

NASA FAA UTM RTT SAA Working Group

02/03/2017

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Agenda

Concept Development

Next Steps

Layers of Separation Provision

		Strategic Separation Provisions: Passive	Strategic Separation Provisions: Active	Tactical Separation Provisions: Passive	Tactical Separation Provisions: Active
UTM	USS	Scheduling and Planning (Separation by Segregation)	Conformance Monitoring and Alerting		
		Current Airspace Constraints	Conflict Alerting		
	UAS	Notification of UAS Operations to Other Airspace Users	Operational Plan Containment (Geo-fencing)	Improve Visibility (e.g. bright paint / strobes, etc.) Position Broadcast / Receiver?	V2V ?
ATM	Other Airspace Users	Checking for planned UAS Operations during pre-flight	Voice Comm ? Data Exchange ?		See and Avoid

Concept Development

4 topics posed at kick-off meeting:

Separation by Segregation for UAS

Separation by Notification for General Aviation

Determining a common measure of altitude

Mechanisms for enforcing operation plan containment (geo-fencing)

Concept Development: Separation by Segregation

Basic Concept:

UAS Operator submits operational plan to USS

USS compares the submitted operational plan against other operational plans received and determines if there is any conflicts in time and space

USS notifies operator of potential conflicts (or lack thereof)

Actions:

a. If operator is alerted of no conflicts, operator proceeds with operation.

b. If operator is alerted of potential conflict, submits a revised operational plan

c. If operator is alerted of potential conflict, operator proceeds with operation and assumes

Concept Development: Separation by Segregation

Consequences of this provision:

Equitability of the Airspace (How do we prevent users from “reserving” swaths of the airspace all the time?)

Interoperability with more capable UAS (Do we allow more capable UAS to have more flexibility? How do we prevent them from causing undue harm to other operations?)

Concept Development: Separation by Notification

Basic Concept:

UAS Operator submits operational plan to USS

USS provides notifications of planned UAS operations to other users of the airspace to support their pre-flight activities

- a. Flight Service Stations ?
- b. UAS Operation Plan website ?
- c. NOTAMS?
- d. Others ?

Other users of the airspace check for UAS operations prior to departure to be aware of potential impacts.

(If applicable) Updates to planned UAS operations or current positions are provided in-flight to other users of the airspace

- a. Voice Comm / Message Broadcast / VHF?
- b. Data Exchange ?
- c. Others?

Concept Development: Separation by Notification

Consequences of this provision:

Timeline and Scope:

Other airspace users might not have uniform equipage or process to support all forms of notification

Imposing too much burden on UAS may limit access to airspace by industry

What can be done using the tools available to other airspace users TODAY?

Given today's limitations what burden does that place on the UAS?

Other airspace users are made up of different communities, how to properly engage them all to provide effective strategic (and eventually tactical) notifications?

Concept Development: Altitude Measure

Basic Concept:

Altitude measurements support UAS operational plan definition (and de-confliction)

Altitude measurements support UAS navigation

Altitude measurements support UAS tracking (by the USS)

Altitude measurements support airspace constraints (e.g. NOTAMS, Class G)

Altitude measurements support other airspace user operations (e.g. general aviation)

Actions:

Concept Development: Geo-fencing

Basic Concept:

Alignment of geo-fence definition between operational plan (sent to USS), GCS display, and onboard UAS

A geo-fence on the UAS should not be larger than the operational plan

Identify mechanism for uploading, and changing geo-fence definitions

Identify mechanisms for enforcing geo-fence boundaries

Operator “soft boundary” alerting

Preventative “soft boundary” maneuvering

Operator “hard boundary” alerting

Next Steps

An input request will be sent out to the group

Provide your thoughts for each box of the Layers of Separation Provision

I will share a google docs with each of the boxes as a section and we can add our thoughts and comments there...

Continue discussing on the existing slack channels (they will be temporarily archived after the next meeting)

Provide comments on the following topics by next meeting (new slack channels will be added):

Qualifying the severity of a geo-fence violations, and the actions that should be taken

Data and metrics that should be collected in the event of a geo-fence violation

Methodologies to test geo-fence mitigation effectiveness