Technological Enablers and Restrictors Discussion

How Do We Evolve Together?

Moderator: Jim Eck

- Jay Merkle
- Earl Lawrence
- Dr. Ed Waggoner
- Paul McDuffee
- Michael Lewis

Send questions to talkUAS@faa.gov – include breakout session topic in subject line
CNS/ATM Evolution

Risk/Complexity

Integrated Operations
By Full Performance-Based Rules
(Class A/B/C/D Ops)

Segregated Operations VLOS –
Over People / High Density

Segregated Operations –
VLOS Over People / Low Density

Segregated Operations
By Rule 107 –
VLOS Class G

333/336 Ops –
Segregated Operations
By Waiver/Exemption

UAS CNS systems
Compliant with risk based performance standards

Registration

Notification

Schedule (UTM)

Transit Controlled Airspace (UTM)

Integrated Class A,B,C,D Airspace

UAS Integrated Information Systems with ATM

UAS CNS/ATM systems fully interoperable with NAS services

UAS Information Systems

Functionality Over Time
### CNS/ATM Evolution

**Functionality Over Time**

**Risk/Complexity**

- **Integrated Operations**
  - By Full Performance-Based Rules (Class A/B/C/D Ops)

- **Segregated Operations**
  - V/LOS – Over People / High Density
  - By Rule 107 – VLOS Class G
  - 333/336 Ops – Segregated Operations By Waiver/Exemption

**CNS/ATM Evolution**

- **Registration**
  - Static Identification
  - User Provided
  - None Beacon?

- **Notification**
  - Identification, Location and Intent

- **Schedule (UTM)**
  - Communication
  - Transit Controlled Airspace (UTM)

- **UAS Information Systems**
  - Detect, Sense and Avoid
  - Command and Control
  - ADS-B
  - Integrated Class A, B, C, D Airspace
  - UAS Integrated Information Systems with ATM

**Segregated Operations**

- V/LOS – Over People / Low Density

**333/336 Ops**

- Segregated Operations

**By Waiver/Exemption**

**By Rule 107**

- VLOS Class G
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Segregated Operations
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Functionality Over Time

Identification, Location and Intent → ADS-B
Command and Control

Detect, Sense and Avoid

Integrated
Class A,B,C,D Airspace

Transit Controlled
Airspace (UTM)

Notification

Schedule (UTM)

Vehicle Information

Automation and Information

UAS Traffic Management

UAS ATM Integration

Fly like an aircraft

Fly autonomous

User Provided

None Beacon?

Static Identification

Registration

UAS Info Management

333/336 Ops – Segregated Operations
By Waiver/Exemption

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