

REPRESENTATIVE
SHELLEY HUGHES

Economic Development
Trade and Tourism Committee
Chairman
Energy Committee
State Affairs Committee
Military & Veterans' Affairs Committee
University Finance Subcommittee
Fish & Game Finance Subcommittee

ALASKA STATE LEGISLATURE



HOUSE OF REPRESENTATIVES District 11 - Greater Palmer

Session:
State Capitol, Room 409
Juneau, Alaska 99801-1182

Interim:
600 E. Railroad Ave.
Wasilla, AK 99654
(907) 376-3725
Toll Free 1-800-565-3743

housemajority.org

To: Chief Clerk and Senate Secretary

From: Representative Shelley Hughes, Co-Chair
Senator Peter Micciche, Co-Chair

Date: January 21, 2016

Re: Committee Schedule for January 26, 2016

Handwritten signature of Shelley Hughes and initials P.M.

The Unmanned Aircraft Systems Legislative Task Force will meet via teleconference in Capitol Room 203 Fahrenkamp beginning at 4:00pm.

Tuesday, January 26, 2016

- * News review and task force updates
 - FAA Reauthorization
 - FAA Notice UAS 7210 891 November 25, 2015
 - FAA UAS Fact Sheet
 - Remarks from Academy of Model Aeronautics representative
 - Alaska UAS laws and resolution for consideration
 - Public Testimony

* This meeting will be teleconferenced for anyone to call in to listen or provide public testimony. This meeting will also be provided through ak1.tv for viewing live.

29-LS1327\W
Wayne
1/20/16

HOUSE CONCURRENT RESOLUTION NO.
IN THE LEGISLATURE OF THE STATE OF ALASKA
TWENTY-NINTH LEGISLATURE - SECOND SESSION

BY REPRESENTATIVE HUGHES

Introduced:
Referred:

A RESOLUTION

1 **Supporting the aviation industry; and urging the governor to make state-owned land**
2 **available to the unmanned aircraft systems industry for the management and operation**
3 **of unmanned aircraft systems and related research, testing, and training.**

4 **BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF ALASKA:**

5 **WHEREAS** the overall health of the economy of the United States is highly
6 dependent on the aviation industry; and

7 **WHEREAS** the civil aviation industry annually creates approximately 5.4 percent of
8 the gross domestic product in the United States and contributes approximately
9 \$1,500,000,000,000 to the economy nationwide; and

10 **WHEREAS** the aviation industry generates more than 11,800,000 jobs, with
11 estimated total employment-related earnings of \$459,000,000,000; and

12 **WHEREAS** the aviation industry enables the economic benefits of tourism, shipping,
13 and travel for business or recreational purposes; and

14 **WHEREAS** ongoing development and implementation of unmanned aircraft systems
15 technologies, policies, and procedures will support continuing economic growth in the

1 aviation industry; and

2 **WHEREAS** the aviation industry affects the economies of large and small
3 communities across the United States, especially those communities where airports are
4 located; and

5 **WHEREAS** the use and regulation of unmanned aircraft systems must be integrated
6 with the use and regulation of manned aircraft systems to ensure that all aircraft can safely
7 navigate national airspace, including the airspace over airports; and

8 **WHEREAS** the state owns approximately 27 percent of the state's landmass and the
9 landmass of the state makes up approximately 20 percent of the landmass of the United
10 States, the state therefore owns approximately five percent of the landmass of the United
11 States; and

12 **WHEREAS** the state can support the growth of the unmanned aircraft systems
13 industry and the advancement of unmanned aircraft systems technology by facilitating the use
14 or purchase of land by the unmanned aircraft systems industry for the purpose of research,
15 manufacturing, testing, training, management, and operation;

16 **BE IT RESOLVED** that the Alaska State Legislature supports the economic growth
17 of the aviation industry in the state and encourages the establishment of safe and responsible
18 unmanned aircraft systems businesses in the state; and be it

19 **FURTHER RESOLVED** that the Alaska State Legislature urges the governor to
20 make state-owned land available to responsible designers, owners, developers, and operators
21 of commercial unmanned aircraft systems to use for research, manufacturing, testing, training,
22 management, and operation of those systems.

ALASKA STATE LEGISLATURE

REPRESENTATIVE

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600 E. Railroad Ave.
Wasilla, AK 99654
(907) 376-3725
Toll Free 1-800-565-3743



SENATOR

PETER MICCICHE

Session:

State Capitol, Room 514
Juneau, Alaska 99801-1182

Interim:

45 Main Street Loop, Suite #226
Kenai, AK 99611-7771
(907) 283-7996
Toll Free 1-800-964-5733

Unmanned Aircraft Systems Legislative Task Force www.AlaskaDrones.org

January 26, 2016

Alaska Congressional Delegation

Dear Honorable Senator Lisa Murkowski,

The Unmanned Aircraft Systems Legislative Task Force was formed under legislative resolve in 2012. The Task Force is made up of government agency representatives, industry representatives and public members and is working to advance this technology to attract economic opportunities and more importantly to protect Alaskans' safety and personal privacy through public awareness in the use of small unmanned aircraft systems (UAS) by government agencies and hobbyists.

As a task force, we respectfully submit the following remarks for consideration when reauthorizing the Federal Aviation Administration 2016.

Education using model aircraft and UAS in public school

- (1) Change FAA interpretation of the definition of "governmental function" in 49 USC 49 USC 40125 to include education:
- (2) Change the definition of "recreation" in the FAA's interpretation of model aircraft to include the teaching of recreational model aircraft flying for compensation.

The list of public aircraft activities in paragraph (2) has been interpreted by the FAA as an "exclusive list," even though the language includes the words "such as" meaning the list is to be used as an "illustrative list." The FAA's interpretation excludes education because it is not specifically listed. *"...if Congress meant education to be included, Congress would have done so, rather like it included law enforcement, search and rescue, firefighting and natural resource management."* Excluding education from the list of public aircraft activities makes it illegal for public school teachers to instruct students to fly model aircraft or UAS because any flight operation that is not a public aircraft operation is a civil aircraft operation. The FAA interpretation goes farther and states any civil aircraft operation for which the pilot is compensated is commercial. Since teachers are being compensated while they are teaching students to fly model aircraft or UAS, flying of model aircraft in public school is illegal without specific FAA authorization.

Other public school property, like sports and band equipment, is used in the teaching of students. The FAA's current interpretations makes teaching model aircraft and UAS technology

illegal simply because the article of public school property is an aircraft, and the function “education” is not specifically listed in the list of “such as” activities in paragraph (2) making the flying activity a civil aircraft activity, and the teacher is being compensated making the teaching activity non-recreational, and therefore requiring FAA authorization for commercial aviation operations.

The combination of FAA interpretation thwarts STEM education in our public schools, and does not seem to be the intent of congress.

49 USC, 40125, paragraph (2) Governmental function.—

The term “governmental function” means an activity undertaken by a government, such as national defense, intelligence missions, firefighting, search and rescue, law enforcement (including transport of prisoners, detainees, and illegal aliens), aeronautical research, or biological or geological resource management.

FAA interpretation of “Governmental function.”

[https://www.faa.gov/about/office_org/headquarters_offices/agc/pol_adjudication/agc200/interpretations/data/interps/2014/williams-afs-80%20education%20-%20\(2014\)%20legal%20interpretation.pdf](https://www.faa.gov/about/office_org/headquarters_offices/agc/pol_adjudication/agc200/interpretations/data/interps/2014/williams-afs-80%20education%20-%20(2014)%20legal%20interpretation.pdf)

FAA legal interpretation of model aircraft (see table on page 11). https://www.faa.gov/uas/media/model_aircraft_spec_rule.pdf.

Beyond Line of Sight operations in Alaska for the purpose of infrastructure inspection and protection.

Unlike most other areas of the United States, inspection and detection of damage, or pending damage of the oil pipeline, rail system, and high tension electrical grid is complicated by remoteness, challenging weather, and lack of supporting road system. Inspector’s lives are put at risk unnecessarily considering the UAS technology available today.

Propose a Special Federal Aviation Regulation (SFAR) for the Alaska Pipeline to make the airspace within 500 feet of the pipeline useable on for the inspection and protection of the pipeline, so that it can only be used for aircraft operations authorized to use that airspace.

1. This airspace will be available to, but not limited to UAS BLOS operations. Access to the airspace will be controlled by FAA Air Traffic Control as it would control any other controlled airspace serving aircraft on instrument flight plans.

2. For that airspace: Remove the words “to see and” for the regulation 14 CFR 91.113: (b) **General.** *When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft. When a rule of this section gives another aircraft the right-of-way, the pilot shall give way to that aircraft and may not pass over,*

under, or ahead of it unless well clear. The FAA's interpretation of this regulation is: a human eyeball must "see" another aircraft. That interpretation is hampering the development of beyond line of sight UAS flight. Removing the words "to see and" does not weaken the requirement of the regulation to maintain vigilance so as to avoid other aircraft. The words "to see and" are being used by the FAA to limit beyond line of sight operations.

3. The SFAR would be used to prove the BLOS concept much as SFAR 97 was used to develop GPS airways. When the concept was proved to work safely in Alaska, the individual regulations in 14 CFR, part 91 were changes, and the concept of GPS airways was exported to the rest of the US National Airspace System (NAS).

In Alaska there is need for beyond line of sight operations, and a good place for those operations to occur safely. There is justification for the project in Presidential Directive 7.

[https://www.google.com/#q=Homeland+Security+Presidential+Directive+7+\(HSPD-7\)%2C](https://www.google.com/#q=Homeland+Security+Presidential+Directive+7+(HSPD-7)%2C)

https://www.dhs.gov/xlibrary/assets/NIPP_Plan_noApps.pdf

"6.3.6 Technology Pilot Programs

DHS identifies CI/KR protection needs common to certain types of assets or geographical areas while conducting site assistance, buffer zone protection visits, and other vulnerability and risk assessments. In some situations, a technological solution may be the best approach to addressing such needs. If a development program is required to create or test a potential technological solution, the DHS S&T Directorate works closely with relevant security partners to implement a technology pilot program. In some cases, this involves working with the DHS Office of Grants and Training (G&T) to identify funds and specialized training. If the pilot program is successful, the technological solutions are then implemented in other locations where similar needs exist. The following technology pilot programs illustrate some of the important capabilities that these programs can offer to security partners:"

Determine a definition of "Navigable Airspace relative to 14 CFR 91.119, and the authority of the FAA to regulate airspace that by regulation is not to be used by aircraft, and determine if that airspace shall be used to protect a person's right to privacy.

<https://www.law.cornell.edu/uscode/text/49/40102>

(32) "navigable airspace" means airspace above the minimum altitudes of flight prescribed by regulations under this subpart and subpart III of this part, including airspace needed to ensure safety in the takeoff and landing of aircraft.

49 USC, 40103

(b) Use of Airspace.—

(1) The Administrator of the Federal Aviation Administration shall develop plans and policy for the use of the navigable airspace and assign by regulation or order the use of the airspace necessary to ensure the safety of aircraft and the efficient use of airspace. The Administrator may modify or revoke an assignment when required in the public interest.

§ 91.119 Minimum safe altitudes: General.

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes: (a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

Thank you for reviewing the remarks from the Unmanned Aircraft Systems Legislative Task Force.

Sincerely,



Representative Shelley Hughes

Senator Peter Micciche

114TH CONGRESS
1ST SESSION

S. _____

To require the Administrator of the Federal Aviation Administration to use the definitions in section 40125 of title 49, United States Code, in determining whether an unmanned aircraft conducting aeronautical research flights qualifies for public aircraft status under that section, to provide for beyond-line-of-sight operations of certain unmanned aircraft systems, and for other purposes.

IN THE SENATE OF THE UNITED STATES

Ms. MURKOWSKI (for herself, Mr. WYDEN, and Ms. HEITKAMP) introduced the following bill; which was read twice and referred to the Committee on _____

A BILL

To require the Administrator of the Federal Aviation Administration to use the definitions in section 40125 of title 49, United States Code, in determining whether an unmanned aircraft conducting aeronautical research flights qualifies for public aircraft status under that section, to provide for beyond-line-of-sight operations of certain unmanned aircraft systems, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Safe Skies for Un-
3 manned Aircraft Act of 2015”.

4 **SEC. 2. PUBLIC AIRCRAFT OPERATING STATUS OF UN-**
5 **MANNED AIRCRAFT USED IN AERONAUTICAL**
6 **RESEARCH FLIGHTS.**

7 (a) PUBLIC AIRCRAFT OPERATING STATUS.—In de-
8 termining whether an unmanned aircraft used in the con-
9 duct of aeronautical research qualifies as a public aircraft
10 under section 40125 of title 49, United States Code, the
11 Administrator of the Federal Aviation Administration
12 shall—

13 (1) for purposes of determining whether the air-
14 craft is used for a commercial purpose, use only the
15 definition given that term in subsection (a) of such
16 section; and

17 (2) for purposes of determining whether the air-
18 craft, including airborne platforms and systems, is
19 used for aeronautical research and platform-based
20 research, include atmospheric and natural resources
21 research, meteorological observation, and airborne
22 astronomy as aeronautical research.

23 (b) UNMANNED AIRCRAFT DEFINED.—In this sec-
24 tion, the term “unmanned aircraft” has the meaning given
25 that term in section 331 of the FAA Modernization and

1 Reform Act of 2012 (Public Law 112–95; 49 U.S.C.
2 40101 note).

3 **SEC. 3. SPECIAL RULES FOR OPERATION OF CERTAIN UN-**
4 **MANNED AIRCRAFT SYSTEMS BEYOND LINE**
5 **OF SIGHT.**

6 (a) IN GENERAL.—Subtitle B of title III of the FAA
7 Modernization and Reform Act of 2012 (Public Law 112–
8 95; 49 U.S.C. 40101 note) is amended by inserting after
9 section 333 the following:

10 **“SEC. 333A. SPECIAL RULES FOR OPERATION OF CERTAIN**
11 **UNMANNED AIRCRAFT SYSTEMS BEYOND**
12 **LINE OF SIGHT.**

13 “(a) IN GENERAL.—Notwithstanding any other re-
14 quirement of this subtitle, and not later than 180 days
15 after the date of the enactment of the Safe Skies for Un-
16 manned Aircraft Act of 2015, the Secretary of Transpor-
17 tation shall—

18 “(1) notwithstanding the proposed rule de-
19 scribed in subsection (b), develop and implement
20 procedures for the safe operation in the national air-
21 space system of public unmanned aircraft systems
22 conducting aeronautical research beyond the line of
23 sight of the operator; and

24 “(2) determine if other unmanned aircraft sys-
25 tems not covered by paragraph (1) may operate

1 safely in the national airspace system beyond the
2 limitations of the proposed rule described in sub-
3 section (b), including the operation of such systems
4 beyond the line of sight of the operator.

5 “(b) PROPOSED RULE DESCRIBED.—The proposed
6 rule described in this subsection is the rule proposed in
7 the notice of proposed rulemaking relating to operation
8 and certification of small unmanned aircraft systems pub-
9 lished in the Federal Register on February 23, 2015 (80
10 Fed. Reg. 9544).

11 “(c) CONSIDERATIONS FOR APPROVAL OF OPER-
12 ATIONS FOR AERONAUTICAL RESEARCH.—In developing
13 the procedures required by subsection (a)(1) relating to
14 beyond-line-of-sight operations by public unmanned air-
15 craft systems conducting aeronautical research, the Sec-
16 retary shall ensure that a decision to approve such an op-
17 eration takes into consideration the safety of the entire
18 operation, including whether any provisions required to be
19 included in the certificate of authorization for the oper-
20 ation result in additional safety risk to any individual as-
21 sociated with the operation.

22 “(d) ASSESSMENT OF UNMANNED AIRCRAFT SYS-
23 TEMS.—In making the determination required by sub-
24 section (a)(2), the Secretary shall determine, at a min-
25 imum—

1 “(1) which types of unmanned aircraft systems,
2 if any, as a result of their size, weight, speed, oper-
3 ational capability, and proximity to airports and
4 populated areas, do not create a hazard to users of
5 the national airspace system or the public or pose a
6 threat to national security when operated beyond the
7 line of sight of the operator;

8 “(2) which beyond-line-of-sight operations by
9 unmanned aircraft systems identified under para-
10 graph (1) provide a public benefit that justifies the
11 authorization of the operations in a manner that is
12 safe and minimizes restrictions on manned aircraft
13 operations; and

14 “(3) whether a certificate of waiver, certificate
15 of authorization, or airworthiness certification under
16 section 44704 of title 49, United States Code, is re-
17 quired for operations identified under paragraph (2)
18 by unmanned aircraft systems identified under para-
19 graph (1).”.

20 (b) CLERICAL AMENDMENT.—The table of contents
21 for the FAA Modernization and Reform Act of 2012 is
22 amended by inserting after the item relating to section
23 333 the following:

“Sec. 333A. Special rules for operation of certain unmanned aircraft systems
beyond line of sight.”.

NOTICE

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

Air Traffic Organization Policy

N JO 7210.891

Effective Date:
November 25, 2015

Cancellation Date:
November 24, 2016

SUBJ: Unmanned Aircraft Operations in the National Airspace System (NAS)

- 1. Purpose of This Notice.** This notice provides information and guidance on air traffic policies and prescribes procedures for the planning, coordination, and services involving the operation of Unmanned Aircraft Systems (UAS) in the NAS.
- 2. Audience.** This notice applies to the following Air Traffic Organization (ATO) service units: Air Traffic Services, Mission Support, and System Operations; and all associated air traffic control facilities, the David J. Hurley Air Traffic Control System Command Center (ATCSCC); and the Flight Service's divisions at Federal Aviation Administration (FAA) Washington headquarters.
- 3. Where Can I Find This Notice?** This notice is available on the MyFAA employee Web site at https://employees.faa.gov/tools_resources/orders_notices/ and on the air traffic publications Web site at http://www.faa.gov/air_traffic/publications.
- 4. Action.** Unmanned aircraft (UA) activities must be provided air traffic services following the policy, criteria, and procedures in this notice and other air traffic publications.
- 5. Background.** The introduction and evolution of UAS into the NAS is a dynamic process. Numerous airframes, missions, and flight characteristics create situations not common to manned flight. In the application of Air Traffic Control (ATC) procedures and techniques by ATC personnel, consideration to the type of unmanned aircraft being flown is required. Numerous UA platforms are similar to rotorcraft type aircraft, while others are similar to fixed wing aircraft, but with limited and at times different performance characteristics than manned aircraft. With a vast array of proponents finding new technological opportunities for UA's, the challenge of integrating these aircraft into the NAS is large. As the usage of UA operations expands, the areas of operation will reach all classes of airspace and altitudes. Open and efficient exchange of information between impacted ATC facilities and the UA proponents about the UA, its mission, contingencies and communication methods, are a fundamental requirement for safe operation in the NAS.
- 6. Scope.** This notice covers UAS operations in the NAS. For the purposes of this notice, a small UA is defined as weighing less than 55 pounds; a UA weighing 55 pounds or more is considered large.
- 7. Policy.** FAA policy for UAS operations is that no person may operate a UAS, including tethered UAS, outside of active restricted, prohibited or warning areas in the NAS without specific authority.

8. UAS Operations Types and Authority.

a. Public.

- (1) Public aircraft operations are defined in Title 14, Code of Federal Regulations (CFR), Part 1, Definitions & Abbreviations.
- (2) For UAS operating as public aircraft, the authority is the Certificate of Waiver or Authorization (COA).

b. Civil.

- (1) Any operation that does not meet the statutory criteria for a public aircraft operation is considered a civil aircraft operation and must be conducted in accordance with all FAA regulations applicable to the operation.
- (2) For UAS operating as civil aircraft, the authority is a special airworthiness certificate or FAA Modernization and Reform Act of 2012 (FMRA) Section 333 exemption. In addition, a COA is also required.
 - (a) FMRA Section 333 Exemption – a grant of exemption in accordance with Section 333 and a COA may be used to perform commercial or other operations in low-risk, controlled environments. When the Section 333 exemption is granted, the petitioner will be issued a Blanket COA. If the requested operation does not meet the requirements of a Blanket COA, the proponent must apply for a Standard COA.
 - (b) Blanket COAs. When the Section 333 exemption is granted, a “Blanket COA” is automatically issued to the proponent; this COA allows small UAS (less than 55 pounds) operations during daytime Visual Flight Rule (VFR) conditions at specific altitudes and outside of certain distances from airports and heliports. The Blanket COA allows the proponent to operate:
 - (i) 5 nautical miles away from an airport with an operating control tower.
 - (ii) 3 nautical miles from an uncontrolled airport with an instrument approach procedure.
 - (iii) 2 nautical miles from all other airports, heliports and seaports.
 - (iv) At or below 200 feet AGL.
 - (c) Standard COAs. For any Civil UAS operation that does not fit into the parameters of the Blanket COA, the proponent must complete the process to obtain a Standard COA. A waiver request to a Blanket COA will not be approved.

c. Model Aircraft (Hobbyist).



- (1) A model aircraft flown strictly for hobby or recreational use.
- (2) Most small UAS are owned by individuals and cannot be used for commercial purposes. Individuals flying for hobby or recreation should follow safety guidelines outlined in AC 91-57A which include:
 - (a) Fly at or below 400 feet and remain clear of surrounding obstacles.
 - (b) Keep the aircraft within visual line of sight at all times.
 - (c) Remain well clear of and do not interfere with manned aircraft operations.
 - (d) Don't fly within 5 miles of an airport unless the hobbyist contacts the airport operator and control tower (if operating at a tower controlled airport) before flying.
 - (e) Don't fly near people or stadiums.
 - (f) Don't fly an aircraft that weighs 55 lbs. or more.
 - (g) Don't be careless or reckless with the unmanned aircraft – hobbyists could be fined for endangering people or other aircraft.
 - (h) Model aircraft operators flying from a permanent location within 5 miles of an airport should establish a mutually agreed upon operating procedure with the airport operator and the airport air traffic control tower (if operating at a tower controlled airport).
 - (i) Model aircraft must not operate in Temporary Flight Restriction Areas (TFR), Prohibited Areas, Restricted Areas, Special Flight Rules Areas, or the Washington National Capital Region Flight Restricted Zone, without specific authorization.
- (3) AC 91-57A advises that hobbyist UAS operators provide notice to the airport operator and the airport air traffic control tower (when an air traffic facility is located at the airport) if the operation will take place within 5 miles of an airport. However, if the airport operator or the air traffic control facility believes the operation could impact safety, the facility may deny the operation and notify the UAS operator of the specific objection.

***NOTE-** The FAA recognizes that people and companies other than model aircraft operators might be flying UAS with the misunderstanding they are legally operating under the authority of AC 91-57A. AC 91-57A provides guidance to model aircraft operators and does not apply to use by persons or companies for business purposes.*

d. Emergency COA (ECOA) application requests.

- (1) The FAA must ensure procedures are available to accommodate real-time application requests that will directly support emergency and law enforcement-type operations. An ECOA may be considered when the following conditions apply:

- There is a situation of distress or urgency
- The proponent is operating under a currently approved COA
- The operation does not introduce any new risk in the airspace where the operation is proposed (determined by FAA Headquarters)

- (2) Emergency UAS COAs will not be considered for demonstration flights, flights to test capabilities or training.

9. UAS Operations and Guidance for the ATO (Not applicable to model aircraft operations).

a. General UAS Operational Information.

- (1) The UAS Pilot in Command (PIC) is to give way to all manned aircraft. UAs flying under IFR should be handled the same as manned IFR aircraft, however consideration should be given to the UA performance characteristics.
- (2) UAS operations should not impede, delay, or divert manned aircraft operations.
- (3) Lost Link Procedures will vary based upon the type UAS and must be included in the COA. ATC specialists must have this information available in its simplest form, to determine the actions a UA will take in these scenarios. Controllers in Charge (CIC)/Front Line Managers (FLM) should have a method of contacting the appropriate UA PIC.
- (4) Some UAS receive their communications through a satellite, which may result in latency issues.
- (5) The UA PIC cannot accept visual separation or visual approach clearances.
- (6) Operational communications with any UA PIC/proponent must be on a recorded line, when available.
- (7) In the event of a UAS emergency, procedures outlined in JO 7110.65, Air Traffic Control, Chapter 10, will be followed.
- (8) Strict UA proponent compliance with the provisions of the COA or using agency/FAA Memorandum of Agreement (MOA) is required.
- (9) UA PICs cannot accept Special VFR clearances.
- (10) UA operations conducted during nighttime hours must comply with all applicable CFRs unless a waiver of those CFRs is approved.
- (11) Flights outside of Class A airspace require that a NOTAM be issued by the proponent.

- (12) Air Traffic Facility Management at facilities where UAS operations are being conducted, are required to ensure air traffic controllers are familiar with the contents of each COA and any applicable LOAs impacting their area of specialization.
- (13) Flights below FL180 must have a dedicated observer. These duties may be performed by a ground based observer or chase plane.
 - (a) Daisy chaining of observers or observers on a moving platform may be authorized on a case by case basis.
 - (b) When a ground based/chase plane observer is required a pilot may not perform concurrent duties as the pilot and an observer.
 - (c) UA pilots and observers must be responsible for only one UA at a time, unless authorized in the COA.
- (14) All categories of Department of Defense (DOD) UAS operations that have a DOD MOA for Class D COA or notification and will be conducted wholly within Class D airspace that has an associated DOD-controlled non-joint-use airfield must follow uniform air traffic control procedures at all locations.
- (15) Procedures for non-joint-use DOD airfield operations will be specified by the DOD.
- (16) UAS that have been authorized by the Class G section of a using agency/FAA MOA must remain within visual line of sight of the pilot or a certified observer in ready contact with the pilot.
- (17) Operations that cannot be contained wholly within active restricted areas or warning areas must be conducted following procedures outlined in the issued COA.

b. UAS operations in Class A airspace.

- (1) UAS must operate on an IFR flight plan and a standard or emergency COA.
- (2) UAS must comply with provision of 14 CFR 91.135.
- (3) ATC must provide separation and ATC services per 7110.65 requirements with consideration given to UA performance characteristics and potential latency issues.

c. UAS operations within Class B airspace.

- (1) Operations in Class B will be considered on a case-by-case basis and will be flown under a standard or emergency COA.
- (2) UAS must comply with the provisions of 14 CFR 91.131, unless otherwise authorized by the jurisdictional ATC facility.

- (3) ATC must apply Class B services and procedures in accordance with 7110.65, Chapter 7, Section 9.
- (4) Alternate methods to ensure separation may be established by an approved Letter of Agreement to supplement the COA.

d. UAS operations within Class C airspace.

- (1) UAS must comply with the provisions of 14 CFR 91.130 unless otherwise authorized by the jurisdictional ATC facility.
- (2) ATC must apply Class C services and procedures within the designated Class C airspace and the associated outer area in accordance with 7110.65, Chapter 7, Section 8.
- (3) Alternate methods to ensure separation may be established by an approved Letter of Agreement to supplement the COA.
- (4) UAS must operate on a standard or emergency COA.

e. UAS operations within Class D airspace.

- (1) UAS must comply with the provisions of 14 CFR 91.129, unless otherwise authorized by the jurisdictional ATC facility.
- (2) UAS pilots may not conduct concurrent or simultaneous operations in the presence of manned aircraft unless approved procedures have been established by Letter of Agreement to supplement the COA.
- (3) UAS must operate on a standard or emergency COA.

f. UAS Operations in Class E. UAS must comply with provisions of 14 CFR 91.127, unless otherwise authorized by the jurisdictional ATC facility. UAS must operate on a standard, blanket or emergency COA.

g. UAS Operations in Class G. UAS must comply with provisions of 14 CFR 91.126, unless otherwise authorized by the jurisdictional ATC facility. UAS must operate on a standard, blanket, emergency COA or a Class G notification in accordance with a using agency/FAA memorandum of agreement.

h. Letters of Agreement (LOA) between ATC Facilities and UA Proponents.

- (1) Facility managers have the option of developing LOA's with UA proponents operating under a COA or a notification process under a using agency/FAA memorandum of agreement. It is recommended that AT facilities develop LOAs with UAS proponents that have any of the following:
 - (a) Recurring operations in the facility's airspace or movement areas.
 - (b) Operations that are complex.

- (c) Operations in any class of airspace other than Class E and G.
- (d) Operations that involve multiple AT facilities.
- (e) Operations transitioning to and from Special Use Airspace (SUA) airspace.

NOTE – LOAs are not required for ECOA operations.

- (2) Facility managers must develop an LOA with UA proponents transitioning to and from Class A airspace in their area of jurisdiction and in Class D, or Class E or G Airports with ATCTs where concurrent or simultaneous operations with manned aircraft occur.
- (3) If a facility determines an LOA would be beneficial, consider these items to be included in the LOA:
 - (a) Communications must be on a recorded line, if available, and the method of contact specifically described, i.e. phone numbers, frequencies.
 - (b) All references to a geographic position from any aerodrome originate at the published Airport Reference Point and are described via a fix/radial/distance from that point.
 - (c) Any specific altitude limitations, geographic boundary limitations, preferred route assignments, and periods of operations. This information must be provided to the ATC facility involved in the LOA via graphical depiction along with any preprogrammed lost link procedures, including routes, holding areas and altitudes. If there are multiple lost link procedures, they should be illustrated to show where they may change as the operation progresses along its route of flight from its origination to its planned destination point and a depiction of each, inclusive of altitudes. Only the geographic portion impacting the facility involved in the LOA must be available to that facility.
 - (d) Weather requirements for operations.
 - (e) The COA number(s) and the COA date(s) of expiration for any operation(s).
 - (f) IFR routings for non-radar environments.
- (4) When a facility manager decides to develop an LOA, in addition to coordinating with the appropriate OSG; all UAS LOAs which are developed must be forwarded to Air Traffic Procedures and the Emerging Technologies Office at 9-AJV-8-HQ-Correspondence@faa.gov for review before signing.

NOTE: Attachment 1 shows an Example of an UAS LOA.

- i. **UAS Reporting.** All employees must ensure that all known unauthorized UAS activities through either direct involvement or observation, are reported. These occurrences or conditions must be reported using the processes contained within FAA Order JO 7210.632, Air Traffic Organization Occurrence Reporting or FAA Order JO 7200.20, Voluntary Safety Reporting Program (VSRP). Submission of a VSRP report satisfies non-management employees' requirement to report according to these directives except when the employee providing air traffic services determines that pilot actions affected national security or the safety of operations. When such a determination is made, UAS activities must also be reported in the Comprehensive Electronic Data Analysis and Reporting (CEDAR) as a Mandatory Occurrence Reporting (MOR) in accordance with FAA Order JO 7210.632 and this Notice.

- (1) **Unauthorized UAS Activities, Controller Reporting.** Issue advisory information on pilot reported, controller observed, or any credible report about unauthorized UA activity which may create a safety hazard in the NAS. Include position, altitude, course and type (if known). Issue the advisory for 15 minutes following the last report to all potentially impacted aircraft.

EXAMPLE –

UAS ACTIVITY. (position), (altitude), (course), (type UAS)

- (2) **Unauthorized UAS Reporting.** Report all unauthorized UAS activities to the DEN and via MOR using CEDAR, or VSRP, as authorized. If the UAS activity is creating a hazard to air traffic, contact your local law enforcement. Ask the local law enforcement to inform the UAS operator of the hazard they are creating to air traffic and to cease the operation. If local law enforcement can obtain the operator's name and address, include this information in the MOR to support possible enforcement action.
- (3) **Authorized UAS Operations Creating a Safety Hazard Reporting.** Any UAS operation that is operating under a COA and is operating in an unsafe manner shall be temporarily terminated. Report the noncompliance UAS activity to the DEN and via MOR using CEDAR, or VSRP, as authorized. Please note within the MOR the COA number and violation that occurred.
- (4) **Other known UAS Reporting.** When a facility has knowledge (i.e. via a COA, hobbyist calling, visual observation, etc.) of a UAS operation occurring within their area of jurisdiction, the FLM/CIC will use their best judgment to determine if manned aircraft operations should be made aware of the UAS activity.

EXAMPLE –

UAS ACTIVITY. (position), (altitude), (course), (type UAS)

10. Certificate of Waiver or Authorization (COA) Processing. This section prescribes the policies, guidance, and procedures about COA applications for UAS operations.

- a. **Application Process.** The ATO issues a COA to a UAS proponent for a specific UA's activity. After a complete application is submitted, the FAA conducts a comprehensive operational and technical review. If necessary, provisions or limitations may be imposed as part of the approval to ensure the UA operates safely.
- b. **Application Submission.** Electronic applications should be submitted at least 60 business days before the proposed start of UAS operations requiring a COA. The proponent must submit an application for a COA using the online application system at:

Civil Operations: <https://oeaaa.faa.gov/oeaaa/external/uas/portal.jsp>

Public Operations: <https://ioeaaa.faa.gov/oeaaa/>

- c. **Application Information.** The FAA must obtain enough information to assess the proposed operations following current standards and procedures. Because of the dynamic changes in the development of UA technologies, the applicant is responsible for adequately describing the proposed operations so an appropriate safety assessment can be conducted by the FAA. For this purpose, the following information may be required in a COA application.
 - (1) Organizational and operational points of contact.
 - (2) Operational description (for example, method of navigation, see-and-avoid).
 - (3) Systems description (for example, airframe, control station, communications).
 - (4) Airframe performance characteristics.
 - (5) Airworthiness.
 - (6) Contingency procedures (for example, lost command/control link, lost communications, and emergency).
 - (7) Avionics equipment.
 - (8) Lighting.
 - (9) Frequency spectrum analysis.
 - (10) Method of air traffic control (ATC) communications.
 - (11) Surveillance capability (for example, electronic and visual).
 - (12) System monitoring/recording capability.
 - (13) Flight crew qualifications.
 - (14) Flight operations description (flight plan).
 - (15) Special circumstances.

- (16) Reports of past incidents or accidents (for those applicants who have previously held a COA).

d. COA Application Processing Procedures.

- (1) After their application is submitted, the proponent's request will be reviewed by FAA Headquarters, FAA Service Center and Air Traffic Facilities (if applicable).
- (2) COAs must have a termination date not more than 2 years from the effective date unless renewed or extended. The COA expires on the stated termination date unless surrendered sooner by the proponent or revoked by the issuing agency.
- (3) UAS may be equipped with standard aircraft anti-collision or navigation lights following criteria in 14 CFS, section 23.1401. If installed, these lights must be operating during all phases of flight to enhance flight safety.
- (4) UAs required to be equipped with an altitude encoding transponder must meet the specifications of 14 CFR, section 91.215. Although paragraph 91.215(b) (2) requires a transponder within 30 nm of an airport listed in the cited appendix (the Mode C Veil), an exception is made for "...any aircraft which was not originally certificated with an engine-driven electrical system or which has not subsequently been certified with such a system installed..." Many small UAS are battery operated and therefore do not have an engine-driven electrical system and would fall under this exception.
- (5) The proponent and/or its representatives must be responsible at all times for collision avoidance maneuvers with nonparticipating aviation activities and the safety of persons or property on the surface.
- (6) The proponent and/or its representatives are responsible for strict compliance with the Incident/Accident and Normal Reporting Provisions contained in the Special Provisions section of each COA. Further guidance can be found in FAA Order JO 7210.3, Facility Management, Chapter 18, Waivers, Authorizations, and Exemptions. The Certificate of Waiver or Authorization, FAA Form 7711-1, provides additional clarity regarding the strict observance of these terms and conditions.

NOTES-

1. Approvals for UAS operations require the proponent to provide the UAS with a method that provides an equivalent level of safety comparable to see-and-avoid requirements for manned aircraft. Methods to consider include, but are not limited to, radar observations, forward- or side-looking cameras, electronic detection systems, visual observation from one or more ground sites, monitoring by patrol or chase aircraft, or a combination thereof.

2. Risk mitigations that would depend on the establishment of new types and categories of airspace are not considered acceptable. The NAS is established and configured through a rigorous regulatory process. Risk mitigations that result in the prohibition of the public's right to transit airspace will not be considered.

e. COA application coordination between Service Centers and ATC Facilities.

- (1) Each class of airspace has its own regulatory requirements for entry as established by the CFRs. The COA process provides for an alternate means to comply with certain CFR requirements. During the COA review process, the appropriate Service Center Operations Support Group representative must coordinate with any impacted air traffic facility.
- (2) Facilities may be contacted for review of COA's even if there is no impact on ATC operations. Facilities must evaluate the COA for impact and if none is found, and no interaction with the UA proponent is necessary, indicate that no contact is necessary for the operations.
- (3) Air Traffic Facility Managers must ensure any operational requirements which are necessary for the safe operation of the UA in the facility's airspace are specifically written into the COA and/or LOA if required. Items to consider when reviewing the proposed COA are:
 - (a) Communication process between the facility and a proponent.
 - (b) Times of operation, notification of beginning and ending of operation.
 - (c) Clearly defined route/altitude information, understandable by the PIC and ATC.
 - (d) Clearly defined route/altitude information and/or graphic illustrations covering lost link procedures /maneuvers for each flight of complex UAs for use by ATC personnel at impacted sectors or positions.
 - (e) Clearly defined notification procedures in the event of an anomaly, if it impacts the NAS.
 - (f) Geographic references for proposed terminal area UA operations should be based off the Airport Reference Point (ARP) using a fix/radial/distance format, additional common visual references can be used only to supplement the location of operations.
 - (g) Some UAS may have multiple PICs for a given flight. Actions to transfer the PIC responsibilities for the UAS should be transparent to ATC. A method of contacting the appropriate PIC is critical.
 - (h) For IFR operations a clear and concise depiction or description of IFR routes and contingency actions which may be taken or be executed must be available to ATC.
 - (i) UAS operations involving towered airports may not be visible from the tower. Consideration of traffic patterns, types of traffic, activity near

common reporting points, model/hobbyist club activity, communication methods and weather are critical when reviewing proposed UA operations.

- (j) For individual classes of airspace consider the following:
- (i) Review of UAS COAs in Class A: Procedures by which the UA will depart and transition into Class A airspace, usually via a TFR, MOA, Restricted Area, or Warning Area.
 - (ii) Review of UAS COAs in Class B or C: Unless specified in the COA, the UAS must comply with all Class B or C equipment and communications requirements.
 - (iii) Review of UAS COAs in Class E: Some UAS will enter the Class E airspace above Class A airspace and proceed to their destination. COAs will also contain the procedures and routes on how the UA will depart a terminal environment and transition to Class A airspace or enter SUA.

11. Military Operations Interface Offices.

If military operations or facilities are involved, prior coordination by the following appropriate headquarters is required for subsequent interface with FAA.

Military Operations Interface Offices

Branch	Address
U.S. Navy / U.S. Marine Corps	Department of the Navy Chief of Naval Operations N980A 2000 Navy Pentagon Washington, DC 20350-2000
U.S. Air Force	HQ USAF/A30-B 1480 US Air Force Pentagon Washington, DC 20330-1480
U.S. Army	Headquarters USAASA 9325 Gunston Road, Suite N319 Fort Belvoir, VA 22060-5582

12. Distribution. This notice is distributed to the following ATO service units: En Route, Oceanic, Terminal, Mission Support, and System Operations; the ATO Office of Safety; the David J. Hurley ATCSCC; and the Flight Service divisions at FAA Washington headquarters and international field offices.

13. Authority to Change this Notice. The contents of this notice will be periodically reviewed and updated as required. Exceptional or unusual requirements may dictate procedural deviations or supplementary procedures to this notice. If there are suggestions for revision or any procedural deviation that alters the level, quality, or degree of service, obtain approval from the Vice President, Mission Support Services, Attention: Air Traffic Procedures, AJV-8.

14. Definitions.

- a. **Airworthiness** – the condition in which the UAS conforms to its type certification (or military equivalent) and is in condition for safe operation.
- b. **Altitude** –
 - (1) Mean sea level “MSL”, unless otherwise specified.
 - (2) Flight level when preceded by “FL.”
 - (3) Above ground level when followed by “AGL.”
- c. **ATC Communications** – the voice or data relay of instructions or information between the UAS pilot and the air traffic controller and other NAS users, normally conducted by radio.
- d. **Autonomous** – not controlled by others or by outside forces; independent judgment.
- e. **Autonomy** – the quality of being autonomous; self-determination.
- f. **Catastrophic** – the loss of the UA, other aircraft and/or loss of life.
- g. **Certificate of Waiver or Authorization (COA)** – an FAA grant for a specific UA operation.
- h. **Civil Aircraft** – means aircraft other than public aircraft.
- i. **Command/Control Link** – the systems supporting the exchange of information between the ground control station and the airframe of the flight control systems.
- j. **Communication Link** – the systems supporting the communication between the pilot and ATC, other aircraft, observers, or NAS users.
- k. **Direct Visual Control** – the means by which the UA is controlled and the pilot/observer exercises see-and-avoid responsibilities.
- l. **Equivalent Level of Safety** – an evaluation of a system and/or operation to determine the acceptable risk to people and property.
- m. **Ground Control Station** – the location and equipment used by a pilot.
- n. **Hobby** – model aircraft used for sport and recreation only.

- o. **Latency** – the time delay incurred between two particular interfaces (for example, data link/communications).
- p. **Lost Link** – loss of command and control link between control station and aircraft. There are two types of link.
 - (1) Up link – transmits command instructions to the aircraft, and
 - (2) Down link – transmits the status of the aircraft and provides situational awareness to the pilot.
- q. **Observer** – A trained person who assists the unmanned aircraft pilot in the duties associated with collision avoidance and navigational awareness.
- r. **Proponent** – the person or organization responsible for the COA and operation of the UA.
- s. **Public Aircraft** – aircraft used in operations that are inherently governmental as defined in 14 CFR, Part 1, Definitions and Abbreviations, Section 1.1, General definitions.
- t. **Segregation** – setting apart from other activities. Segregation is not synonymous with required ATC separation standards. Therefore, segregation does not prescribe or mandate criteria such as vertical, lateral, or longitudinal distances.
- u. **Swarm** – An operation of more than one UA in which all UAs operate in unison to commands from one PIC, who controls them all through a common link.
- v. **Tethered/Moored UAS** – An UA which is attached to a permanently fixed point (moored) or to a mobile platform (i.e. boat, trailer, auto or other mobile asset: tethered) which allows the UA to operate in a confined altitude, radius or both at the direction of the PIC.
- w. **Unmanned Aircraft (UA)** – an aircraft operated without the possibility of direct human intervention from within or on the aircraft.
- x. **Unmanned Aircraft System (UAS)** – airframe, ground control station, command and control links, and crewmembers.

15. Word usage.

- a. *May* (need not be followed by a verb) means a procedure is optional.
- b. *Must* (followed by a verb or the use of an appropriate action verb in the imperative sense) means a procedure is mandatory.
- c. *Should* (followed by a verb) means a procedure is recommended.
- d. *Will* (followed by a verb) indicates futurity; not a requirement for application of a procedure.
- e. Singular words include the plural and plural words include the singular.

16. Related Publications.

- a. Title 14, Code of Federal Regulations, part 91, General Operating and Flight Rules

- b. FAA Order JO 7110.65, Air Traffic Control
- c. FAA Order JO 7210.3, Facility Operation and Administration
- d. FAA Order JO 7610.4, Special Operations
- e. Obstruction/Evaluation/Airport/Airspace/Analysis (OEAAA), COA online
- f. RTCA Special Committee SC-203 documents, Unmanned Aircraft Systems
- g. Flight Standards Information Management Systems (FSIMS) 8900.1 Volume 16
- h. FAA Air Traffic Organization Safety Management System Manual
- i. FAA Order 1100.161, Air Traffic Safety Oversight

Original signed by Jodi S. McCarthy

11/23/15

Jodi S. McCarthy
Director, Airspace Services AJV-1

Date Signed

Attachment 1. Example of LOA

Example Sheriff's Department / Hometown, XXX Airport Traffic Control Tower (XXX ATCT)

LETTER OF AGREEMENT

Effective Date: June 30, XXXX

SUBJECT: Unmanned Aircraft System (UAS) Operations within the XXX ATCT Class D Surface Area at Hometown, XXX International Airport (XXX).

1. PURPOSE. Establish standard operating procedures for the Sheriff's Department UAS operations within the XXX ATCT Class D Surface Area.
2. SCOPE. These procedures herein apply only to UAS operations within the FAA approved Certificate of Waiver of Authorization (COAs) and the associated addendums for operations within the State of XXX portion of the XXX ATCT Class D Surface Area. This LOA and the current approved associated FAA COA(s) must be on file with XXX ATCT.
3. DISTRIBUTION. Sheriff Department, XXX ATCT, FAA Repository.
4. UAS OPERATING AREA.
 - a. UAS operations will be confined to the operating area as depicted in the Notice to Airman (NOTAM) issued for operations, by referencing the bearing, range and radius from the Airport Reference Point (ARP) for XXX, as found in the FAA Airport / Facility Directory (AFD).
 - b. Simultaneous operations of manned and unmanned aircraft in the XXX ATCT Class D Surface Area are authorized provided UAS operations are contained within the operating area described in the NOTAM and known manned aircraft do not penetrate this depicted area.
5. SCHEDULING. The UAS Pilot-In-Command (PIC) must submit a request for issuance of a NOTAM no later than (SRMD states 24 hours) prior to UAS flight within the XXX ATCT Class D Surface Area. The UAS PIC must ensure the NOTAM has been issued prior to operations and cancelled when operations are complete.
6. PROCEDURES.
 - a. Sheriff's Department UAS PIC must:

- (1) Request authorization from XXX ATCT at 000-000-0000 not later than

(suggest 30 minutes) minutes prior to commencing a planned UAS flight within the XXX ATCT Class D Surface area.

- (2) Provide XXX ATCT the location of the UAS operating area by referencing the bearing, range and radius from the ARP for XXX, as found in the AFD.
- (3) Provide XXX ATCT the NOTAM number and the proposed times for commencement and termination of UAS operations. Include PIC name and on-site phone contact number, to be used in-lieu-of direct two way radio communications with the XXX ATCT.
- (4) Notify XXX ATCT, immediately prior to commencement of operations to ensure the previously requested UAS operating area within the XXX ATCT Class D Surface Area is sterile of known traffic prior to UAS launch.
- (5) Conduct all UAS operations within the XXX ATCT Class D Surface Area under visual meteorological conditions (VMC) defined as a cloud ceiling at or above 1000 feet and the visibility is at or greater than three miles. NOTE: The PIC is responsible for checking current and forecast weather conditions and for maintaining appropriate cloud avoidance.
- (6) Maintain at or below 200 feet AGL when operating within 3 nautical miles of XXX.
- (7) Maintain at or below 400 feet AGL when operating between 3 and 5 nautical miles of XXX.
- (8) Maintain visual contact with the UAS during all phases of flight.
- (9) Comply with all ATC instructions.
- (10) In the event of a lost link, ensure the UAS returns to the launch site and lands, or executes the lost link procedures and notify XXX ATCT. Lost link procedures must not interfere with manned aircraft flight operations.
- (11) Contact XXX ATCT immediately to declare an emergency or advise of any unusual situation and intentions. (i.e. Loss of visual sight of the UAS or a Fly-Away)
- (12) Notify XXX ATCT immediately of the completion of UAS flight operations.

b. XXX ATCT must:

- (1) Ensure the requested UAS operating area within the XXX Class D Surface Area is sterile of all known air traffic prior to UAS launch.
- (2) Ensure known manned operations remain segregated from the coordinated UAS operating area upon notification by PIC of imminent launch.
- (3) Ensure UAS operations do not impede delay or divert manned aircraft.
- (4) Notify the UAS PIC if weather conditions fall below VMC.
- (5) Notify the UAS PIC of any known manned aircraft which enters the XXX ATCT Class D Surface Area without authorization from ATC which may interfere with the Sheriff's Department UAS operational area.
- (6) Deny or delay Sheriff's Department UAS operations which impact the safety of manned aircraft operation in the XXX ATCT Class D Surface area.

Signatures as needed for LOA from Air Traffic and Proponent

IFLY SAFE



All drones are aircraft—even the ones at the toy store.
So when I fly a drone I am a pilot.
Before I fly I always go through my pre-flight check list.
I regularly check the safety guidelines at faa.gov/uas



Federal Aviation
Administration

FLY SMART, FLY SAFE, AND HAVE FUN!

knowbeforeyoufly.org | faa.gov/uas

PRE-FLIGHT CHECKLIST

- ▶ I fly below 400 feet
- ▶ I always fly within visual line of sight
- ▶ I'm aware of FAA airspace requirements: faa.gov/go/uasftr
- ▶ I never fly over groups of people
- ▶ I never fly over stadiums and sports events
- ▶ I never fly within 5 miles of an airport without first contacting air traffic control and airport authorities
- ▶ I never fly near emergency response efforts such as fires
- ▶ I never fly near other aircraft
- ▶ I never fly under the influence