



NORTH ATLANTIC TREATY ORGANIZATION
ORGANISATION DU TRAITÉ DE L'ATLANTIQUE NORD

UNCLASSIFIED



NATO Land Capability Group Land Engagement

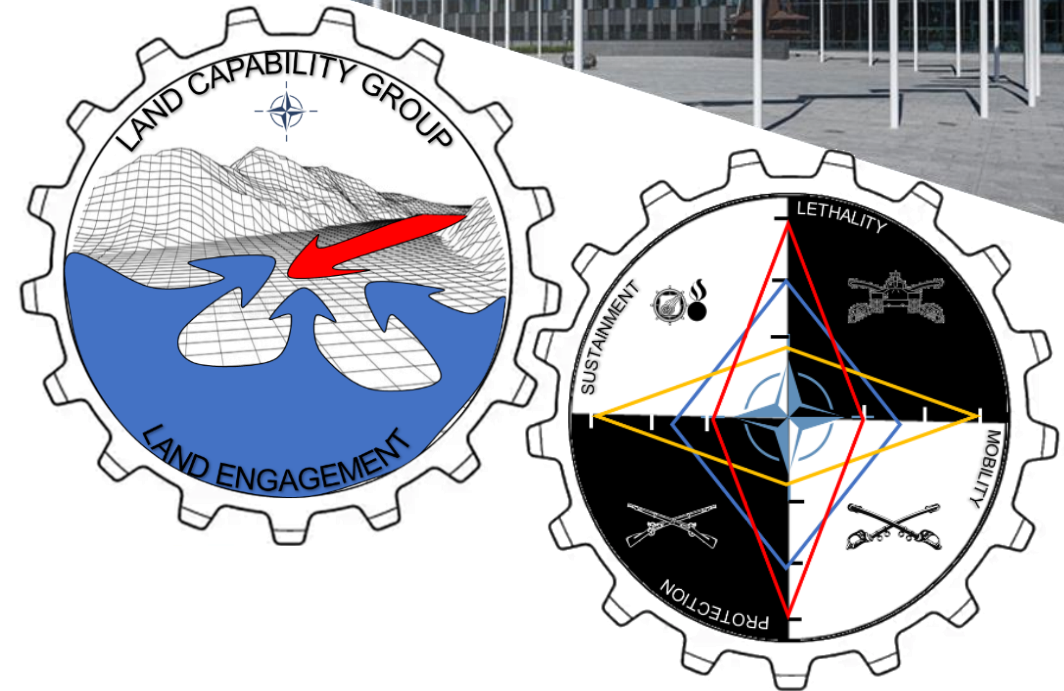
07 November 2024

By:

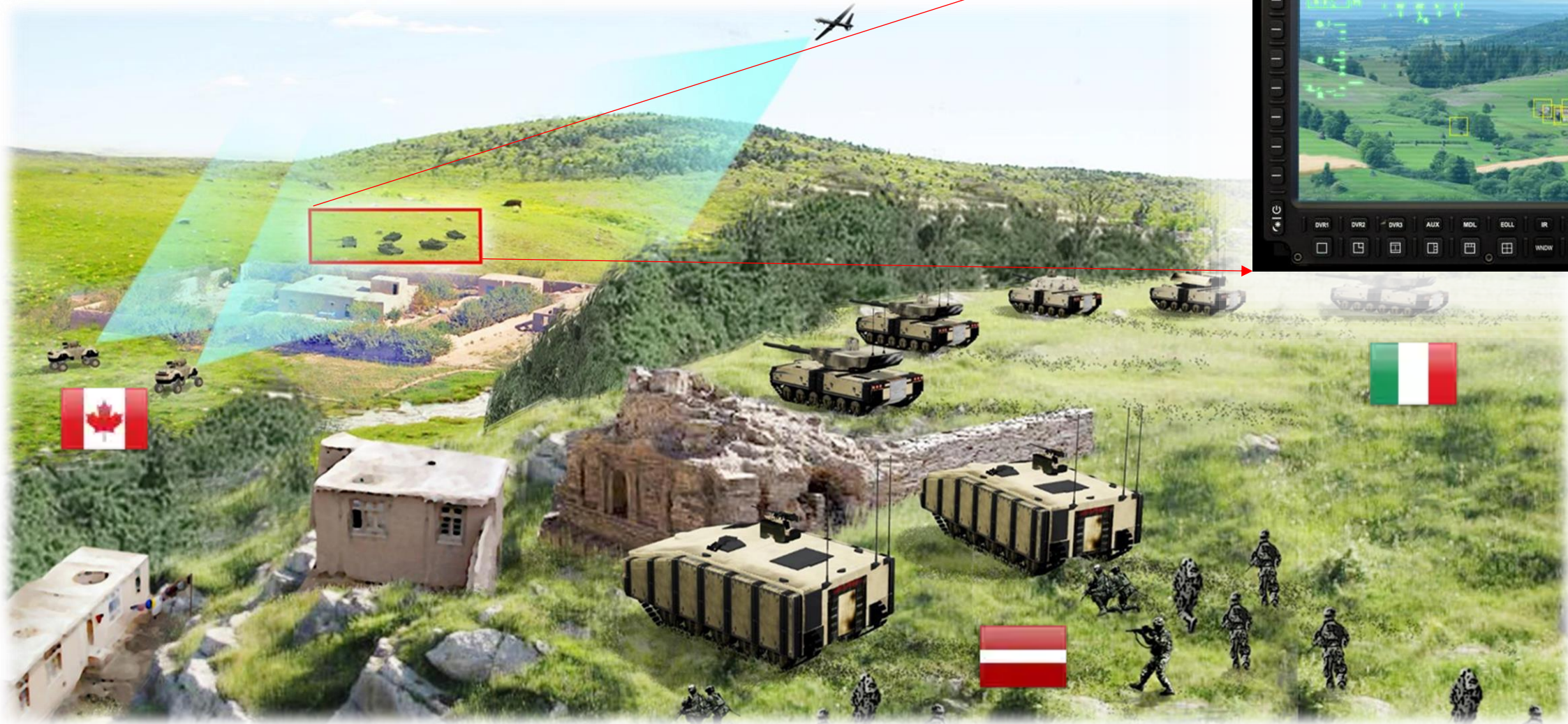
Joseph Cannon, PhD
Chair, NATO LCG-LE

VERSION

1.0



UNCLASSIFIED



Question: In a coalition/allied operation how long would it take to plan coordinate and execute an attack on this enemy position?

What is NATO LCG-LE?

EMBARKED CREW



POWER & MOBILITY



LETHALITY



VEHICLE ARCHITECTURES



PROTECTION



AUTONOMY



The Vision:



ALLIED INTEROPERABILITY:

- MOBILITY
- FIREPOWER
- PROTECTION
- SUSTAINMENT
- INTELLIGENCE

C5

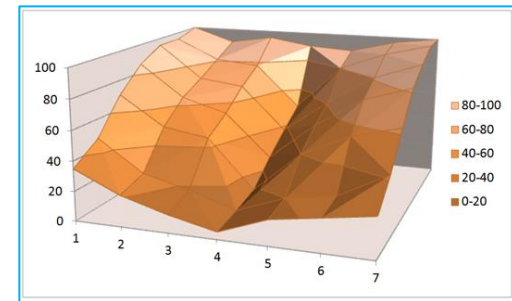
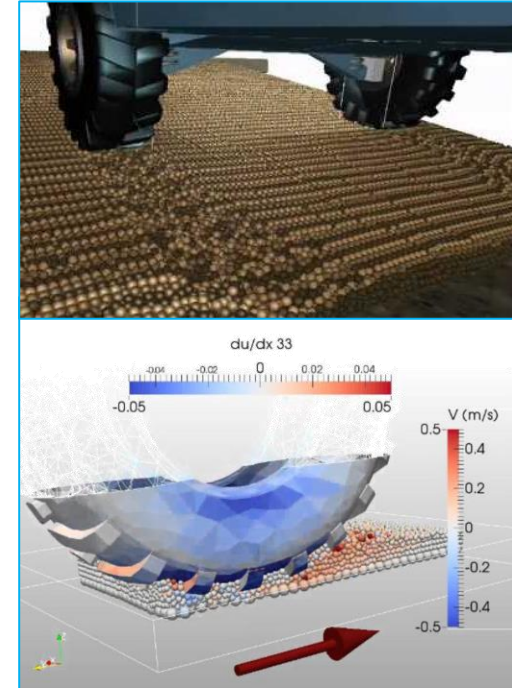
Interoperability is achieved through common STANDARDS.

Current:

- Towing and Recovery (4478)
- Towing Attachments (4101), Interface Geometry (4009)
- Run-Flat Wheels (4825)
- Fording and Floatation (2805)
- Engine Testing (4195)
- Starter Battery Space (4105)

Future:

- *Mobility Testing & Classification TOE (4357, 4358)*
- *Hybrid Electric Power Train Test and Evaluation*



Future Mobility Standards



*Advanced
Powertrain*

*Advanced Energy
Storage*

*Advanced
Suspension*

*Terrain Mobility
Classifications*

Standardizing Platform Power and Mobility Across NATO

LETHALITY

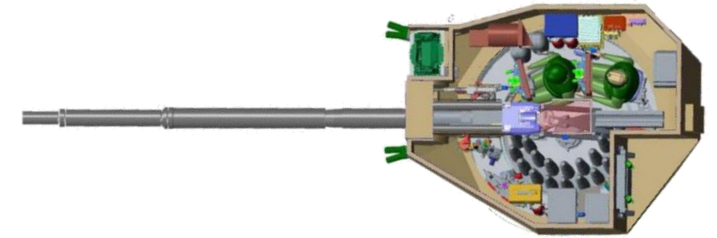
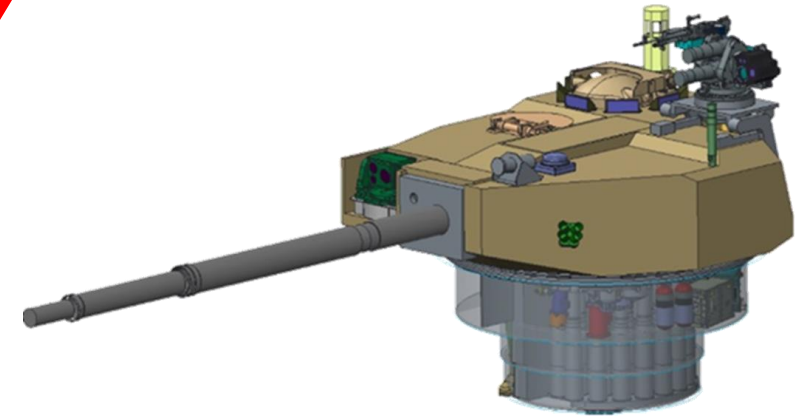
Current:

- 40MM Cased Telescopic Munitions (4749)
- Armour Penetration Testing (4164)
- NATO Medium & Large Caliber Direct Fire Munition Interoperability (NIAG SG303)

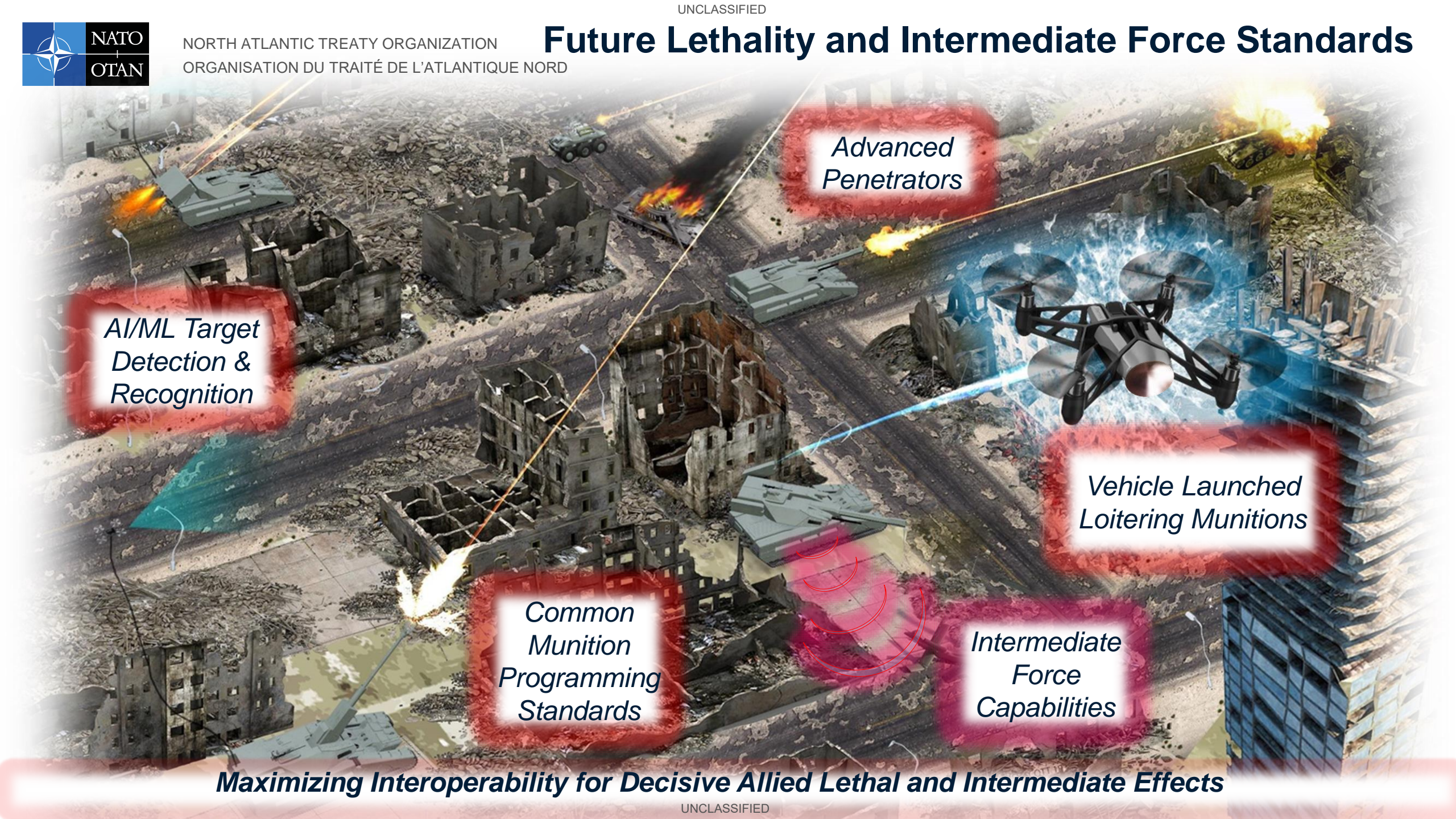
Future: (Revised/Updated Versions)

- 20mm Ammunition and Links for Aircraft Guns (3585)
- 25mm x 137 Ammunition (4173)
- 30mm X 173 AMMUNITION (4624)
- 105mm Ammunition for Rifled Tank Guns (4458)
- 120mm x 570 Ammunition for Smooth Bore Tank Guns (4385)

-
- Muniton/Fuse Programming
 - Land Vehicle Intermediate Force Capability Integration
 - Land Vehicle Directed Energy, Missile and Loitering Munition Integration
 - Aided Target Detection and Recognition



Future Lethality and Intermediate Force Standards



*Advanced
Penetrators*

*AI/ML Target
Detection &
Recognition*

*Vehicle Launched
Loitering Munitions*

*Common
Munition
Programming
Standards*

*Intermediate
Force
Capabilities*

Maximizing Interoperability for Decisive Allied Lethal and Intermediate Effects

VEHICLE PROTECTION

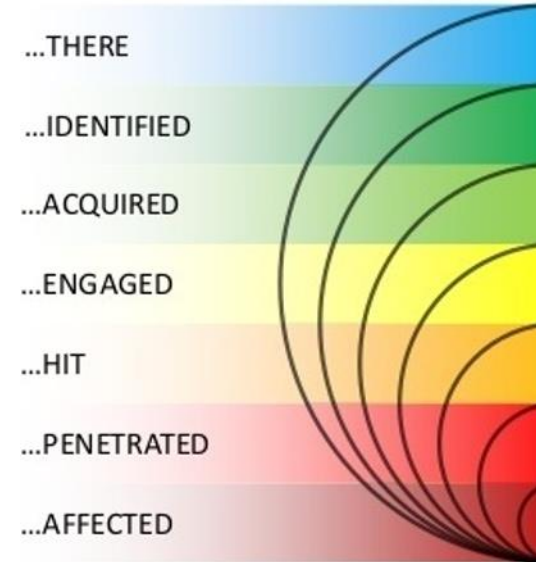
Current:

- Protection Levels for Occupants of Armoured Vehicles (4569)
- Defensive Aides and Suites (4686)
- Countersurveillance (4316, 4318, 4319)
- Fire Suppression (4317)

Future:

- *STANAG 4860 - Ageing Armour (4860)*
- *Updated/New Volumes DAS Residuals, Top Attack, Commercial Vehicles & DEW*
- *Updated/New Counter-UAS Volume (4686)*

Don't be ...



Future Protection & Survivability Standards



*Hi Performance
DAS*



*Final Protective
cUAS*

*DAS
Architectures*

*Advanced
Modular Armor*

Promoting Enhanced Allied Force Protection

UNCREWED GROUND VEHICLES (UGV)



Current:

- Ground Robotics Interoperability Profiles (STANREC 4818)
- NATO Robotic Operation System – Behaviour Library

Future:

- *Common NATO Controller – Small UGV/UAV*
- *STANAG 4818 - Ground Robotics Interoperability Profiles*
 - *Artificial Intelligence / Machine Learning Data Annotation Standards*

Future Uncrewed Ground Vehicles

*Coalition AI/ML
Reference Libraries*

*Uncrewed System
Architectures*

*Common
Autonomous System
Controls*

*Algorithmic
Threat Detection*

*Robust Mesh
Networks*

*Advanced
Autonomous
Mobility and
Behaviors*



Unlocking the Power of Allied AI and Autonomous Systems



VEHICLE ELECTRONICS: ARCHITECTURES

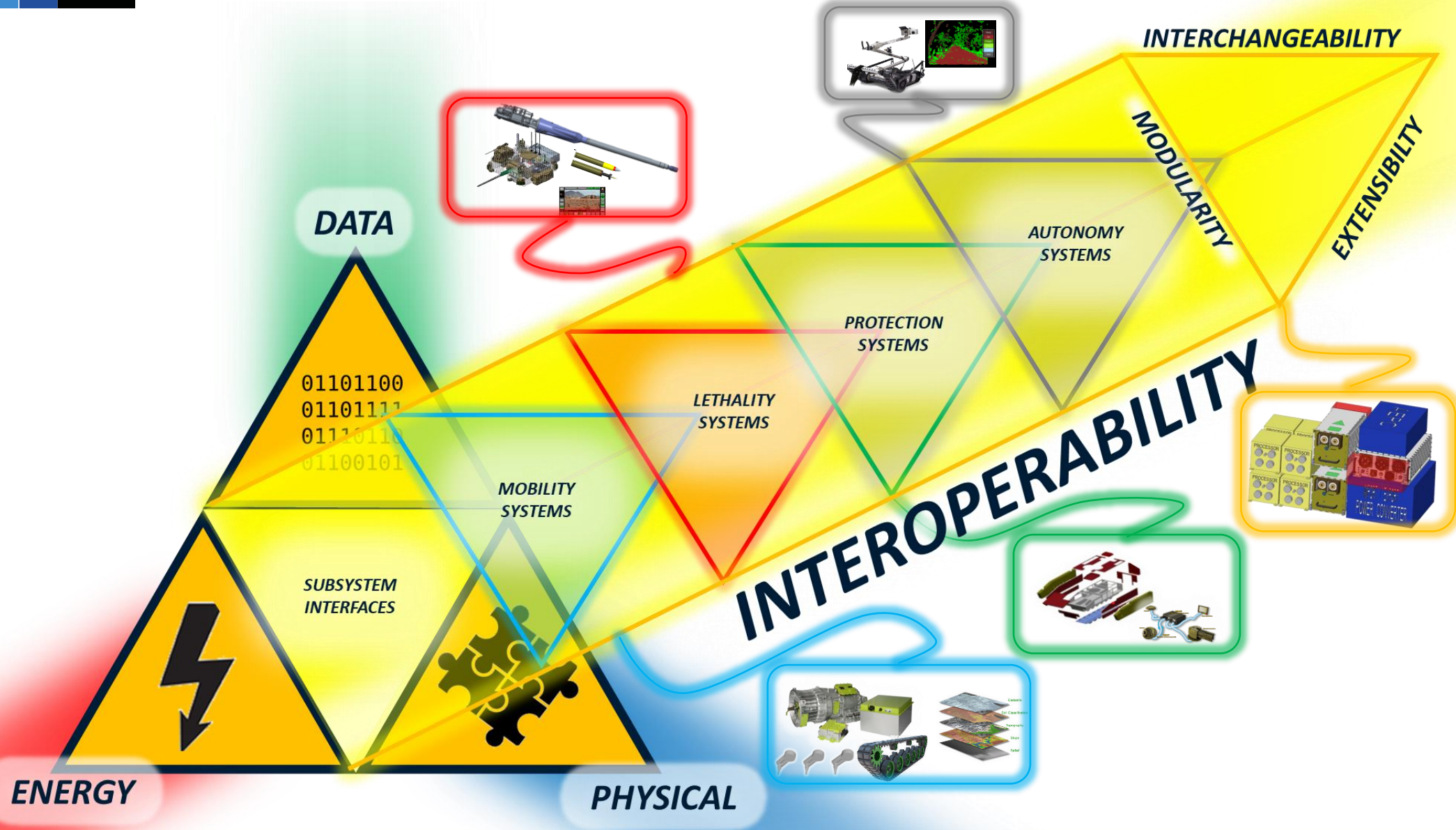
Current:

- NATO Generic Vehicle (4754)
- Controller Area Network Protocols (4628)
- Platform-level Extended Video (4697)
- Electrical Systems (2601)
- Electrical Connectors (4007)
- Auxiliary Power (4074)
- Symbols of Functional Control in Vehicles (4050)
- Platform Cyber Protection Best Practice (4853)

Future:

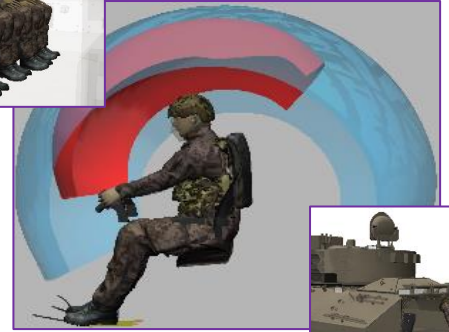
- *Defensive Aides & Suites Architectures (4822)*
- *Autonomous Vehicle Architectures*
- *High Voltage Power Distribution*

Objective Architecture Standards



Harmonizing System and Subsystem Interoperability Across the Alliance

EMBARKED SOLDIER



Anthropometry and Modeling

- *Compile anthropometry measurements and methodologies across alliance*
- *Define a common set of body measurements (e.g. widths, breaths, heights, circumference) and use measurements methodologies.*

Test and Evaluation

- *Common Measurement requirements for:*
 - *occupant interior, seat, restraint, touch points*
- *Level of testing needed:*
 - *Component vs. System vs. Both.*
- *Common/Updated Injury Metrics, Performance Standards, and Vehicle Requirements*

Embarked Soldier / Vehicle Interfaces

- *Data*
- *Power*

Future Embarked Soldiers

*Embarked
Situational
Understanding*

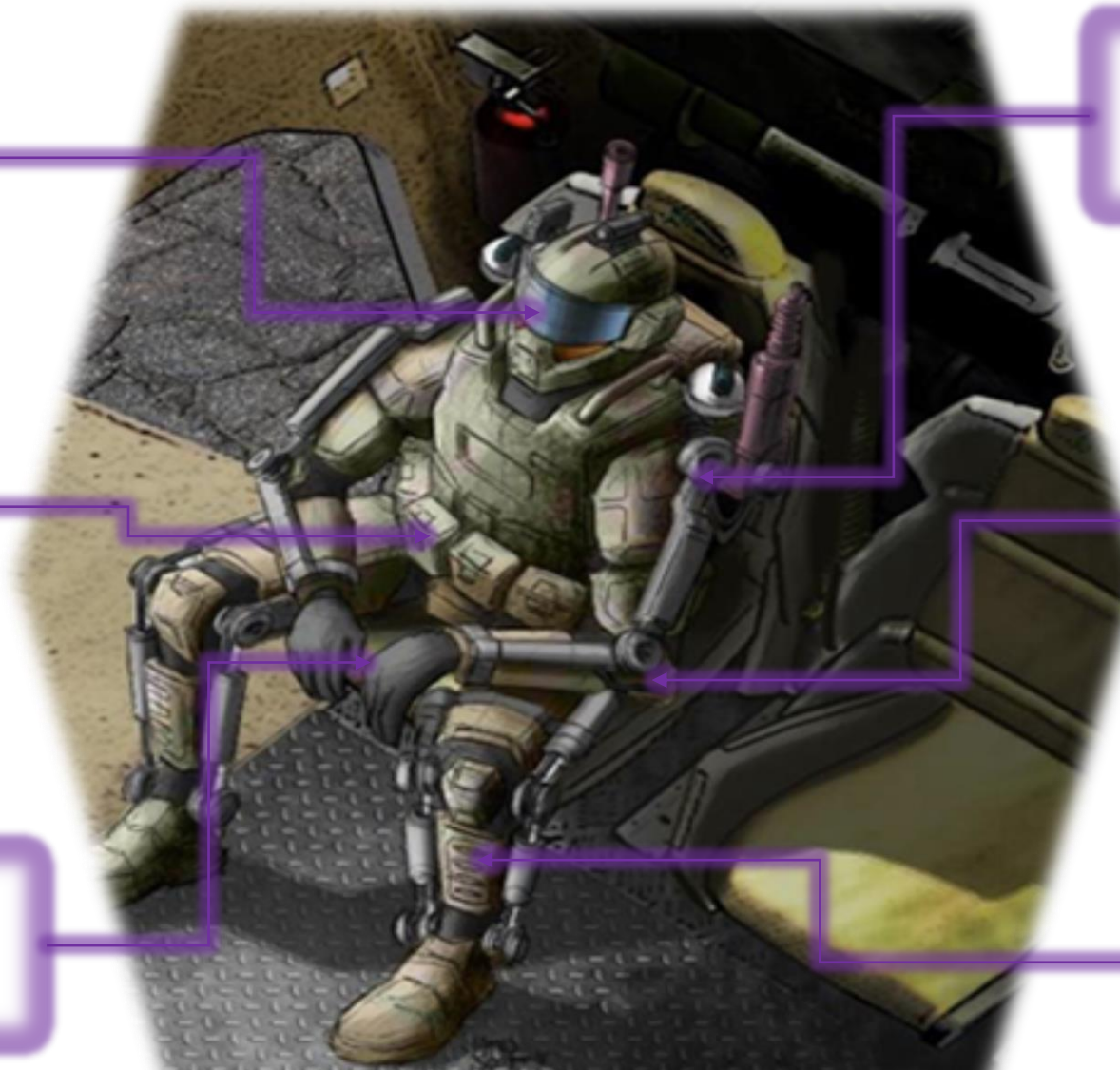
*Embarked
Comfort &
Conformability*

*Embarked
Power & Energy
Architecture*

*Embarked
Energy
Absorption*

*Embarked
Fight-ability*

*Embarked
Survivability*



Empowering the Human Interface Across Alliance Land Vehicles

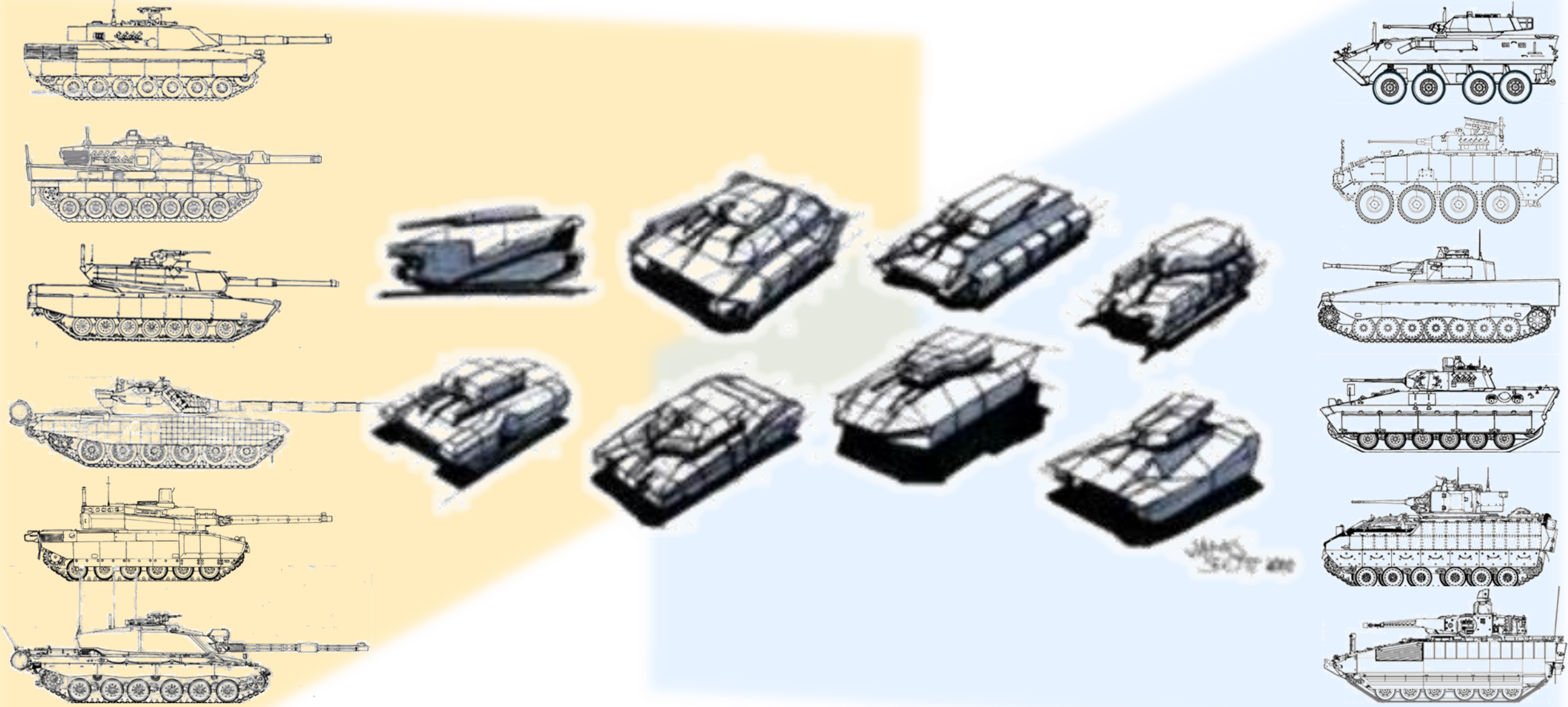
Platform Class Initiative



Platform Class Cooperation Initiative: MBT & IFV

- ***Pre-concept documents Accepted & Published - 2022***
- ***Concept of Need (CON) Team of Experts work underway***
- ***CON to inform the NATO Defense Planning Process (NDPP) and common NATO Definitions of “MBT” and “IFV” capability for 2030 and 2045 time horizons***

Next Gen Combat Vehicles



Setting the Standard for Future MBT and IFV Concepts and Capabilities.

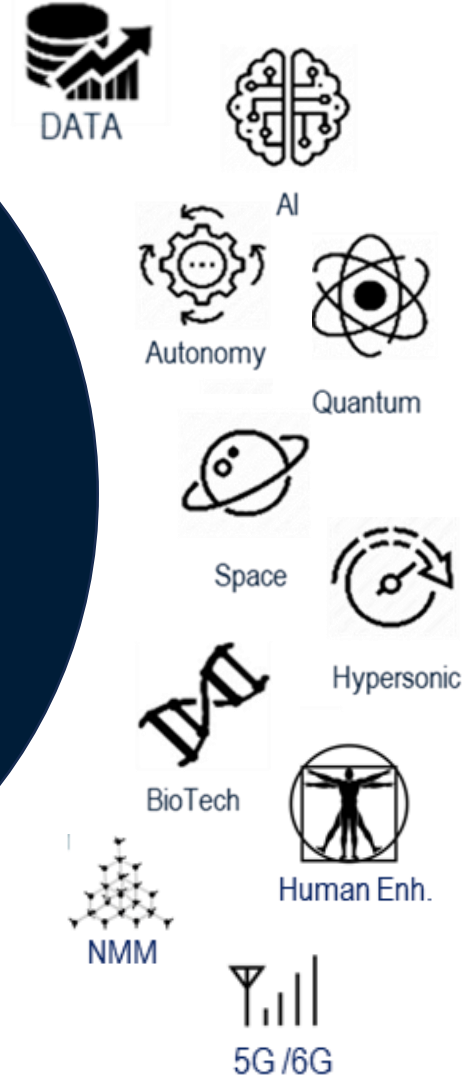
Emerging Disruptive Technologies

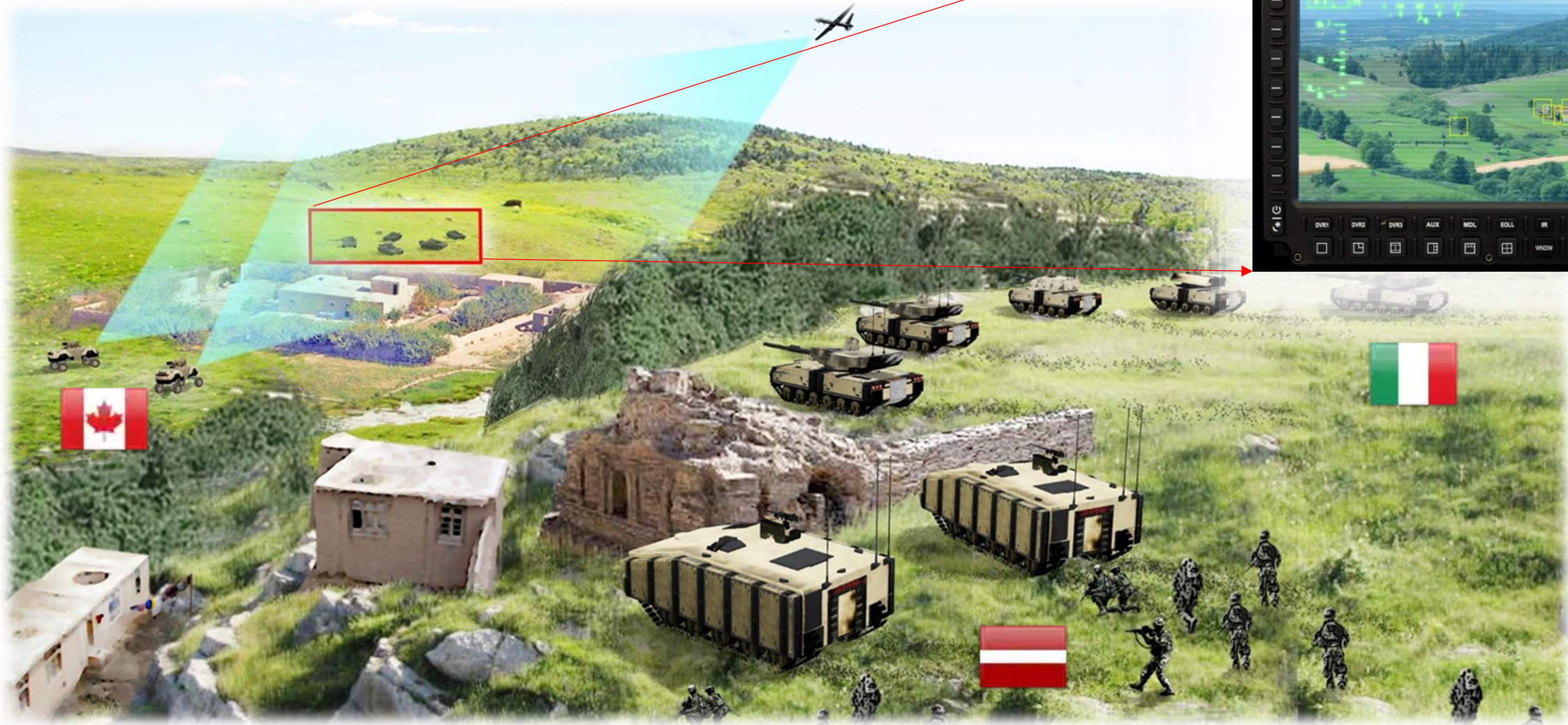
•Emerging: Those technologies or scientific discoveries that are expected to reach maturity in the period 2020-2040; and...are not widely in use currently or whose effects on Alliance defense, security and enterprise functions are not entirely clear.

•Disruptive: Those technologies or scientific discoveries that are expected to have a major, or perhaps revolutionary, effect on NATO defense, security or enterprise functions in the present through 2040.

1. DATA: Big Data & Advanced Analytics (BDAA)
2. AI: Artificial Intelligence (AI)
3. AUTONOMY: Autonomous Systems (AS)
4. QUANTUM: Quantum Technologies (QT)
5. SPACE: Space Technologies (ST)
6. HYPERSONICS : Hypersonic Flight/Weapons (HW)
7. BIOTECH: Biotechnology (BT)
8. HUMAN ENHANCEMENTS: Human Enhancement (HE)
9. NEW MATERIALS: Novel Materials and Manufacturing (NMM)
10. 5G, 6G: Ubiquitous communications 5G, 6G Spectrum (5G)

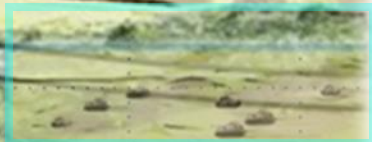
Promising
Research Areas
Toward Game
Changing
Opportunities





Question: In a coalition/allied operation how long would it take to plan coordinate and execute an attack on this enemy position?

EDTs At the Forward Edge



In a matter of seconds...

- **Assess the Enemy**
 - MLCOA
 - MDCOA
- **Assess Terrain**
 - OAKOC
- **Assess Coalition Force Capabilities**
 - Weapon System
 - Range
 - Effect
 - Mobility
 - Protection
- **Present Options**
 - Assault Positions
 - Support Positions
 - Phase Lines
 - Fire Control Measures
 - Protected Routes
 - Casualty Collection Points

...Distribute the Plan.

Allied Standards are the KEY to Unlocking the Full Operational Potential of NATO EDTs

QUESTIONS?

