UTM in Germany - A connected vision

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Explorative UTM project „U:CON“ by DFS and Deutsche Telekom AG

- Provide evidence that efficient connectivity, surveillance and tracking as well as command and control of UAV in very low level airspace via the mobile communications network is possible
- Define operational and technical requirements for systems and infrastructure (incl. system architecture)
- Identify the relevant elements for a Concept of Operations (ConOps)
- Develop a business case for establishment and operation of an UTM System

More use cases in 2018:
- Blood transport between hospitals
- Gas infrastructure inspection
- SAR missions on rivers and over sea
- UAS in food production
- Airport construction progress monitoring
System components of U:CON: HODs & MF (DTAG), Tracker & UTMF (DFS)
Technical feasibility of drone tracking using mobile telecom & HOD was proven 2017

UTM at DFS
AWC, Madrid 6.-8.3.2018
The U:CON tracking tests also showed possible fusion of UAS with manned aviation.
Unifly UTM framework consists of 2 types of web applications (PRO, SENTRY) and one mobile app.

Users of UTM PRO web clients

Users of UTM SENTRY web clients

Users of UTM PRO mobile app clients (UAS and A/C pilots)
Configuration of working positions and work share may be designed for cooperative usage

Users of UTM PRO web clients

Users of UTM SENTRY web clients

Users of UTM PRO app clients (UAS and A/C pilots)
Work sequences in UTM

Typical sequence in UTM PRO

- **Register, create profiles and fill database**
  - Definition of companies or operators
  - Definition of pilots
  - Definition of drones to be used
  - Definition of documents for means of compliance

- **Planning of mission**
  - Planning of mission
  - Validation against rules, NFZ, other missions
  - Adaptation of planning
  - Publication and submission for approval
  - Evtl. modification on request

- **Mission execution**
  - Activation with mobile app (TakeOff)
  - Activation by flight, detection, and tracking
  - Execution of flight, use of situation display
  - Validation against NFZs, changes, and evtl. temp. NFZs
  - Check of collision risk

- **Mission termination**
  - Report
  - Logbook maintenance
  - Battery management
  - Incident management

Typical sequence in UTM SENTRY

- **Permissions**
  - Process permission requests
  - Manage permissions

- **NFZ Workflow**
  - No Fly Zone creation
  - No Fly Zone deletion
  - No Fly Zone editing
  - No Fly Zone management

- **Situation display**
  - Supervision
  - Zoom / Decenter / Layer selection
UTM framework: example screens mission planning, flight view
Mobile apps close the „control loop“ with the pilot in the field
What ANSPs can do for UTM

**Knowhow Supply**
- Traffic management (operational and technical)
- Efficient workflow and HMI components and conventions
- Proven safety culture (QA, qualification, training, supervision, auditing, ...)
- Mediation between existing ATM stakeholders and new participants

**Data Supply**
- Relevant A/C track data
- Airspace usage / booking
- Airspace map data
- Weather data

**Service Supply**
- Provision of MSDF tracking systems
- Geofencing and collision warnings and alerts
- Weather warnings and alerts
- UTM ASP
Who else could be airspace service provider for VLL?

**ANSP**
- Could provide knowhow, data and service
- Is anyway a “neighbor”
- Paradigmatic change required for UTM

**CAA**
- More regulator and authority than service orientation
- No qualified personnel for service supply
- No or limited organisational structure to start with

**Cities**
- May have local needs
- Strict budget restrictions
- Other priorities
- No qualified staff
- What with rural ops?

**Police**
- Is a stakeholder
- Staff restrictions
- Other priorities
- No qualified staff

**1-N large operator(s)**
- Conflict of private vs. Public interest
- Biased service?
- Sufficient business model?
- Overarching common standards of safety?
Questions? Contact

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