ICAO UTM FRAMEWORK

Core Principles for Global Harmonization

17 NOVEMBER 2020
• 2015 – States started requesting that ICAO address UAS issues
  – Since then, formal requests were raised during several key events
• Recognized that existing ICAO processes could not keep up with the pace of technology
• UAS-AG formed to address these challenges
• Initial UAS-AG work included the development of ICAO UAS Toolkit
• Once Toolkit completed, UAS-AG moved onto UTM activities
• Several innovative approaches were adopted
  – UTM RFI Process
  – DRONE ENABLE Symposia
A framework and core capabilities of a “typical” UTM system

Need to interact/integrate with ATM systems

High level UTM requirements/considerations

Not a technical solutions document

Developed in collaboration with industry/academia
• Foster common framework and harmonization of core UTM principles
• Maintain safety and minimize disruption to existing aviation system
• Support technological developments in UTM and UAS
• Provide safety-focused recommendations for UTM system development
• Address security and environmental risks
• Enable stakeholders to grow safely and efficiently
Provide key principles, scope and building blocks
• Oversight is the responsibility of the regulator.

• Existing aircraft prioritization policies should be applicable, and practices unique to UTM should be compatible.

• Access to airspace should remain equitable.

• Key personnel should be trained and qualified.

• States should have unrestricted, on-demand access to critical UTM system data.

• The creation, adoption and maintenance of safety culture among the UTM community is essential.

• Free and open reporting of accidents and incidents should be facilitated for all stakeholders.
Provide key principles, scope and building blocks

Define/describe the various services to be provided
• Activity reporting service
• Aeronautical Information Management
• Airspace authorization
• Discovery service
• Mapping service
• Registration service
• Restriction management service
• Flight planning service
• Identification service
• Tracking and location service
• Meteorological service

• Conflict management and separation service
  — Strategic deconfliction service
  — Tactical separation with manned aircraft service
  — Conflict advisory and alert service
  — Conformance monitoring service.
  — Dynamic reroute service
UTM FRAMEWORK – MAIN DOCUMENT

- Provide key principles, scope and building blocks
- Define/describe the various services to be provided
- Identify complementary concurrent activities
- Develop a regulatory approach that is performance- and risk-based
- Development of and compliance with standards data management
- Optimization of common and shared airspace
- Optimization of frequency spectrum
- Application of appropriate assurance standards (e.g. cybersecurity or software assurance level)
- Prescribe/promote appropriate education, guidance and usage standards
- Ensure AIS or GIS data is trusted, accurate and timely
- Develop common horizontal, vertical and temporal reference sources
UTM FRAMEWORK – MAIN DOCUMENT

Provide key principles, scope and building blocks

Define/describe the various services to be provided

Identify complementary concurrent activities

Identify gaps/issues/challenges
GAPS

- Airspace classification
- Rules of the Air
- Airspace access
- Operational procedures
- Liability determination
- UTM system certification
- Data standards
- Contingency management
ISSUES

• Airspace/procedure design
• Frequency spectrum availability and supportability
• Provision of service may change airspace classification
• UTM and ATM interface
• Data exchange and privacy protocols
CHALLENGES

- Capability to identify/detect and avoid conflicting aircraft
- Enhanced detectability/conspicuity of UA by manned aviation
- Development of separation standards within the UTM
- Policies to address means of compliance or system approval
- Implementation/maintenance of a safety management system
- Forecasting and dissemination of micro-weather
UTM FRAMEWORK – MAIN DOCUMENT

- Provide key principles, scope and building blocks
- Define/describe the various services to be provided
- Identify complementary concurrent activities
- Identify gaps/issues/challenges
- Appendices address specific topics or problem areas
EDITION 1

• Registration, identification and tracking
• Communications systems
• Geofencing-like systems
• Potential architectures
EDITION 2

• UTM-ATM boundaries and transitions

• Information exchange between ATM and UTM
EDITION 3

• Structure and approval processes for UTM service providers

• Separation and deconfliction in UTM

• UTM risk assessment/contingency procedures
UTM FRAMEWORK – RFI BASED CONTENT

EDITION 4 (RFI STAGE)

• UA performance requirements in a UTM environment
• UTM system certification requirements
• UTM integration into aerodrome environments/activities
• Update to earlier Appendices

RFI available on ICAO’s Unmanned Aviation page
https://www.icao.int/safety/UA/Pages/default.aspx
Q & A
Model UAS Regulations

Humanitarian Aid & Emergency Response Guidance

UTM Guidance Edition 2

UAS Toolkit

www.icao.int/safety/UA
DRONE ENABLE 2021 (Virtual)
13, 14, 15, 20, 21 April 2021
www.icao.int/Meetings/DRONEENABLE4
THANK YOU FOR YOUR PARTICIPATION