace DPICM Capability ?

Target Scenarios

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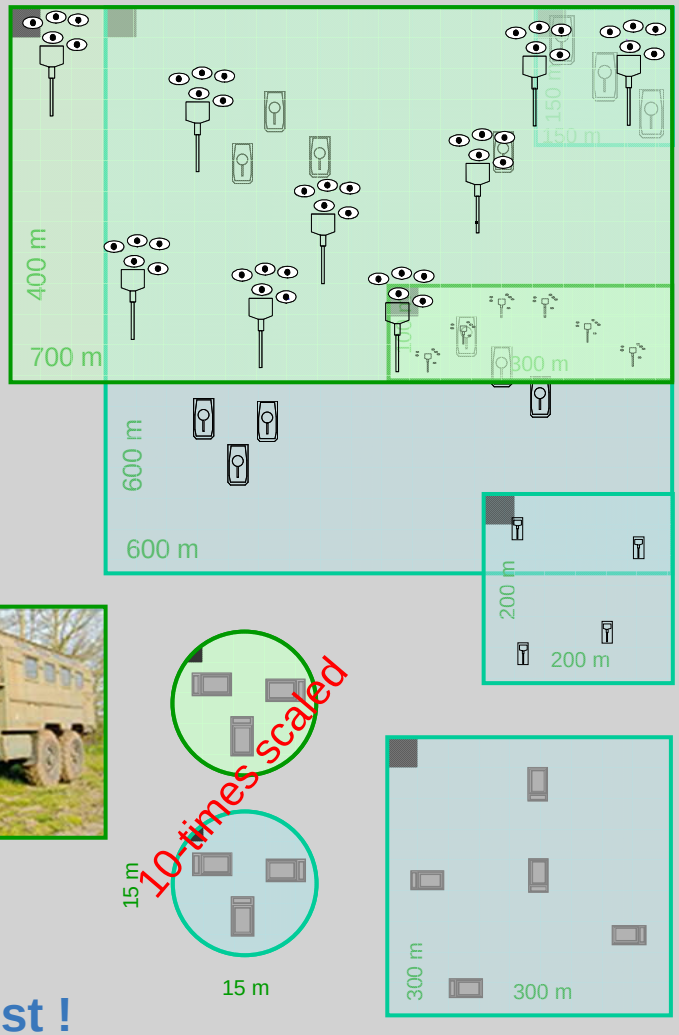
- No longer
  - huge Dimensions (“Grids”) and
  - literally countless Target Elements of “Cold War”
- But
  - small Area
  - few Target Elements
  - individual Target Coordinates not to be known
  - Target Elements are
    - unprotected
    - protected
    - lightly armoured
    - armoured



Area Targets still do exist !

Area Coverage of Munitions

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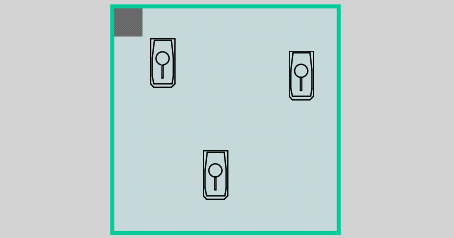
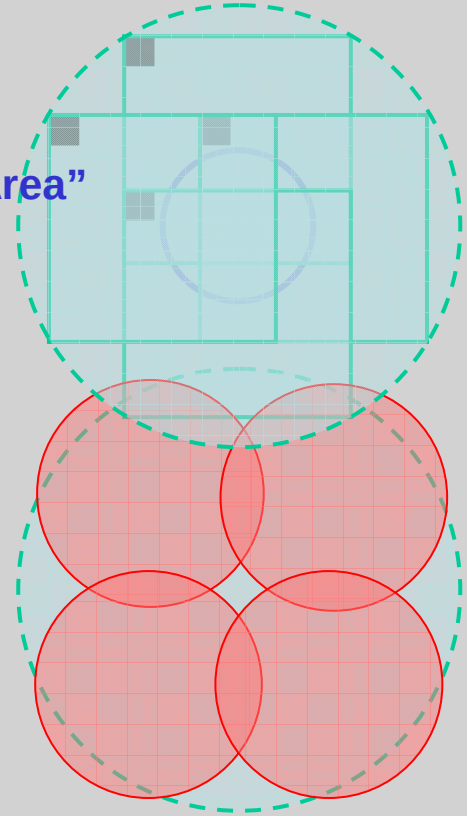


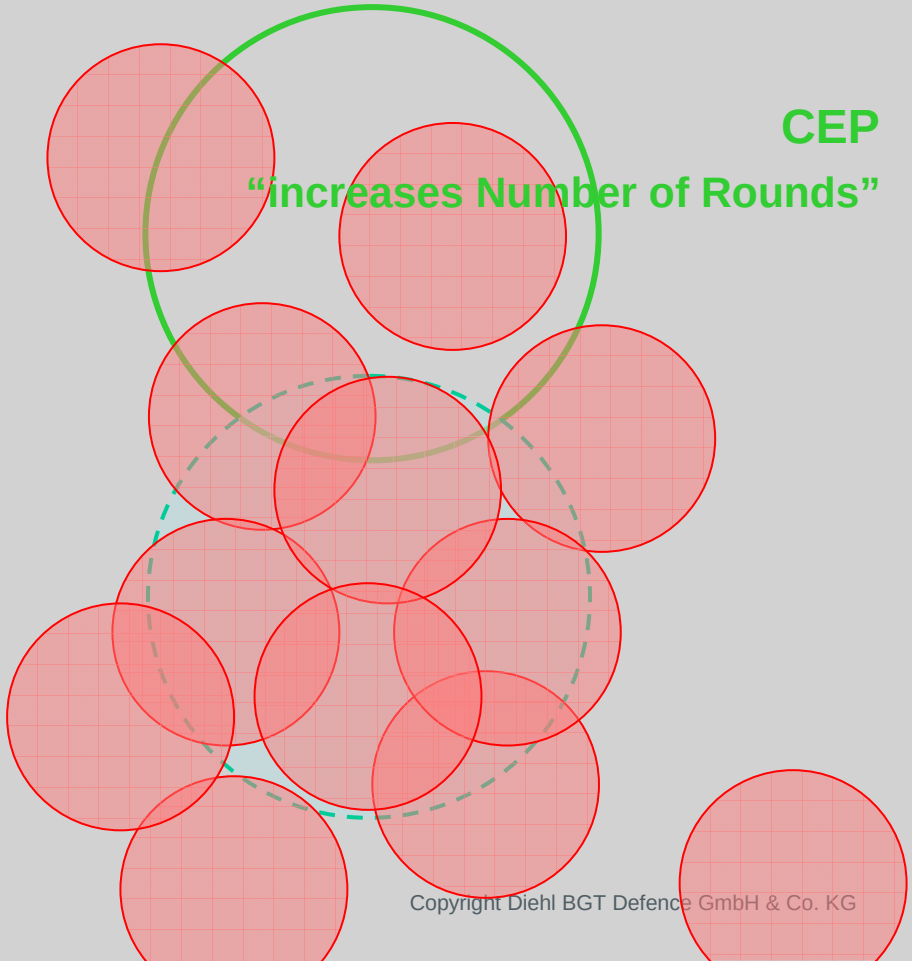
TLE

“increases Target Area”

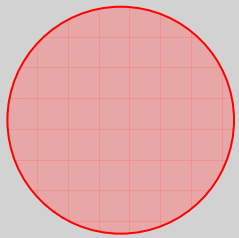


CEP

“increases Number of Rounds”



WH lethal Area



Area Coverage of Munitions

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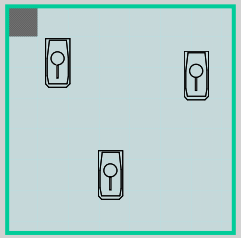

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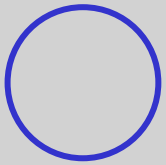

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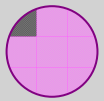

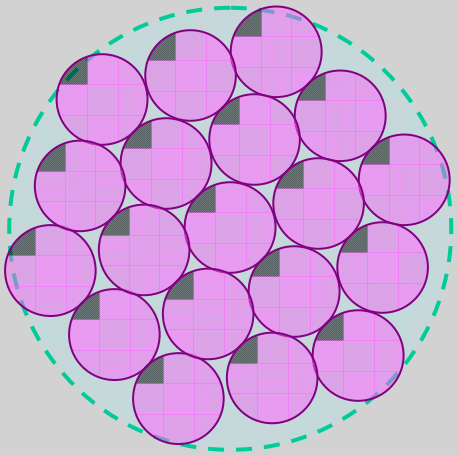

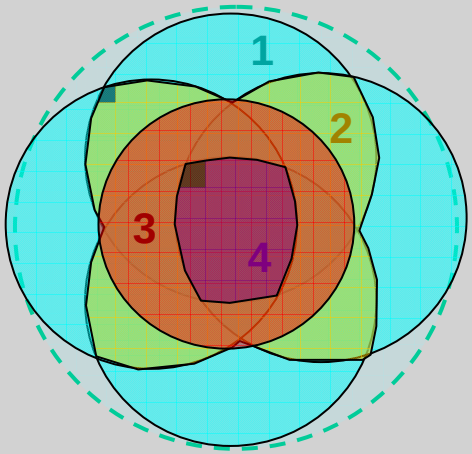

Area Effects required ! Precision is not a Replacement for Target Acquisition

A Trend towards more Target Protection

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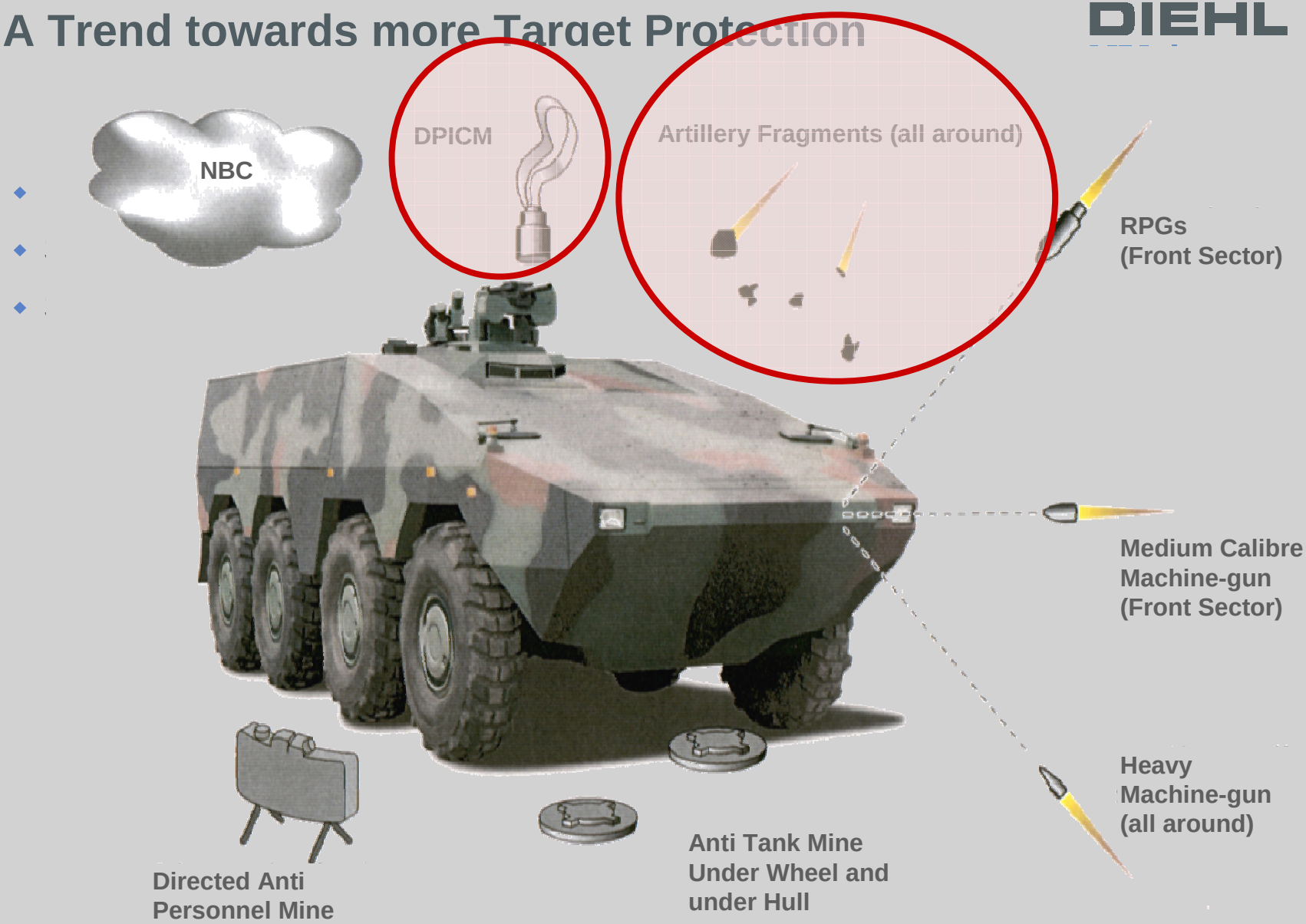
- Increased Protection for all Classes of Target Elements
- STANAG 4569 defines Requirements
- Some very recent Examples

Table 1 – STANAG 4569 Protection Levels

Threat Level	Ammunition	Velocity (m/s)	Threat Type
5	25 mm x 137 APDS-T, PMB 073	1258	Automatic Cannon, APDS Ammunition
4	14.5 mm x 114 API/B32	911	Heavy Machine Gun, AP Ammunition
3	7.62 mm x 51 AP (WC core)	930	Assault and Sniper Rifle, AP WC Core
3	7.62 mm x 54R B32 API	854	Assault and Sniper Rifle, AP WC Core
2	7.62 mm x 39 API BZ	695	Assault Rifles/ AP Steel Core
1	7.62 mm x 51 NATO ball	833	Assault Rifles/ Ball Round
1	5.56 mm x 45 NATO ball	900	Assault Rifles/ Ball Round
1	5.56 mm x 45 M193	937	Assault Rifles/ Ball Round

A Trend towards more Target Protection



More “Punch” needed to counter improved Protection !

SMArt® 155 DM 702/A1

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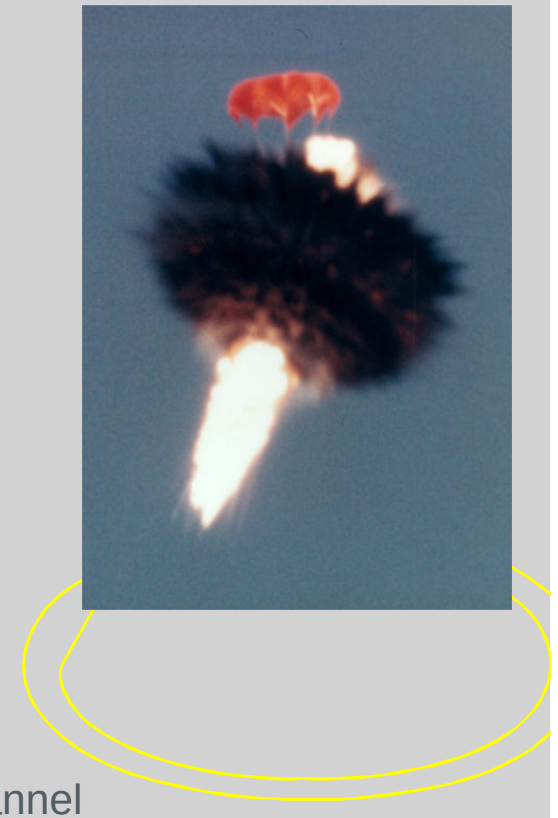
Characteristics

- **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

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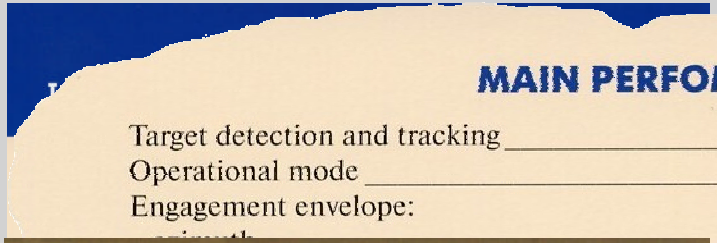
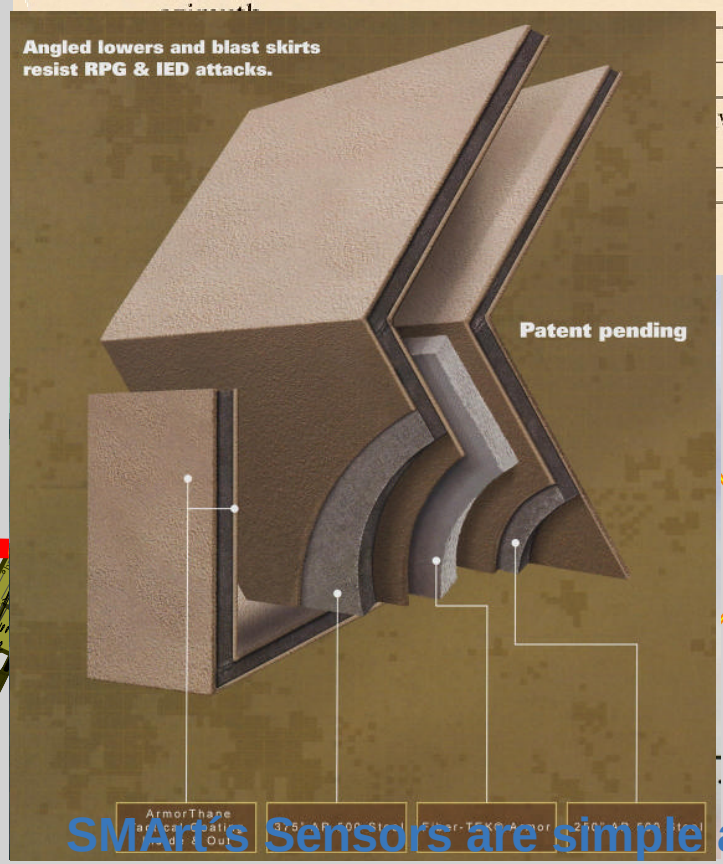


Descent

(SLR)



SMArt's Sensors are simple and the Kill Mechanism is very robust !

Sensor Fuzed GMLRS-SMArt

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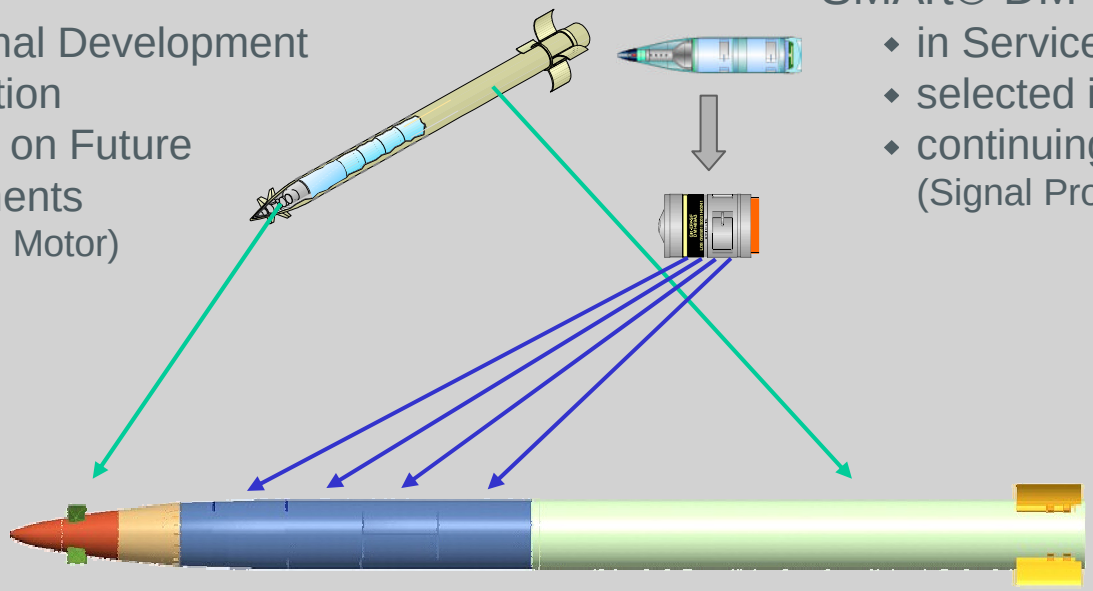
GMLRS M30
- international Development
- in Production
- leverages on Future Improvements
  (Nav, GPS, Motor)



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

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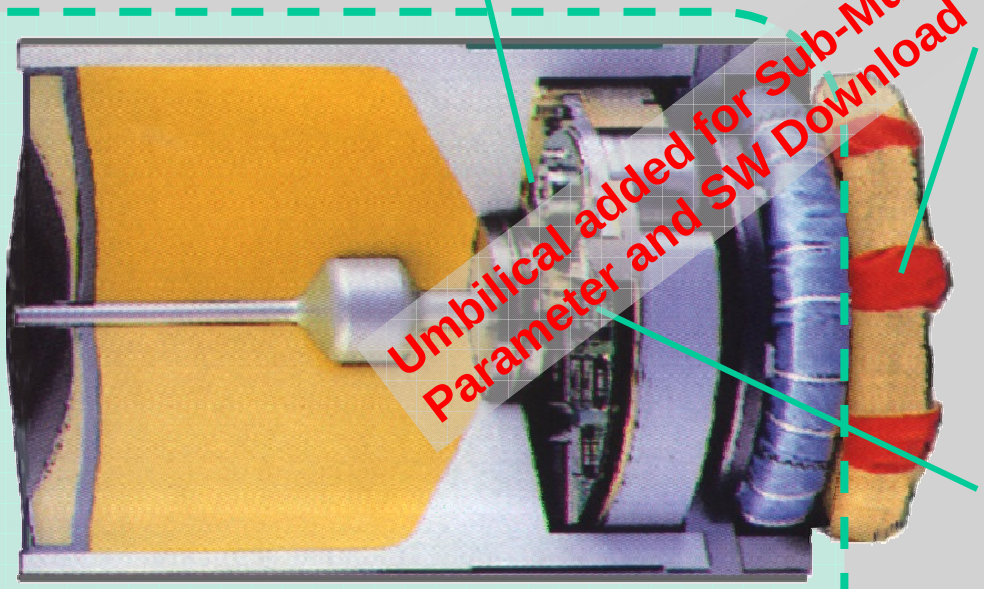
Battery Activation under Rocket Control



Ballute changed to
High Speed Drag Chute

S&A Acceleration
Environment changed
to Rocket ESAD Control

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

Minor Modifications only to SMArt Sub-Munition !

G-SMArt Sub-Munition Dispense

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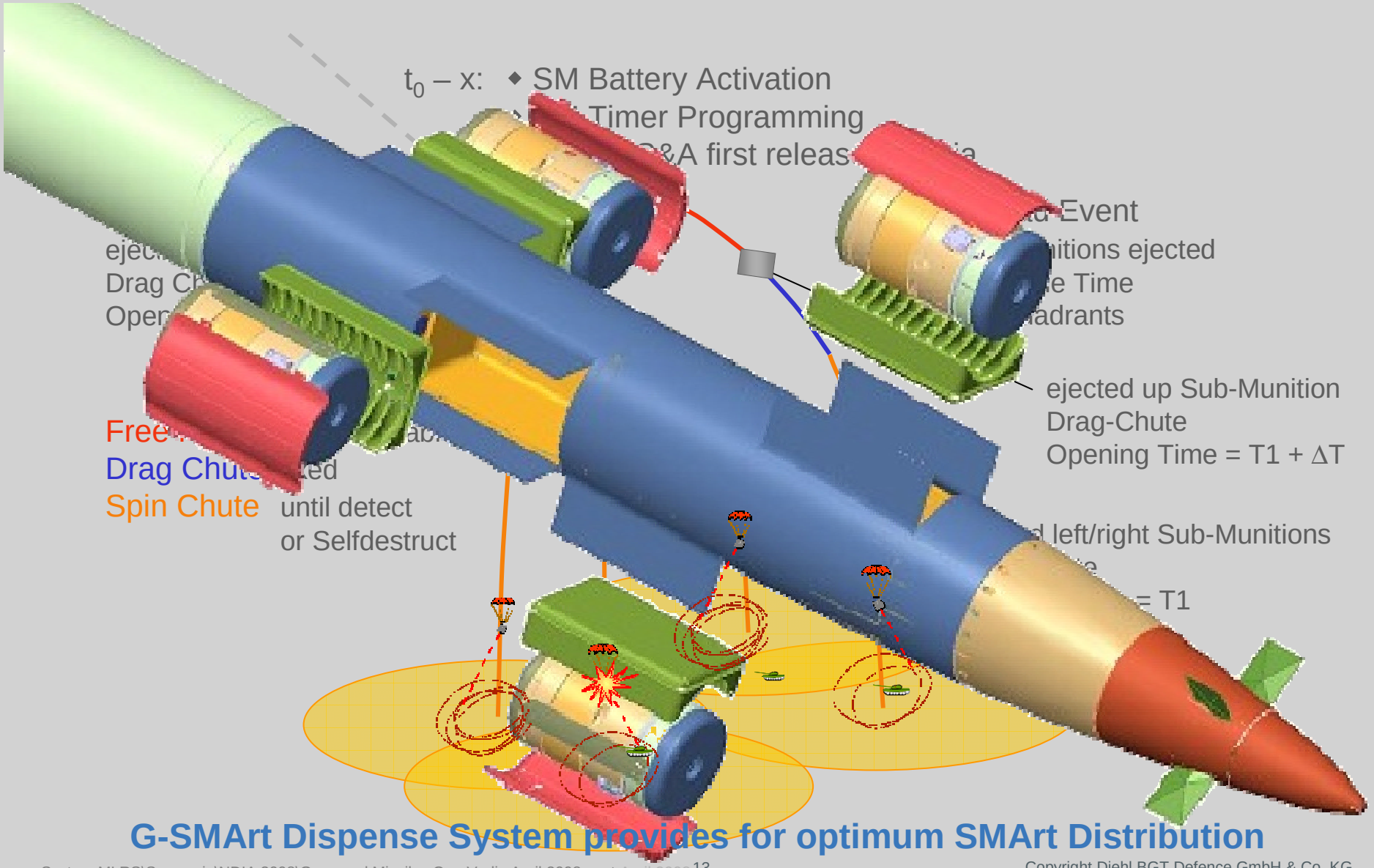

G-SMArt Dispense System provides for optimum SMArt Distribution

G-SMArt Firings on M26

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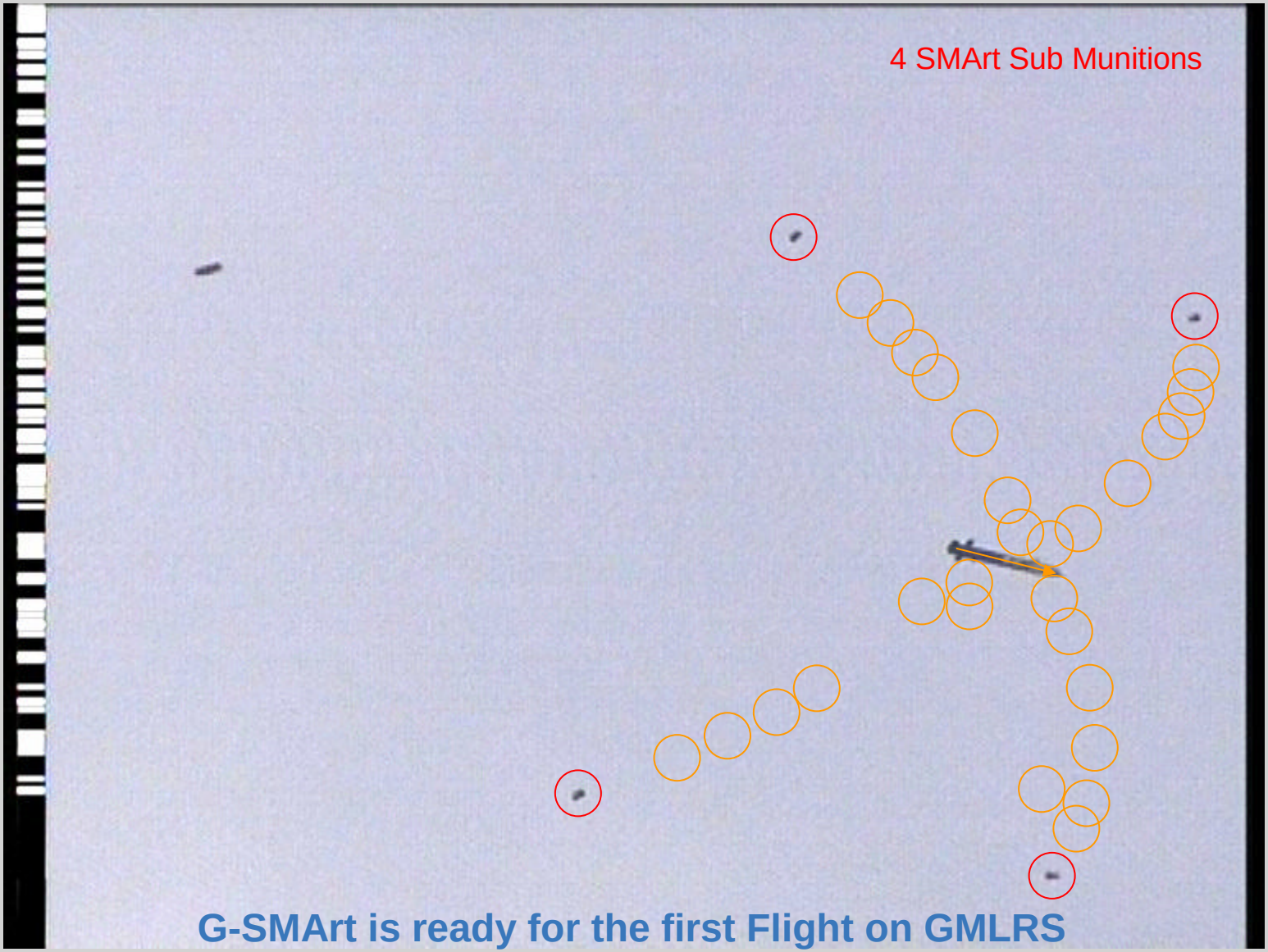
BGT Defence



G-SMArt is ready for the first Flight on GMLRS

The “protected and lightly armoured” Targets

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- That´s what you know about SMArt

Big Holes in thick Armour!
combined with dramatic behind Armour Effect

The “protected and lightly armoured” Targets

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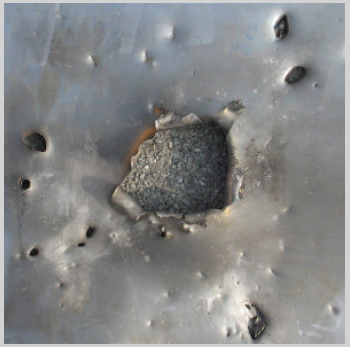
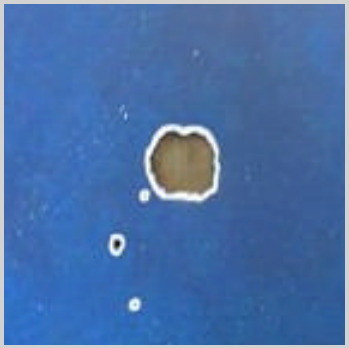
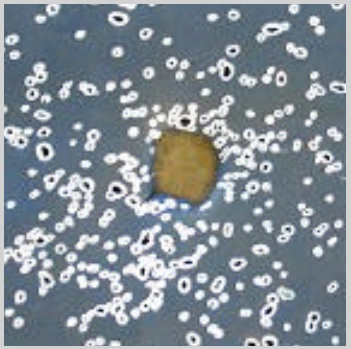
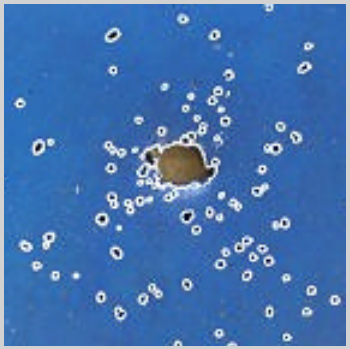
- That´s what you know about SMArt
  Overwhelming Armour Penetration
- This is new: we have to learn about SMArt´s light Armour Penetration

10 mm RHA





1.5 mm St 37

SMArt´s Penetrator provides for significant Effect in light Armour !

SMArt´s full Spectrum Capability

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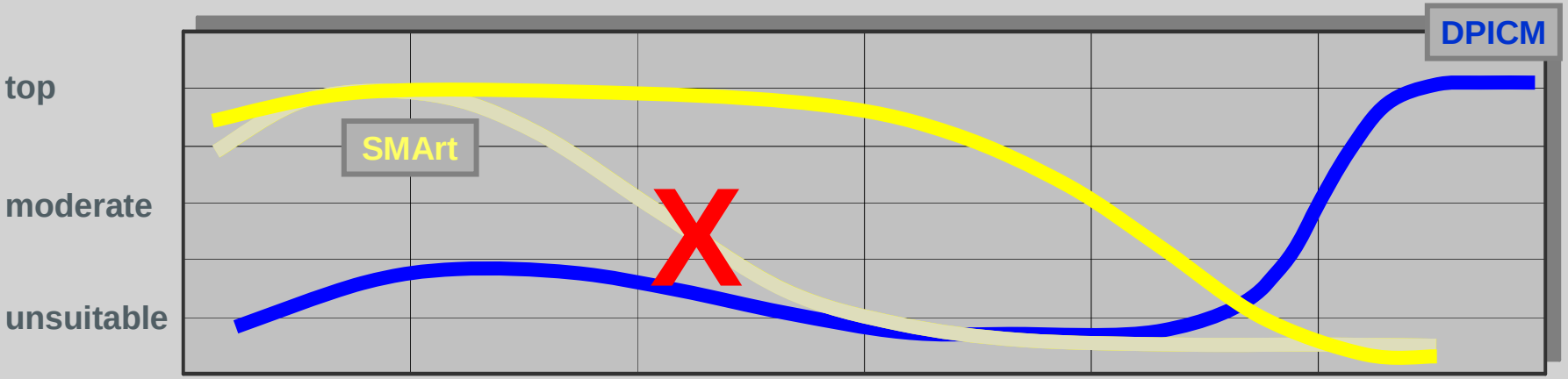

SMArt engages a large Target Set for DPICM Replacement !

DPICM Replacement Effectiveness

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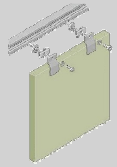
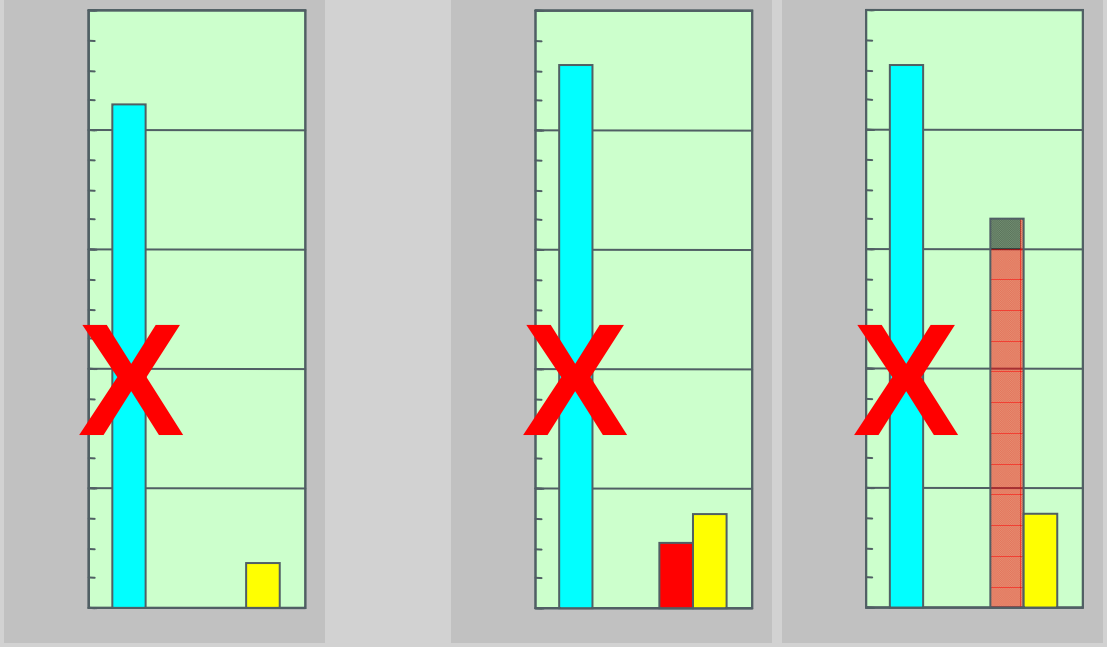
Mech Infantry

Command Post



Artillery

Number of Rockets per Scenario



M26 KE-Rod SMArt

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

G-SMArt Summary

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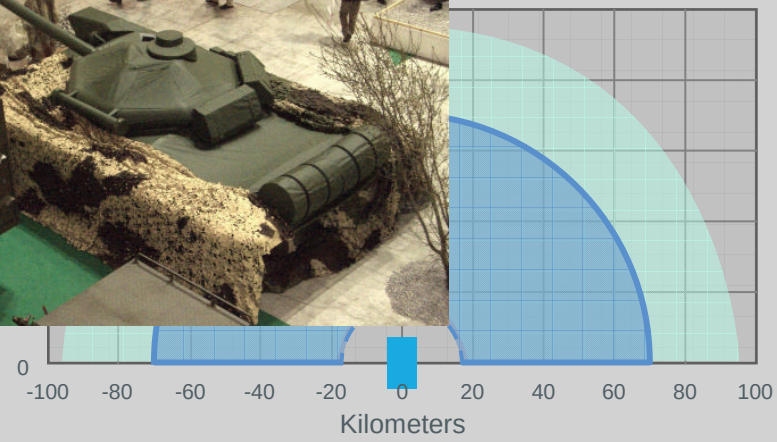
- Quick Solution based on “In Production” SMArt® and GMLRS
  - low Cost
  - low Risk
- Effective against **protected, semi-hard and hard** Targets
  - robust against passive Protection and reactive Armour
  - robust against DAS Countermeasures
  - robust against Decoys
- Wide Attack Footprint
- Minimized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

„Remarkably realistic Decoys“



G-SMArt will take care of all Future Needs attacking protected Targets !