Dual Use CNS Boosts Civil-Military Interoperability

Presentation to Integrated CNS Conference 2018

Nikos FISTAS on behalf of Jorge PEREIRA
EUROCONTROL
11th April 2018
Priority for military aviation are Defence and Security missions. However, military are vulnerable to ATM/CNS modernisation!

- Military fulfil legitimate National Defence and Security role
- Military aircraft are "weapon systems"
- Military operate in mixed mode environment relying on civil infrastructure
- There is a mismatch between civil ATM/CNS requirements and military capabilities
- Military strive for the recognition of modern military aircraft capabilities
- Global interoperability is a key factor also for military aviation
- Infrastructure rationalisation is fundamental
- Seamless accommodation and benefits in terms of capacity, safety, flight efficiency, environment, etc. are a permanent target
Evolution of aviation CNS infrastructure calls for enhanced civil-military interoperability

- Digitalisation and Automation
- Satellite-based systems
- Performance-based concepts
- Aircraft-centric
- Security and Resilience
- Spectrum efficiency
- Integrated C-N-S

Dual Use: Reutilise Military Capabilities!
Dual Use CNS Approach is key to enable the reutilization of military capabilities to cope with civil ATM/CNS requirements

- Responds to civil ATM/CNS evolution
- Dual Use CNS recognised in the European ATM Master Plan
- Equipage exemptions must be last resort
- Civil-military interoperability must be the basis for military accommodation
- Performance based approach is key as it decouples equipment from performance levels
- Low cost technical solutions are paramount: re-utilisation of avionics, forward fits, backwards compatibility.
Success story: Performance-Based / Dual Use CNS is viable for military aircraft!

- Successful research based on successful partnership with the European Defence Industry
- Prototypes and flight trials finalized in September 2014
- Enable Automatic Dependent Surveillance (ADS-B) relying on the Mode S component fully embedded in the military IFF configuration
- Military transponders can be used for ADS-B with swift adaptations
- Military aircraft integrated in SESAR at lower cost
- Same approach to be followed for other military capabilities!
Military aircraft integration considerations

Sometimes there is a need to equip like civil aircraft
Rationalised avionics is key
Performance of available military avionics considered for compliance
Reliance on multi-mode / modular architectures

Aircraft more cooperative with ground
Trajectory management and advance navigation enabled
Different approach for transport-type a/c and for fighters
High level of avionics integration

Dual Use CNS means: capability re-use, focus on functions and performance and rationalized and optimized equipage!
Integrated Modular Avionics (IMA) architecture opens the door to the application of Dual CNS approaches in military aircraft!

IMA is a set of standardized modules communicating over a common network bus. Functional application software is independent from modules which are easily replaced and upgraded. IMA uses a minimum number of common parts and that opens the door to the easy application of dual use approaches due to isolation and independence of individual systems/functions.
Reutilization of military mission systems (MMS) to process trajectory and NAV data, use of available COM and sensors and control panel and display adaptation are critical for ATM/CNS compliance!

Military avionics must enable Performance Based Navigation (PBN) and trajectory (TBO) requirements (e.g. processing of ARINC 424 data and exchange of EPP)

Military sensors must be deemed eligible for compliance (Inertials, GPS restricted signals, visual systems, TACAN, etc.)

Displays and panels are multifunctional and manage several functions. Technical solutions for appropriate adaptation are crucial.
Dual Use CNS: Benefits

- Military operations facilitated in mixed mode environment
- Higher capacity and safety levels
- ATM/CNS infrastructure rationalized
- Adherence of military aviation to ICAO global concepts (PBN, TBO, etc.) at lower cost and with limited technical impact
- Civil-military interoperability, technology convergence and synergies.