Criteria for Making Determinations for Detect and Avoid

Organization Name			
Address1		Responsible Person	
Address2		Phone	
City		Email	
State			
Zip Code			

Introduction

This criteria for making determinations for Detect and Avoid (CMD-DAA) is for enabling beyond visual line-of-sight (BVLOS) unmanned aircraft operations (UAS) operations. This document contains criteria for substantiating DAA solutions proposed by an organization and is primarily intended for use by Public Service Organizations (PSO), to include those that operate as a Public Aircraft Operator (PAO) but may be expanded to others on a case-by-case basis.

Use of this document is optional, however an organization may use this document to assist in submitting a safety case for operating a UAS(s) in a beyond visual line of sight operation, over people and moving vehicles, under reduced weather and altitude minimums, while conducting official public safety duties and training. Failure to submit a complete CMD document, including supporting documentation, can result in delays in the CMD acceptance process.

The FAA will use the responses to the enclosed questions, along with any substantiating data provided, to determine the ability for a PSO to be issued a waiver for specific operations for the purpose of beyond visual line of sight UAS operations using the described DAA solution. At any time, the FAA may, at its discretion, ask for additional substantiating data supporting this criteria document. The FAA may contact the manufacturer of any identified equipment for further documentation and clarification. The FAA may respond to the organization with a request for information (RFI) document to gain clarification or further details on the equipment and procedures described herein.

A submitter shall not make or cause to be made any fraudulent, intentionally false, or misleading statements regarding the CMD-DAA or any supporting documentation /data. The commission of any of these acts, may result in denial of granting a waiver, and/or revoking any waivers previously granted. The submitter must be an individual who has the authority for submitting the information on behalf of the organization responsible for the DAA system described herein and will be the primary contact with the FAA for this document.

Submission of this CMD-DAA along with requested supporting documentation may be made to: 9-AVS-AFS-750-91.113Waivers@faa.gov

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Description of the Operation*:

*a separate Concept of Operations (CONOPs) document may be submitted to comply with this element

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Supported Unmanned Aerial Systems (UAS):

Make	Model	Ground Control Station (GCS)	Docking Station (if used)

Detect and Avoid (DAA) System Components:

Make	Model	Description (Radar, Optical, ADS-b In, Acoustic)	Airborne / Ground

Required Crewmembers (list others as applicable):

Title	Cert Number (If Applicable)	Notes
Remote Pilot in Command (RPIC)		

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Operational Volume Description for certified installations*:

*a Google Earth .kml file may be submitted to comply with this element

Element	Latitude	Longitude	Altitude Limit	Airspace Category
Operations Center Location				
Geographic Boundaries				
Dock Locations (if applicable)				
Ground-Based DAA Installation Locations				
Mode C veil:	If the operational area is being conducted inside a controlled airport's Mode C veil, identify which airport(s).			
Airspace:	Identify the type(s) of airspace the operation is being conducted in.			

Detect and Avoid (DAA) System Description

DAA systems must be effective in detection of both cooperative (ADS-B out equipped) aircraft and non-cooperative aircraft. Strategic actions must be effective in avoidance of such aircraft.

	General		
1	Describe the system components.		
2	Describe the DAA telemetry elements provided to the RPIC	examples include heading, altitude, speed, distance from UAS, system status, etc.	
3	What is the avoidance strategy?	Are the maneuvers automated, or do they require PIC action? What is the expected time from alert to mitigation? Etc.	
4	Describe the RPIC role for monitoring and taking actions.		
5	Will the system support operations of multiple UAS by a single RPIC?	If yes, please identify any proposed operational limits	
6	Describe how the system alerts the RPIC.		
7	What safeguards are there to protect the system from undesired behavior?	If the avoidance maneuver is automated, is the RPIC able to monitor the avoidance maneuver and take manual control if necessary? If RPIC initiated, what happens in the event of a C2 loss?	

8	Describe the DAA system GCS interface	i.e. how is the DAA system status and alerts displayed to the RPIC or Electronic Observer? Are there visual as well as audible cues?	
9	Is there adequate low-altitude DAA coverage to support the operation?	Describe the operational volume coverage.	
10	What is the effective range of the system in detecting other aircraft?	This should describe the detection range with any classifier in place, just as the system would be intended to be operated.	
11	What is the minimum distance for detection so the avoidance strategy can be safely carried out?	How do you determine the time needed for detection of an intruder, alerting the RPIC/EO, and initiation and completion of the avoidance maneuver.	
12	What are the DAA system operating limitations?	e.g., night or lighting conditions, reduced visibility from fog or rain, attenuated signal from obstructions trees, rain, temperature, etc.	
13	What are the alerting criteria for non-cooperative intruders and ADS-B equipped intruders?	e.g., does the system have differing alert levels dependent on the distance, altitude and vector of the possible intruder	
14	If automated, describe the procedures upon system failure. (e.g. return to home, hold in place, land now etc.)	E.g., Lost link procedures	

15	Describe the command and control (C2) link for the UAS to include the communications system from the GCS to the Dock (if used), Dock to the UA, or GCS to the UA. Include the operational frequency (e.g. 900 MHz, 2.4 or 5.8 GHz, LTE, 4G or 5G)		
16	Does the system incorporate the use of an Unmanned Traffic Management (UTM) system employed through an FAA Approved Unmanned Service Supplier (USS)?	If "Yes", provide identification of the Service Provider. If an operator uses strategic deconfliction and conformance monitoring services provided by an approved UAS Service Supplier (USS), the use of those services must be submitted to the FAA and approved by the FAA prior to use.	
17	Describe any FCC approvals obtained for the equipment.		
	ADS-B In		
18	Is the receiver airborne or ground based?	ADS-B out transmissions may be received or obtained through a sensor owned, operated, or controlled by the responsible person, onboard the UA itself, or an FAA approved third party ADSP	
19	Is the receiver TSO compliant and able to receive 1090 ES or 978 MHz UAT signals?		

	Radar – Optical – Acoustic		
20	If ground-based, describe the mounting location.	Examples include mast mounted, directly on ground, on top of a building or structure such as an antenna or water tower.	
21	Has the DAA system been evaluated against any published DAA Standards (DO-381a, ASTM F3442/F3442M)?	Describe any areas of non-compliance	
22	List any limitations of the DAA system with respect to effectivity in reduced visibility conditions		