BAE SYSTEMS

nexter

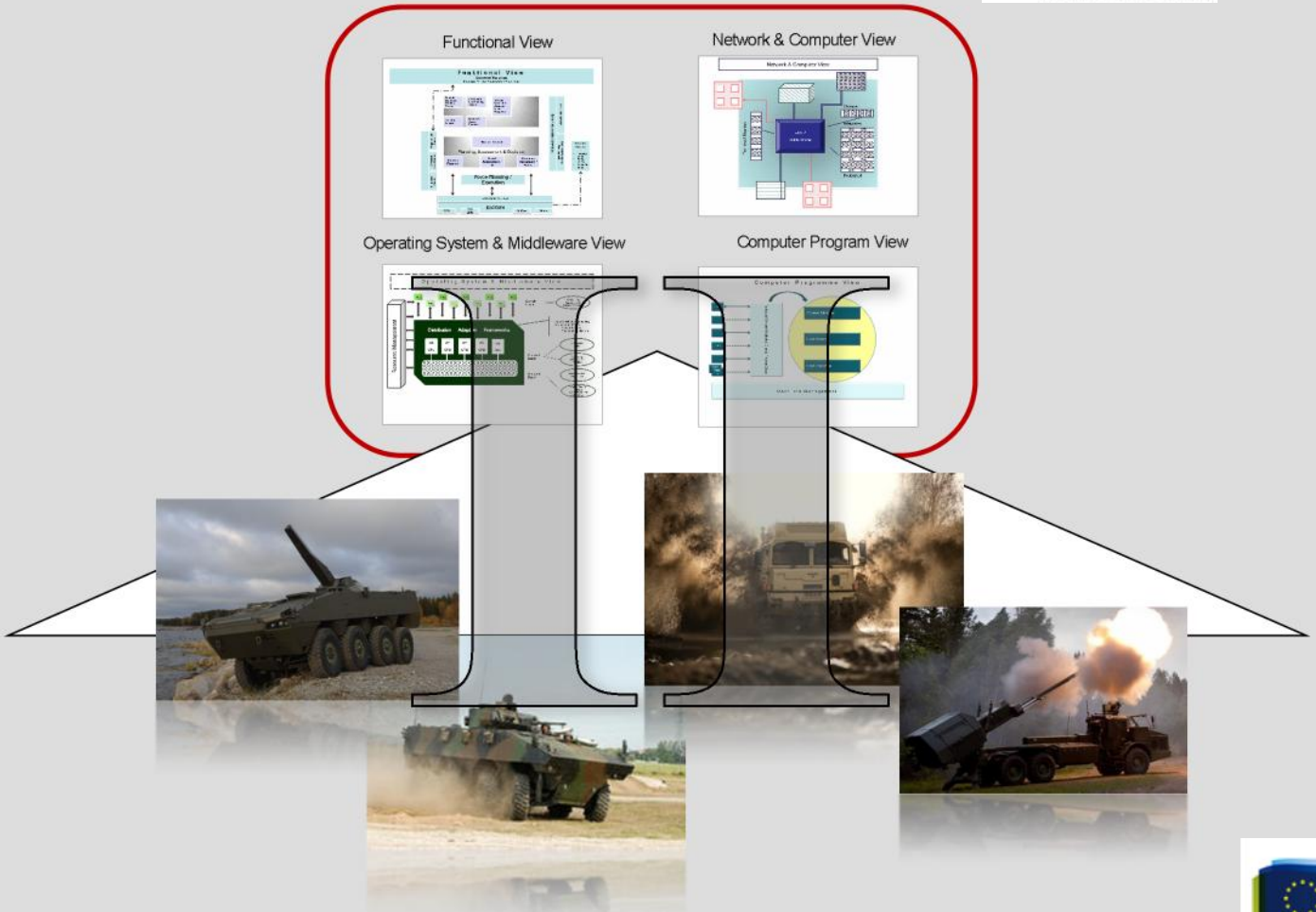
RHEINMETALL DEFENCE

VRC Vetronics Research Centre

Fraunhofer FKIE

Patria

Selex ES A Finmeccanica Company



EUROPEAN DEFENCE AGENCY

WP5 – Alignment with the NGVA

George Valsamakis - Vetronics Research Centre, University of Brighton, UK

Objectives

- **Identify LAVOSAR II concepts & contributions as future enhancements to the NGVA.**
- **Identify future short & long term goals from LAVOSAR II results.**
- **Harmonisation of LAVOSAR II results & Development of NGVA Roadmap.**
- **Relevant guidelines on gaps between NGVA and LAVOSAR II.**

Input

- **LAVOSAR I (12.R&T.OP.336) results**
- **NGVA (STANAG 4754)**
- **Def Stan 23-09 (GVA), Victory, Scorpion and FACE ***
- **LAVOSAR II WP's 1,2,3,4 and 6 output**

* open information from

Aim of this presentation

Collection of ideas for future standardisation:

What else could be agreed to be included in future NGVA?

Expectations?

NGVA Benefits/Aims

- Reduced platform integration time & costs
- Improved sub-system integration
- Inherent modularity and scalability
- Better obsolescence management, more 3rd party options
- Integration with future training and simulation architectures
- Enabler for automated collection of system data
- Flexibility of design

- Reflecting GVA benefits internationally

NGVA (STANAG 4754) current developments:

To be submitted in 2015:

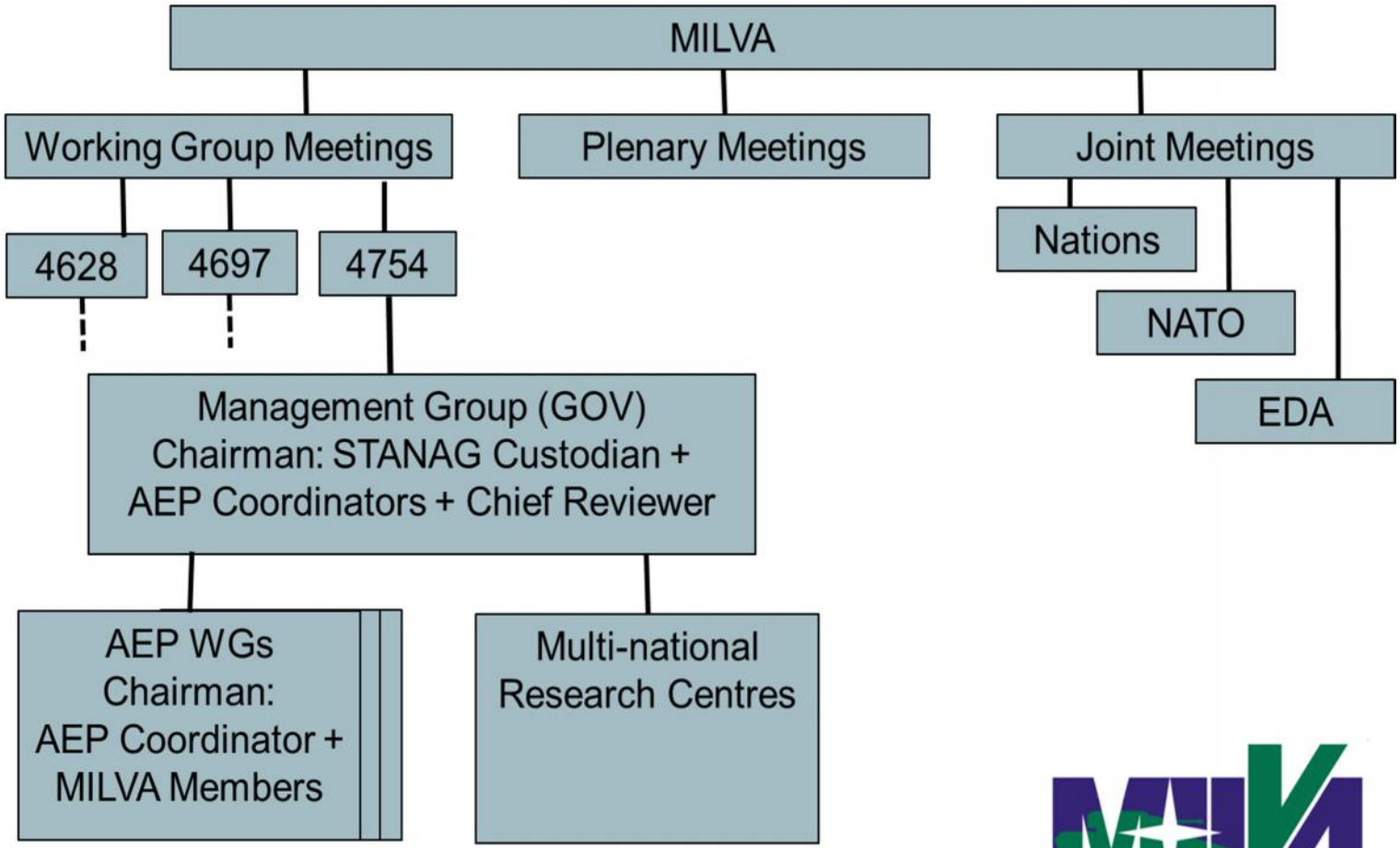
- **Architectural Concept AEP**
- **Data Infrastructure AEP**
- **Data Model AEP**
- **Power Infrastructure AEP**
- **Safety AEP**
- **Verification & Validation AEP**

Under Consideration:

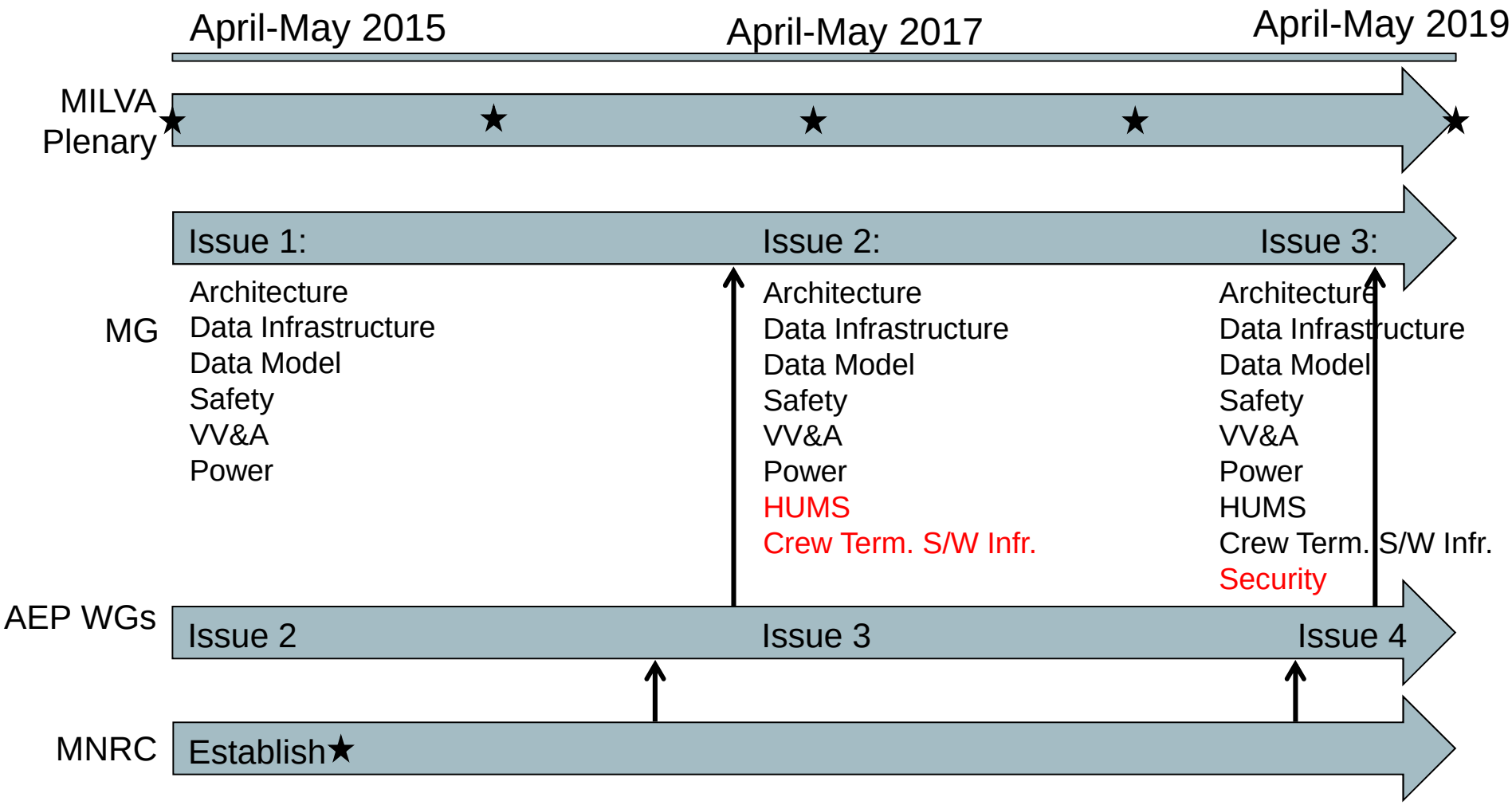
- **Crew Terminal Software Architecture AEP**

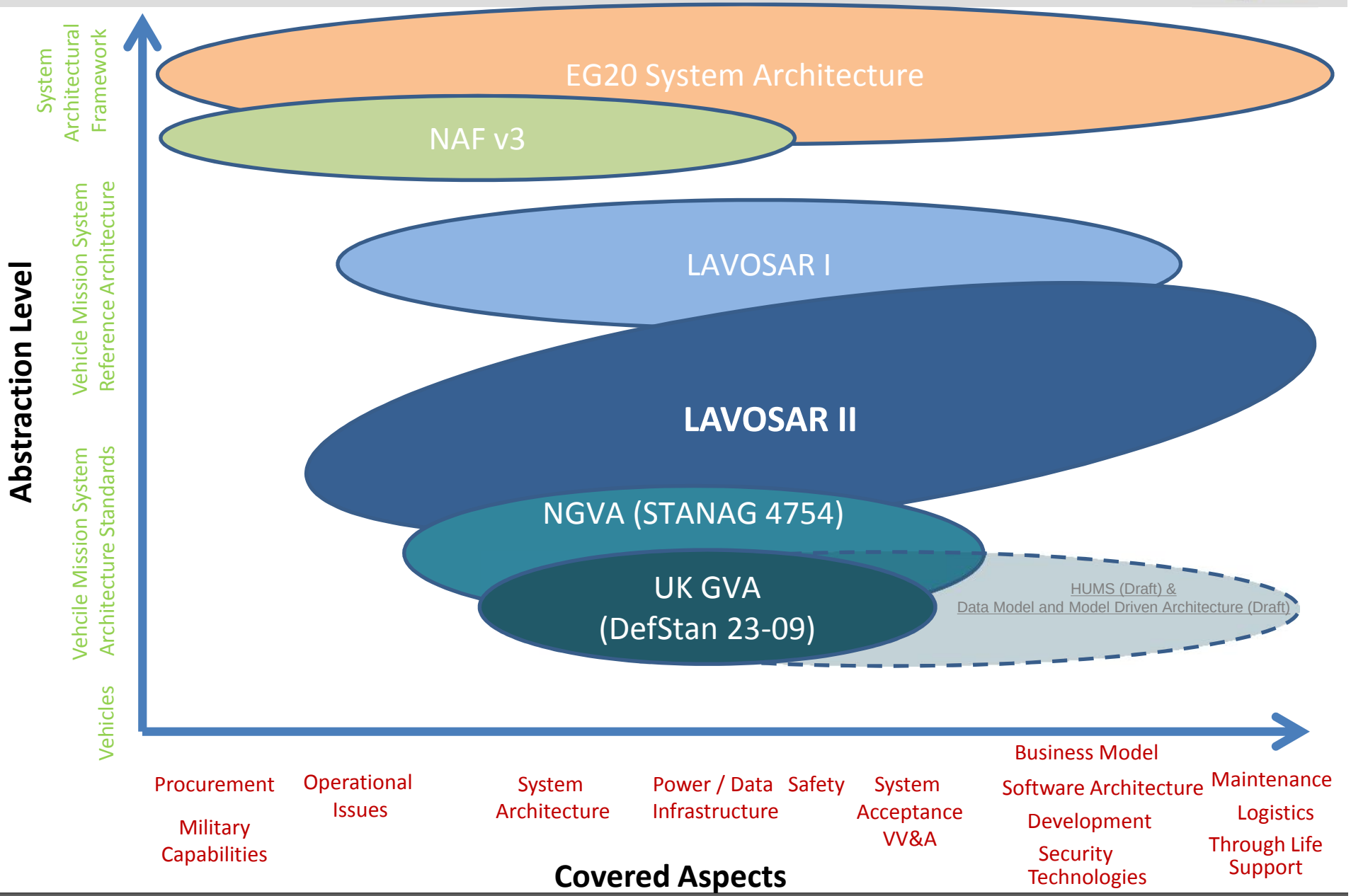
Future:

- **HUMS**
- **Physical Interfaces**



MILITARY VETRONICS ASSOCIATION





UK GVA

- Approach
- Infrastructure
- HMI
- HUMS
- Data Model
- Security
- Common Services
- Safety-Critical Networks

NGVA

- Approach
- Data Infr.
- Crew Term. S/W Infr.
- HUMS
- Data Model
- Power Infr.
- Safety
- V&V
- Phys. Interf.

LAVOSAR I & II

- Operational Approach
- System Architecture
- Power / Data Infrastructure
- Software Architecture
- Safety
- V&V
- Logistics
- Maintenance, Upgrade & Support
- External Data exchange
- Architectural Views
- ... ? (more as study develops)

WP5 Potential Subject Areas

- **Logistics**
  - Data exchange procedures.
  - Data model for logistics.
  - HUMS logistics related status.
- **Architectural views**
- **Training** (potential AEP)
- **Upgrading** (potential AEP)
- **Modular safety cases guidelines** (LAVOSAR I)
- **Security and domain separation through virtualisation**
- **Best Practises standards**
  - LAVOSAR I standards for ORA
- **Common EU Level Requirements**

Areas already influenced

Data Infrastructure, V&V principles, Harmonised definitions of terms

Based on LAVOSAR results, NGVA could cover:

Logistics common data

- Maintenance, support & upgrading data (AEP for upgrading?)
- Definition of data exchanges at different tactical levels
- (Logistics AEP?)

HUMS common data

- Common Data schemas
  - Systems data
  - Measures
  - Operational Records
- HUMS & logistics related data

External Data Exchange mechanisms

- Communication mechanisms for data schemas for logistics & HUMS
- Security aspects (virtualisation & network)
- Other data (Mission, LSA, IS?)

Training (built-in, software emulated training modes – Training AEP?)

NGVA Benefits/Aims LAVOSAR aligned

- **Reduced platform integration time & costs** **<- WP1/2 for mission systems**
- **Improved sub-system integration** **<- WP1/2 for mission systems**
- **Inherent modularity and scalability** **<- LAVOSAR 2**
- **Better obsolescence management, more 3rd party options** **<- LAVOSAR Logistics**
- **Integration with future training and simulation architectures** **<- WP4 LAVOSAR**
- **Enabler for automated collection of system data** **<- WP4 external GW concepts**
- **Flexibility of design** **<- WP6 & Design practices (LAVOSAR I)**

Further opportunities/concepts

- Model Based Systems Engineering practises such as Harmony™ in SysML
  - Research challenge: Could Assessment criteria, MoE's and MoP's be specified in a future standard to assess mission system development at its early design stages?
  - (For interpoperability, performance lifecycle properties etc)

- Modular Safety Case practices
  - Also for the through-life capability aspects

- Technology-independent specifications
  - In favour of future capability/service oriented architecture
  - Including security practices/requirements

- Modern technologies and protocols
  - Network security
  - Benefits: advantages in efficiency and security, future proof

  (could enhance networking aspects in Data Infrastructure AEP)

End of File

Questions/Remarks