

**BY ORDER OF THE
SECRETARY OF THE AIR FORCE**

**AIR FORCE INSTRUCTION 11-5FT,
VOLUME 1**



27 AUGUST 2015

Flying Operations

***SMALL UNMANNED AIRCRAFT SYSTEMS
(SUAS) FLIGHT TEST TRAINING***

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publications and forms are available for downloading or ordering on the e-Publishing website at www.e-Publishing.af.mil

RELEASABILITY: There are no releasability restrictions on this publication.

OPR: AFMC/A3

Certified by: AF/A35
(Maj Gen Martin Whelan)

Pages: 38

This publication implements Air Force Policy Directive (AFPD) 11-5, *Small Unmanned Aircraft Systems (SUAS) Rules, Procedures and Service*; and AFI 11-502, *Small Unmanned Aircraft Systems Training, Standardization/Evaluation Programs, and Operations*. It provides guidance and procedures for Small Unmanned Aircraft Systems (SUAS) in Air Force Materiel Command (AFMC) and US Air Force Academy (USAFA). It applies to individuals at all levels who operate Group 1, Group 2, or Group 3 SUAS for the purposes of Research, Development, Test and Evaluation (RDT&E) within or on the behalf of AFMC and USAFA, including the Air Force Reserve and Air National Guard (ANG). (AFMC and USAFA units operating SUAS for operational or training missions, not directly associated with RDT&E, operate under the appropriate AFI 11-5 Mission, Design, Series (MDS) instruction.) This AFI may be supplemented at any level, but all supplements that directly implement this publication must be routed to the OPR for coordination prior to certification and approval. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*, route AF Forms 847 from the field through the appropriate functional chain of command. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, Table 1.1 for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW Air Force Records Disposition Schedule (RDS) located in the Air Force Records Information Management System (AFRIMS). This publication requires the

collection and or maintenance of information protected by Title 5 United States Code (USC) Section 552a, *The Privacy Act of 1974*. The authorities to collect or maintain the records prescribed in the publication are 10 USC § 8013, *Secretary of the Air Force*; Executive Order 9397, *Numbering System for Federal Accounts Relating to Individual Persons*, as amended. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

Chapter 1—GENERAL INFORMATION	4
1.1. Scope.	4
1.2. Unit Supplements.	4
1.3. Recommended Changes.	4
1.4. Waivers.	5
1.5. Responsibilities.	5
1.6. Accepting Previous Qualification.	6
1.7. Training Guidelines.	7
Table 1.1. SUAS Type Categories vs FAA Categories and Classes.	9
1.8. Training Folders.	10
Table 1.2. Instructions for completing AFMC Form 67, Ground Training Record.	12
Table 1.3. Instructions for completing AFMC Form 68, Flying Training Record.	13
Table 1.4. Instructions for Completing AFMC Form 69, SUAS Flying Training Comments.	15
Chapter 2—PHASE I – SUAS QUALIFICATION TRAINING	16
2.1. General.	16
2.2. Instructor Requirements.	16
2.3. Conversion/Difference Training.	16
Chapter 3—PHASE II - MISSION QUALIFICATION TRAINING	18
3.1. General.	18
3.2. Customized MQT.	18
3.3. Theater Indoctrination Training.	18
3.4. Local Area Orientation (LAO).	18
3.5. SUAS Flight Test Orientation (FTO) Training.	19
3.6. Special Mission Qualifications and Certifications.	19
Chapter 4—PHASE III - CONTINUATION TRAINING	21
4.1. General.	21

Table 4.1.	SUAS Operator Currency and Semiannual Basic Proficiency Requirements.	21
4.2.	Basic Sortie Credit.	22
4.3.	Simulator Training.	22
4.4.	Aircrew flight equipment.	22
4.5.	Phase II/Mission Event Currency/Proficiency.	22
Table 4.2.	SUAS Operator Phase II/Special Mission Event Currency Requirements.	22
4.6.	Cross-System, Multi-Qualification, and Multi-Event Currency.	23
Table 4.3.	Currency/Recurrency Restrictions and Cross-reference Matrix.	23
4.7.	Updating/Regaining Currency.	24
Table 4.4.	Regaining Currency Requirements.	25
Chapter 5—UPGRADE QUALIFICATION TRAINING		26
5.1.	General.	26
5.2.	SUAS-I Upgrade.	26
Table 5.1.	Minimum Takeoffs and Landings Required for Instructor Upgrade.	26
5.3.	SUAS-E Upgrade.	27
5.4.	Other Special Mission Qualifications and Certifications.	27
Chapter 6—TRAINING RESTRICTIONS		28
6.1.	Operating procedures and restrictions are located in AFI 11-5FT Volume 3.	28
Attachment 1—GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION		29
Attachment 2—SUAS GROUP 1 TRAINING GUIDELINES		36
Attachment 3—SUAS GROUP 2 TRAINING GUIDELINES		37
Attachment 4—SUAS GROUP 3 TRAINING GUIDELINES		38

Chapter 1

GENERAL INFORMATION

1.1. Scope. AFMC produces a three-volume set of Flight Test (FT) instructions containing attachments for each Small Unmanned Aircraft Systems (SUAS) Group flown in AFMC. These instructions are numbered AFI 11-5FT Volumes 1, 2, and 3, and contain the training, evaluation criteria, and operations procedures, respectively, for each SUAS Group. AFMC uses these instructions in lieu of AFI 11-5GP Group-specific volumes for Research Developmental Test and Evaluation (RDT&E) flying operations. The purpose of this instruction is to establish roles and responsibilities, standardize policy, and define basic processes for the training of operators involved with SUAS flight RDT&E activities. The intent of this instruction is to complement existing flight test approval processes and ensure AFMC and USAFA units effectively manage technical and safety risks during the conduct of SUAS RDT&E activities by properly training and certifying SUAS Operators. In this instruction the term “RDT&E activities” shall include participation of AFMC owned/possessed SUAS in laboratory tests, experiments, technology demonstrations, or war gaming exercises. **Note:** AFRL is the lead AFMC organization for SUAS flight research and test activities. USAFA RDT&E activities follow AFMC lead command guidance.

1.2. Unit Supplements. The SUAS unit will supplement this instruction if required to include:

1.2.1. Training for operators not specifically covered in this instruction.

1.2.2. Ground and flying training requirements needed to qualify operators for the unit's mission.

1.2.3. Ground and flying training requirements needed for conversion and difference training.

1.2.4. Local Area Operating procedures.

1.2.5. The unit may direct additional required training not covered in this instruction in order to meet any unit specific requirements. The unit commander will publish any unit specific training requirements in a supplement to this instruction. All original and any permanent changes to the content of the supplement must be coordinated through AFRL/DO and approved by HQ AFMC/A3V using the AFMC Form 73 process. For training plans associated with unit supplements, changes will also be submitted through AFRL/DO to HQ AFMC/A3V using the AFMC Form 73 process or through MAJCOM approved software.

1.2.6. Unit supplements will be coordinated with AFRL/DO for coordination/staffing prior to being sent to HQ AFMC/A3V, 508 W. Choctawhatchee Ave, Suite 4, Eglin AFB, FL 32542-5713, or emailed to AFRL/DO Workflow for review and submission to HQ AFMC/A3V for approval prior to publication. Include AFMC/A3V on the distribution list for approved supplements.

1.3. Recommended Changes. Send recommended changes on AF Form 847, *Recommendation for Change of Publication*, to AFRL/DO for coordination/staffing prior to HQ AFMC/A3V, 508 W. Choctawhatchee Ave, Suite 4, Eglin AFB, FL 32542-5713 or email them to AFRL/DO

Workflow for review and submission to HQ AFMC/A3V. HAF/A3O is the approval authority for interim changes (IC) and revisions to this instruction.

1.4. Waivers. Unless otherwise specified in this instruction, HQ AFMC/A3V is the waiver authority for this instruction. All waivers will be routed through appropriate training channels to unit commanders and coordinated with AFRL/DO prior to submission to HQ AFMC/A3V. Use an AFMC Form 73, *AFMC Flight Operations Waiver Request*, to process the waiver.

1.4.1. Tier requirements refer to waiver authority based on level of risk.

1.4.1.1. "Tier 0" (T-0) requirements are reserved for requirements that non-compliance is determined and waived by respective non-Air Force authority.

1.4.1.2. "Tier 1" (T-1) requirements are reserved for requirements that non-compliance may put airman, mission, or program strongly at risk, and may only be waived by the MAJCOM/CC or delegate with concurrence of publication approver. When multiple MAJCOMs are affected, then T-1 is appropriate.

1.4.1.3. "Tier 2" (T-2) requirements are reserved for requirements that potentially put the mission at risk or potentially degrade the mission or program, and may only be waived by the MAJCOM/CC or delegate.

1.4.1.4. "Tier 3" (T-3) requirements are reserved for requirements that non-compliance has a remote risk of mission failure, and may be waived by the Wing/CC but no lower than the OG/CC.

1.5. Responsibilities.

1.5.1. SUAS flight test unit commanders and AFRL supervisors at all levels must monitor the progress of operator training to ensure timely progression through the appropriate training phases and to identify areas in which an operator needs more training.

1.5.2. The unit SUAS Training Manager/office will: (T-3)

1.5.2.1. Develop and implement programs to carry out required operator training. SUAS operator training in preparation for SUAS research activities will occur concurrently with program test planning and well enough in advance so that all required operators are fully qualified and certified prior to the Test Approval Authority (TAA) flight authorization approval.

1.5.2.2. Ensure all course prerequisites are completed before entering a crewmember into any phase of training.

1.5.2.3. Track training progress (entry and training completion dates as a minimum) via a locally developed process.

1.5.2.4. Maintain operator training records by electronic means using MAJCOM approved training software or, if no such means available, by using paper copies for all assigned/attached operators. As a minimum, conduct end of half reviews of active training records.

1.5.2.5. Maintain an Operator Letter of Certification (Letter of Xs or LOX) by electronic means using MAJCOM approved training software or, if no such means available, by using paper copies. This letter documents all operator mission certifications. The Letter

of Xs must be updated monthly and certified by the unit commander, or operations officer. The Letter of Xs in conjunction with the AF Form 1381, *USAF Certification of Aircrew Training*, and AFMC Form 68, *Flight Training Record*, signed at the conclusion of training serve to document each operator's certifications. For those qualifications or events that only require a Form 67, *Ground Training Record* (e.g. Evaluator Training) and do not require an AFMC Form 68 as part of training, also document completed training on the AF Form 1381.

1.5.2.5.1. The Letter of Xs must be updated and made available upon request to AFRL/DO and/or AFMC/A3V at the end of each semi-annual training cycle.

1.5.2.6. Ensure no SUAS test activity is conducted unless operators are trained and certified in appropriate systems and mission events as applicable, and proper documentation is provided to AFRL/DO training section. All SUAS test flight activity must be correlated to an approved test plan and within its scope, guidance, restrictions, and safety planning.

1.6. Accepting Previous Qualification. Unit commanders may accept an operator's basic SUAS qualification, mission, and upgrade training from other AFMC units or non-AFMC sources such as other MAJCOM units, contractor units, or external industry partners. Acceptance will be predicated on applicable validation such as the AF Form 8/8a, *Certificate of Aircrew Qualification*, AF Form 1381, *USAF Certification of Aircrew Training*, or other appropriate documentation presenting evidence of specific SUAS Operator (SUAS-O) training, certification, and experience. Use the AF Form 4348 to document rated/formal MDS qualification certification, such as accepting a Form 8 qualification. Document all accepted qualifications, other than rated/formal MDS qualifications, on AF Form 1381. Annotate acceptance by either 1) annotating "Previous Qual" above the date (if known) in the date block for qualifications accepted or 2) annotating "(Accepted)" next to the accepted qualification. If another unit's qualification training is accepted, the unit commander will ensure AFMC-specific training items are covered in adequate detail. IAW AFI 11-502 Volume 1, para 1.5.7.5., in-processing must include completion of at least one SUAS local familiarization flight (LAO training normally accomplishes this) under the supervision of a SUAS-Instructor (SUAS-I). If additional training is required, document additional requirements via Memo for Record in the individual's SUAS-O's training folder. Units may require at their discretion a flight or ground station evaluation by a SUAS-Evaluator (SUAS-E).

1.6.1. Proficiency (Grandfathered) Qualifications. Where a new SUAS training qualification documentation requirement becomes identified for tasks already being performed, appropriately experienced SUAS-Os may be documented as "Proficiency Qual" and qualified for those tasks prior to the appropriate standardized training AFMC Forms 67 and 68 for that task being developed. SUAS-Os must accomplish the appropriate AFMC Forms 67 and 68 for that task (once developed) and maintain them in their training records. The word "Proficiency Qual" will be annotated in AFMC Form 68 block 8, Flight Evaluation Completion Date, for those members deemed qualified based on tasks already being performed. The unit Director of Operations (SUAS Lead) will be the approval authority for all proficiency qualifications.

1.6.2. Inter-fly. Inter-fly is the exchange and/or substitution of SUAS operator members and/or aircraft system between commands or other organizations outside of AFMC.

Normally, inter-fly will be limited to specific test programs but may include basic flight currency as determined by the unit Director of Operations (SUAS Lead). As a minimum, operators will be already qualified or be provided difference/conversion training in the SUAS design and series, as well as systems or configurations required to fly the aircraft and/or mission. AFRL/DO may authorize inter-fly agreements by mutual agreement with the other participating unit. A formal inter-fly agreement is not required for intra-AFMC evaluators to perform evaluations, or members that occasionally act as “guest help” where AFRL/DO and the operating unit has accepted the credentials of the guest SUAS operator through the flight test safety review process and “Guest” status is reflected on the Letter of Xs. Any training, qualifications, or certifications provided by the guest unit must reflect in the individual’s host unit master training folder and LOX. Inter-fly involving the transfer of aircraft between MAJCOMs must be coordinated and approved through HQ AFMC/A3O. (T-2)

1.6.3. GFRs will approve contractor SUAS operator qualifications and training in accordance with DCMA INST 8210.1, applying sound judgment to meet the intent of the policies where not well-defined for SUAS operations. (T-3)

1.7. Training Guidelines.

1.7.1. SUAS research or flight test units may conduct operator Phase I initial qualification, requalification, conversion, or difference training and Phase II mission qualification training concurrently. This training will be IAW AFI 11-502 Volume 1 and CJCSI 3255.01, *Joint Unmanned Aircraft Systems Minimum Training Standards*, requirements. (T-2)

1.7.2. Definitions.

1.7.2.1. *SUAS* have been defined by HQ USAF/A3 as the class of UAS smaller than MQ-1 Predator (less than 1320 lbs). *SUAS* are classified into 3 Groups as described in AFI 11-502 Volume 3, Attachment 5, Figure A5.1, “DoD UAS Categories/Groups.”

1.7.2.2. AFI 11-502 Volume 3 requires designation of a Lead *SUAS-O* having ultimate authority as to the operation of the aircraft, equivalent to the Pilot-in-Command (PIC) of a manned aircraft. *SUAS-Os* act a Lead *SUAS-O* (PIC-equivalent) of a *SUAS* when they are the primary controller, and Lead *SUAS-O* responsibilities normally transfer with a handoff, unless briefed otherwise. See AFI 11-5FT Volume 3 for further requirements applicable to Lead *SUAS-Os* (11-202 PIC equivalents).

1.7.2.3. *SUAS* Operators (*SUAS-O*) are defined in AFI 11-502 Volume 3 (para 1.3) as individuals qualified and responsible for the safe ground and flight operations of the unmanned aircraft and onboard systems. *SUAS-Os* launch and land the aircraft via laptop, radio control (R/C), or through an autonomous interface. The aircraft can also be controlled during the mission section through the same control interface. When referencing *SUAS-Os*, standard terminology will be used to avoid confusion and ensure interoperability with legacy unmanned platforms. *SUAS* operators will use the standard terminology (i.e. LRE and MCE pilot/sensor) of the larger Group 4/5 UAS/RPA Categories to the max extent possible. *SUAS* Operators are classified as an External Operator (EO) and/or Internal Operator (IO), which correlates to LRE and MCE aircrew.

1.7.2.3.1. *SUAS-O* qualifications shall state the *SUAS* Group qualification first, then the Aircraft Type Category (Fixed Wing, Rotary, Powered Lift), then qualification (External, Internal), then Airframe name, followed by Control interface (Laptop, R/C,

Autonomous) and Autopilot (if equipped); for example, “GP1/FW/Internal Pilot/RQ-11/Laptop/Kestrel™ autopilot”.

1.7.2.3.1.1. **SUAS External Operator.** Qualifications for SUAS External Operators are airframe-centric, with primary focus on skills involving direct real-time aircraft control through a handheld (RC-type/joystick) controller. The primary pilot skill is in controlling the aircraft’s flight controls through controller-hand-eye coordination. The Family of Systems for SUAS External Operators is defined by the SUAS Group, Aircraft Type Category (fixed wing, rotary, powered lift), and Control interface (aircraft interface). Basic familiarity with onboard autopilot systems and modes (if installed) is required for Internal Operator (GSO) manipulation of the autopilot during mission legs. This interaction does not constitute primary piloting skills (i.e. does not require proficiency/training as SUAS External Operator). Operations using tethered handheld R/C-type controllers through a ground station link (as opposed to a direct R/C link) also require a qualified SUAS External Operator.

1.7.2.3.1.2. **SUAS Internal Operator.** Qualifications for Internal Operators are autopilot-centric, with primary focus on skills involving operating a computer or laptop running the ground station’s autopilot interface software and displays, such as waypoint navigation, user menus, normal and contingency programming, and autopilot-override (“override mode”) inputs. The primary IO skill is in operating the aircraft through commanding the autopilot from the ground station. The Family of Systems for SUAS-O pilots is defined by the SUAS Group, Aircraft Type Category (fixed wing, rotary, powered lift), and Control interface (aircraft interface). Basic familiarity with airframe performance and control techniques is also necessary, although this is secondary to primary IO skills. Operating the aircraft through direct real-time control is not the primary IO skill. Typically, SUAS autopilot override (“override mode”) control is available as a backup, but not of sufficient fidelity nor used for fine or critical control tasks such as normal takeoff and landing. In these cases, either autonomous autopilot control or handoff with a SUAS External Pilot shall be used to perform these tasks. Advanced SUAS ground stations, such as hybrids with a cockpit-type layout or joystick controller, and those suitable for high-fidelity autopilot override/direct commands to the flight controls, enabling takeoff and landing, require SUAS External Pilot qualification to perform those tasks.

1.7.2.3.2. Although SUAS-Os may be both Internal and External qualified on a particular system, SUAS-Os shall not serve in both positions simultaneously in systems requiring handoffs, unless specifically authorized as part of an approved test plan. SUAS-Os shall not serve as Lead SUAS-O (Pilot-In-Command-equivalent) for/or in direct control of two or more UAVs simultaneously, unless approved to do so by the waiver authority for this instruction.

1.7.2.3.3. **Payload Operators (PO)** operate whatever payload is carried by the aircraft, if applicable, (datalinks, sensors, navigation systems, etc.) and typically have neither authority nor direct control over the aircraft’s trajectory, propulsion, or flight controls. POs must operate under the authority and supervision of a separate Lead SUAS-O

(11-202 PIC equivalent). At a minimum, payload operators will be qualified to operate all aircraft and mission systems under their control.

1.7.2.4. SUAS Classifications. See Table 1.1 for SUAS Classifications. See section 2.3 for requirements regarding training and qualification requirements relating to different SUAS classifications.

1.7.2.5. SUAS Groups. When determining which SUAS Group to place a particular vehicle in, use the DoD UAS Groups matrix (AFI 11-502 Volume 3, Attachment 5, Figure A5.1) as defined by maximum weight, speed, and altitude. The DoD criteria yield insight into air vehicle kinetic energy levels and consideration for resultant mishap damage effects. Training Managers must specify on the Letter of Xs which DoD Group each UAV in their inventory belongs to. Note that the word “Categories” appears in the matrix but all AFI 11-502 or 11-5FT guidance uses the “Group” designations. For those SUAS that can operate in multiple Groups, the normal operating weight, altitude, and speed will be used to determine the primary SUAS Group.

1.7.2.6. SUAS Type Category/Family of Systems (FOS). This section outlines the different type categories and classes of a variety of current SUASs, mirroring the classic FAA usage. The major drivers for these distinctions are training and technique differences in lift/drag and thrust operating principles for control of the vehicle. These very different kinds of aircraft require different, and sometimes conflicting, operator techniques, training, and habit patterns. Although the vast majority of AFMC SUAS are Fixed-Wing, the remaining types are not beyond potential use, and similar training distinctions and considerations must be taken into account for SUAS operators and qualifications. For AFMC operations, multiple qualification and difference training is addressed in the AFMC Supplement to 11-502 Vol 2 **paragraph 5.2.16**.

Table 1.1. SUAS Type Categories vs FAA Categories and Classes.

SUAS Type Category	Similar to FAA Categories	FAA Class distinction 1	FAA Class distinction 2	
Fixed Wing (FW)	Airplanes	Single-Engine	Land	
		Multi-Engine	Sea	
	Gliders	(none)	(none)	(Not typical SUAS – reserved for future use)
Rotary Wing (RW)	Rotorcraft	Helicopters Gyroplanes	(none)	VTOL with classic tailrotor counter torque considerations
Powered Lift (PL or VTOL)	Powered lift	(none)	(none)	Quadrotors and other VTOL without counter torque considerations
Powered Parachute	Powered parachute	(none)	Land	(Not typical SUAS – reserved for future use)

			Sea	
Lighter-than-Air	Lighter than air	Airship Balloon	(none)	(Not typical SUAS – reserved for future use)
Weight-shift-Control	Weight-shift-control	Land Sea	(none)	(Not typical SUAS – reserved for future use)

1.8. Training Folders.

1.8.1. Training folders are required for all SUAS operators authorized to perform SUAS flight duties or entered into any phase of training. The training folder is used to organize and track training and to document completed training and may contain multiple SUAS platform specific training documentation. SUAS Operators/Training Managers will maintain training folders electronically if possible or manually in paper format. Electronic signatures on training forms are authorized. Construct and maintain folders IAW paragraph 1.8.4. Avoid using PII unless necessary. For example, it is allowable to use the last four of the SSN instead of the full number.

1.8.2. Access to electronic training folders will be restricted to authorized personnel via a password or other means. Active training folders will be readily accessible to instructors and trainers, supervisory personnel, and the individual operators in training. Instructors and trainees will review training folders for each specific training session and complete the necessary forms in a timely manner.

1.8.3. The individual is primarily responsible for accomplishing required training and maintaining currencies. The training manager is responsible for supervising and reviewing each training folder for accuracy and required training as well as tracking aircrew currencies. Certifications are maintained by the local unit via the Letter of Xs, with monthly updated copies provided to the AFRL/DO training office, SUAS-I/Training Manager. If the individual changes units, the individual and/or unit Lead SUAS-I/Training Manager will ensure the training folder (in electronic or paper format) and certifications are forwarded to the gaining unit.

1.8.4. Organize training folders as follows:

1.8.4.1. Place a label with the trainee's name, grade, SUAS, and operator position on the folder, if in paper form. Multiple systems can be listed or "Multiple SUAS Operations" can be used. Maintain a current AF Form 1381 (on the inside cover if in paper form). Annotate all completed Phase I/initial qualification training (IQT) and Phase II/mission qualification training (MQT) and acceptance of non-AFMC/previous qualifications if applicable.

1.8.4.2. Divide the folder into separate sections as described below. File completed training sessions as a set (applicable AFMC Forms 67, 68, and 69) with the most recent set on top. The set will be ordered with the AFMC Form 67 on top, the AFMC Form 68 in the middle, and the AFMC Forms 69 last.

1.8.4.3. Section One will contain ground and flying training documentation for Phase I/IQT. Section Two will contain ground and flying training documentation for Phase II/MQT. Section Three will contain ground and flying training upgrade documentation for instructor and/or flight examiner upgrade training. Section Four will contain any other training correspondence to include training letters, commander approvals/authorization, letters certifying previous qualifications, waiver approvals, email coordination, mission and/or upgrade qualifications, memorandums for record, and flight evaluation records if no Flight Evaluation Folder (FEF) is separately maintained. AFMC does not require separate FEFs for SUAS.

1.8.5. Entry into Training. Prior to beginning externally (non-AFMC) provided training, or each Phase I or Phase II qualification, the flying unit commander or operations officer (unit SUAS Lead) must authorize the training. The training may be authorized on a signed Letter of Xs or with an Entry into Training letter maintained in Section Four of the training folder. Use the AF Form 80, IAW AFI 11-502 Volume 2, to document above-unit approval for entry into training for SUAS-Os seeking to gain and maintain SUAS multiple qualifications. Do not enter SUAS-O personnel into more than one training program at the same time. In all cases the training office must track training start and completion due dates. Trainees and Operators must complete all required ground and flight training required for the specific SUAS intended for operation. If the trainee is unable to complete any aspect of Phase I or Phase II during the course, a training deficiency letter will be forwarded to the trainee's supervisor and a determination made on whether to correct the deficiency or remove the individual from the training program.

1.8.6. Training Forms:

1.8.6.1. HQ AFMC/A3V approved SUAS training forms used to document all AFMC SUAS aircrew training are provided in electronic format by AFRL/DO. AFMC/A3V will approve all SUAS training forms. These AFMC/A3V-approved forms are the only authorized training forms. EXCEPTION: If the training plan form/syllabus for a unique mission is not available, units may develop a unique training plan for AFRL/DO concurrence and AFMC/A3V approval. After approval the unit-specific plan must be referenced in a unit supplement to this instruction, or may be maintained locally after approval by HQ AFMC/A3V. Units will maintain electronic training forms using MAJCOM approved software, if possible. (T-2)

1.8.6.2. Training Form Usage. To ensure the most current syllabus is used, Training Managers and SUAS-Is will only download the forms when Phase I or Phase II training is initiated as training forms frequently change and previous editions of training forms are obsolete.

1.8.6.3. Training Form Update Cycle. AFRL will always have the most current edition of all forms. AFMC/A3V will approve all training forms. Phase I and Phase II training forms will be updated each year.

1.8.6.4. The AF Form 1381, *Certification of SUAS Operator Training*, is used to document and certify all individuals' certifications and qualifications, and is the official source of what is reflected on the Letter of Xs. Completion of training and certification will be documented on the AF Form 1381 or suitable computer product, maintained inside the front cover of the individual's training folder, and copies forwarded to

AFRL/DO to support qualifications shown on the Letter of Xs. The AF Form 1381 must be signed by the SUAS-O's TD Director or designated official such as the Lead SUAS-I/Training Manager (electronic "signatures" are permitted).

1.8.6.5. The AFMC Form 67, *Ground Training Record*, is used to record all ground training required before the trainee's first flight. This form provides for the overprint of required ground training tasks. Any additional ground training (simulators, cockpit procedural trainers, etc.) accomplished during the flying training phase will be documented on the AFMC Form 69. **Table 1.2** provides detailed instructions for completing the AFMC Form 67.

Table 1.2. Instructions for completing AFMC Form 67, Ground Training Record.

Item	Description	Entry
1	Name/Rank	Self-explanatory
2	SUAS	Specific SUAS for which training is being accomplished
3	Operator Position	The operator position to which the individual is upgrading. For example, if training is for SUAS External Operator, Internal Operator (GSO), upgrade to IP, list in this item.
4	Type of Training	Enter the exact type of training being performed. (i.e., BAT3 External Operator training.)
5	Training Events	The left column will list the tasks and subtasks requiring specific trainee knowledge. In the right columns, the instructor conducting the training will print his name and the date that the specific training event was completed.
6	Trainee's Signature/Date	The trainee will sign and date when the last training item is completed.
7	Instructor's Signature/Date	The instructor completing the last required training item on the form will sign and date. The instructor's signature certifies that all the required ground training events have been accomplished.
8	Remarks	Record any pertinent comments or direction regarding specific training.

1.8.6.6. The AFMC Form 68, *Flying Training Record*, is used to record all flying training. This form provides for the overprint of required training tasks and end-of-course proficiency levels for each ground/flying training task. It also records the number of events accomplished and proficiency level attained by the trainee. AFMC Form 68 lesson plans establish the minimum required training events to be completed for initial qualification (QUAL), requalification (REQUAL), and instructor upgrade (INST). The AFMC Form 68 is the official certifying document for any locally-conducted Phase I qualification, and each Phase II qualification. Table 1.3. provides detailed instructions for completing the AFMC Form 68.

1.8.6.6.1. Grading and Grade Definitions. Each AFMC syllabus training event must be graded. Unless noted otherwise (with a "D" in the events required column) all training events on the AFMC Form 68 must be accomplished until Proficiency, "P", is achieved. The AFMC Form 68 indicates the required events and grades for each training event. A grade of "P", Proficient, "T", Training Required, or "D",

Demonstration/Discussion will be given at the instructor's discretion using the following definitions:

1.8.6.6.1.1. **(P) Proficient.** The student demonstrated the knowledge and skill necessary to successfully complete the event without instructor intervention and, in the instructor's opinion, will be able to repeat the event successfully in the future.

1.8.6.6.1.2. **(T) Training Required.** The student did not demonstrate the knowledge and skill necessary to successfully complete the event. The student must continue training in that event until a grade of "P" is achieved.

1.8.6.6.1.3. **(D) Demonstration.** The event was discussed/demonstrated inflight by the instructor, and either 1) was not yet attempted by the trainee for a "T" or "P" grade (if required), or 2) requires only instructor discussion and/or demonstration, and a "P" or "T" grade is not nor will be assigned for the event.

Table 1.3. Instructions for completing AFMC Form 68, Flying Training Record.

Item	Description	Entry
1	Name/Rank	Self-explanatory
2	SUAS Name (Group/Type)	Specific unmanned system for which training is being accomplished.
3	Operator Position	The position to which the individual is training or upgrading. For example, if training is for upgrade to IP, list IP in this item.
4	Type of Training (Autopilot name)	Enter the exact type of training being performed. (i.e., BAT3 External Operator training)
5	Training Events	The left column will list the tasks and subtasks requiring a specific trainee proficiency standard. All listed events require a proficiency level "P" or must be identified with a "D". Break the tasks out by general areas (i.e., discussion topics, ground operations, emergency procedures, etc.). The right six columns (excluding the far right, total events) correspond to the sorties accomplished. Record in each of these columns the number of events accomplished and proficiency level attained (#/P, #/T, or #/D) during the sortie. The trainee must attain a proficiency level of "P" on the accomplishment of the last event; otherwise he or she remains in a training status until proficiency is attained. If two lesson plans are conducted concurrently, i.e., requalification training and instructor upgrade, and similar events are required on both; the highest minimum requirement listed will be accomplished. Indicate the type of training to be accomplished by circling it or highlighting the appropriate column.
	Qual/Conv	Minimum number of events per task required to complete this lesson plan for Basic/Mission (Phase I or II) qualifications under an IQT or Conversion training program.
	Requal/Diff	Minimum number of events per task required to complete this lesson plan under a Requalification or Difference training

		program.
	Inst	Minimum number of events per task required to complete this lesson plan for Instructor upgrades.
6	Trainee's Signature/Date	Printed name, signature, and date trainee completes all requirements on the form.
7	Instructor's Signature/Date	Printed name, signature, and date the Instructor certifies Trainee has completed all requirements.
8	Flight Evaluation Completion Date	Date the official flight evaluation was accomplished. Note: Annotate "grandfathered" in this block for operators already deemed certified by the unit commander prior to the appropriate standardized training AFMC Forms 67 and 68 for that qualification/task being developed.
9	Flight Evaluator Signature/Date	Printed name, signature, and date the Government Flight Evaluator certifies Trainee has successfully accomplished all requirements. The Flight Evaluator may require a demonstration check flight to certify the trainee. If flight evaluation is not required, the signature certifies all training is complete and the individual is certified to perform the particular mission for which training was accomplished.
10	Remarks	Record any pertinent comments or direction regarding specific training.

1.8.6.6.2. Proficiency Advancement. If the student demonstrates proficiency in at least 75 percent of the minimum required events, the instructor, with certifying official concurrence, may proficiency advance that item. For example: if the minimum number of required takeoffs was 4 and the student is proficient for at least three takeoffs, then the instructor may recommend advancing that training item. Comments and justification on the associated AFMC Form 69 will describe which items were advanced. The Certifying Official signature in Block 9 serves as concurrence for proficiency advancement. If training is complete, the number of required sorties may also be reduced using these same guidelines. If the student reaches proficiency and then regresses, proficiency must be regained before training is complete.

1.8.6.6.3. Training events listed may be completed in any order; however, student progression will be based on level of performance. At first, training will be designed to familiarize the student with the normal operation and flight characteristics of the SUAS. The student will then advance to the more challenging system operations. The instructor will be responsible for constructing a profile for each training flight based on the student's proficiency and the minimum number of events to be completed.

1.8.6.7. The AFMC Form 69, *Flying Training Comments*, is used to document flying training. This form is used in conjunction with AFMC Form 68, or can be used independently to document training (e.g. recurrency training). It provides for narrative descriptions of the trainee's progress and a means for documenting the training office review. Maintain with AFMC Form 68 in the appropriate section of the training folder. A separate AFMC Form 69 will accompany each type of SUAS flight training received

(i.e. each AFMC Form 68). The instructor will document any significant problems the student has in completing a training event in enough detail so that subsequent instructors can provide appropriate training. **Table 1.4** provides detailed instructions for completing the AFMC Form 69.

Table 1.4. Instructions for Completing AFMC Form 69, SUAS Flying Training Comments.

Item	Description	Entry
1	Name/Rank	Self-explanatory.
2	Type Of Training	Enter the exact type of training being performed. (i.e., BAT3 EO IQT).
3	Flight Number(s)	Consecutive sortie number(s). If multiple short sorties are used to train items such as takeoff and landings for a radio controlled aircraft, list the sortie numbers in this block. Any abbreviations used much match those used on the AFMC Form 68.
4	Date	Date of the specific sortie.
5	MDS	SUAS type (Group, Airframe, Control interface & autopilot) for which training was completed. (i.e. Gp1, BATCAM, Laptop, Kestrel™)
6	Comments	MISSION OVERVIEW: Describe the mission scenario, including mission profile, and any events that impacted the mission (e.g., severe crosswinds, confined launch/recovery area, etc.). STRENGTH: Comments will elaborate on trainee's strengths and indicate student progress. AREAS FOR IMPROVEMENT: Describe the trainee's weaknesses, identify problem areas, and areas requiring student self-study, and record unusual circumstances. RECOMMENDATIONS: Recommendations will include tasks requiring further training and the type of training required. If more space is needed, use the next blank section. Upon completion of all training requirements, a statement such as "Recommended for evaluation" or "All training requirements for night operations completed" are appropriate. However, a statement such as "cleared for night operations mission" is not appropriate as only the designated government flight evaluator or Certifying Official may certify an individual for operations.
7	Instructor	Instructor will sign at completion of sortie.
8	Student/Date	Trainee will sign and date at completion of sortie.
9	Training Office Review/Date	The individual in the trainee's chain of command, or designee, will review the comments before the next training sortie. He or she will highlight any comments that are pertinent to follow-on training. Annotate this review by initials of person conducting review and date of review. When conditions preclude a timely review, the instructor will explain in remarks.

Chapter 2

PHASE I – SUAS QUALIFICATION TRAINING

2.1. General. This section outlines training needed to qualify a SUAS Operator for duties in an assigned position for a specific unmanned aircraft system. AFMC Initial Qualification Training (IQT), also called Phase I training, can include training for requalification, conversion/difference, or instructor duty training.

2.1.1. Before entering qualification training, each member must have unit commander's approval. Unit commanders may authorize a SUAS Operator to be qualified in multiple SUAS vehicles if mission needs dictate (IAW 11-502 Vol 2, **Paragraph 5.2.16**). Appropriate documentation must be maintained in the individual's training folder as dictated in section 1.8 of this instruction.

2.1.2. All AFMC SUAS Phase I/IQT training plans (Forms 67 and 68) will be managed by AFRL/DO. AFMC/A3V will approve all training plans. The training plans maintained by AFRL/DO are the only ones authorized to execute locally-conducted Phase I/IQT training. EXCEPTION: Unit-specific training forms may be maintained locally after approval by HQ AFMC/A3V. To ensure use of the most current training plans, training instructors will download the current training forms and materials just prior to starting each IQT session. (T-2)

2.1.3. Trainees must complete all academic and demonstration requirements as directed in the applicable courseware and satisfy all criteria set forth by the training plans and instructor. For research or test programs utilizing systems with an existing Formal Training Unit course, training officers must use the MAJCOM-approved training plans and courseware for the specific SUAS. If there is no approved training plan, units will submit a proposed training plan through the chain of command to AFMC/A3V for approval. Section 1.8 of this instruction provides instruction for using the required AFMC ground and flight training forms.

2.1.4. Flying training lessons will be completed in order, if practical. However, if mission scheduling or student progress dictates otherwise, the unit commander or designated training supervisor may change the order. There will be a minimum time lapse between training missions and every effort will be made to complete qualification training requirements within the prescribed time period. All applicable IQT requirements for a specific SUAS must be completed prior to commencement of MQT for the same SUAS, unless concurrent Phase I/II training is approved by AFMC/A3V.

2.2. Instructor Requirements. For qualification flight training in all SUAS, the instructor must be in a position to take immediate positive control of the aircraft. This requirement could be met through another set of controls (i.e. buddy box) or close enough to take over using the student's controls. The SUAS instructor will be the primary safety observer any time a trainee is controlling the SUAS during IQT. The SUAS-I will be physically located with the trainee and will be able to assume direct control of the SUAS if required. (T-3)

2.3. Conversion/Difference Training. Conversion training is typically required when dissimilarities within (or between) series of the same mission designation aircraft are significant

enough to warrant more in-depth training, usually including flight training. Within the scope of AFMC SUAS operations, conversion training applies when transitioning to a different SUAS Group or SUAS Control interface (IAW multiple qualification described in 11-502 Vol 2 AFMC Supplement para 5.2.16). Conversion training requires completion of an in-depth Phase I/IQT program (or a formal school initial qualification course, if one exists for that particular SUAS type). Trainees placed in IQT are in Unqualified status for that system, and at completion of training receive either Basic or Mission qualification. Formal IQT courses also typically culminate with an evaluation by a SUAS-E; although in AFMC, an evaluation is not normally required for additional Conversion certifications within the same SUAS Group. Conversion training across different SUAS Groups or Control interface is considered a new qualification requiring a Form 8/8a QUAL evaluation. If gaining and maintaining qualification across two or more SUAS Groups or Control interface, the SUAS-O will be considered Multiple Qualified IAW AFI 11-502 Volume 2 para 5.2.16, requiring approval on the AFMC Form 80 prior to entering training. Conversion training will usually require open/closed book testing. Unit Commanders will determine if open/closed book testing is not required. (T-3)

2.3.1. Difference training is typically required when transitioning within (or between) series of the same mission/design aircraft. Within the scope of AFMC SUAS operations, difference training applies when transitioning to another aircraft in the same SUAS Group or using a different Autopilot without changing the Control interface. Difference training may be accomplished with a Phase II/MQT training plan conducted by a qualified SUAS-I, with no regression to Unqualified, and no SUAS-E evaluation. If no qualified SUAS-I/E or formal school exists to provide conversion or difference training, the unit training office will develop, and coordinate, with the Lead SUAS-I/Training Managers, training programs that maximize use of highly experienced personnel as the initial cadre to self-instruct and build experience.

2.3.2. Notwithstanding the guidance in 2.3 above, the varying configurations of SUAS platforms may make it difficult to always provide precise criteria for conversion/difference training for all types. If differences between aircraft are great enough such that the individual needs more than cursory training in basic operation skills, the unit commander will determine if conversion training requiring completion of a Phase I/IQT program is required. Upon review and concurrence from AFRL/DO, the unit commander may factor in non-DOD professional or recreational SUAS experience. Use the AF Form 4348, IAW AFI 11-502 Volume 2, to document completion of conversion/difference training when a Form 8/8a evaluation is not required. In addition, for each individual on the Letter of Xs, units will document all Form 8/8a qualifications, and Form 4348 and other certifications on a single AF Form 1381 and continuation sheet, if necessary.

Chapter 3

PHASE II - MISSION QUALIFICATION TRAINING

3.1. General. Use this instruction when completing mission qualification training (MQT), also called Phase II training, in AFMC. Units will establish mission ground and flying training requirements for those aircraft, missions, and crewmembers (to include mission and operational support crew) not addressed in this instruction. Upon HQ AFMC/A3V approval, document this training in unit supplements. Forms 67 and 68 may be published in unit supplements and/or unit maintained websites. Simulator requirements, based on availability and applicability, will be included in the unit developed programs. Use AFMC Forms 67/68/69 to document simulator training. When structuring programs, flying units will ensure that mission operational and training areas are compatible.

3.1.1. All AFMC SUAS Phase II/MQT training plans (Forms 67 and 68) will be managed by AFRL/DO. AFMC/A3V will approve all training plans. The training plans maintained by AFRL/DO are the only ones authorized to execute Phase II/MQT missions. EXCEPTION: Unit-specific Phase II training forms may be maintained locally after approval by HQ AFMC/A3V. To ensure use of the most current training plans, the training instructors will download the current training form just prior to starting training for each Phase II mission qualification. (T-3)

3.1.2. Phase II mission event qualification is lost upon loss of event currency exceeding six months. Phase II mission event Unqualified up to two (2) years: Complete REQUAL training. Use the REQUAL training column on the AFMC Form 68 training plan(s). Unqualified over two (2) years: Complete QUAL training, Use the QUAL training column of the AFMC Form 68 training plan(s). The duration of the unqualified time is from the date the SUAS-O became unqualified until the specific retraining start date.

3.2. Customized MQT. Programs are allowed to tailor their MQT plans to individual operators. This is based on the individual's current qualification, experience, currency, documented performance, available training assets, and formal training. Applicable portions of MQT may be used to create a requalification program for operators who have regressed from mission ready to specifically address the deficiencies that caused the regression. Tailored training plans must still be routed through AFRL/DO and approved by AFMC/A3V.

3.3. Theater Indoctrination Training. AFMC SUAS units conducting SUAS flying operations in deployed locations outside of the CONUS will ensure SUAS-Os are thoroughly trained for specific theater operations. This training may be accomplished in conjunction with normal pre-mission planning. As a minimum, this training will include a thorough review of ICAO procedures, theater unique requirements and procedures, the use of non-DOD/NOAA approach procedures, required instrumentation for specific operations, theater weather conditions, local area procedures, host nations agreements, specific theater NOTAMs, Airspace Control Plan, Airspace Control Order, Air Tasking Order, SPINS, and Foreign Clearance Guide. (T-2)

3.4. Local Area Orientation (LAO). AFMC SUAS units will establish ground and flying training requirements for LAO. Newly assigned operators will not perform SUAS-O duties, except under the supervision of an instructor, until they complete this training. Ground training

will include, as a minimum, a briefing on the local area visual flight rules (VFR) procedures, restrictions, navigation aids, and unit aircraft differences (e.g. test instrumentation). LAO training will also include an introduction to AFMC command and unit-specific rules and directives if the crewmember is new to AFMC and/or the unit. LAO flying training may be conducted concurrently with Phase I or Phase II training. Only one LAO is required for SUAS-Os qualifying in multiple aircraft at one installation. Document this training in Section Four of the individual's training folder. (T-3)

3.5. SUAS Flight Test Orientation (FTO) Training. All AFMC operators must receive one-time Flight Test Orientation Training prior to executing flight test missions. The training outlines the required minimum reviews required for documentation, test equipment, test support, test execution, and decision criteria. To augment ground training, some aircraft test training may also include flight training. (T-3)

3.5.1. The SUAS Flight Test Orientation Training syllabus is maintained by AFRL/DO. If required, Flight Test flying training (AFMC Form 68) may be published in MDS attachments or unit supplements to this instruction.

3.5.2. Document SUAS Flight Test Orientation Training in Section Four of the training folder and on the AF Form 1381.

3.5.3. Any supervisor (commander, operations officer, or branch chief) or instructor qualified in that mission may complete the applicable ground training. Flight training, if specified, will be conducted by a SUAS-I qualified in the Flight Test mission.

3.6. Special Mission Qualifications and Certifications. The unit commander will select SUAS-Os qualified in the unit's mission to maintain additional special qualifications and certifications. Special mission events are not considered core mission events and are not required for mission ready status. SUAS-Is are authorized to teach any special mission events in which they are qualified and current unless specifically restricted.

3.6.1. Autopilot Gain Tuning (AGT) Training. All AFMC Internal Operators must receive one-time Autopilot Gain Tuning Training for each specific autopilot system prior to executing flight test missions performing that task on that autopilot system. SUAS External Operators supporting gain tuning missions as an additional crewmember must receive familiarization training in AGT mission procedures and terminology for that autopilot system, including a mission rehearsal or simulation.

3.6.1.1. The Autopilot Gain Tuning training plan description and syllabus is maintained by AFRL/DO.

3.6.2. Night Operations (NT) Training. Night SUAS operations are not normal for AFMC operators and qualification must normally be obtained via formal IQT course. If AFMC elects to develop and publish a Night Operations training plan/syllabus it will be maintained by AFRL/DO. All AFMC operators must receive Night Operations training and certification prior to executing missions during hours of darkness or using NVGs.

3.6.3. Stores Release (SR) Training. All AFMC operators must receive one-time Stores Release Training prior to executing flight test missions releasing stores or payloads. As a minimum, Stores Release training will include normal arming, safing, release and separation, inadvertent/unintentional ground and inflight release, arming and release malfunctions,

jettison, hung/misfired store recovery and landing, environmental considerations, range safety, aircraft instrumentation, and range clearance and test control procedures. If energetic release systems or stores (explosives, stored energy springs, etc) are used, training will also include special handling requirements unique to positively determining a disarmed state in order to safely launch and recover the aircraft with the energized system or store aboard.

3.6.4. Weapons Delivery (WD). This section describes procedures for aircrew air-to-surface training and is applicable to all AFMC SUAS carrying or releasing any live explosives, or kinetically impacting any target. Weapons delivery training will be IAW AFI 13-212, Volume 1, *Range Planning and Operations*, and if applicable, T.O. 1M-34, *Aircraft Weapons Delivery Manual*, and aircraft specific -34 T.O.s. AFI 11-214 provides procedures for air-to-surface training for MAJCOMs with tactical missions. AFMC does not have a tactical mission, but invokes AFI 11-214 for air-to-surface training. Developmental air-to-surface testing will be conducted in accordance with test and safety review board guidance.

3.6.5. Additional special mission qualifications and/or certifications, and associated training plans, may be defined by the unit, with AFRL/DO concurrence and AFMC/A3V approval.

Chapter 4

PHASE III - CONTINUATION TRAINING

4.1. General. AFMC SUAS operators will accomplish the basic currency and proficiency requirements specified in **Table 4.1** **Failure to meet these minimum requirements and regain basic currency within 6 months of expiration will result in the SUAS-O regressing to Unqualified status in that event per AFI 11-502V1 paragraph 1.7, necessitating Requalification training per AFI 11-502V1 paragraph 1.8** The SUAS operating unit commander may specify additional requirements necessary to ensure operators maintain proficiency and mission readiness. These requirements will be included in SUAS specific supplements to this instruction. (T-2)

Table 4.1. SUAS Operator Currency and Semiannual Basic Proficiency Requirements.

REQUIREMENT	CURRENCY	Semiannual Requirements (prorated on months available)	NOTES
<u>Basic Currency/Proficiency Events</u>		Number Required	
Basic Sortie – Live flight	60 days	6	1
Basic Sortie – Simulated (IOs only)	60 days	6	1
* Go Around Procedure	90 days	3	2
GCS Handoff – SUAS-EO to IO / IO to EO	90 days	3	3
Simulated Emergency Recovery Procedures	90 days	3	4
NOTES: * = Items often only performed by SUAS EOs – see Note 2 for clarification			
1. IOs may use Live or Simulated sorties to update currency. Basic Sortie Credit: See paragraph 4.2 for component events required to log a Basic Sortie.			
2. IOs are not required to complete events normally performed solely under External Operator/manual pilot flight control, as indicated above by an asterisk (i.e. radio control piloted takeoff, landing, and go around procedures). In such cases, conduct appropriate GCS Handoffs in lieu of those events. In order to use autopilot controlled takeoff and/or landing capability, IOs must complete these requirements.			
3. For systems with only one-way handoffs, only the applicable handoff applies.			
4. Events will include scenarios such as lost communication procedures, engine out procedures, etc. Event may be updated using ground station simulations/mission rehearsals provided all			

SUAS operator test team members are present, and team coordination is practiced.

4.2. Basic Sortie Credit. In order to log a sortie for currency or proficiency, the logging SUAS-O must perform at a minimum: Launch Sequence, one Takeoff/Launch event, one VFR traffic pattern (as applicable), and one Landing/Recovery event, and log at least 0.2 hours (10 minutes) primary (Lead SUAS-O/Pilot-in-Command-equivalent) or Instructor time. NOTE: Launch Sequence includes preflight checklists, aircraft preparation, engine start, and all other procedures up to initiating takeoff/launch. In lieu of Pilot-conducted Takeoff/Launch and/or Landing/Recovery events, Internal Operators shall perform the appropriate GCS handoff(s) to/from an External Operator as applicable for the system.

4.3. Simulator Training. Simulator training is not required; however, some GCS vendors provide a Hardware-in-the-Loop capability allowing simulated missions in a lab environment. Additionally the radio control hobby industry provides several radio control aircraft training simulators. The use of the above tools for training, practice, and mission rehearsals is highly encouraged. As the lead command for SUAS research and test operations, AFMC allows units to use simulator training to maintain currency but the subsequent sortie must be live. Units unable to schedule live sorties for currency and desiring to use simulators instead to regain currency must request a waiver through AFRL/DO to AFMC/A3V.

4.3.1. The AFSOC-approved Aerovironment, Inc™,-provided “Small UAS Simulator” for use with the Raven®, Wasp®, and Puma systems is also approved for use within AFMC to maintain (NOT regain) “Basic Sortie – Simulated” currency in the Raven®, Wasp®, and Puma systems.

4.4. Aircrew flight equipment. Aircrew flight equipment and SERE training requirements as described in AFI 11-301 and AFI 16-1301 do not apply to SUAS operators. Proper PPE is required as determined by the Safety Review Board.

4.5. Phase II/Mission Event Currency/Proficiency. AFMC SUAS Operators will maintain or accomplish the currency and proficiency requirements specified in **Table 4.2** prior to performing those mission tasks. Maintain/regain currency to meet mission requirements as needed. **Paragraph 3.1.2 of this instruction outlines Requalification requirements for failure to meet these requirements.** The SUAS operating unit commander may specify additional requirements necessary to ensure operators maintain proficiency and mission readiness. These requirements will be included in SUAS specific supplements to this instruction. (T-2)

Table 4.2. SUAS Operator Phase II/Special Mission Event Currency Requirements.

REQUIREMENT	CURRENCY	Semiannual Proficiency Requirements—	NOTES
<u>Phase II/Special Mission Currency Events</u>		Number Required	
Autopilot Gain Tuning (AGT)	30 days	6 if required	1
Night Operations	30 days	6 if required	2
Weapons Delivery (WD)	30 days	6 if required	1

NOTES:

1. Event may be updated using ground station simulations/mission rehearsals provided all SUAS operator test team members are present, and team coordination is practiced. Simulators may be used to update currency every other time. Submit waivers to this policy through AFRL/DO to AFMC/A3V.

2. For IOs, event may be updated using ground station simulations/mission rehearsals.

* Semiannual proficiency requirements will be prorated based on months available.

4.6. Cross-System, Multi-Qualification, and Multi-Event Currency. Normally, currency events must be accomplished independently in each system (airframe and autopilot). **Table 4.3** expands on where events may be combined for expediency to meet this basic requirement, where permissible. (T-2)

Table 4.3. Currency/Recurrency Restrictions and Cross-reference Matrix.

Event / Phase II Qualification	Cross-System Currency (Note 1)	Multi-Qualification Currency (Note 2)	Multi-Event Credit (Note 3)
Basic Currency/Proficiency Events			
Basic Sortie (live)	Y	Y (IOs only, on same autopilot)	
Basic Sortie (simulated – IOs only)	Y	Y (IO only, on same autopilot)	
Go Around Procedure			
GCS Handoff Procedures			
Simulated Emergency Recovery			
Phase II Mission Events			
Theater Indoctrination Training	Y (one-time)	Y (one-time)	
Local Area Orientation (LAO)	Y (one-time)	Y (one-time)	
Flight Test Orientation (FTO)	Y (one-time)	Y (one-time)	
Special Mission Events			
Autopilot Gain Tuning (AGT)	Y (EOs only, on same autopilot)	Y (on same autopilot)	
Night Operations	Y (IOs only)	Y (IOs only)	
Weapons Delivery (WD) Training			

NOTES: (Blank cells = "NO")

1. Cross-System Currency. A "Y" in this column indicates that an update to the currency updates that currency for all primary systems SUAS-Os are qualified in, within that Group.
2. Multi-Qualification Currency. A "Y" in this column indicates that an update to the qualification currency updates that currency across SUAS Groups, for all primary systems SUAS-Os are qualified in.
3. Multi Event Credit. A "Y" in this column indicates that a currency update of this event may update the currency of other event(s). See individual paragraphs or training plan descriptions for more details.

4.7. Updating/Regaining Currency. To update currency while still current, accomplish the event during the course of a relevant mission. Normally, to regain currency after expiration, accomplish the particular event under the supervision of a current SUAS-I in the same crew position and primary control system (External Operator=Airframe or Internal Operator=Autopilot). Table 4.4 expands on this base requirement where applicable, and for ease of reference consolidates all applicable guidance in AFI11-502V1AFMCSup1 and this instruction. (T-2)

Table 4.4. Regaining Currency Requirements.

EVENT	To Regain Currency [reference]				Cross-Systems Instructor? (Note 1)
If Length of Lapse in Currency is:	within 6 months of expiration, [11-502 p 1.7.1]	expired > 6 mo., [11-502 p 1.7.2]	expired > 24 mo., [11-502 p 1.8.1]	expired > 39 mo., [11-502 p 1.8.2]	
SUAS-O is considered:	Non-Current for that event	Unqualified in that Event	Unqualified in System & Crew Position		
Type of Supervision Required:	Current SUAS-I in like crew position & primary system		Current SUAS-I, and Evaluation with SUAS-E		
	PERFORM:				
<u>Phase I/Basic Currency Events</u>					
Basic Sortie	Delinquent Items	REQUAL/DIFF	All Phase 1	Entire Phase 1	Y
Go Around Procedure		program # of	REQUAL/DI	Phase 1	
GCS Handoff Procedures		items for	FF program	IQT	
Simulated Emergency Recovery Procedures		Delinquent Items	& crew position (requires	QUAL/CONV program in that	
<u>Phase II/Special Mission Currency Events</u> [reference para 3.1.2 of this instruction]					
SUAS-O is considered:	Non-Current for that Mission Event		Unqualified in that Mission Event		
Type of Supervision Required:	Current mission-event qualified SUAS-I in like crew position & primary system				
	PERFORM:				
Autopilot Gain Tuning (AGT)	Delinquent Items	REQUAL/DI	Entire Phase I IQT		Y (EOs Only)
Night Operations		FF program #	QUAL/CONV program		Y (IOs only)
Weapons Delivery (WD)		of items for that mission event	for that mission event		
NOTES:					
1. Cross-Systems Recurrency. A "Y" in this column indicates that an SUAS-I from another system or crew position can provide in-flight instruction to regain this currency, provided that SUAS-I possesses this qualification in their system & crew position, and is current.					

Chapter 5

UPGRADE QUALIFICATION TRAINING

5.1. General. Unit commanders and SUAS Leads/Training Managers will select only the best qualified SUAS Operators for upgrade training to Instructor or Evaluator status. Instructors must pass an initial and annual evaluation administered by an appointed evaluator. (T-3)

5.2. SUAS-I Upgrade. A sound and practical SUAS-I program is a prerequisite for effective training, standardization, and aircraft mishap prevention. Unit commanders will personally review each SUAS-I candidate's qualifications and select SUAS-Is based on their background, experience, maturity, and ability to instruct. The following characteristics must be considered:

5.2.1. Technical knowledge. The SUAS-I must be thoroughly familiar with respective aircraft systems and equipment, normal and emergency operating procedures, prohibited maneuvers and UAS performance under all conditions of flight. Additionally, all AFMC SUAS-Is must be thoroughly familiar with flight test management, flying training, and flying operations publications.

5.2.2. Flying experience prerequisites. SUAS-Is must possess reasonable flying experience to include desired standards of skill and proficiency in both the aircraft and assigned missions. Flying hours alone cannot be accepted as criteria for selection to SUAS-I.

5.2.3. Initial candidates. All initial AFMC SUAS-I upgrade candidates must be mission ready in their unit's mission for a minimum of 6 months, meet the AFI 11-502 Vol 1, Table 6.1 "Minimum Hours Required for Instructor Upgrade" requirements, and additional flying experience requirements identified in this paragraph, **Table 5.1:** (T-3)

Table 5.1. Minimum Takeoffs and Landings Required for Instructor Upgrade.

Group	Minimum T/Os+Ldgs – External Operator (Note 1)	Minimum T/Os+Ldgs – Internal Operator (Note 2)
1	50	25
2	50	50
3	50	50
<p>Note 1: External Operator Instructor candidates must also have performed 50 takeoffs and landings with the aircraft from that SUAS Group.</p> <p>Note 2: Internal Operator Instructor candidates for aircraft that perform takeoffs and/or landings under autopilot control must also have performed, as IOs, the same number of takeoffs and/or landings, in aircraft with the same autopilot and from that SUAS Group, as the Minimum Hours requirement in AFI 11-502 Vol 1, Table 6.1.</p>		

5.2.3.1. SUAS-I Requalification (Operators Previously Qualified as SUAS-Is). Follow Requalification guidelines per AFI 11-502, Vol 1 and AFMC supplement.

5.2.3.2. SUAS-I Transfers. See AFI 11-502, Vol 1 and AFMC supplement.

5.2.4. Ground and Flight Training Requirements. Before being designated a SUAS-I, candidates will demonstrate to a SUAS-E, on an Initial Instructor (INIT INSTR) evaluation, their ability to instruct and perform selected maneuvers and items according to applicable directives.

5.3. SUAS-E Upgrade. SUAS-Es are selected from the most qualified and competent SUAS-Is. Before being designated as a SUAS-E, candidates will demonstrate satisfactory knowledge of command training and evaluation policies and procedures. Conduct initial training IAW AFI 11-502, Vol 1, the AFMC supplement, and this AFI. Certification will be annotated in the individual's training records/folder. (T-3)

5.4. Other Special Mission Qualifications and Certifications. Reserved for future use. The commander will select SUAS-Os qualified in the unit's mission to maintain other additional special qualifications and certifications. Special mission events are not considered core mission events and are not required for mission ready status. SUAS-Is are authorized to teach any special mission events in which they are qualified and current unless specifically restricted.

Chapter 6

TRAINING RESTRICTIONS

6.1. Operating procedures and restrictions are located in AFI 11-5FT Volume 3.

SCOTT A. VANDER HAMM, Maj Gen, USAF
Deputy Chief of Staff, Operations

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFI 10-220 IP (DCMA INST 8210.1), *Contractor's Flight and Ground Operations*, 1 Mar 07

AFI 10-220 IP (DCMA INST 8210.1), AFMC SUP, *Contractor's Flight and Ground Operations*, 6 Nov 08

AFPD 11-5, *Small Unmanned Aircraft Systems (SUAS) Rules, Procedures, and Service*, 17 Aug 09

AFI 11-202V1, *Aircrew Training*, 22 Nov 2010

AFI 11-202V1 AFMC SUP 1, *Aircrew Training*, 25 Jul 2011

AFI 11-202V2, *Aircrew Standardization/Evaluation Program*, 13 Sep 2010

AFI 11-202V2 AFMC SUP 1, *Standardization/Evaluation Program*, 12 Jul 2011

AFI 11-202V3, *General Flight Rules*, 22 Oct 2010

AFI 11-202V3 AFMC SUP 1, *General Flight Rules*, 25 Aug 2011

AFI 11-214, *Air Operations Rules and Procedures*, 14 Aug 2012

AFI 11-218, *Aircraft Operations and Movement on the Ground*, 28 Oct 2011

AFI 11-218 AFMC SUP, *Aircraft Operations and Movement on the Ground*, 21 Mar 2013

AFI 11-502V1, *Small Unmanned Aircraft Systems Training*, 26 Apr 2012

AFI 11-502V2, *Small Unmanned Aircraft Systems Standardization/Evaluation Program*, 26 Apr 2012

AFI 11-502V3, *Small Unmanned Aircraft Systems Operations*, 26 Apr 2012

AFI 13-212, *Range Planning & Operations*, 16 Nov 2007

AFMAN 33-363, *Management of Records*, 1 Mar 2008

AFI 33-360, *Publications and Forms Management*, 25 Sep 2013

Forms Adopted

AFMC Form 67, *Ground Training Record*

AFMC Form 68, *Flying Training Record*

AFMC Form 69, *Flying Training Comments*

AFMC Form 73, *AFMC/A3V Waiver Request*

AFMC Form 80, *Multiple Qualification Request and Authorization*

AF Form 8, *Certification of Aircrew Qualification*

AF Form 8a, *Certification of Aircrew Qualification (Multiple Aircraft)*

AF Form 4348, *USAF Aircrew Certifications*

AF Form 1381, *USAF Certification of Aircrew Training*
AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

AFI—Air Force Instruction
AFMAN—Air Force Manual
AFPAM—Air Force Pamphlet
AFPD—Air Force Policy Directive
AFMC—Air Force Materiel Command
AFRC—Air Force Reserve Command
AFSOC—Air Force Special Operations Command
AGL—Above Ground Level
ANG—Air National Guard
ATC—Air Traffic Control
COA—Certificate of Authorization
CONUS—Continental United States
DoD—Department of Defense
EP—Emergency Procedures/Evaluator Pilot
FAA—Federal Aviation Administration
FAR—Federal Aviation Regulation
FLIP—Flight Information Publication
GCS—Ground Control Station
IAW—In Accordance With
ICAO—International Civil Aviation Organization
IFR—Instrument Flight Rules
MAJCOM—Major Command
MSL—Mean Sea Level
NAS—National Airspace System
ORM—Operational Risk Management
PMC—Partial Mission Capable
R/C—Radio Control
SOF—Supervisor of Flying
Stan/Eval—Standardization and Evaluation

SUA—Special Use Airspace

SUAS—Small Unmanned Aircraft Systems

SUAS-E—Small Unmanned Aircraft Systems Evaluator

SUAS-I—Small Unmanned Aircraft Systems Instructor

SUAS-O—Small Unmanned Aircraft Systems Operator

TTP—Tactics, Techniques and Procedures

UAV—Unmanned Aerial Vehicle

UAS—Unmanned Aircraft System

USAF—United States Air Force

VFR—Visual Flight Rules

VMC—Visual Meteorological Conditions

Terms

Airlift—Aircraft is considered to be performing airlift when cargo is carried.

Air traffic—Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.

Bingo Fuel/Battery—The computed fuel or battery capacity remaining at a point in flight that will allow safe return to the point of intended landing with required reserve.

Catastrophic failure—Any failure that leads to the loss or destruction of the UA.

Command Chief Operator—An aircrew assigned to HQ AFMC/A3V or an appointee that assists the HQ Stan/Eval team and conducts flight evaluations on behalf of the headquarters

Critical Phase of Flight—Takeoff, low level (below MSA defined by 14 CFR 91.119), approach and landing.

Director—AFMC civilian equivalent having the same authority as a Squadron Commander

Direct Instructor Supervision—Supervision by an instructor of like specialty with immediate access to controls (for pilots, the instructor must occupy either the pilot or copilot seat).

Due Regard—Operational situations that do not lend themselves to International Civil Aviation Organization (ICAO) flight procedures, such as military contingencies, classified missions, politically sensitive missions, or training activities. Flight under “Due Regard” obligates the military aircraft commander to be his or her own air traffic control (ATC) agency and to separate his or her aircraft from all other air traffic. (See FLIP General Planning, section 7).

Estimated Time In Commission (ETIC)—Estimated time required to complete required maintenance.

Evaluator (SUAS-E)—A SUAS crewmember who conducts evaluation of SUAS-Os, SUAS-Is and evaluators in designated SUAS and promotes safety among crew members. Evaluation includes air vehicle operation, qualification, unit employment, visual flight, and crew performance.

Execution—Command-level approval for initiation of a mission or portion thereof after due consideration of all pertinent factors. Execution authority is restricted to designated command authority.

External Operator (EO)—The SUAS crewmember who, in the absence of full automatic takeoff and landing systems, visually controls the UA flight path, generally during takeoff and/or landing.

Familiar Field—An airport in the local flying area at which unit assigned aircraft routinely perform transition training. Each operations group commander will designate familiar fields within their local flying area.

Fix—A position determined from terrestrial, electronic, or astronomical data.

Fuel—

Normal Fuel—Fuel state on initial or at the final approach fix such that the aircraft can land with the fuel reserves specified in AFI 11-5FT Vol 3.

Minimum Fuel—Fuel state, where, upon reaching the destination, the aircraft can accept little or no delay. This is not an emergency situation but merely indicates an emergency situation is possible should any undue delay occur.

Emergency Fuel—Fuel state requires immediate traffic priority to safely recover the aircraft. An emergency will be declared and the aircraft immediately recovered at the nearest suitable field.

Initial Cadre—Those personnel assigned to conduct flight testing of experimental, developmental, or new aircraft for which there are no established formal training programs nor standardized evaluation criteria. Initial Cadre designations are appropriate through Initial Operational Capability.

Instructor (SUAS-I)—A SUAS crewmember who conducts training and evaluation of SUAS-Os and SUAS unit trainers in designated SUAS and promotes safety among crew members. Training and evaluation include air vehicle operation, qualification, unit employment, visual flight, and crew performance.

Instructor Supervision—Supervision by an instructor of like specialty (see also Direct Instructor Supervision).

Internal Operator (IO)—An SUAS crewmember that operates the UA from within a control station that exercises complete control over the air vehicle.

Inter-fly—The exchange and/or substitution of aircrews and aircraft between other MAJCOMS and AFMC. These forces are not gained by AFMC.

Knock-it-Off—A term any crewmember may call to terminate a training maneuver. Upon hearing “knock-it-off” the crew will establish a safe altitude, airspeed and return the aircraft power and flight controls to a normal configuration.

Landing—For purpose of this AFI, includes all actions appropriate to transition the UA from flight to the ground (e.g., recovery, wheeled or skid landing, parafoil recovery, deep stall landing, arrested engagement, etc.)

Landing Zone (LZ)—An area of sufficient size to allow discharge or pickup of passengers or cargo by touchdown or low hover.

Lead SUAS-O—The person who has been designated as Lead SUAS-O (Pilot-In-Command-equivalent) before or during the flight. The person who has final authority and responsibility for the operation and safety of flight, has been designated as Lead-SUAS-O before or during the flight, and holds the appropriate qualifications, as appropriate, for the conduct of the flight. The responsibility and authority of the pilot in command as described by 14 CFR 91.3, *Responsibility and Authority of the Pilot in Command*, apply to the Lead SUAS-O. The Lead SUAS-O position may rotate duties as necessary with equally qualified operators. The individual designated as Lead SUAS-O may change during flight. See “Pilot In Command” for further details.

Letter of Xs (LOX)—A document used in AFMC, signed by appropriate authority, that lists each assigned/attached aircrew’s aircraft designation, crew position, and mission qualifications.

Local Training Mission—A mission scheduled to originate and terminate at home station (or an off-station training mission), generated for training or evaluation and executed at the local level.

Low Altitude Navigation Leg—Low altitude navigation leg is that portion of the route designed primarily for low altitude flight; does not include segments intended for descent into and climb-out from the route.

Maintenance Status—

Code 1—No maintenance required.

Code 2 (Plus Noun)—Minor maintenance required, but not serious enough to cause delay. Add nouns that identify the affected units or systems, i.e. hydraulic, ultra high frequency (UHF) radio, radar, engine, fuel control, generator, etc. Attempt to describe the nature of the system malfunction to the extent that appropriate maintenance personnel will be available to meet the aircraft. When possible, identify system as mission essential (ME) or mission contributing (MC).

Code 3 (Plus Noun)—Major maintenance. Delay is anticipated. Affected units or systems are to be identified as in Code 2 status above.

Manmade Obstructions—Structures which present a hazard to flight. Structure height is measured from the ground-base.

Mission Essential Personnel (MEP)—Personnel who are required for the execution of the aircraft or unit mission, to include follow-on missions. Includes additional aircrew members and other personnel not authorized AOs who are tasked to perform ground support duties at enroute locations or destination points that are directly related and essential to accomplishment of the aircraft or unit mission, e.g. a specialist or technician required to provide aircraft support or a security team required to guard the aircraft. MEP may include military staff personnel when those individuals are required to accompany a senior officer.

Mission. 1—The task, together with the purpose, that clearly indicates the action to be taken and the reason therefore. **2.** In common usage, especially when applied to lower military units, a duty assigned to an individual or unit; a task. **3.** The dispatching of one or more aircraft to accomplish one particular task.

Mission Commander (MC)—The designated individual tasked with the overall responsibility for the operation and safety of the SUAS mission.

Mission Contributing—Any degraded component, system, or subsystem which is desired, but not essential to mission accomplishment.

Mission Essential (ME)—A degraded component, system, or subsystem which is essential for safe aircraft operation or mission completion.

Off-Airport—Any location used to launch or recover an unmanned aircraft that is not considered an airport (i.e., an open field).

Off Station Training Flight—A training flight that originates or terminates at other than home station that is specifically generated to provide the aircrew experience in operating away from home station. Off station trainers will not be generated solely to transport passengers, cargo, or position/deposition crewmembers.

Operational Risk Management (ORM)—A logic-based common sense approach to making calculated decisions based on human, machine, mission, and media factors before, during, and after Air Force operations. It enables commanders, functional managers and supervisors to maximize operational capabilities while minimizing risks by applying a simple systematic process appropriated for all personnel and Air Force functions.

Operational Site—An LZ that has (1) been surveyed by an instructor pilot (IP) experienced in remote operations to ensure no hazards exist, (2) a photograph available for aircrews to study the site prior to landing and (3) approval from the responsible FOA to be designated an operational site. Whenever practical, operational sites will have permanently installed and properly maintained wind indicators (wind sock, streamer, etc.).

Originating Station—The base from which an aircraft starts on an assigned mission. May or may not be the home station of the aircraft.

Over Water Flight—Any flight that exceeds power off gliding distance from land.

Pilot in Command (PIC)—For SUAS operations, the term “Lead SUAS-O” is used as the PIC-equivalent role in lieu of the term “PIC.” The person who has final authority and responsibility for the operation and safety of flight, has been designated as pilot in command before or during the flight, and holds the appropriate category, class, and type rating, if appropriate, for the conduct of the flight. The responsibility and authority of the pilot in command as described by 14 CFR 91.3, *Responsibility and Authority of the Pilot in Command*, apply to the unmanned aircraft PIC-equivalent, the Lead SUAS-O. The pilot in command position may rotate duties as necessary with equally qualified pilots. The individual designated as PIC may change during flight.

Significant Meteorological Information (SIGMET)—Area weather advisory issued by an ICAO meteorological office relayed to and broadcast by the applicable ATC agency. SIGMET advisories are issued for tornadoes, lines of thunderstorms, embedded thunderstorms, large hail, sever and extreme turbulence, severe icing, and widespread dust or sand storms. SIGMET frequently covers a large geographical area and vertical thickness. They are prepared for general aviation and may not consider aircraft type or capability.

Squadron Top 3—Squadron Assistant Director of Operations (ADO), Director of Operations (DO), Commander (CC).

Takeoff—For purposes of this AFI, includes all actions required to transition the UA from ground to flight (e.g. launch, throwing, catapulting, wheeled takeoff, etc.).

Temporary - 2 Modification—T-2 modifications are temporary modification required to support research, development, test, and evaluation (RDT&E), in service testing of potential replacement items (form, fit, and function), and for aircraft/stores compatibility testing.

Training Mission—Mission executed at the unit level for the sole purpose of aircrew training for upgrade or proficiency. Does not include operational missions as defined in this AFI.

Unilateral—Operations confined to a single service.

Unmanned Aircraft (UA)—An aircraft capable of flight beyond visual line of sight under remote or autonomous control for military purposes, primarily for reconnaissance, surveillance, and other intelligence gathering missions, as well as for the adjustment of artillery and mortar fire, and may be used in an aerial target spotting/identification role. A UA can be expendable or recoverable, can carry a payload, is not operated for sport or hobby, and does not transport passengers or crew. For purposes of compliance with 14 CFR 1, subchapter A, part 1.1., UAs are to be considered “aircraft,” typically either an “airplane” or “rotorcraft,” as defined in 14 CFR 1, subchapter A, part 1.1. (FAA refers to these aircraft as remotely operated aircraft (ROA)).

Unmanned Aircraft System (UAS)—The entire unmanned aircraft system used to operate, communicate, and fly an unmanned aircraft (UA). This includes the Unmanned Aircraft (UA), Ground Control Station (GCS), Remote Video Terminal (RVT), and Communications equipment; can also include video capture device and portable computer.

Visual Contour Flight—Operation at a predetermined altitude above the ground, following contours visually using the radar altimeter to crosscheck altitude. An operating radar altimeter is required.

Visual Line-of-Sight—A method of control and collision avoidance that refers to the pilot or observer directly viewing the unmanned aircraft with human eyesight. Corrective lenses (spectacles or contact lenses) may be used by the pilot or visual observer. Aids to vision, such as binoculars, field glasses, or telephoto television may be employed as long as their field of view does not adversely affect the surveillance task.

Visual Reconnaissance—Aerial survey of areas, routes, or LZs.

Zero Fuel Weight—Weight, expressed in pounds, of a loaded aircraft not including wing and body tank fuel. All weight in excess of the maximum zero fuel weight will consist of usable fuel.

Attachment 2**SUAS GROUP 1 TRAINING GUIDELINES**

A2.1. General. AFI 11-502 Volume 1, AFMC Supplement 1, this instruction and approved test plans will be used to qualify AFMC crewmembers in Group 1 SUAS (initial, requalification, conversion, difference, mission, and upgrade training) as applicable.

Attachment 3

SUAS GROUP 2 TRAINING GUIDELINES

A3.1. General. AFI 11-502 Volume 1, AFMC Supplement 1, this instruction and approved test plans will be used to qualify AFMC crewmembers in Group 2 SUAS (initial, requalification, conversion, difference, mission, and upgrade training) as applicable.

Attachment 4**SUAS GROUP 3 TRAINING GUIDELINES**

A4.1. General. AFI 11-502 Volume 1, AFMC Supplement 1, this instruction and approved test plans will be used to qualify AFMC crewmembers in Group 3 SUAS (initial, requalification, conversion, difference, mission, and upgrade training) as applicable.