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# **NATO GBAD in Transition, A high priority complex capability**

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**Joint Capability Group on Ground Based Air Defense  
(JCG GBAD)**

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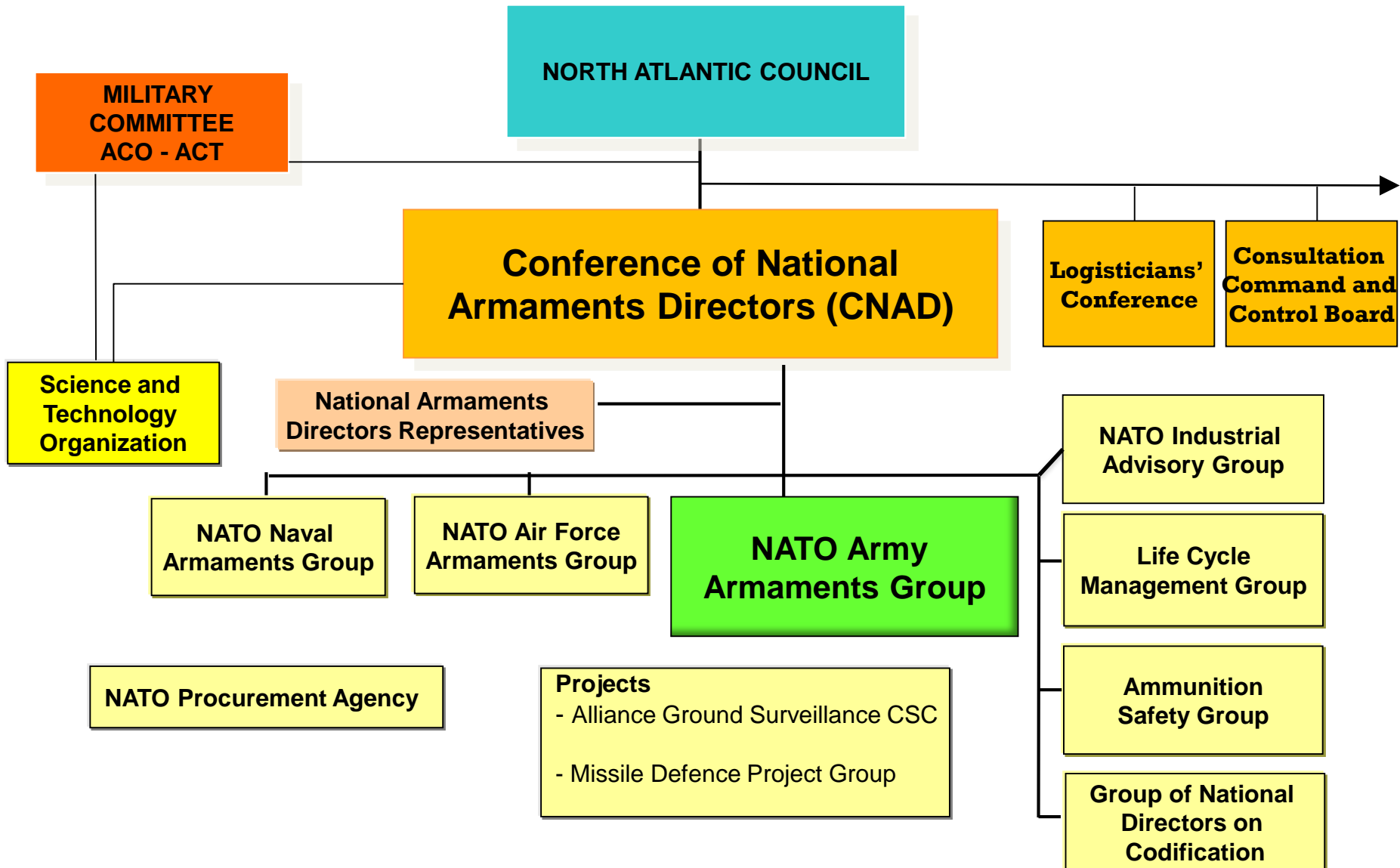
# Disclaimer

- The views presented here are those of the Chairman, JCG GBAD and do not necessarily reflect the view of the North Atlantic Treaty Organization, nation or organization.

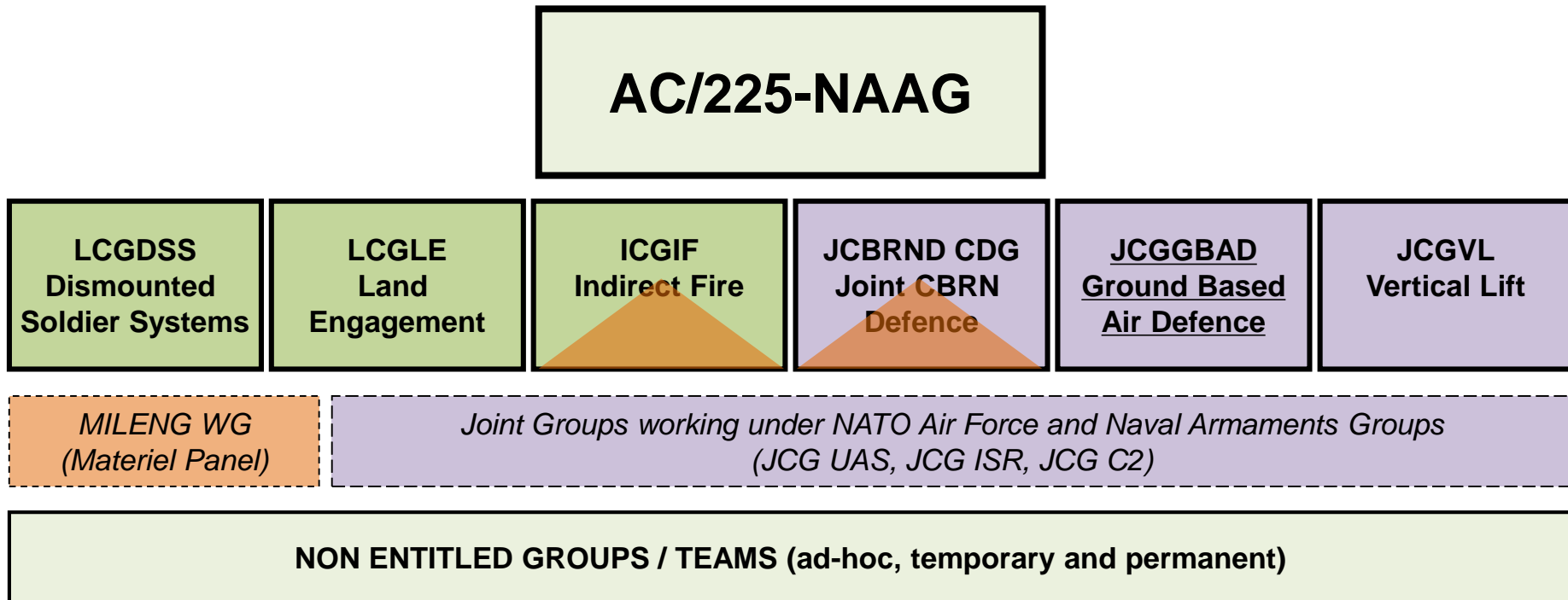
# Outline

- Who is NATO JCG GBAD and what is their mission and functions?
- Understanding the current and rapidly evolving GBAD threats.
- JCG GBAD Program of Work, to include C2 interoperability, exercises and the definition of future GBAD system requirements.

# The CNAD Structure

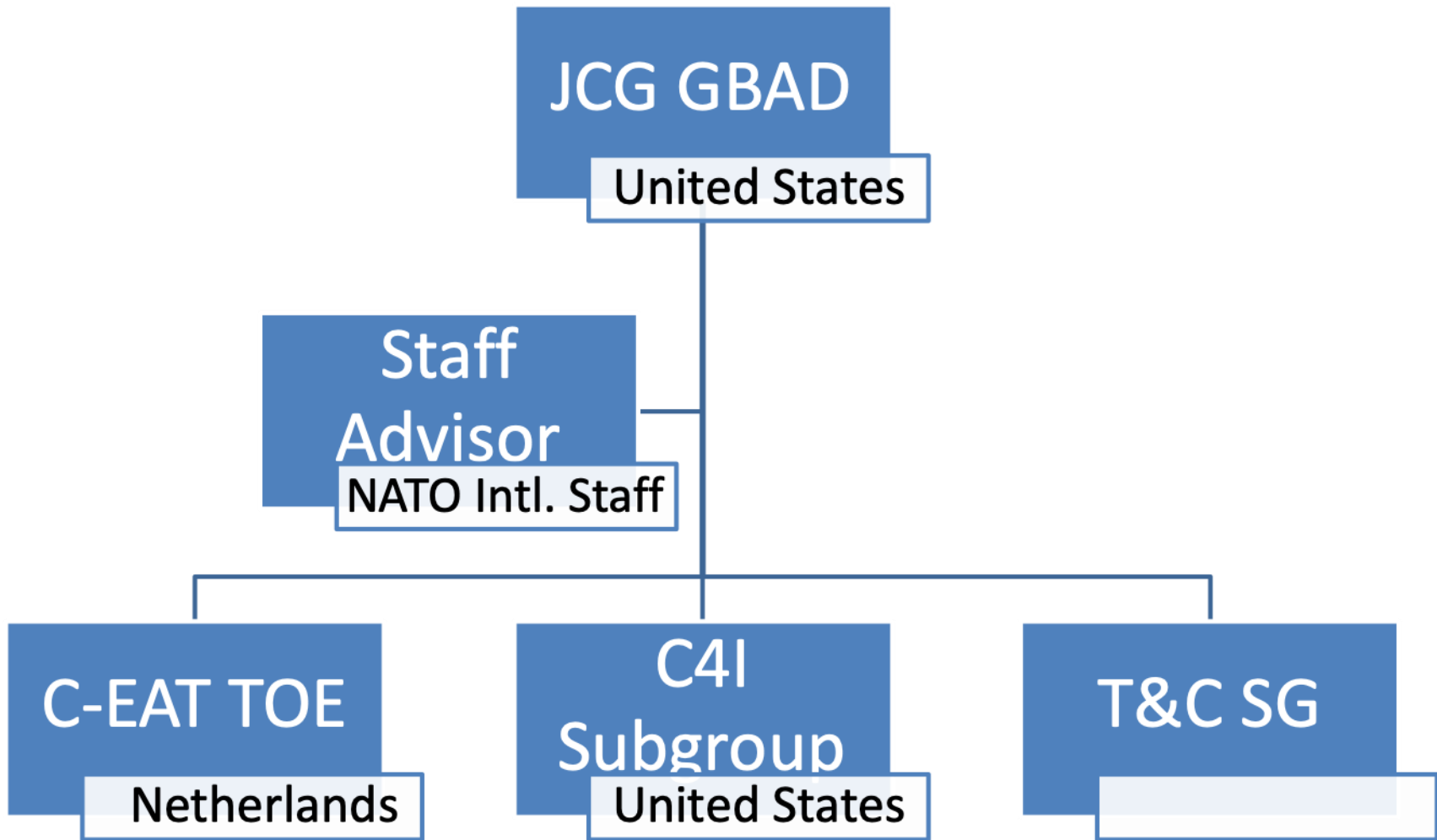


# NAAG Structure



**LCG:** Land Capability Group; **ICG:** Integrated Capability Group; **CDG:** Capability Development Group; **JCG:** Joint Capability Group  
**Orange:** ICGIF and JCBRND CDG are merged with their counterparts under the Military Committee (MC), and assumed responsibility of both materiel and doctrine capability development under NAAG (also reporting to MC). The MILENG WG is a merged group with Military Engineering doctrine and materiel capability development under MC. It also reports to the NAAG for materiel aspects.  
**Purple:** The joint groups also receive guidance from NNAG and NAFAG. Similarly, NAAG gives guidance to joint groups under NNAG and NAFAG.

# JCG GBAD Organization



# JCG GBAD

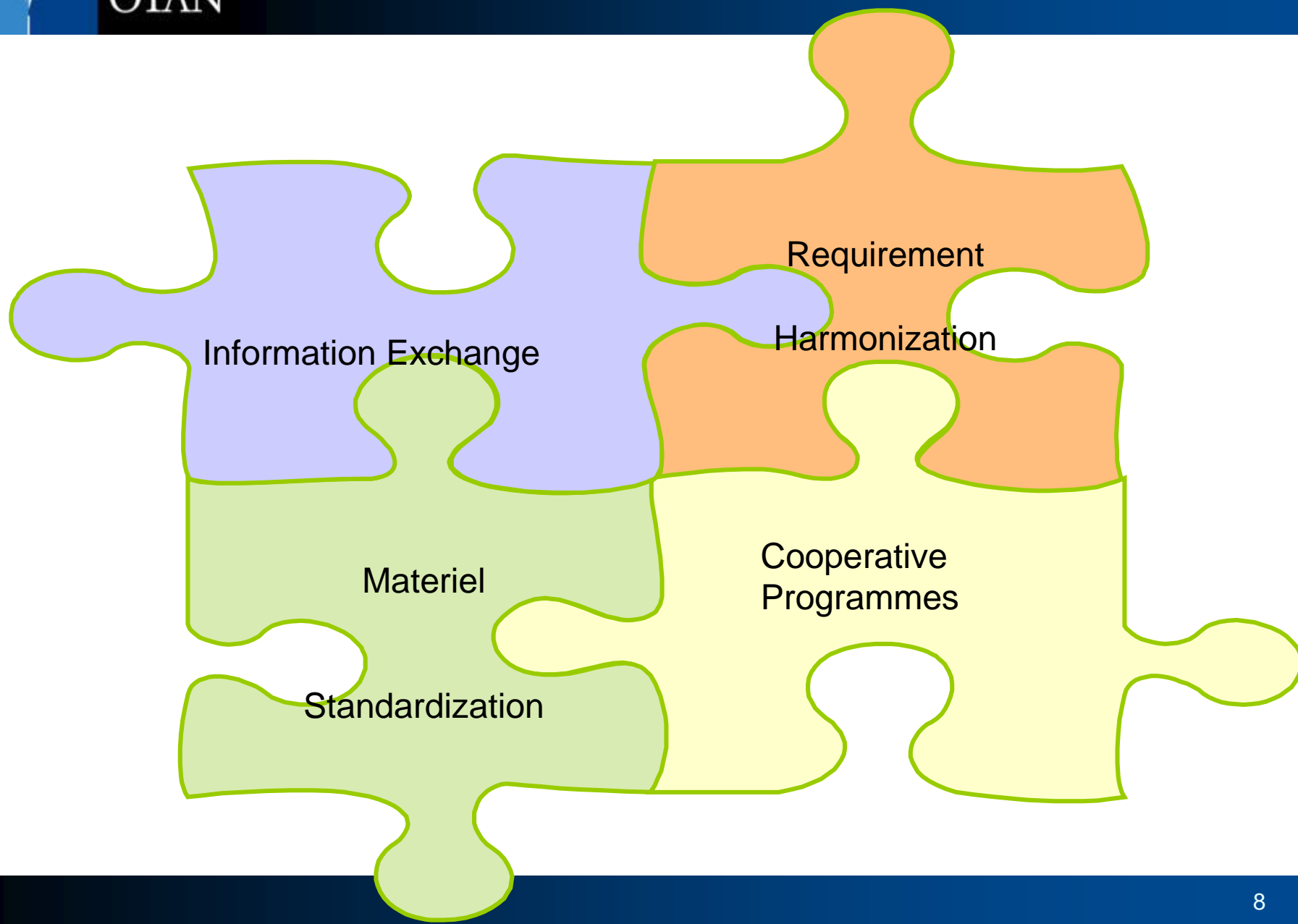
***JCG GBAD is responsible for ground-based air defence systems required for the protection and defence of all services forces and critical assets as well as civil and military installations.***

***The mission of JCG GBAD is to promote GBAD integration and interoperability.***

***Tasks include the Exchange of Information, identifying areas for bilateral or multilateral collaboration, opportunities for integration, interoperability and standardization, development of STANAGs, conduct of demonstrations and exercises, and sponsorship of NATO Industrial Advisory Group and Science and Technology Organization studies.***

***JCG GBAD seeks to create synergy among the procurement, science and technology, and industrial communities.***

# Means of Cooperation





# Rapidly Evolving Threats

## THE THREAT ENVIRONMENT IS COMPLEX AND EVOLVING

### Ballistic Missiles

- Increased Payloads
- Increased Precision
- Proliferation
- Maneuvering
- Decoys

### Hypersonics

- Faster
- Lower RCS

### 5<sup>th</sup> Gen Fighters

- Improved Stealth
- Improved EW

### Contested Space

- Satellite ISR
- Space Based Weapons
- Congestion

THE PACE OF GLOBAL  
MILITARY DEVELOPMENT  
HAS INCREASED

### UAVs

- Tactical & Lethal
- Lower Cost
- Mass Raids

### Cruise Missiles

- Long Range Bombers
- Maneuvering
- Mass Raids
- More Launch Platforms

### Electronic Warfare

- Sophisticated EA
- Spectrum Denial
- Robust Networks

### Non State Actors

- Rockets & Mortars
- Improved Precision
- Unpredictable

### Cyber Warfare

- Data Loss

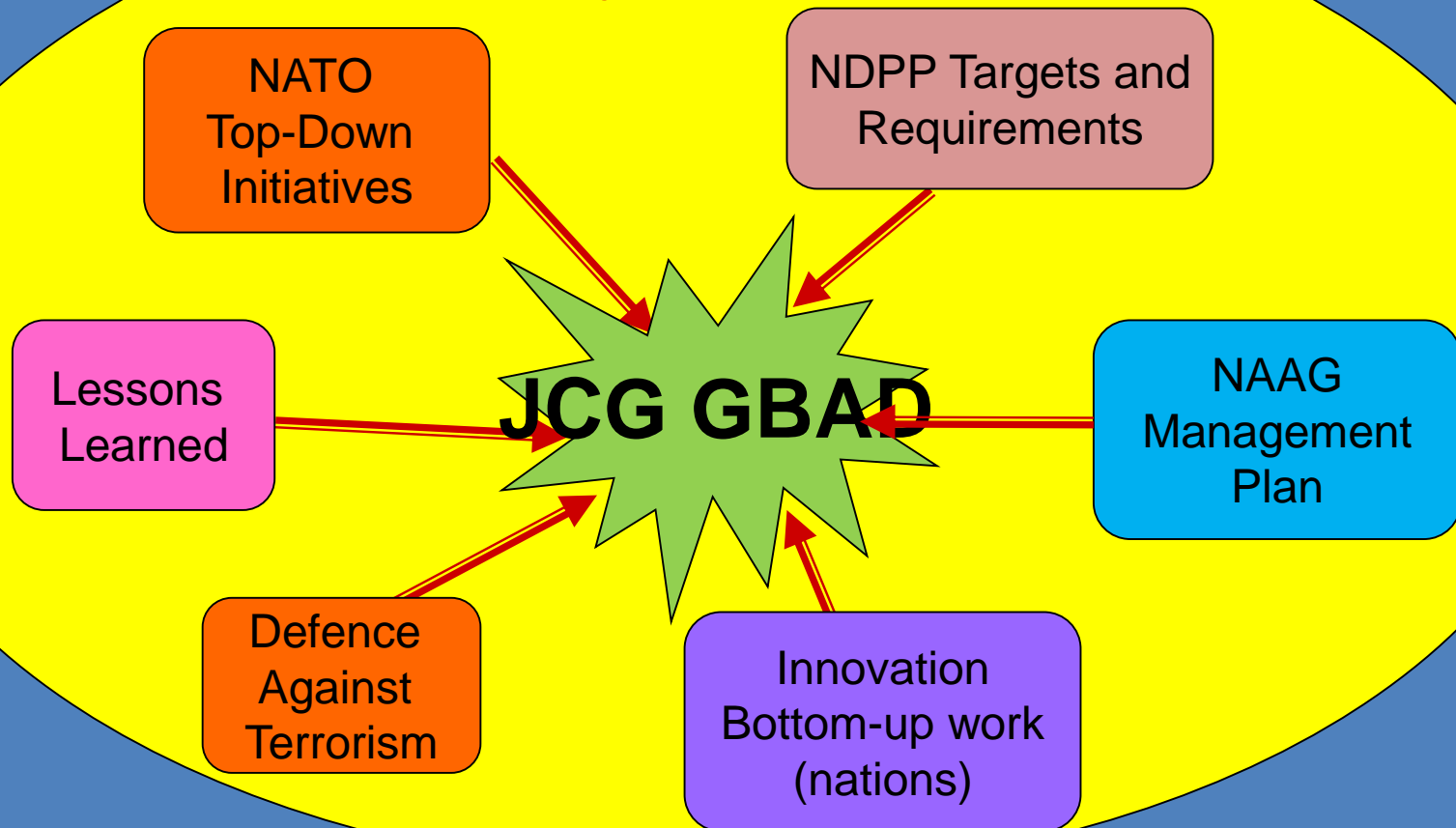
Extracted from the UK RUSI MISSILE  
DEFENCE CONFERENCE (Feb-2019)

- The GBAD threat continues to evolve.
  - 5<sup>th</sup> generation manned fighters with air launched munitions.
  - Advanced rotorcraft with air launched munitions.
  - Low altitude maneuvering subsonic/hypersonic stealth cruise missiles.
  - Long range rockets, artillery and missiles.
  - SRBM with depressed trajectories.
  - Ground and Airborne based advanced ECM.
  - Cyber attacks on networks.
  - Special Forces with large caliber long range rifles.
  - Rapidly Expanding LSS & Hi-G Stealthy UAVs (ISR/Attack).
- The requirement to counter a rapidly evolving complex threat requires an increasingly complex GBAD systems capability.

# POW SOURCES

## *Threats & Military Shortfalls*

### *Capability Requirements*



# Program of Work

- The primary focus is Interoperability.
  - Revise and update the Future V/SHORADS NSR.
    - Take advantage of recent NIAG and STO studies.
    - Incorporate C-LSS, C-RAM, C-CM, EW and Cyber.
  - Promote and support the GBAD C2 MOU.
    - Currently a twelve nation MOU.
  - Conduct/promote NATO/multi-national exercises.
    - GBAD Table Top Exercises.
    - Tobruk Legacy.
    - Operation Bristow
  - Exchange of Information

# Interoperability Baseline

- 29 NATO nations
- 30 different types of Air Defense systems
- Multiple Design Standards
- Multiple Equipment Manufactures
- Impact of Defense Industry Business Models
  - Competitive Advantage
  - (Interoperable digital radio example)
- Integration and Supportability

# The LSS UAV Threat

- Observations from eight years of NATO Industrial Advisory Group (NIAG) studies.
  - Mini UAVs are easily obtained over the internet.
  - Platform capabilities are being modified/enhanced by hostile state/non-state actors in a matter of weeks at minimal cost.
  - Electronic countermeasures have become less of a deterrent.
- GBAD system capabilities will have to increase.
  - Multiple sensors and multiple effectors.

# Recent NIAG Studies

SG No.	Title	Start	End
170	Engagement of Low, Slow and Small Aerial Targets by GBAD	Mar 12	Jul 13
188	Sensor Mix Optimization	Feb 14	Jul 15
200	Low, Slow and Small Threat Effectors	Mar 15	Oct 17
220	GBAD Operations in the 21 <sup>st</sup> Century	Mar 17	Jul 19
238	GBAD Operations Against 21 <sup>st</sup> Century Peer Nation Cruise Missile and Unmanned Aerial Threat	Feb 19	Jul 21

# Acquisition

- An Observation.
  - GBAD has been designated a priority capability.
  - The design and development of complex systems to counter the rapidly evolving threat takes time and money.
  - GBAD capabilities need to be updated and modernized frequently to keep pace with the evolving threats.



# Summary

- JCG GBAD is a high visibility and active group within NATO.
- Today the threat continues to evolve rapidly in both type, capability, complexity and tactics.
- GBAD system capabilities must be significantly enhanced to mitigate the evolving threats.
- GBAD system acquisition and modernization time lines must be reduced.



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# Questions or Comments



# GBAD C2 MOU Nations

Austria

Finland

Hungary

Norway

Slovakia

United Kingdom

Czech Republic

Germany

Netherlands

Poland

Sweden

United States

As of 16 July 2017



# NATO ARMY ARMAMENTS GROUP (NAAG)

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(presenter etc...)