



California Droning





Unmanned Aircraft Systems (aka: drones and rockets)

Think Before You Fly

Robert Leong ARM, Joe Risser CPCU, ARM-P



Introduction & Information

- Moderator
 - Handouts (downloads post conference)
 - Evaluations
 - Time Keeping
- Contributors & Presenters
 - William Hsu, Esq. Office of General Counsel
 - Robert Leong, CSURMA Program Administrator
 - Joseph C. Risser, CPCU, ARM-P



Important Information

- Restrooms
- Emergency Exits
- Questions
 - Please hold campus questions
 - Please ask system wide questions
- Rob and Joe will be here all of the conference
 - Campus based questions
 - Additional questions about drones



Presentation Overview

1. CSU OGC Guidance – UAV aka Drones
2. UAS, UAVs, Model Airplanes, Amateur Rockets
3. FAA, National Airspace System, Integration
4. Risks, Values, Management Techniques
 - CSU OGC UAV aka Drones UPDATE #1
 - Certificate of Waiver or Authorization (COA)
 - FAA Proposed Rule sUAS
5. Model and Amateur Rockets
6. References & Resources (for your use)



Office of General Counsel Guidance

Unmanned Aerial Vehicles (aka Drones)

1. Any UAV operated by CSU within United States National Airspace is subject to FAA rules and regulations.
2. Any UAV operated by a **public** university, such as the CSU, must apply to the FAA and receive a Certificate of Authorization (COA).
3. A COA allows the UAV to be used only for the limited purpose or activity specified in the approved COA.
4. The FAA will grant a COA to a public university only if the UAV is being used for a non-commercial purpose.
5. The University must obtain a COA for any faculty, staff or student operating or using a UAV in connection with or as part of his/her official CSU activities.
6. Any UAV operated by CSU faculty, staff or students in connection with or as a part of his/her official activities does **not** qualify as a hobby or recreational use.
7. Any UAV operated by an auxiliary organization are subject to a different and more stringent application process for **civil** operations.



Unmanned Aircraft Vehicle (UAV)



Unmanned Aircraft Vehicle (UAV)





Model Airplanes



Amateur Rockets





Unmanned Aircraft

Classification by Ownership & Usage

- Model Aircraft (Individual Recreation)
- Amateur Rocket (Recreation & Science)
- Public (Government) UAS/UAV “government function”
- Civil (Commercial) UAS/UAV “commercial activities”



“Model Airplanes & Model Rockets”

- Size – 55 pounds / 53 ounces, 4.4 ounces fuel
- Type – Fixed Wing or Rotor Craft
- Below 400 feet / 93.2 miles (amateur rockets)
- Within Visual Line of Sight of the “Pilot”
- Community Based Safety and Programming
- Sufficient distance & notification
- Not for Commercial purposes
- Gives way to any manned aircraft



SLO Flyers RC Airplane Club EFR





Model Airplane & Rocketry Associations





Here Come The Drones!





“Drones”

Unmanned Aircraft SYSTEMS (**UAS**)

- Unmanned Aircraft Vehicle
- Control unit
- Radio & Transmitters
- Pilot (& Observer)
- Maintenance & Inspection
- Software, Data
- Payload (radio controlled)

Unmanned Aircraft VEHICLES (**UAV**)

- Unmanned Aircraft Vehicle
 - Airframe
 - Prop(s)
 - Fuel (batteries)
 - Radio
 - Controls



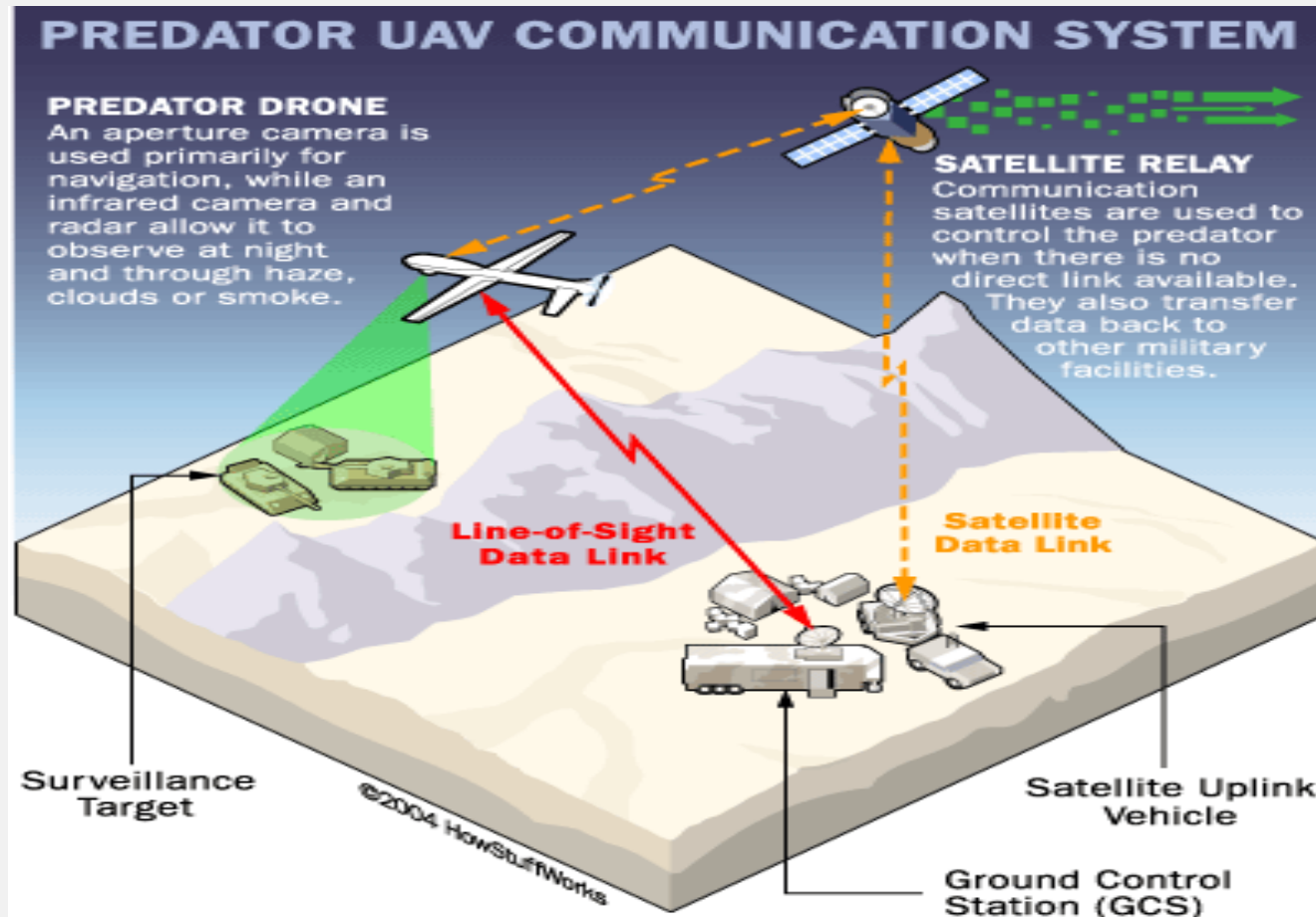
Unmanned Aircraft Vehicle (UAV)



Unmanned Aircraft System (UAS)



UAS/UAV Capabilities





Unmanned Aircraft Characteristics

- Remotely operated (no person on board)
- Pilot and Crew (Observer) On the Ground
- Several ounces to commercial aircraft size
- Airplane or Rotorcraft (multi-rotors), Motors
- Payload – Cameras, Sensors, Cargo,....



Unmanned Aircraft Challenges

- No Pilot On Board
 - **See and Avoid other Aircraft**
 - Limited Navigational Equipment & Systems
- Communication and Control
 - Radio interference
 - **Loss of communication = Loss of control**
- Pilot In Command
 - Aeronautical Knowledge
 - Skills



UAS Operations Experience

- Customs and Border Protection (CBP)
- 2006 – 2010 5,688 flight hours
- Accident rate 52.7/100,000 hours
- 7 times the general aviation accident rate
- 353 times the commercial aviation accident rate
- 65% Equipment Failures
- 17% Pilot Errors



Federal Aviation Administration





FAA Mission, Vision, Values

- **Mission**

- Our continuing mission is to provide the **safest**, most efficient aerospace system in the world.

- **Vision**

- We strive to reach the next level of **safety**, efficiency, environmental responsibility and global leadership. We are accountable to the American public and our stakeholders.

- **Values**

- **Safety** is our passion. We work so all air and space travelers arrive **safely** at their destinations.



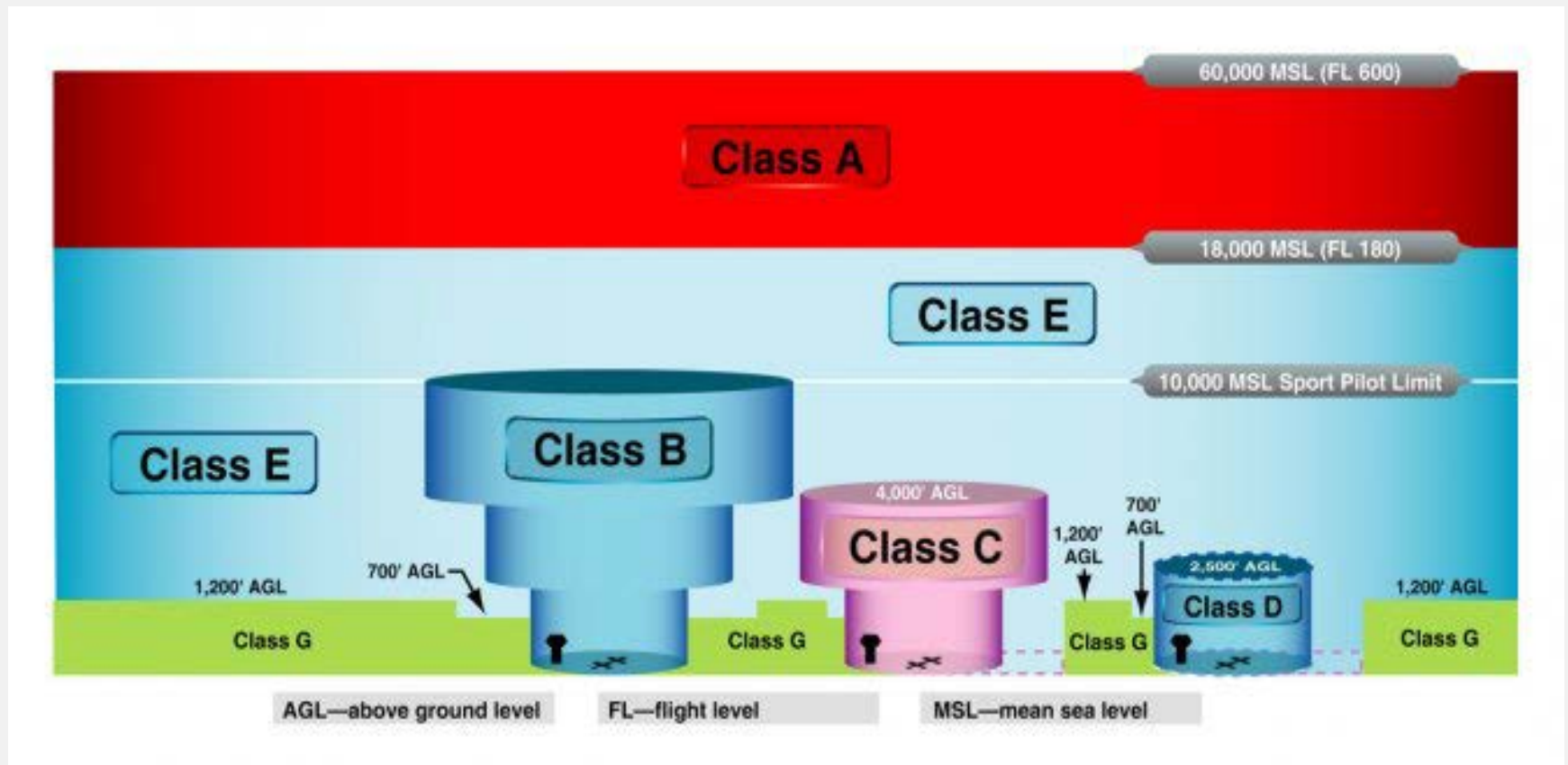
FAA Regulatory Authority

- Code of Federal Regulations (CFR)
- Title 14 - Aeronautics & Space
 - Chapter 1 – Administration FAA, DOT
 - Sub Chapter F – Air Traffic & General Operating Rules
 - Part 91 General Operating & Flight Rules

Aircraft operation in the National Airspace System requires a certificated and registered Aircraft, a licensed Pilot and operational approval.



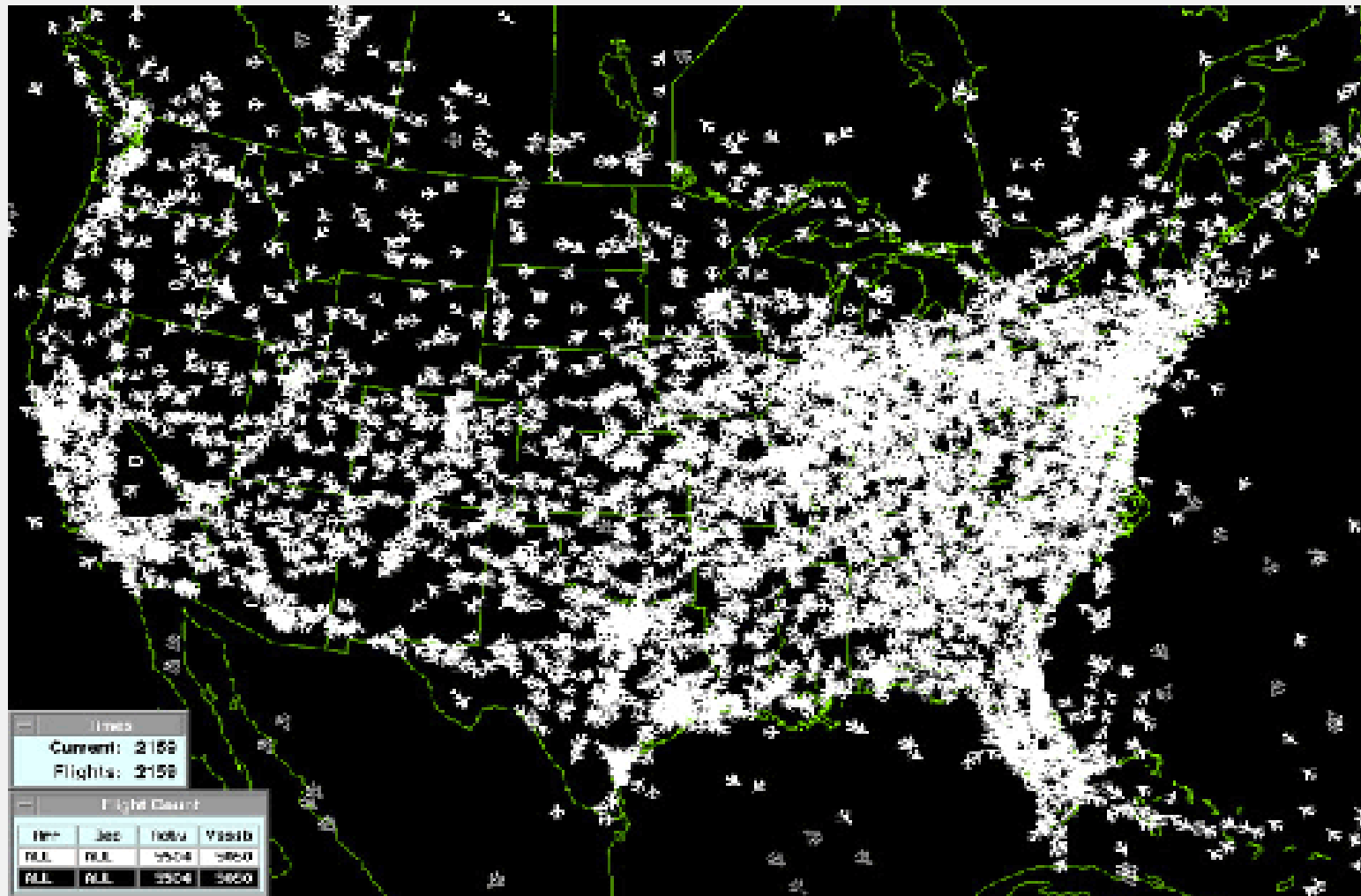
National Airspace System (NAS)





National Airspace System Activity

- > 100,000 Aviation Operations per day
- > 238,000 General Aviation Aircraft
- > 500 Air Traffic Control (ATC) facilities
- > 12,000 Air Navigation Facilities
- > 19,000 Airports
- **Airspace is Three Dimensional**
- High Speed





FAA Modernization & Reform Act of 2012

- **INTEGRATION** of UAS/UAV into the National Airspace System without:
 - Reducing existing capacity
 - Decreasing safety
 - Impacting current operations
 - Placing other airspace users or persons and property on the ground at increased risk
- Rule Making Process – Proposed for Comment



Most Frequent Cause of Pilot Accidents

- Inadequate preflight preparation/planning
- Failure to obtain/maintain flying speed
- Failure to maintain direction control
- Improper level off
- Failure to see and avoid objects/obstructions
- Mismanagement of fuel
- Improper inflight decisions/planning
- Misjudgment of distance and speed
- Selection of unsuitable terrain
- Improper operation of flight controls

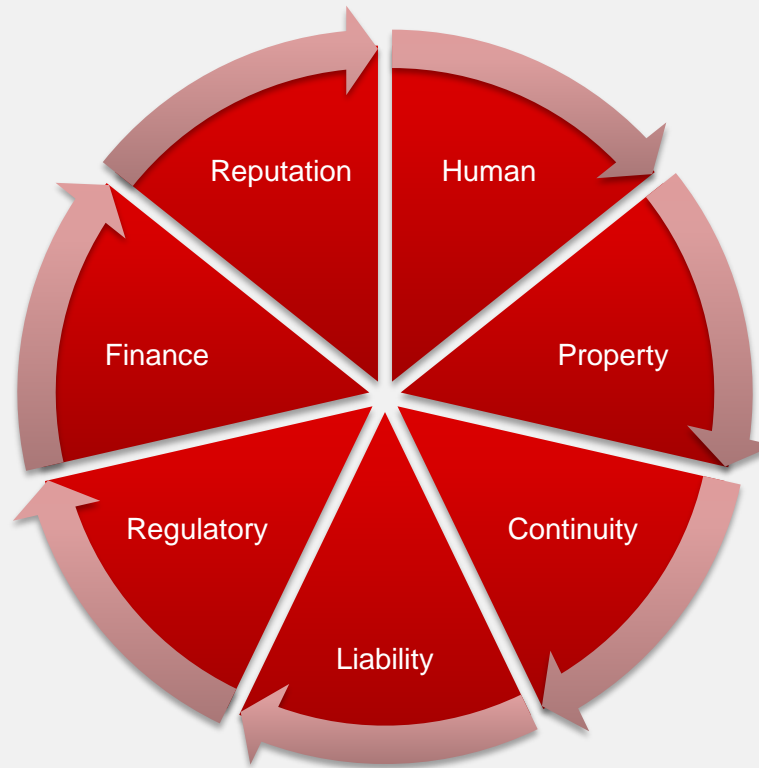


Physical Hazards to Flight

- Obstructions to flight
 - Structures below 500 feet
 - VERY DANGEROUS
 - Structures below 200 feet
 - Unmarked power lines, antennas, support wires
 - Spanning flyways, highways, RR, geographic features
 - Antenna Towers 1,000 – 2,000 feet
 - Extreme Caution - 2,000 feet horizontal



University Values Exposed to Risk





Operational Risks - UAS/UAV

1. Stationary Object Collision

- Damage
 - UAV
 - Object
 - Fire
- Injury
 - Pilot & Observer
 - Bystanders
 - Flora & Fauna

3. Trespass

2. Mid Air Collision

- Damage
 - UAV
 - Other Aircraft
 - Falling Debris
- Injury
 - Pilots & Observer
 - Passengers
 - Bystanders
 - Flora & Fauna

4. Privacy



Risk Identification – UAS Operations

Risk	Description	Risk Rating	Techniques	Implement	Residual Risk
Regulation Violation	FAA UAS/UAV Rules	?			
Crash /Collision	Loss or Lack of Control	?			
- Injury	Pilot or Bystanders	?			
- Damage	UAV, Property	?			
Privacy	Expectations & Civil Codes	?			
Trespass	Illegal Acts	?			



Risk Assessment

Severity/Li kelihood	Minimal 5	Minor 4	Major 3	Hazardous 2	Catastrophic 1
Frequent A	Low	Medium	High	High	High
Probable B	Low	Medium	High	High	High
Remote C	Low	Medium	Medium	High	High
Extremely Remote D	Low	Low	Medium	Medium	High
Extremely Improbable E	Low	Low	Low	Medium	Medium/High







Drone flights pose threat in wildfires, officials say — August 16, 2014 Oregon Statesman Journal

- Hobbyist drones have been involved in three wildfires, including an incident in Northern California that almost grounded aerial firefighting efforts, officials say.
- "They were in the preparation process of getting ready to shut down aircraft," said Lynne Tolmachoff, a spokeswoman for the California Department of Forestry and Fire Protection, or CAL FIRE.



CSU OGC UAV Update #1 - Guidance

1. FAA requires Public Declaration Letter on behalf of a campus in order to to apply for Certificate of Authorization (COA) to operate UAS/UAV.

1. Requirements for a Public Declaration Letter
 - CSU is part of the State government
 - UAS/UAV is a “public aircraft”
 - Use will be for a “government function”
 - Use will not be for “commercial purposes”



Before Requesting a Public Declaration

1. Review Certificate of Authorization (COA) Form
 - Collect all necessary information
2. Implement campus process for review & approval for UAS/UAV activity
 - Consistent with legal, risk management, public safety and ethical responsibilities of university
3. Review recommended UAS/UAV guidelines & good practices from CSU Risk Management and Research. (Available shortly)





UAS/UAV Risk Issues for Consideration

- Compliance with FAA Regulations
- Bodily Injury
- Property Damage
- Privacy
 - Public Expectation
 - California Civil Code 1708.8
 - Presidential Memorandum (February 15, 2015)
- Trespass, Disruption of Activity of Others

Loss of Opportunity - Integration of Technology



To Request a Public Declaration Letter

- University Counsel assigned to your campus
 1. Identify entity(s) which own or operate UAS
 2. Detailed description & purpose of UAS activity
 3. Detailed description of funding of use of UAS
 - Direct or indirect
 - Compensation
 - Reimbursement
 4. Additional information as requested
- If requirements are met, CSU OGC has authority to issue Public Declaration Letter to the FAA



In addition

- Public Declaration Letter does not guarantee an application for Certificate of Authorization for UAS/UAV operation will be approved by FAA.
- Non governmental use of UAS/UAV may be authorized by the FAA through a different petition/certificate process. **Auxiliaries**
- New Proposed Regulations for Small UAV (sUAV) 55 lbs. or less are being reviewed.





Certificate of Authorization (COA)


- What is it –
 - FAA Authorization to operate UAS/UAV in National Airspace System
- What does it allow – UAS/UAV Operation
 - Specific governmental entity (public declaration letter)
 - Specific Purpose & Activity
 - Specific Date(s) & Time(s)
 - Specific Location & Altitude
 - Specific Flight Access to/from Location
 - Specific Pilot & Observer
 - Specific UAS/UAV
 - Specific Radio Frequencies
 - Specific Emergency Procedures



COA Application “Sections”

1. Project Description/**Location** (**Property Owner Approval**)
2. Operations (“**Government Functions**”)
3. Proponent & Point of Contact (**Public Declaration Letter**)
4. **Pilot & Observer** (**Certification & Medical**)
5. Unmanned Aircraft Vehicle (**Registration, Capabilities**)
6. Unmanned Aircraft System (**Radios – FCC License**)

Sample COA Application


Enter/Edit UAS COA Draft

DoD Notifications COA Cases Tools Data Reports Options Help Log Out

UAS COA Case

Draft #: 796
Case Status: DRAFT
Submitted: 05/29/2008

- Proponent Information
- Point of Contact Information
- Operational Description
- System Description
- Performance Characteristics
- Airworthiness
- Procedures
- Avionics/Equipment
- Lights
- Spectrum Analysis Approval
- ATC Communications
- Electronic Surveillance/
Detection Capability
- Visual Surveillance/
Detection Capability
- Aircraft Performance
Recording
- Flight Operations Area/Plan
- Flight Aircrew Qualifications
- Special Circumstances
- Preview Case

- COA Status History
- Case Management
- Status Notes History

Proponent Information

Select an existing Proponent: FAA HQ
or Create a new Proponent by filling out the form below

- * Sponsor: FAA HQ
- * Attention Of: Randy Willis
- * Address: 800 Independence Ave
- Address 2:
- * City: Washington *State: DC *Postal Code: 20591
- * Telephone: (202) 267-8565 DSN #: Ext: Fax:
- * Email: randy.ctr.willis@faa.gov

Declarations

- * a) ☒ Yes ☐ No The applicant declares it is a government or unit of government of the United States, a State, the District of Columbia, or a territory or possession of the United States, or a political subdivision of one of these governments.
- * b) ☒ Yes ☐ No The applicant declares the operations described in this application meet the definition of public aircraft operations as defined in 14 C.F.R. Part 1.1.
Note: For guidance see Advisory Circular (AC) 00-1.1 Government Aircraft Operations.

CLONE THIS CASE PREVIEW CASE SAVE AS DRAFT COMMIT CASE CANCEL DRAFT PRINT DOWNLOAD MAP UAS COA MAP 3D PREVIOUS NEXT



Civil UAS/UAV Operations (Special Exemption Process)

- Section 333 Exemption – Low risk controlled environments
 - Petition
 - COA
- Special Airworthiness Certificate (SAC)
 - Experimental – R&D, Crew Training, Market Surveys
 - Not for carrying persons, compensation or for hire
 - Restricted – Special Purpose or Production
 - Manufacturer design and development



Section 333 Exemption – Auxiliaries

- Petition for a Grant of Exemption
- COA application
 - Commercial Operations in low risk, controlled environments
 - Certificated and registered aircraft
 - Licensed Pilot
- Operational approval



Section 333 Exemption Elements

- Specific section(s) from CFR Title 14
- Extent of relief
- Reason for relief
- Benefit to public
- Why exemption would not adversely affect safety
- Summary for publishing in Federal Register
- Rationale for use of privilege outside of US
- **FAA Approval Very Limited!**



Special Airworthiness Certificate

- Registration of aircraft
- Pilot
- Application
- 2 Classifications of certificates
 - Standard – type certificated aircraft
 - Normal, Utility, Acrobatic, Commuter, Transport, Special Classes
 - Special – operation specific - UAS
 - Primary – personal use
 - Restricted – specific use – Ag, Forest, Wildlife, Surveying, Patrolling, Weather, Advertising, Other
 - Experimental – R&D, Compliance, Training, Exhibition





COA - Registration of Aircraft

- Registration
 - Application – Original Form 8050-1 (FSDO)
 - Evidence of Ownership (Bill of Sale)
 - \$5 Fee
- Marking Aircraft
 - sUAS/UAV
 - As large as practicable on largest surface





Pilot Certification – Recreational

- Eligibility
 - 17 years old
 - English R/W/S
 - FAA Medical Certificate
 - Student or Sport Pilot Certificate
- Logbook Endorsement
- Knowledge Test
- Flight Training Endorsement
- Aeronautical Experience Requirements
- Practical Test
 - Aircraft
 - Class Rating
- Comply with Regulations
 - Aircraft
 - Class Rating

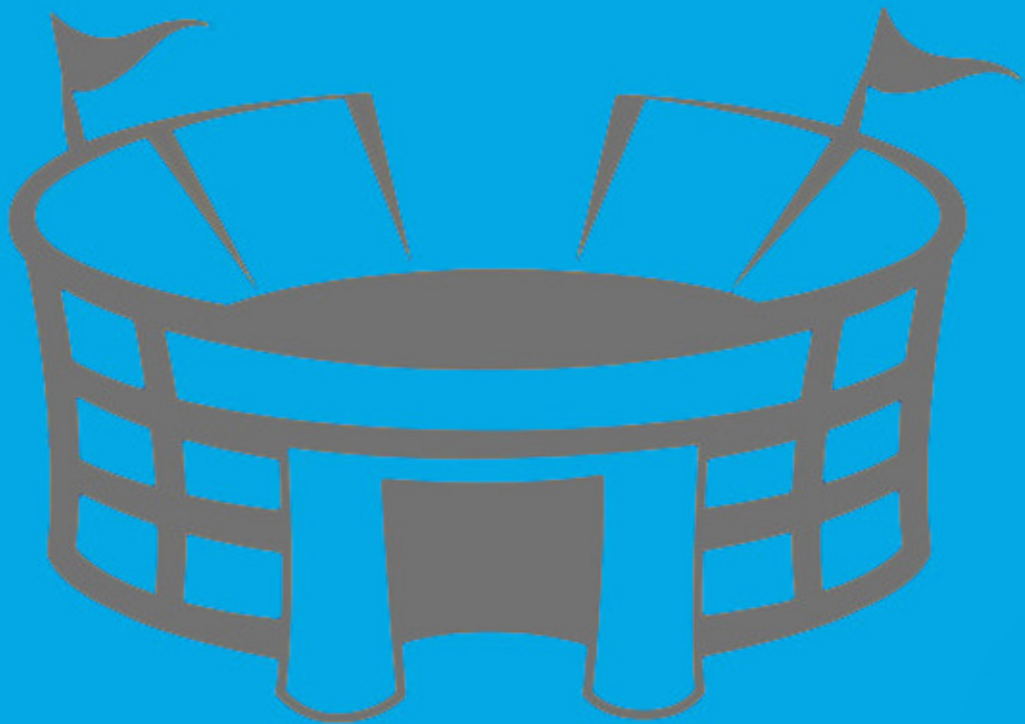


Pilot Certificate Training

- **Aeronautical Knowledge (Test)**
 - Federal Regulations
 - Pilotage
 - Weather
 - Airport Tower Operations
 - Collision Avoidance
 - Aerodynamics
 - Systems
 - Performance
 - Stall/Spin Awareness
- **Flight Experience (Instructor)**
 - 30 Hours Minimum
 - 15 Dual
 - 2 Cross Country (w/in 50 miles)
 - 3 Solo
 - 3 Flight Test Prep
- **Practical Test**
 - FAA Examiner
- **Pilot in Charge**



DID YOU KNOW?



Unmanned aircraft must follow temporary flight restrictions around stadiums and racetracks.



Notice to Airmen (NOTAM)

- Sporting Events
 - Temporary Flight Restriction (TFR)
 - FDC NOTAM 4/3621
 - 1 hour before – 1 hour after Event
 - All Aircraft Operations Prohibited
 - 3 Nautical Miles Radius (NMR)
 - 3,000 feet At Ground Level (AGL)
 - Stadium 30,000 seating or more
 - Similar activities, facilities



COA - Location & Operations

- Sectional Aeronautical Chart
 - Airports - Terminal Control Areas (dark blue circles)
 - Airways (wide, straight blue lines)
 - Restricted & Prohibited Airspace (blue and purple “fences” or shaded)
 - “White House”, portions of “Grand Canyon”
 - Military Operations Areas
 - Obstructions (blue figures, often labeled & with height)
- Latitude and Longitude (degrees, minutes, seconds)
- Agreements to fly over public/private property

Sectional Aeronautical Chart





FAA Risk Management Techniques Regulations for UAS/UAV

- Pilot in Charge
 - Training
 - Aeronautics
 - UAS/UAV
- Location Control
 - Airspace
 - Environment
 - Weather
- Operational Plan
 - Contingency Plans
 - Loss of Control
 - Emergencies
- UAS/UAV Control
 - Capability
 - Flight
 - Control



Academic Safety Code Small Airborne Objects on Institutional Property

- No Hazard
 - Persons
 - Property
- Not Exceed 400 Feet
 - Or nearby obstacles
- Not Enter Property
 - Below 400 Ft
 - W/O Permission
- Labeled
 - Owner's Contact
- Give Way
 - Manned Aircraft
- Comply w/ Guidelines
 - Institution
 - Community Based Safety Programming



UAS/UAV Operations Checklist Overview

- Area & Environment
 - Weather
 - Unexpected Conditions
- Equipment – UAS/UAV
 - Manufacturer's CkLst
- Mission Plan
 - COA
- Public Awareness
 - Property owners
- Pre-Flight
 - Testing
- In-Flight
 - Observation
- Post-Flight
 - Inspection



Risk Management Techniques - UAS/UAV

Risk	Description	Rating	Techniques	Implement	Residual Rating
Regulation Violation	FAA UAS/UAV		Campus Guidance	Process or Committee	
Crash /Collision	Loss or Lack of Control		COA parameters, Pilot Training & Experience w/ equipment, Checklists	Faculty or Staff acting as Pilot In Command for specific COA Mission	
- Injury	Pilot or Bystanders				
- Damage	UAV, Property,				
Privacy Violation	Expectations & Civil Codes		Campus Guidelines	Process or Committee	
Trespass	Illegal Act		Compliance	PIC	



CSURMA & AORMA Coverage

- Liability Memorandum of Coverage Amended
 - Small drones
 - 100 lbs. Maximum Take Off Weight (MTOW)
 - Onboard equipment & fuel
 - Owned and operated
 - \$20 Million Liability
 - Campus Deductible



Special Liability and Hull Insurance

Liability

- \$1 Million
 - Per UAV
 - First 5 Units
 - \$ 1,375
- \$5 Million
 - Per UAV
 - \$2,625

Hull

- \$25,000
 - \$2,625
- \$50,000
 - \$4,750
- \$100,000
 - \$8,000
- \$150,000
 - \$12,000
- Deductible 10% of Insured Value





Residual Risk – UAS/UAV Operations

Risk	Description	Risk Rating	Techniques	Implement	Residual Risk
Regulation Violation	FAA UAS/UAV	?	Campus Guidance	Process or Committee	?
Crash /Collision	Loss or Lack of Control	?	1. COA, Pilot Training, Instructions Campus Guidance 2. CSURMA Liability and Property Coverage	1.Employee as Pilot in Charge 2.Risk Manager Registration of UAV with CSURMA for Coverage	?
- Injury	Pilot or Bystanders	?			?
- Damage	UAV, Property,	?			?
Privacy Violation	Expectations & Civil Codes	?			?
Trespass	Illegal Acts	?			?



The Unspoken UAS/UAV Risk Management Technique

- Contractually Transfer Risks of Data Gathering
 - Request for Proposals – Independent Contractors
 - Due Diligence in Selection of Service Provider
 - CSU Standard Agreement
 - Professional Services, Compliance with Law
 - Information to be Gathered
 - Indemnification of the University
 - Insurance with Endorsements



Aerial Photography Contractors



Air Views
Aerial Photography of Los Angeles



FAA Small UAS/UAV Operations Rule Making Proposal

- Crop monitoring/inspection
- Wildlife monitoring
- Research & development
- Educational/academic uses
- Power-line/pipeline inspection – terrain
- Antenna & bridge inspections
- Aiding rescue operations
- Aerial photography



Ambulance UAS/UAV





FAA Proposed Regulations (sUAS)

- Aircraft Registration & Marking
- National Airspace System Operations
 - Pre-Flight Inspection (all systems safe for flight)
 - Accident Reporting (injury and/or damage)
- Operator Certification (vetting by TSA)
- Visual Observer Requirements
- Operational Limits



FAA Proposed Regulations sUAS

Small UAS

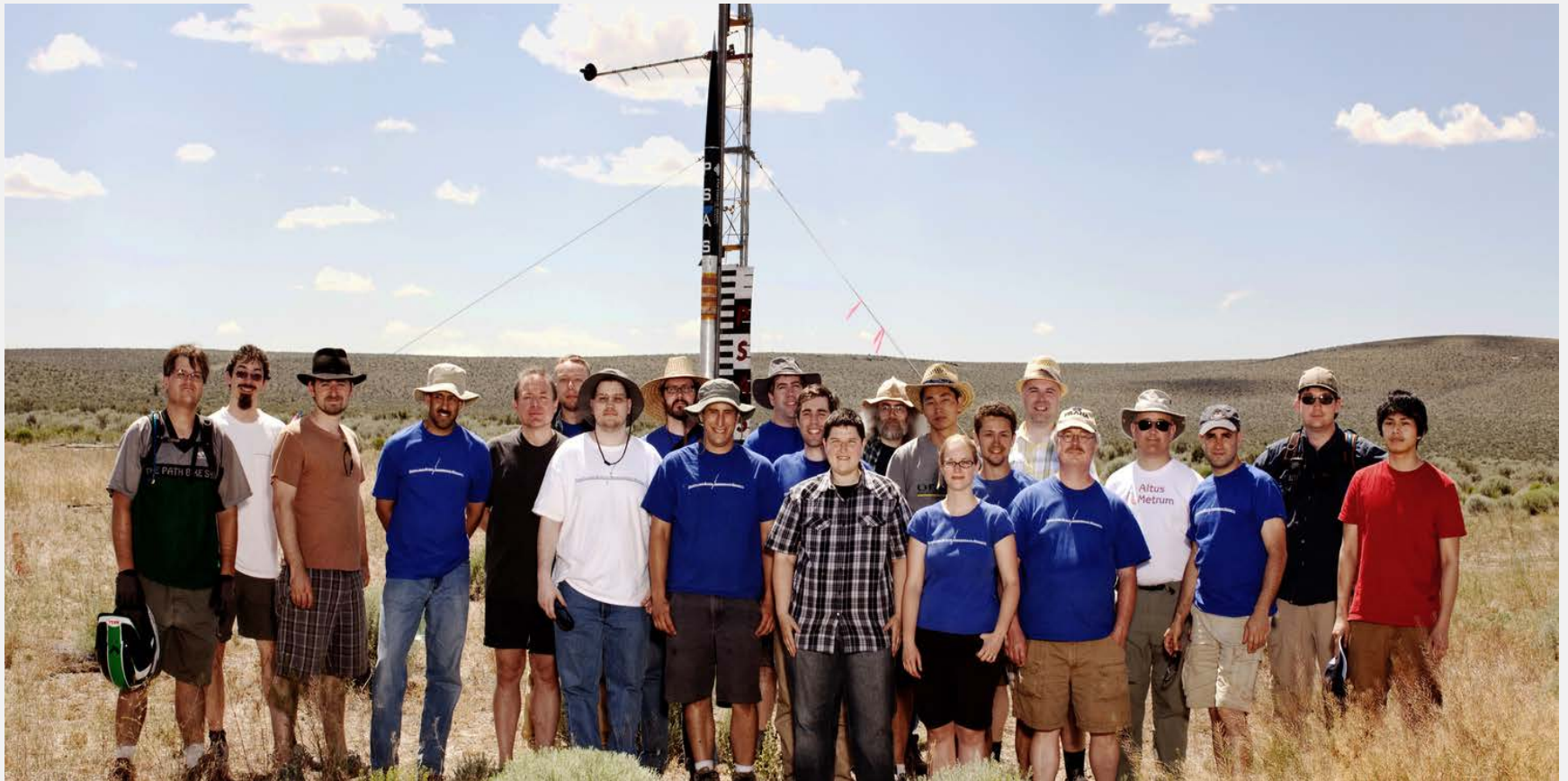
- Up to 55 lbs.
- Max Altitude 500 ft.
- Max Airspeed 100 mph
- Class G Airspace + w/ATC
- Daylight Only
- Line of Sight (3 mile weather)
- Not over People*
- Operator – knowledge test
- Airport as approved ATC

Micro UAS (Sub-Category)

- Up to 4.4 lbs.
- Max Altitude 400 ft.
- Max Airspeed 35 mph
- Restricted to Class G
- Daylight Only
- Line of Sight (1,500 ft.)
- Over People
- “Operator” Self-Certify
- 5 miles from Airport
- Frangible Materials



Amateur Rockets





Amateur Rockets

- Unmanned
- Propelled by a motor(s)
 - Combined total impulse of 200,000 lbs. or less
 - Altitude of 93.2 statute miles above the earth surface or less
- 3 Classes
 - Class 1 – **Model**
 - Class 2 – High Power
 - Class 3 – Advanced High Power



Class 1 – “Model” Rocket

- No more than 125 grams (4.4 ounces) of propellant
- Slow burning propellant
- Construction of paper, wood, breakable plastic
- No metal substantial metal parts
- Weight no more than 1,500 grams including propellant



Operating Limitations – Class 1 Rockets

- Suborbital trajectory launch
- Not cross into territory of foreign country
- Unmanned
- Not create hazard to persons, property, aircraft
- FAA may require additional operating limitations
- No ATC notification is required
- No Certificate of Waiver or Authorization



Class 2 & 3 – High Power Rockets

- Application for Certificate of Waiver or Authorization (COA) FAA Form 7711-2
- Suborbital Trajectory
- Does not cross territory of foreign country
- Unmanned
- No hazard to persons, property, other aircraft
- Not at altitude where clouds >5/10 coverage
- Not at altitude where horizontal visibility < 5 Miles
- Between Sunrise and Sunset
- Not within 5 miles of any airport boundary
- Not in controlled airspace
- Separation of 1,500 ft. or $\frac{1}{4}$ maximum altitude
- Person > 18 years old Safety of Operation, Final Authority
- Reasonable precautions provided to report and control fire caused by rocket activities
- FAA Airspace management required over 18,000 ft., recommended over 10,000 ft.



Model Rocket Safety Code Overview

- 1 Materials
- 2 Motors
- 3 Ignition system
- 4 Misfires
- 5 Launch Safety
- 6 Launcher
- 7 Size
- 8 Flight Safety
- 9 Launch Site
(dimensions & location)
- 10 Recovery System
- 11 Recovery Safety



CSURMA Rocket Insurance

- **Class 1 Rockets**
- Coverage by Launch Location – Mojave Desert
 - Approved by State Federal Government
- Coverage:
 - Each Occurrence/Offence \$ 5,000,000
 - Annual Aggregate Personal Injury \$5,000,000
 - Fire Damage \$ 100,000
 - Medical Expense \$ 5,000
- Premium \$3,881.25 per location



Campus Air Space

- Operation of Aircraft above campus property
 - Buildings
 - Facilities – Athletic Facilities, Parking Lots
 - Open Spaces
- Controlled or Prohibited
 - Permits and Prevention
 - Authority to Stop Unauthorized Overhead Flight
- Terrorist, Criminal, Protest, Disruption Activities



References and Resources - FAA

- Unmanned Aircraft Systems (UAS) Operational Approval
https://www.faa.gov/documentlibrary/media/notice/n_8900.227.pdf
- Integration of Civil Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) Road Map.
http://www.faa.gov/uas/media/uas_roadmap_2013.pdf
- Plane Sense: General Aviation [Information](#)
http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/media/aa-h-8083-19a.pdf
- Operation and Certification of Small Unmanned Aircraft Systems
<http://www.gpo.gov/fdsys/pkg/FR-2015-02-23/pdf/2015-03544.pdf>
- Risk Management Handbook
https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/risk_management_handbook/

References and Resources - Regulations

- Code of Federal Regulations (CFR)
 - Title 14: Aeronautics and Space
 - UAS/UAV – Chapter 1, Subchapters C - J
 - Rockets – Chapter 1, Subchapter F, Part 101
- Unmanned Aircraft Systems (UAS) Operational Approval – National Policy (N 8900.227)
- Procedures for Handling Airspace Matters (JO 7400.2)
 - Rockets – Chapter 31 Amateur Rockets and Commercial Space Operations, Sections 1 & 2

References and Resources - Policies

- Academic Safety Code for Small Airborne Objects on Institutional Property <http://www.saosafetycode.org>
- Policy SY45 USE OF UNMANNED AIRCRAFT ("UA") <https://guru.psu.edu/policies/SY45.html>
- University Use of Uncrewed Aerial and Submersible Vehicles ("Drones") <http://police.msu.edu/wp-content/uploads/2014/09/DroneInterimPolicyJune2014.pdf>
- Unmanned Aircraft (Drones and Model Aircraft) <http://policies.iu.edu/policies/categories/administration-operations/public-safety-institutional-assurance/PS-05.shtml>

References and Resources – “Permits”

- Certificate or Waiver of Authorization (COA)
 - http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/systemops/aaim/organizations/uas/coa/
- Section 333 Exemption
 - <http://aes.faa.gov/petition/>
- Special Airworthiness Certificate (SAC)
 - https://www.faa.gov/aircraft/air_cert/airworthiness_certification/aw_cert_proc/
 - <http://www.faa.gov/documentLibrary/media/Form/FAA%208130-6%20OMB%20rev%208-11.pdf>

References & Resources - Training

- Humanitarian UAV Network <http://uaviators.org/docs>
- Unmanned Vehicle University
<http://www.uxvuniversity.com/uav-pilot-training-certificate/>
- Unmanned Experts <http://www.unmannedexperts.com>
- Aviation Schools Online
<http://www.aviationschoolsonline.com>

References and Resources - Associations

- UAS/UAV
 - Association for Unmanned Vehicle Systems – International auvsi.org
- AIRCRAFT OWNERS & PILOTS
 - Aircraft Owners & Pilots Association aopa.org
- MODEL AIRCRAFT
 - Academy of Model Aeronautics modelaircraft.org
- ROCKETS
 - National Rocket Association nar.org

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- William Hsu
 - Member of the Office of General Counsel and serves as the Counsel to CSURMA
- Robert Leong
 - First Vice President at Alliant Insurance Services Program Administrator for CSURMA
- Joe Risser
 - CSU Retiree and Consulting Risk Manager, Risk Management Design

