
Small Unmanned Aircraft System Crew Training Program

January 2020

DISTRIBUTION RESTRICTION. Copywrite: IM Davis, 2020

To receive publishing rights and updates contact:
irldavis@gmail.com

Small Unmanned Aircraft System Crew Training Program

	Page
PREFACE.....	v
Chapter 1 INTRODUCTION.....	1-1
Responsibilities	1-1
Chapter 2 CREW TRAINING PROGRAM.....	2-1
Overview	2-1
Standardization Program	2-2
Manager's Evaluation	2-2
Mission-Level Status Progression	2-3
Mission Preparation.....	2-3
Mission Qualified	2-3
Training Year	2-3
Failure to Meet Crew Training Program Requirements.....	2-4
Removal from Mission Qualified Status.....	2-4
Currency	2-5
Chapter 3 EVALUATION.....	3-1
Evaluation Principles	3-1
Semi-Annual Proficiency and Readiness Test.....	3-1
No-Notice Evaluation.....	3-2
Proficiency Flight Evaluation.....	3-2
Grading Considerations.....	3-2
Conducting Evaluations.....	3-2
Local Area Orientation.....	3-5
Chapter 4 TEAM TASK DEVELOPMENT.....	4-1
Crew Training Manual Task Model Development	4-1
Task Format.....	4-1
Chapter 5 TEAM TRAINING.....	5-1
Training Program Requirements	5-1
Training Prerequisites.....	5-1
Task Considerations.....	5-1

Contents

	Training Strategy	5-2
Chapter 6	INDIVIDUAL OPERATOR TRAINING RECORD	6-1
	Individual Operator Training Record Requirements	6-1
	Company Form 7122-R	6-1
	Company Form 4507-R	6-6
	Company Form 4507-1-R	6-8
	Company Form 4507-2-R	6-10
Chapter 7	COMPOSITE RISK MANAGEMENT	7-1
	General	7-1
	Composite Risk Management Concept	7-1
	Responsibilities	7-2
	Leaders	7-2
	Safety Officer.....	7-4
	Crews.....	7-4
	Individuals	7-4
	Composite Risk Management Training.....	7-4
	Composite Risk Management Process.....	7-4
	Risk Assessment Tools.....	7-6
Appendix A	SMALL UNMANNED AIRCRAFT SYSTEM TASKS.....	A-1
	GLOSSARY	Glossary-1
Appendix B	Example Flight Test Method	A-2

Figures

Figure 4-1. Example of task format.....	4-2
Figure 4-2. Warning, caution, and note examples	4-3
Figure 4-3. Individual task condition statements examples	4-4
Figure 4-4. Condition statement issues.....	4-5
Figure 4-5. Special condition statement example.....	4-5
Figure 6-1. Sample Form 7122-R, page 1.....	6-4
Figure 6-2. Sample Form 7122-R, page 2.....	6-5
Figure 6-3. Sample Form 4507-R, page 1.....	6-7
Figure 6-4. Sample Form 4507-R, page 2.....	6-8
Figure 6-5. Sample Form 4507-1-R	6-9
Figure 6-6. Sample Form 4507-2-R	6-11
Figure 7-1. Composite risk management steps.....	7-5
Figure 7-2. Probability chart	7-7
Figure 7-3. Risk assessment matrix.....	7-7

Tables

Table 4-1. Task performance criteria	4-6
Table A-1. Small unmanned aircraft system task list	A-1

Preface

This Training Program standardizes Crew Training Programs (CTPs) and flight evaluation procedures. This crew training manual (CTM) provides specific guidelines for executing small unmanned aircraft system (SUAS) crew training. This CTM establishes crewmember qualification, refresher, mission, and continuation training and evaluation requirements. This manual applies to all SUAS crewmembers and their managers unless otherwise stated, and any unmanned aircraft system (UAS) crewmembers and their managers not covered by another CTM.

This manual is not a stand-alone document; all the requirements contained in Company Policies must be met.

The operator's manual is the governing authority for operation of the aircraft. If differences exist between the maneuver descriptions in the operators' manual and this manual, then this manual is the governing authority for training and flight evaluation purposes only. If a conflict exists between this manual, the CTP manager determines the method of accomplishment based upon the requirement and the team's mission as to which manual takes precedence.

This manual in conjunction with FAA regulations will help SUAS managers at all levels; develop a comprehensive CTP. By using this CTM, managers ensure that individual crewmembers and crew proficiency commensurate with the organizations mission and that unmanned aircraft crewmembers (UAPs) routinely employ standard techniques and procedures.

Instructors will use this manual as a "how to" source for performing crewmember duties. It provides performance standards and evaluation guidelines so that crewmembers know the level of performance expected. Each task provides a description of how the task should be performed to meet the standard. CTP managers of the Company, and all departments operating the SUAS will use this CTM to develop individual managers task lists for assigned operators. CTP managers will assign instructor/operators to assist in developing individual managers' task lists tailored to the current position using this CTM.

Managers and master trainers (MTs) will use this manual, as the primary tools to assist the manager in developing and implementing the CTP.

Chapter 1

Introduction

1-1. The training objective of any team is for the team to be able to conduct combined training (CT). The SUAS crew training program (CTP) focuses on individual and crew training. Once the manager establishes individual and crew training programs, it must integrate them into an effective collective training program. linking individual and team collective tasks. The design and management of an effective training program requires the manager to analyze each of these elements. The mission essential task list (METL) identifies collective training and defines the manager as a member of the combined team. To ensure the proficiency of Company SUAS operators in the combined effort, individual proficiency in tasks required to operate an SUAS is essential.

RESPONSIBILITIES

MANAGER

The manager is the primary training manager and trainer for the team and is responsible for safety programs, standardization programs, and the CTP. The manager bases training on the team's mission, maintains standards, and evaluates proficiency. The manager also provides the required resources and develops and executes training plans that result in proficient individuals, leaders, and teams. The manager has subordinate supervisors that help him or her plan and prepare SUAS training.

MASTER TRAINER

1-3. The SUAS MT is the manager's technical advisor. The MT helps the manager develop, implement, and manage the CTP. The MT designated to conduct initial Qualification training will conduct this training in accordance with the approved SUAS training package.

1-4. To perform MT duties, the MT will be current and mission qualified (MQ) in the SUAS in which the MT will be performing his or her duties. The MT will conduct team Qualification (mission level [ML] progression), refresher, transition differences training approved SUAS training package and continuation training only for personnel who have completed an approved SUAS initial Qualification course. Upon completion of the approved MT course or Evaluation and Standardization equivalency, the manager has the authority to appoint MTs.

1-5. Those MTs selected to conduct initial Qualification training approved program of instruction, will be designated by the manager. Initial Qualification training will be managed by a designated MT that is a qualified graduate of the MT course, and current. This provision is effective when the team Qualification training program" is approved and implemented manual.

AIRCRAFT OPERATOR

1-6. These individuals perform duties that are essential to the operation of the SUAS.

This page intentionally left blank.

Chapter 2

Crew Training Program

This chapter describes requirements for team qualification, refresher and continuation training. The SUAS CTP standardizes UAP training and evaluations to ensure readiness. Crewmember qualification requirements will be in this Crew Training Manual (CTM).

Note. This CTM uses many terms with which SUAS operators may not be familiar. Understanding of these terms is necessary in the use of this Publication; therefore, this chapter explains these terms as appropriate.

OVERVIEW

2-1. Goal and applicability. The goal of the CTP is to produce mission ready SUAS operators. The CTP outlined in this CTM is mandatory for all crewmembers that perform duties controlling the flight of an SUAS or the operation of its mission equipment, as well as preparation, launch, and recovery tasks essential to operate the SUAS. The CTP includes requirements for tasks (see appendix A), SUAS simulator, Mission Level (ML) progression, and the Semi-Annual Proficiency and Readiness Test.

Note. The team manager may excuse a UAP (Unmanned Aircraft Pilot) scheduled for retirement or separation from active duty from all CTP requirements. The UAP may be excused beginning no earlier than 6 months prior to their scheduled retirement or separation te. However, UAPs who are excused are prohibited from performing further UAP flight duties.

2-2. Individual/crew qualification. Operators arrive at the organization with various levels of experience. They are recent graduates of a SUAS Remote Pilot License and are proven operators with various SUAS backgrounds. These crew members progress from mission preparation will be based on a manager's evaluation/proficiency flight evaluation (PFE) by demonstrating proficiency in tasks required (see appendix) and those tasks selected by the manager based on the team's Mission. If required, prior to designation, training must be conducted and assessed by the appropriate SUAS MT. This process is explained in detail in this Manual. This is a prescriptive process and must be followed to ensure standardization across the organization.

2-3. Mission qualified. MQ operators are those who have completed ML progression training and demonstrated proficiency to be a member of a crew. MQ operators train as crews to sustain and continually improve task proficiency, proficiency in the conduct of the team's unique Mission requirements and refine the skills necessary to perform as part of the team.

2-4. Simulators. Simulation is very useful in the conduct of training. Simulators are excellent resources in training emergency procedures, maneuvers that are infrequently conducted with the unmanned aircraft (UA), and as a rehearsal tool for complex portions of operations. They can also be used to correct negative trends found through analysis of accidents, and to practice those skills in a low risk environment. As the fidelity of our simulators improves, environmental training can be very beneficial to our crews.

STANDARDIZATION PROGRAM

2-5. Proficiency versus currency. The Technology of modern UAV's has exponentially increased the capabilities of SUAS organizations, creating diverse operational and training challenges. These increased capabilities require a higher degree of individual and crew proficiencies in very complex mission equipment packages, sometimes compounded by harsh flight environments. An CTP that focuses on operator currency rather than proficiency will no longer satisfy SUAS readiness requirements and will be a detriment to training and safety.

2-6. The objectives of a standardization program are the improvement and sustainment of proficiency and readiness among operators and teams throughout the organization. Standardization is accomplished through the use of approved practices, procedures, and standards.

2-7. Standardization roles. The manager with SUAS assets is responsible for the team's standardization program. The manager must include standardization throughout the overall training strategy. The manager's primary staff members include subordinate managers and team MTs. Standardization must be implemented in all training tasks. Standardization enables teams of any size— crews, multiple-aircraft formations, teams, units, companies, —to readily function together to accomplish the mission.

2-8. CTP implementation. This Publication is the manager's guide for implementing the CTP.

2-9. Integrating operators into the CTP. Upon joining a team, operators designated for the mission as SUAS operators are members of the team's CTP. Within 14 years of joining the team, operators must present their training folder, if applicable, to the manager or the manager's designated representative. If the training folder is not available, operators will provide the MT with appropriate logbooks and account information. ML status determination is per the manager's evaluation.

MANAGER'S EVALUATION

2-10. Purpose. The purpose of the manager's evaluation is to determine the proficiency and initial Mission Level (ML) status of newly assigned operators. This evaluation consists of a records review and a PFE (Pilot Flight Exam), if required. The manager or MT will complete the evaluation within 45 calendar days after the operator is designated for a mission as an SUAS operator.

2-11. Records review. Team managers, or their designated representative (MT), will review the operator's training folder. They will compare the individual's qualifications with the tasks required by the assigned position. If the appropriate ML status can be determined from the records review, the manager will document the ML status on the Crew Member Training Record.

2-12. PFE. If the initial ML status cannot be determined by the records review or if the manager desires, the operator will undergo a PFE. The PFE should include tasks from each flight mode in which the operator can expect to perform duties. The results of the PFE will determine the operator's ML status. The manager will document the ML status on the individual's record.

2-13. Considerations. If, at the time of initial ML status designation, 6 months has passed since the operator has completed any element of an evaluation or SUAS operator's manual examination, the operator must complete that element before designation as, or progression to, MQ (Mission Qualified). Graduates of an SUAS course who are on their first utilization tour are exempt from this requirement; therefore, managers may not assign these individuals an initial mission qualified status solely on the basis of a records review.

2-14. Required training. After determining the initial ML (Mission Level) status, the manager will direct team qualification (ML progression training), refresher (if Pilot has not flown in 180 ys), or continuation (all training and evaluations used for developing proficiency) training for the operator as applicable. Time allotted for completion of the required training will start accruing on the day of the ML status designation. If recommended by the MT, operators may credit the flight tasks satisfactorily completed on the PFE toward completion of their ML status training requirements.

MISSION-LEVEL STATUS PROGRESSION

2-15. Definition. MLs are the training status Classifications of the individual operator. They identify the training phase in which the operator is participating and measure readiness to perform assigned missions. The MLs provide a logical progression of SUAS training based on task proficiency.

2-16. Progression requirements. Operators will progress in ML status by completing tasks in all areas of the SUAS. Once the operator begins training, he or she will have 90 consecutive ys to advance from mission preparation to mission qualified status. Once MQ, the operator will have to perform the minimum requirements to maintain this status.

2-17. Exclusion period. ML status progression will exclude years lost due to—

- Medical or nonmedical suspension from operations.
- Approved Vacation.
- Grounding of SUAS.
- Non-availability of SUAS due to maintenance or operational considerations, including movement to deployment/redeployment and aircraft preset/reset; preset/reset requirements only apply if 50 percent of the team's aircraft are not available.
- Documented flight cancellations due to weather and/or maintenance that have had a significant impact on flight operations, as well as restrictions to flight operations

2-18. If the exclusion period exceeds 45 consecutive ys, the operator must restart the ML progression cycle. The operator will have 90 consecutive ys from this point to progress to the MQ status level. When an operator has not progressed within the required period, the team manager will investigate, and based on his or her findings, take action according to appropriate directives.

MISSION PREPARATION

2-19. An operator who has been initially designated mission preparation (MP), based on the manager's evaluation, will begin training on all critical and team selected tasks as designated by the team manager. MP programs help operators verify and develop their ability to perform specific tasks that support the team's Mission. Because the goal is proficiency in mission-related tasks, managers should tailor their task list to meet specific team needs. An operator progresses from MP to MQ by demonstrating proficiency in all base selected tasks to an MT. An operator has 90 consecutive ys to progress from MP to MQ. An operator may progress to the MQ status in less time than prescribed in paragraph 2-16 by demonstrating proficiency to an MT.. All MP operators will only operate the system with an MT present and positioned to gain full access to the controls.

MISSION QUALIFIED

2-20. An operator who has completed MP training is considered mission ready and designated MQ. The operator must perform those tasks designated by the team manager for the operator's table of organization and equipment or table of distribution and allowance position.

TRAINING YEAR

2-21. The CTP training year is divided into semiannual training periods. The first training period begins the first y of October and continues for 6 months. The second training period begins the first y of April and continues through the end of the fiscal year.

FAILURE TO MEET CREW TRAINING PROGRAM REQUIREMENTS

2-22. Investigations. When CTP requirements are not met, the manager will conduct an investigation. The manager will complete the investigation within 30 ys of Notification of the failure. After the investigation, the manager will—

- Take one of the following two actions:
 - Extensions of up to 30 ys may be given on a one time basis to complete the requirements. The 30-y extension will start after the manager completes the investigation.
- Restrict operators from performing duties with the SUAS until CTP requirements are met.
- Restrict operators who fail a hands-on performance test from performing the duty for which he or she was evaluated and failed. The restriction will apply to all SUAS with similar operating and handling characteristics. Restrictions will be entered in the operator's file and will remain in effect until successful completion of a re-evaluation.
- When the failure is in the operator's primary SUAS, the manager must—
 - Re-designate the individual to MP.
 - Authorize additional training if necessary.
- When the failure is in the operator's additional or alternate SUAS, the manager must—
 - Re-designate the individual to MP.
 - Authorize additional training if necessary.
 - Re-evaluate, retrain or restrict the UAP from performing duties in that SUAS.

Note. A primary SUAS is that the UAP primarily operates for that team. An additional SUAS would be another SUAS that the UAP is also trained on that is of the same type. If the UAP were also trained on a rotary-wing UAS, this would be considered an alternate UAS.

2-23. Team waivers. Team waivers for primary SUAS CTP requirements may be granted only by managers of the following:

- Direct reporting VO's.
- Company Managers

2-24. Waiver authorization. Managers, may grant team waivers and/or extensions to CTP requirements for teams under their responsibility. These managers may grant team extensions for up to 180 ys from their self-established "start training day" after redeployment.

2-25. Individual waivers. Individual waivers to primary SUAS CTP requirements may be granted by the manager.

REMOVAL FROM MISSION QUALIFIED STATUS

2-26. Training deficiency. An operator removed from MQ status for a training deficiency must still meet all MQ CTP requirements. CTP requirements met while in a MP status will be applied to the MQ requirements.

2-27. Other than a training deficiency. An operator has until the end of the training period to complete CTP requirements. If an operator is removed from MQ status for other than a training deficiency before the end of the training period (for example, a permanent change of station departure), his or her CTP requirements no longer apply.

CURRENCY

2-28. Frequency. To be considered current, an SUAS operator must—

- Perform a launch, a recovery, and a 15-minute flight of the SUAS or utilization of a compatible simulator every 30 consecutive ys.
- Perform a launch, a recovery, and a 15-minute flight of the SUAS every 150 consecutive ys.

2-29. Tracking. Tracking actual flight time for a flying is required. Individual flight records folders are required; also, documentation of flight operations (sorties) for the purpose of tracking currency is required.

2-30. Currency lapse. The SUAS operator whose currency has lapsed must complete a proficiency flight evaluation. Simulators may not be used to reestablish currency.

2-31. Waivers. Waivers to currency may not be granted

2-32. Similar unmanned aircraft systems. Currency in one series SUAS will satisfy the requirement for all SUAS within the series or group; separate currency is required for all other SUAS.

This page intentionally left blank.

Chapter 3

Evaluation

This chapter describes evaluation principles and considerations. It also contains guidelines for conducting academic and hands-on performance testing. Evaluations are a primary means of assessing flight standardization and operator proficiency and are a key part of the Company standardization process.

EVALUATION PRINCIPLES

3-1. The value of any evaluation depends on strict adherence to the fundamental principles described below.

- Selection of MTs. The selection of MTs must not be based only on technical qualifications. Criteria for selecting MTs should include demonstrated performance, objectivity, powers of observation, maturity, judgment, the ability to effectively mitigate risk, and the ability to provide constructive comments.
- Method of evaluation. The method of evaluation must be based on uniform and standard objectives. In addition, the evaluation method must be consistent with the team's mission and adhere to the appropriate standing operating procedures (SOPs) and regulations.
- Participant understanding. Complete understanding of the purpose of the evaluation, by all concerned, is essential. Moreover, the evaluation must be conducted in a manner that is purpose-oriented.
- Participant cooperation. Cooperation by all participants is necessary to fulfill the evaluation's objectives. The emphasis is on all of the participants, not just the examinee.
- Training needs identification. The evaluation must produce specific findings to identify training needs. General comments do not always provide the direction and guidance essential for improvement. The evaluation must pinpoint both strengths and weaknesses.
- Purpose of evaluation. The evaluation will determine the examinee's ability to perform essential hands-on/academic tasks to prescribed standards. Flight evaluations also will determine the examinee's ability to exercise crew coordination in completing these tasks.

Note. All evaluations of an MT will be conducted by an MT.

SEMI-ANNUAL PROFICIENCY AND READINESS TEST

3-2. Purpose and components. This measures an operator's proficiency and readiness. It consists of a written examination and a hands-on performance test evaluated by an MT as follows:

- SUAS operator's written examination. This open-book exam is prepared at the local level and consists of 25 objective questions that cover the SUAS operator's manual, local airspace, regulations, SOPs, and other pertinent topics as determined by the manager and MT. The minimum passing score is 70 percent.
- Hands-on performance tests. This component consists of oral and flight position evaluations.
 - Paragraph 3-12 lists of oral subjects for the hands-on performance.
 - The appendix lists the evaluation tasks for the hands-on performance.

3-3. Evaluation periods. MQ operators must pass each component of the test during their evaluation periods. These periods are the two-month period ending on March 30th for the first semiannual training period and the two-month period ending on the last y of the fiscal year. While deployed to

designated areas, the manager should consider reducing this evaluation requirement to once annually. At the end of the training year, the manager must certify that each operator has completed all requirements. This action serves to recertify the operator in his or her designated duty position(s). An operator designated MQ at any time within this two-month period must complete all evaluation requirements. Operators receive credit for the operator's written examination and hands-on performance test during mission preparation if they complete the tests within the two-month period.

3-4. Training deficiencies. Operators participating in MP programs are not subject to the monthly evaluations. Operators removed from MQ status due to a training deficiency are subject to the flight evaluations.

NO-NOTICE EVALUATION

3-5. A comprehensive no-notice evaluation program is a valuable tool that allows managers to monitor training effectiveness at all levels. Each manager must establish a no-notice proficiency evaluation program in the team SOP. No-notice evaluations may be written, oral, hands-on flight evaluation in a UA/compatible flight simulator, or a combination thereof. Ten percent of these evaluations must be hands-on flight evaluations. This program measures the effectiveness of individual, crew, and collective training. Managers use the results of no-notice evaluations to ensure team standardization and readiness and to tailor the team's individual, crew, and collective training programs. Each operator will receive at least one no-notice evaluation per year.

PROFICIENCY FLIGHT EVALUATION

3-6. Administration. The manager directs and administers the PFE using the guidelines established in paragraph 2-12. This evaluation is conducted to determine—

- The individual's ML status upon assignment to the team if the readiness level cannot be determined through a records review.
- The individual's proficiency when SUAS currency has lapsed.
- The individual's proficiency when questioned by the manager.

3-7. Records. After the evaluation, the MT will debrief the individual and complete records.

GRADING CONSIDERATIONS

3-8. Oral evaluation. The examinee must demonstrate a working knowledge and understanding of the subject areas presented. The MT will assess the examinee's knowledge during the oral evaluation.

3-9. Hands-on test. Performance standards are based on an ideal situation. Grading is based on meeting the minimum standards. The MT must consider deviations from the ideal during the evaluation and make appropriate adjustments if other than ideal conditions exist.

CONDUCTING EVALUATIONS

3-10. Purpose, sequence and procedures. Evaluations are conducted to determine the operator's ability to perform appropriate duties. Phase 1 and phase 4 are always required. The MT will determine the amount of time devoted to each phase. When the examinee is a MT, the recommended procedure is for the MT to reverse roles with the examinee. When the MT uses this technique, the examinee must understand how the role-reversal will be conducted and when it will be in effect.

PHASE 1-INTRODUCTION

3-11. In this phase, the MT—

Evaluation

- Reviews the examinee's records to verify that the examinee meets all prerequisites for the qualification
- Confirms the purpose of the flight evaluation, explains the evaluation procedure, and discusses the evaluation standards and criteria to be used.

Note. If the examinee is an MT, he or she will be evaluated on the ability to apply the learning and teaching process outlined in the Federal Aviation Administration's (FAA) Aviation Instructor's Handbook. The examinee must demonstrate a working knowledge of the conditions, standards, and descriptions of the tasks he or she will be instructing/evaluating. The examinee must also demonstrate the ability to determine when tasks are not performed to standard and how to train to standard.

PHASE 2-ACADEMIC/ORAL EXAMINATION

3-12. The examinee must have a working knowledge and understanding of all applicable topics in the respective subject areas. At a minimum, the MT will select two topics from each appropriate subject area. If the examinee is an MT, he or she will also demonstrate the ability to instruct and evaluate any topic.

- Regulations Topics in this subject area are—
 - CTP requirements.
 - SOP requirements.
 - Weather restrictions and procedures.
 - Local airspace usage.
 - Publications required for using the SUAS.
 - Forms and records.
- Operating limitations and restrictions. Topics in this subject area are—
 - Battery limits.
 - Airspeed limits.
 - Environmental restrictions.
 - Other limitations.
- SUAS emergency procedures and malfunction analysis. Topics in this subject area are—
 - Emergency terms and their definitions.
 - Battery malfunctions.
 - Loss of link.
 - Mission equipment.
 - Loss of Communication.
 - Loss of global positioning system.
- Mission tasks. Topics in this subject area are—
 - Mission statement and employment methods.
 - Terrain analysis.
 - Use of navigational chart, map, and navigation aids
 - Evaluation of environment.
 - Accident prevention.
 - Reports.
 - VO and Crew support.
 - Downed UA procedures.
 - Mission equipment.
 - Crew coordination.

- Night mission operation use of lights.
- Aviation instructor's handbook (FAA-H-8083-9). Topics in this subject area are—
 - The learning processes.
 - Effective Communication.
 - Teaching methods.
 - Types of evaluations.
 - Planning instructional activity.
 - Flight instructor characteristics and responsibilities.
 - Techniques of flight instruction.
 - Human behavior.
 - Teaching process.
 - The instructor as a critic.
 - Instructional aides.
 - Critiques and evaluations.

PHASE 3-FLIGHT EVALUATION

3-13. If this phase is required, the following procedures apply:

- Briefing. The MT will explain the flight evaluation procedure and brief the examinee on which tasks will be evaluated. When evaluating an MT, the MT must advise the examinee that during role reversal the MT may deliberately perform some tasks outside the standard to check the examinee's diagnostic and corrective action skills. The MT will conduct or have the examinee conduct a crew briefing.
- Before-flight procedures. The MT will evaluate the examinee's use of the appropriate technical manuals (TMs), checklists (CLs), technical bulletins (TBs), and/or the integrated electronic technical manual as appropriate.
- Flight tasks. The MT will evaluate those tasks listed in appendix A. An MT must demonstrate the ability to instruct and/or evaluate the appropriate tasks. When used as part of the proficiency flight evaluation, the evaluation may include an orientation of the local area, checkpoints, and other pertinent information.
- After-landing tasks. The MT will evaluate the examinee's use of the appropriate TMs, CLs, TBs, and/or the manuals as appropriate.

PHASE 4-DEBRIEFING

3-14. Upon completing the evaluation, the MT will—

- Discuss the examinee's strengths and weaknesses.
- Offer recommendations for improvement.
- Inform the examinee if he or she passed or failed the evaluation and discuss any tasks not performed to standards.
- Complete the applicable/appropriate forms, and ensure the forms are reviewed and initialed by the examinee.

Note. Inform the examinee of any restrictions, limitations, that the MT will recommend to the manager following an unsatisfactory evaluation.

LOCAL AREA ORIENTATION

3-15. Training area orientation. The manager will ensure that operators are given a tour of and a briefing on the training area and facilities. The tour should include the mission planning procedures (location of maps and other flight planning aids) and the airspace. The briefing also should include the items listed below:

- Obtaining maps and charts.
- Obtaining weather information.
- Obtaining any restricted-area information.
- Information on frequencies and access phone numbers.
- A review of airspace in the local area.

3-16. Range layout and facilities. The manager will ensure that operators are familiar with range facilities.

3-17. Local area orientation flight. Before progressing to MQ, operators will receive a local area orientation flight. Teams may conduct this flight along with other training. The manager will determine which orientation items are required for the flight. Items specific to the local area or those that cannot be adequately covered during the ground portion will be pointed out, demonstrated, or discussed during the flight. The orientation flight should include familiarization with local—

- Boundaries.
- Reporting points.
- Prominent terrain features.
- Restricted areas and no-fly areas.
- Tactical training and range areas.
- Airfields, helipads, and frequently used landing zones.
- Obstacles or hazards to flight.

Note. Company commands, particularly those operating near sensitive borders, should establish additional requirements or restrictions for local area orientations.

This page intentionally left blank.

Chapter 4

Team Task Development

CREW TRAINING MANUAL TASK MODEL DEVELOPMENT

4-1. Managers are authorized to develop additional tasks for inclusion on the manager's task list as needed, to accomplish the team's mission if the appendix does not adequately cover a maneuver or mission that is required. To develop an additional task, the manager will create the task in the format described in this chapter, assign a 3000-series number to the task, and add it to the MANAGERS TASK LIST along with iteration and mode requirements.

4-2. When an additional task is developed by the team, the manager must perform a risk analysis for performance of the task, and determine training required for personnel to attain proficiency in the task. The manager will ensure that the operators receive the necessary academic and flight training for this new task during the progression and will determine if there is a requirement for an annual evaluation of the task. Managers will add any new task to the training module and include the following information.

- Task number and title.
- Conditions for task performance.
- Standards for task performance.
- Description of task performance.
- Considerations for task performance (such as environmental and safety).
- Training/evaluation requirements.
- References.

TASK FORMAT

4-3. The following format will be used to develop 3000-series tasks (figure 4-1, page 4-2). Each task element is explained further in the following paragraphs.

Note. The following task is intended for *explanation of formatting style only*; it **does not** constitute doctrinal procedure.

TASK 3000

Perform Close VO Support

WARNING

All warnings associated with the task will follow the task title.

CONDITIONS: Condition statements set parameters or sample parameters. They explain what to provide and what to withhold and may be modified if necessary. Condition statements describe the circumstances under which the task is taught or measured in the learning environment. The individual task condition statement describes the field circumstances (on-the-job or full spectrum operations) under which the individual critical task is performed as closely as possible. It also lists what materials, personnel, and equipment must be provided for task accomplishment.

STANDARDS: The individual task standard describes the minimum acceptable level of performance in the field to successfully accomplish the task under the prescribed conditions. It notes how well someone should perform the task to be considered competent. For SUAS flight tasks, standards are based on ideal conditions.

DESCRIPTION:

1. Crew actions.
 - a. Ensure that the correct designation for the crewmember is used in the description to avoid confusion.
 - b. Make sure crew actions (for example VO) by all individuals involved to accomplish this task are captured.
2. Procedures.
 - a. Procedures identify the preferred method of accomplishing the task.
 - b. Make sure that all individual (for example VO) procedures involved to accomplish this task are captured.

ENVIRONMENTAL CONSIDERATIONS:

1. Task considerations define the different requirements for performing the task under different flight modes or under adverse environmental conditions.
2. They must address the unique requirements of performing the task under those conditions.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training. Training may be conducted while operating the aircraft or simulator.
2. Evaluation. The evaluation will be conducted while operating the aircraft.

REFERENCES:

Figure 4-1. Example of task format

TASK NUMBER

4-4. Task numbers are uppercase, bolded format. Task numbering begins with 3000 and runs sequentially.

TASK TITLE

4-5. The task title describes the performance required of the Operator on the job. It is frequently referred to as the task. The task title has one action verb, one object, and may also have a qualifier that describes the required action. Task titles are title case, bolded format. Do not use acronyms in the title. Using standard, well-defined verbs—

- Provides/promotes clarity.
- Allows analysts, task selection boards, trainers, and operators to understand what the task title means.
- Prevents duplication. Using standard verbs makes it simple to group tasks by verbs to avoid duplications.
- Promotes application of sound training principles.

WARNINGS, CAUTIONS, AND NOTES

4-6. Figure 4-2 provides examples of warning, cautions, and notes.

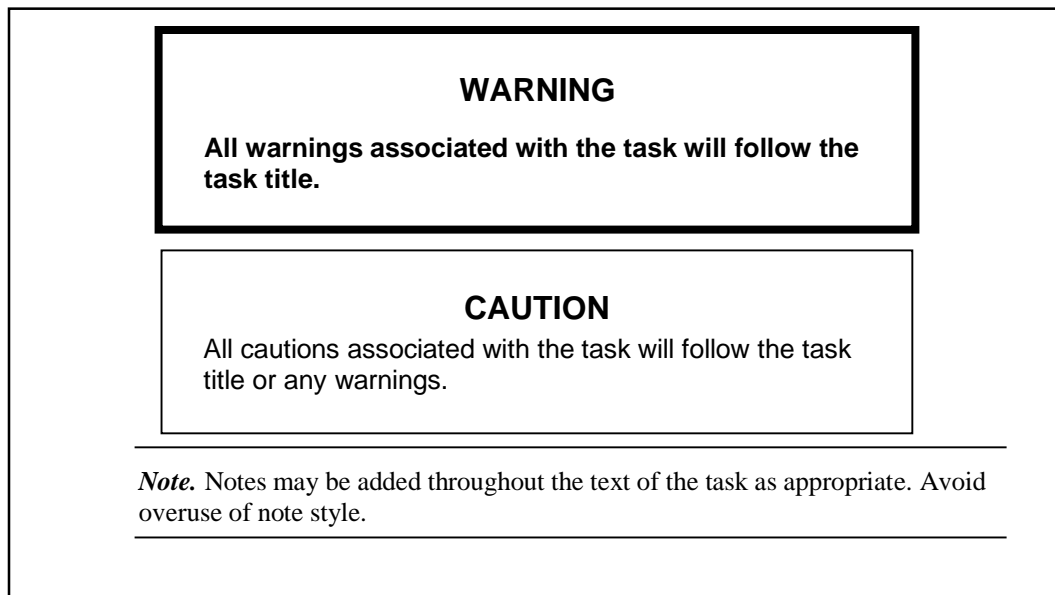


Figure 4-2. Warning, caution, and note examples

CONDITIONS

4-7. Condition statements set parameters or sample parameters. They explain what to provide and what to withhold and may be modified if necessary. Condition statements describe the circumstances under which the task is taught or measured in the learning environment. The individual task condition statement describes the field circumstances (on-the-job or full spectrum operations) under which the individual critical task is performed as closely as possible. It also lists what materials, personnel, and equipment must be provided for task accomplishment.

4-8. A condition statement has two parts:

- Cue—a word, situation, or other signal for action. An initiating cue is a signal for an individual to begin performing an individual task. An internal cue is a signal to go from one element of a task to another. A terminating cue indicates task completion.

- Descriptive ta-information that identifies when, why, and where the task is performed and what resources (materials, personnel, and equipment) are required to perform the individual task.

4-9. Write the individual task condition statement in standard paragraph format, containing one or more sentences. Use the following guidelines and tips for writing an individual task condition statement:

- Identify the cue.
 - The cue may be very evident or “understood” when writing a condition statement and may not require detail.
 - Specifically, identify the cue if it is not evident. Identifying the cue may require studying items, such as, organizational diagrams; mission analysis; mission information; actions performed by outside teams, operators, managers, or events; or procedural manuals.
- Identify/describe the physical setting, or the site of individual task performance. The amount of detail provided varies, based on the effect that the setting has on the task performance.

Note. Not all individual critical tasks are performed during all missions.

- **DO NOT** make the setting too generic or too specific. **DO NOT** refer to a training environment. (A task condition is written to field performance, **NOT** training performance.)
- When the task is performed at multiple performance sites, describe all sites, as practicable.

4-10. Figure 4-3, page 4-5, provides examples of individual task condition statements. Write your individual task condition statements in a similar manner. Each example provides discussion points.

<p>Condition #1</p> <p>Given a VO position,</p> <p>Discussion: In this example—</p> <ul style="list-style-type: none"> • When is-anytime a VO or the PIC is in danger • Where is-anywhere a VO or the PIC is in danger • Why is-because there is a threat to the VO or the PIC. •
<p>Condition #2</p> <p>You have a VO who is suffering from a sprained ankle. The VO has no other serious conditions. A first aid packet are available.</p> <p>Discussion: In this example—</p> <ul style="list-style-type: none"> • When is-upon finding a sprained ankle. • Where is-whenever there is a sprained ankle . • Why is-there a sprained ankle • Resources required-are limited to the resources on hand, which includes a first aid packet.

Figure 4-3. Individual task condition statements examples

4-11. Figure 4-4 provides questions that are useful in determining whether condition statements have been well written.

Does the condition statement address the following issues?

- Describe the conditions under which this task will be performed under operational (field) or selected training conditions?
- Identify the initiating cue?
- Identify the physical setting (when and where the operator performs the task)?
- Identify the resources (materials, personnel, and equipment) needed to accomplish the task?
- List special conditions when applicable?
- Utilize standard paragraph format?

Figure 4-4. Condition statement issues

SPECIAL CONDITIONS

4-12. A special condition is an aiding or limiting factor that occasionally occurs and affects an operator's ability to perform the task to the established standard. These special conditions include, but are not limited to, wearing of mission oriented protective equipment (hard hats, glasses, etc). These unique circumstances are identified as separate special condition statements when conducting the individual task analysis and are also entered under the conditions.

4-13. Writing special condition statements. Once changes to the task performance standard caused by performing the task under a special condition are identified, developers must include them. When writing a special condition statement, be aware that—

- More than one special condition simultaneously may affect task performance.
- A special condition may affect such standards as speed or accuracy.

Condition

You are in an area where chemical agents have been used. You are wearing protective over-garments and mask, or they are immediately available. You encounter your VO who is breathing and lying on the ground. The casualty is partially dressed in protective clothing and is wearing the protective mask carrier with mask.

Figure 4-5. Special condition statement example

Standard

4-14. The individual task standard describes the minimum acceptable level of performance in the field to successfully accomplish the task under the prescribed conditions. It notes how well someone should perform the task to be considered competent. For SUAS flight tasks, standards are based on ideal conditions.

4-15. Standards must be—

- Written in present tense.
- Written in standard paragraph format. The paragraph may contain one or more sentences and may include subparagraphs and/or bullets.
- Written in job holder language.
- Observable, measurable, achievable, objective, valid, reliable, usable, comprehensive, discriminating, and quantifiable.

4-16. A standard statement has two parts:

- Performance—A verb phrase that identifies what action the standard will evaluate (that is, the process the Operator performs, the product produced, or a combination of both).
 - A process standard describes the critical task elements necessary for adequate task performance.
 - A product standard describes the end result of individual task performance. Product standards should be used when the process it takes to perform the task is not important, as long as the product (end result) is correct.
 - A combination standard is used when task performance produces both a product and process.
- Criterion—May include, but is not limited to, accuracy, quantity, speed, and quality. Table 4-1 addresses recommended criteria for each type of task performance.

Table 4-1. Task performance criteria

<i>Individual Task Standard</i>	<i>Criteria to Use</i>
Product Standard	Accuracy, tolerances, completeness, format, clarity, number of errors, and quantity.
Process Standard	Sequence, completeness, accuracy, and speed of performance.
Combination Standard	Accuracy, tolerances, completeness, format, clarity, number of errors, quantity, sequence, and speed of performance.

4-17. Parts of example standard statements may include the following:

- Take 10 consecutive pictures of an object within 20 seconds
- Read license plate of stationary vehicle while moving at 15 mph.
- Calibrate the sUAV Compass.

Note. It is preferred not to use a standard that refers to another document; but, in the case of aircraft maintenance, it is mandatory to use the TM. Duplicating the TM causes extra work and serves no value, since the TM is used when the task is performed.

DESCRIPTION

4-18. Task descriptions are the “how to” portion of the task.

- Descriptions will normally be divided into two sections: crew actions and procedures.
- Ensure that the correct designation for the crewmember is used in the description to avoid confusion.
- Procedures identify the preferred method of accomplishing the task.
- Make sure the standards for the task are clearly defined in the “STANDARDS” section; however, it may be necessary to refer the reader to the description section for specific requirements.
- Deviations from task procedures—but not crew actions—are authorized as long as task standards and safety are not compromised.

CONSIDERATIONS (NOT MANTORY FOR ALL TASKS)

4-19. Task considerations define the different requirements for performing the task under different flight modes (visual meteorological conditions, night, or different payload sensors or under adverse environmental conditions. They must address the unique requirements of performing the task under those conditions.

ENVIRONMENTAL CONSIDERATIONS

4-20. The environmental considerations section of a task must address the unique requirements of performing the task under different flight modes or under adverse environmental conditions.

4-21. The following are examples of environmental considerations:

- Altitude, apparent ground speed, and rate of closure are difficult to estimate at night.
- Surrounding terrain or vegetation may decrease contrast and degrade depth perception during the approach. Before descending below obstacles, determine the need for artificial lighting.
- Use proper scanning techniques to avoid spatial disorientation.
- Acquire, identify, track and/or designate targets using the sensor's optimum capabilities (electro-optical, infrared) for a given situation based on mission; Search & Rescue, Law Enforcement, etc.

REFERENCES

4-22. The reference section of the task lists the sources of information relating to that specific task.

This page intentionally left blank.

Chapter 5

Team Training

Team managers are authorized to conduct refresher training at team level. Operators receiving the training must have attended the initial operator qualification course for the SUAS being flown.

TRAINING PROGRAM REQUIREMENTS

5-1. Refresher training. An operator entering refresher training will participate in training that consists of critical and team-selected tasks. The operator must complete all training before he or she is designated MQ. The operator is designated MP during this training. Refresher training should include academic courses and practice of all tasks. During refresher training, the operator does not have semiannual proficiency and readiness test requirements in the SUAS in which the training is being conducted. The only requirements he or she has are those designated by the manager.

- The operator will complete the appropriate academic requirements paragraph 3-12 and those tasks listed in this manual.
- All flight training in MP will be conducted by an MT.
- The operator will be evaluated by an MT.
- The operator will complete a qualified sortie at night (if applicable).

5-2. Mission training. The SUAS mission and operation of mission equipment is an integral part of being an operator qualified in a SUAS. This training must be completed before an operator is qualified to perform missions within his or her team with a SUAS.

TRAINING PREREQUISITES

5-3. An operator returning to an operator position after having been prohibited/excused from flying duties for more than 180 consecutive ys will receive refresher training. When an operator enters the team's CTP with fewer than 180 consecutive ys of non-operator duties, the manager may require him or her to undergo refresher training based on a record check or a PFE.

TASK CONSIDERATIONS

MASTER TRAINER

5-4. If an MT is part of a condition, he or she will be in a position close enough to assist the operator or assume control as the situation requires.

VISUAL METEOROLOGICAL CONDITIONS

5-5. Unless otherwise specified in the conditions, all in-flight training and evaluations will be conducted under VMC.

EMERGENCY PROCEDURES

5-6. The operator will know all underlined emergency procedures well enough to perform the required action from memory. Upon completion of the procedure, the checklist will be used to verify that no item was overlooked.

LIMITATIONS

5-7. Operators will maintain operation within SUAS limitations at all times. Operation outside: these limits, in other than an emergency situation, is unsatisfactory.

MISSION LEVEL TRAINING/EVALUATIONS

5-8. All ML training and evaluations will be conducted with an MT present and in a position to gain full access to the system controls.

TRAINING STRATEGY

5-9. The training strategy is developed using the outcome of the training assessment. It is then issued to subordinate managers through the manager's training guidance (CTG).

NEAR-TERM PLANNING

5-10. Near-term planning is used for the monthly training schedule. The manager, with assistance from the MT will...

- Reviews training aids, devices, simulators, and simulations and allocates training resources to specific trainers.
- Ensures that training events are well structured, efficient, realistic, safe, and effective.
- Must ensure that informal evaluation and feedback by trainers and managers are continuous and that formal evaluations are included in training plans. (Evaluation documentation can range from annotated training and evaluation outlines to take-home packages.)

LONG-RANGE PLANNING

5-11. Long-range planning is used for the new annual training calendar. The manager, with assistance from the MT -

- Carefully studies the key training events in which the team will participate.
- Selects appropriate training scenarios with supporting operations plans from the training support packages.
- Coordinating with the team chooses training event that do not conflict with other key calendar events.

5-12. The tools used to develop a long-range training plan are the training strategy, the long-range training calendar—12 to 18 months out. These calendars may be viewed by any person during their team training planning.

QUARTERLY TRAINING CALENDAR

5-13. When preparing the quarterly training calendar, the manager, with assistance from the MT—

- Studies the battalion annual training calendar.
- Identifies, allocates, and coordinates short lead-time resources such as local training facilities.
- Pays particular attention to lessons learned when developing training objectives and tasks to include in an field training exercise operation order.
- Allocates time on other critical training resources.
- Cross-references each event with specific training objectives and coordinates with all team members

CREW TRAINING PROGRAM

5-14. The CTP is an integral part of the manager's overall team training program and should be briefed at each quarterly training brief. Proficient crews are essential to effective collective training. SUAS leaders/MTs must maintain a balance between individual, crew, and collective training. The CTP, is a structured and prescriptive management and evaluation program focused on training Company crews. The CTP applies to all Company operators in operational flying positions. The CTP includes training of the base, mission and additional tasks necessary for the accomplishment of a team's mission. In toy's operating environment, small team leadership is critical to mission execution. Training must be tailored to ensure these elements are integrated into the training regime of our teams. Leader supervision and participation at all levels is essential to the successful execution of the CTP.

5-15. The CTP, with the factors that affect it, is a major consideration in developing the long-range training plan. Consideration must be given to—

- Individual operator proficiency.
- Crew proficiency
- The team maintenance program.
- Flight-hour Allocation to supported teams when SUAS training is conducted during supported team missions.
- Individual and crew training that is usually accomplished while not in a support role; for example, emergency procedures training, and flight evaluations.
- Operator training accomplished in crew and collective simulators/simulations.

5-16. Teams are required to have an CTP addressing specific requirements for conducting training, evaluation, assessment, and program revision. Managers should use training objectives, scenarios, and standard training exercises to facilitate the development, execution, and continual assessment of their training program. Scenarios for individual, crew, and collective training must be mutually supportive and progressive in intensity and complexity. Effective individual and crew training programs form the foundation for a SUAS training program. These programs produce ready crews and are the basis for the team's collective training program. Collective training must focus on combined operations across the spectrum of the team's mission. Limited resources, environmental restrictions, new and sophisticated aircraft mission equipment packages, and multiple contingency operations will all impact on the manager's ability to train and maintain proficiency at all levels.

This page intentionally left blank.

Chapter 6

Individual Operator Training Record

The manager must ensure that a training record is prepared and maintained for each SUAS operator in an operational duty position assigned or attached to the team. The CTP records system provides managers with a comprehensive performance record on each operator in their team. The required forms can be completed by hand using blue or black ink, by typewriter, or digitally. Crew training records are important quality control and standardization tools. They should be completed carefully, completely, and legibly. Examples of completed CTP forms with instructions are provided in figures 6-1 and 6-6 (pages 6-2 and 6-4); however, the examples are not intended to be all inclusive of required entries on the forms. Use the Remarks section of the forms and/or the comment slips to explain situations not clearly covered by the written guidelines.

INDIVIDUAL OPERATOR TRAINING RECORD REQUIREMENTS

6-1. The training record will be maintained as follows:

- Form 7122-R will be used. It will be maintained in the operator's team training folder.
- Operators assigned or attached for flight duty will present their Form 7122-R to the manager or the manager's representative upon arrival into the team.
- Form 4507-R (Crew Member Grade Slip) should be used to document training and evaluation flights.

COMPANY FORM 7122-R

6-2. Purpose. Form 7122-R is used to permanently record all individual operator evaluations and summaries. It is also used to record any change in operator status or other significant events. General instructions for completing the form are as follows:

- Type or clearly print all entries in black, dark blue, or red ink (for out-of-sequence te entries only).
- For blocks that do not require an entry, enter "NA" for Not Applicable or a dash(—).
- To make minor corrections, use correction fluid/tape or neatly line through the incorrect information and add the correct information. Use procedures found in paragraph 6-3 to make major corrections.
- Keep entries as clear and concise as possible. Use standard abbreviations and acronyms.
- Significant related events that occur (aircraft qualification or MT course enroute) during the time a crewmember departs the previous duty station and is integrated into a new CTP will be entered on Form 7122-R prior to the assignment entry.
- When one page of the form is filled, close out the other page of the form by drawing a diagonal line from the first unused block to the last unused block.
- Not every possible event or occurrence can be anticipated. If situations arise that are not covered by these instructions, use sound judgment and enter the event in the most logical manner.

6-3. Corrections to Form 7122-R may be needed for several reasons. Careful and timely entering of events as they occur will eliminate the need for corrections.

- Out-of-sequence events. If an event is not entered at the proper time and one or more events have been recorded, enter the event as you would any other event on the next available line. Use red ink when entering (to include year) the out-of-sequence event.
- Unusable form. If enough mistakes accrue to make the form unusable, transcribe the data to a new form. Place a diagonal line across the front of the unusable form, label it "transcribed," and retain this copy of the form (permanently) under the current form.

Note. Do not destroy or discard any Form 7122-R that contains an entry.

FORM 7122-R INSTRUCTIONS

6-4. Instructions for completing Form 7122-R are as follows.

Crewmember Training Record, Page 1

- **Sheet Number.** Number each sheet in numerical order.
- **Name.** Enter the crewmember's full name (last, first, and middle initial). If reproducing the form on two separate sheets of paper, enter the crewmember's name on the first line of the second sheet, in the Remarks area, followed by the sheet number with which it corresponds.
- **PID.** Until further notice leaves this blank.
- **Rank.** Enter the crewmember's rank (i.e. PIC, VO, etc).
- **Birth Month.** Enter the crewmember's birth month. Enter the y, month, and year of the event. After the first entry, it is acceptable to omit the year until entry of the first event of the following year. If an entry is out of chronological order, only the entry will be in red and the year must be included.
- **A/C.** Enter the alphanumeric designation of the appropriate aircraft
- **Event.** Enter a short summary of the event on one line. Record events listed below:
 - Team assignments and reassignments.
 - Start and completion of time-limited training programs, such as, ML progression or MT qualification.
 - Start and completion of qualification courses, both flying and non-flying.
 - Completion of significant training or retraining programs. (Summarize the event on one line.)
 - All evaluations.
 - MT designation.
 - Completion of the written examination.
 - All proficiency flight (oral or written) evaluations. (Specify the type of evaluation; for example, a no-notice evaluation, the flight portion of a manager's evaluation, or currency evaluation.)
 - All requests for waivers or extensions and their disposition.
 - Involvements in any accident or incident and the results of any post-accident evaluation (if given).
- **Duty.** Not applicable.
- For the event being recorded, enter the number of flights conducted under the appropriate flight modes/conditions. The number entered will be the flight flown on any single flight event (such as an evaluation) or the total flights flown in multi- flight training programs.

- **Seat.** Not applicable.
- **Recorded By.** MTs, trainers, operations personnel and others when authorized by the manager will enter their first initial, last name, rank and duty position. If the event was an evaluation and someone is recording it other than the MT, record the MT's name in the remarks section.
- **GR (grade).** If the event was graded, enter an "S" (Satisfactory) or a "U" (Unsatisfactory). For an unsatisfactory evaluation, state the specific tasks the crewmember performed unsatisfactorily, and any restrictions imposed due to the failure. Provide a recommendation to the manager for retraining and re-evaluation.
- **CM Init (crewmember initials).** Brief the crewmember on the entry and ensure that the crewmember understands any change in status. Crewmembers will then initial this block. A crewmember's initials indicate that the crewmember is aware of the entry on the form and any remarks and understands any change in status. The crewmember will immediately initial any entry resulting in a change of status, such as, an unsatisfactory evaluation or a suspension. The crewmember will initial routine entries, such as, assignment to a team or satisfactory evaluations, as soon as practical.
- **RMK (remarks).** Enter "Yes," "Y," "No," or "N" in this column to show whether comments are entered in the Remarks section regarding the entry. Do not enter "NA" in this column or leave it blank.

Crewmember Training Record, Page 2

- **Time.** Include time pertinent information was recorded in remarks. Enter the time in the same format used on the front of the form.
- **Remarks.** Record pertinent information not shown on the front of the form in this section. Do not restate information entered on the front of the form, for example, "This was a satisfactory evaluation." There is no single correct way of entering remarks. However, they should be clear, concise, and specific. When entering remarks, use standard abbreviations and acronyms or logically shortened words. If the remarks require more than one line, do not repeat the time on the second or subsequent line(s). Remarks that could be entered include the issuance of an MT qualification by an MT and an explanation of extension for completion of CTP requirements.

6-5. Only the following events recorded on the Form 7122-R require the manager's signature:

- Nonmedical suspension.
- ML designation after failure of a hands-on performance test or a training deficiency.
- Extensions or waivers.
- Return to previous duties after nonmedical suspension or ML designation after failure of a hands-on performance test or a training deficiency.

Note. The manager, pertaining to the training folder, is defined as the manager responsible for the CTP. Waiver and extension authority is IAW AR 95-23, local regulations, and SOPs. The appropriate manager will sign the Form 7122-R, page 2, when required. Memorandum for Record granting extensions or waivers signed by the manager will be retained in the miscellaneous section of the training folder until the end of the CTP year.

FORM 7122-R SAMPLE

6-6. Figures 6-1 and 6-2, pages 6-4 and 6-5, provide a sample of a completed Form 7122-R.

[illegible]

Figure 6-1. Sample Form 7122-R, page 1

[illegible]

Figure 6-2. Sample Form 7122-R, page 2

COMPANY FORM 4507-R

6-7. The Form 4507-R will be filed on the right side of the individual crew training folder (IATF) until training has been completed and the event has been documented on the Form 7122-R. Once the event has been entered on Form 7122-R, then Form 4507-R will be removed from the IATF.

FORM 4507-R INSTRUCTIONS

6-8. Instructions for completing the form are as follows.

Form 4507-R, Page 1

- **Name.** Enter the crewmember's name (last, first, middle initial).
- **Rank.** Enter the crewmember's rank.
- **PID.** Enter the individual's SUASMAN identification.
- **Team.** Enter the team to which the crewmember is assigned.
- **Purpose.** Enter the purpose of the training or evaluation using standard phraseology, for example, refresher training or AC evaluation.
- **Aircraft Type.** Enter the alphanumeric designation of the aircraft or flight simulator; for example, MQ-5B, RQ-7B, MQ-1C.
- **time Started.** Enter the time on which the flight training program starts.
- **Must Complete By.** If the training program is time limited, enter the time on which the crewmember must complete it. If the time changes, line through the original time and enter the new time above it. Explain the change in the Comments section.
- **time.** Enter the y, month, and year of the flight.
- **Flight ta.** This form provides a cumulative record of the time flown under those flight modes normally requiring minimum amounts. Record all flight time in hours and tenths of hours.
 - **Time Toy.** Enter the total time flown toy.
 - **Cumulative Time.** Record the total flight time accrued to time.
 - **y Flight-Toy.** Enter the time flown toy under y flight conditions. For flights conducted under other than y flight conditions, enter the applicable flight mode or condition in the space provided. Then record the time flown toy for that flight mode or condition.
 - **y Flight-Cumulative.** Record the total time accrued under y flight conditions. For flights conducted under other than y flight conditions, enter the applicable flight mode or condition in the space provided. Then record the total flight time accrued to time for that flight mode or condition.
 - **Duty Position.** Enter the crewmember's duty position for the flight.
 - **Seat Position.** Enter the crewmember's seat position for the flight.
 - **Overall Grade.** Enter either "S" or "U" in the overall grade block after the crewmember completes the flight. This grade reflects the MT's/trainer's overall assessment of the flight. If the overall flight is graded a "U", a comment is required on Form 4507-2-R.
 - **Crewmember Initials.** Have the crewmember initial the grade slip to certify that the crewmember has been debriefed. The initials do not mean that the crewmember agrees with the results.
 - **Trainer or Evaluator Name, Rank, and Duty Position.** Enter the trainer's or the evaluator's first initial, last name, rank, and duty position.

Form 4507-R, Page 2

- **time.** Enter time of pertinent comments.
- **Comments.** Enter pertinent comments on Form 4507-R. Enter sound, objective comments. If the overall flight or any individual task is graded "U", a comment is required. For unsatisfactory tasks, indicate which standards were not met and any other appropriate remarks.

These comments are important for reference by other trainers or evaluators during future training or evaluation.

FORM 4507-R SAMPLE

6-9. Figures 6-3 and 6-4, page 6-8, provide a sample of a completed Form 4507-R.

CREW MEMBER GRADE SLIP											
For use of this form see TC 3-04.11; the proponent agency is TRADOC.											
Name: Moody, Dwight L.						Rank: SPC			PID:		
Unit: C Trp, 407 Cavalry						Purpose: ML Progression					
Aircraft Type: RQ-11B			Date Started: 20120123			Must Complete By: 20120425					
Flight Data						Date					
Time Today						4.0					
Cumulative Time						4.0					
Day Flight--Today						2.0					
Day Flight--Cumulative						2.0					
N Flight--Today						2.0					
N Flight--Cumulative						2.0					
Flight--Today											
Flight--Cumulative											
Flight--Today											
Flight--Cumulative											
Duty Position						AO					
Seat Position						/					
Overall Grade						S					
Crew Member Initials						DM					
Trainer or Evaluator Name, Rank, and Duty Position						B. Sunday, SGT, MT					

DA FORM 4507-R, DEC 2009

PREVIOUS EDITIONS ARE OBSOLETE.

APD PE v1.00

Figure 6-3. Sample Form 4507-R, page 1

MANEUVER/PROCEDURE GRADE SLIP											
For use of this form see TC 3-04.11; the proponent agency is TRADOC.											
Trainee's/Examinee's Name: <u>Moody, Dwight L.</u>											
S E L E C T			DATE								
	Page No.	No. Pages	2012-01-26								
	1	1									
	MANEUVER/PROCEDURE										
<input checked="" type="checkbox"/>	Assemble SUAS		S								
<input checked="" type="checkbox"/>	Assemble Ground Control Station (GCS)		U								
<input checked="" type="checkbox"/>	Assemble Remote Video Terminal (RVT)		/								
<input checked="" type="checkbox"/>	Operate SUAS Battery Charger		S								
	Perform Airspace Management Coordination										
	Complete SUAS Preflight Mission Planning										
	Complete a SUAS Crew Mission Briefing										
	Complete SUAS Preflight Checks										
	Respond to Warning Displays										
	Complete Before Take-off Checks										
	Launch Unmanned Aircraft										
	Complete SUAS In-flight Operations										
	Complete Before Landing Checks										
	Complete Autoland Procedures										
	Complete Post Flight Procedures										
	Respond to an Emergency										
	Complete Remote Launch Procedures										
	Complete Hand-off Procedures										
	Disassemble and Store System										
	Complete SUAS Operator Level Maintenance										
	Complete Mobile Operations										
	Implement Covert Approaches										
	Implement Low-level Flying										
	Implement Low-level Approach										
	Implement Low-level Landing										
	Implement High Altitude Autoland										

DA FORM 4507-1-R, DEC 2009 PREVIOUS EDITIONS ARE OBSOLETE. APD PE v1.00

Figure 6-5. Sample Form 4507-1-R

FORM 4507-1-R INSTRUCTIONS

6-12. Instructions for completing the form are as follows.

- **Trainee's/Examinee's Name.** Enter the examinee's name (last, first, middle initial).
- **Select.** If the form is tailored to the training or evaluation being conducted, use as desired. If the form lists all base and mission/additional tasks, place an "X" in the selection column by each task that is mandatory for the training program or evaluation underway based on the guidance in the applicable CTM, this training circular, the manager's task list, the team SOP, and other documents.

- **Page No.** Enter the number of this page.
- **No. Pages.** Enter the total number of Forms 4507-1-R used.
- **Maneuver/Procedure.** Enter the task number followed by the task title as required by the team's CTP. Teams may list all tasks required by the manager's task list. Another option is to develop separate forms for each training program; for example; night goggle refresher training, RL progression, and mission training. Teams may also use a highlighter pen or any other suitable method to track completion of tasks in different modes. Task titles may be abbreviated to fit within the space provided.
- **te.** Enter the y, month, and year of the flight. It is acceptable to have multiple entries for the same te to specify tasks trained/evaluated in different flight modes. In the blocks under the te, the evaluator/trainer or team trainer grades each task performed. An unsatisfactory grade "U" requires a brief description of the deficiency in the comments section of Form 4507-2-R (Continuation Comment Slip). Place a diagonal (/) in the grade blocks for all maneuvers or procedures not performed. When three or more consecutive tasks are not graded, place a diagonal line in the first and last task and connect the two with a straight vertical line.

COMPANY FORM 4507-2-R

6-13. The Form 4507-2-R is used to record comments and explain Form 4507-R and Form 4507-1-R entries, as appropriate.

FORM 4507-2-R INSTRUCTIONS

6-14. Instructions for completing the form are as follows.

- **Examinee's/Trainee's Name.** Enter the examinee's name (last, first, middle initial).
- **time.** Enter time of entry.
- **Comments.** Enter comments as necessary. Comments should be clear, concise and objective. These comments are important for reference by other trainers or evaluators during future training or evaluation.

FORM 4507-2-R SAMPLE

6-15. Figure 6-6, page 6-11, provides a sample of a completed Form 4507-2-R.

Figure 6-6. Sample Form 4507-2-R

This page intentionally left blank.

Chapter 7

Composite Risk Management

Tough, realistic training conducted to standard is the cornerstone of Company warfighting skills. The battle-focused training environment places stress on both Soldiers and their equipment, creating a high potential for loss. As training realism increases, so does the potential for loss. If risk is not reduced, personnel and equipment losses caused by training mishaps pose a serious drain on warfighting assets. Accidental losses during training are no different from combat losses; in either case, the assets are gone. Managers must find ways to protect individuals and equipment from accidents during realistic training to prepare for war. Guidance on composite risk management (CRM) is contained in ADP 5-0, FM 5-19, and AR 385-10.

GENERAL

7-1. An effective risk management program is vital at all levels of operations and requires the personal attention and participation of team managers and leaders all along the chain of command. The protection of Soldiers and their weapon systems is a way of life in the Company. An effective CTP, thoughtfully planned in conjunction with appropriate regulations and guidance, is arguably the most important factor in any team's safety program once it is embraced by every Soldier in the team. Flying "by the book" does not hinder, but actually enhances, a team's battle focus. The crawl/walk/run approach to training is imperative to reduce risks, as is the active participation of managers at all levels of the training process.

COMPOSITE RISK MANAGEMENT CONCEPT

7-2. CRM is the decision-making process for identifying hazards and mitigating risks across the entire spectrum of Company missions, functions, operations, and activities. It is a holistic assessment, blending tactical and threat-based risk management with accidental, hazards-based risk management. CRM is not a stand-alone process, a paperwork drill, or an add-on feature to planning. Rather, it is used as a fully integrated element of planning and decision making. It may also be executed intuitively in situations that require hasty planning or immediate action. CRM should be viewed as part of the military art interwoven throughout the Company's military decision-making and training management cycles. CRM follows a process which personnel of all ranks must continually use. The CRM steps are shown in figure 7-1, page 7-5.

7-3. Using the CRM process, leaders identify the hazards that may cause mission degradation and loss of team combat readiness and effectiveness. These include those hazards that may cause injury and/or death to personnel or damage and/or destruction of equipment. A manager should then determine the possible impact of each hazard on the mission, take action to minimize or eliminate the hazards, then execute the mission or modify the mission to further reduce risk.

7-4. CRM is not a restrictive measure. It is a conscious analysis of the mission itself, possible courses of action, and the implementation of appropriate controls to ensure any risk is reduced or eliminated.

7-5. The CRM process includes several terms all leaders should know. These terms are—

- CRM process. The process of identifying and controlling hazards to protect the force.
- Control. Any action taken to eliminate hazards or reduce their risk.
- Hazard. Any real or potential condition that can cause the loss of an asset. These losses include injury, illness, and death of personnel; damage to or loss of equipment or property; and mission degradation.

- Risk. The chance of hazard or bad consequences. Exposure to a chance of injury or loss. Risk level is expressed in terms of hazard probability and severity.
- Exposure. The frequency and length of time subjected to a hazard.
- Probability. The likelihood that an event will occur.
- Severity. The expected consequence of an event in terms of the degree of injury, property damage, or other mission impairing factors that could occur.
- Risk assessment. The identification and assessment of hazards.
- Residual risk. Any anticipated level of risk remaining after controls have been identified and selected for hazards that may result in loss of combat power.
- Risk decision. Accept or not accept the risk(s) associated with an action; made by the manager, leader, manager, or individual responsible for performing that action.

7-6. The standard for CRM is leadership at the appropriate level of authority making informed decisions to control hazards or accept risks. Leaders are responsible and accountable for assessing their operation as a total system.

7-7. The degree of risk determines the level of decision authority. When resources to reduce risk to an acceptable level are not available, the risk issue must be elevated to the next higher command. This process continues until the information is presented to the level of command that has the resources and authority to eliminate the hazard or control the risk to an acceptable level. In this manner, a conscious and informed decision is made to either commit the resources to control the hazards or to accept the risk.

RESPONSIBILITIES

7-8. CRM is not complex, technical, or difficult and is not limited to the brigade and battalion managers. It is a simple decision-making process and a way of “thinking through a mission” to balance mission demands against known risks. Trainers/evaluators can maintain realism in training accomplishment through CRM. In peacetime, the process must be deliberate, continuous, and must become second nature to those responsible for planning, approving, or leading activities. In combat, the process is no less deliberate, though risks may be accepted as dictated by the mission priority.

LEADERS

7-9. What is the managers responsibility, at all levels? Who establishes what risk: extremely high (E), high (H), moderate (M), or low (L)?

7-10. Managing risks is a leadership responsibility. At the crewmember level, MTs and instructors are the principal risk managers. Planning must incorporate consideration for known hazards and must address appropriate control measures to minimize exposure to these hazards. While CRM is introduced in the planning phase of a mission, for MTs, CRM responsibilities are not complete until the mission debriefing is complete.

7-11. To meet these responsibilities, leaders do not accept unnecessary risk. If the risk can be eliminated or reduced and the mission can still be accomplished, the risk is mitigated and acceptable. Find ways to mitigate the risk (for example, change the crew mix, change the mission execution time, provide additional preparation and training, and add additional supervision) that will still allow completion of the mission. Once hazards are identified and controls recommended, compare and balance the residual risk against the mission expectation.

7-12. Pre-mission. The manager, or other designated risk approval authority, decides if the controls are sufficient to accept the risk. If the risk is excessive, the manager can direct additional control measures, modify controls, request the next higher manager’s involvement, or reject the mission.

7-13. During mission execution. The manager cannot always be available to make every risk decision. In the aircraft, when the situation, time, or other factors do not allow for the manager’s decision, the MTs, instructors, or other team leaders become the primary risk managers. In such cases, they should use the manager’s guidance, their professional experience, team SOPs, CTMs, regulations, current situation,

developing conditions, and so forth as the basis upon which they formulate control measures. They should evaluate unexpected hazards that are encountered during the course of the mission and apply the appropriate control measures.

7-14. Make risk decisions at the proper level. Decisions made at the proper level eliminate the involvement of managers not normally involved in the mission or managers not authorized to accept the level of risk. ACs must know the appropriate level of approval authority based on the level of risk. The risk approval authority will vary between teams and risk approval authority must at all levels be capable of mitigating risk or accepting that level of risk.

7-15. Weigh the risks versus the benefits. The benefits gained by accepting a residual risk must clearly outweigh the potential cost in terms of life, limb, or equipment loss should an incident occur.

7-16. Identify controls. Integrate CRM into all stages of all operations. Integration begins with the pre-mission planning and continues through the completion of the mission debriefing. Consider CRM as contingency planning. The manager and staff should look at factors that could cause the mission to fail (cause loss of life, limb, or equipment) and implement controls to minimize that probability. During the debriefing, unexpected hazards for a completed mission then become expected hazards for follow-on missions.

7-17. While crewmembers are not specifically members of the team staff, they normally provide input to the battalion staff through their company manager. During operations, the staff normally does not occupy a crew station, but through their work, a significant portion of CRM does occur before any start switch is pressed. Some functions that the staff performs, relative to CRM, are as follows:

- Assist in the planning and identification of hazards for operations.
- Integrate CRM into operations plans and orders. In developing plans, the staff evaluates the risks, recommends controls to minimize the risks, and provides the manager with an assessment of the effectiveness of the imposed controls. In training situations, the staff—
 - Advises the manager of the controls that impact on training realism, so the manager can make the risk acceptance decision.
 - Evaluates imposed safety restrictions to ensure optimal training benefit is achieved without unnecessary restrictive measures applied.
 - Assess the operational risk. Using mission, enemy, terrain and weather, troops and support available, time available, and civil considerations factors to identify the risk to mission accomplishment, the staff begins to assess operational risks. The most important consideration is the outcome of the operation for the team, higher headquarters, and adjacent teams. Risk analysis is formulated using a course of action that is developed along the spectrum of frequent to seldom event occurrence. The staff reviews and expands or refines the list throughout the planning and execution of the exercise. The staff then evaluates the possible consequences of those risks from Catastrophic to marginal, for example, the staff plans a multi-aircraft mission to airlift personnel or supplies. If the weather forecast is for marginal conditions, part of the planning should include the possibility of weather conditions degrading during the mission.

7-18. Controls the staff might propose are—

- Reinforcing those sections of the SOP pertaining to adverse weather.
- Briefing crews regarding the current and forecast adverse weather and the possible courses of action selected by the manager.
- Planning alternate transportation.
- Designating recovery airfields.

7-19. The staff should also consider the possibility of additional personnel or equipment showing up for transport than were expected. How will the crews accommodate this change? What impact will the additional payload have on the aircraft performance? Controls could include maximums on payload, additional sorties, backup aircraft, or other controls that would ensure mission accomplishment with minimum risks. There are additional hazards that could be identified in this example.

SAFETY OFFICER

7-20. The safety officer—

- Is an integral part of the CRM, planning process.
- Is a special staff officer who advises the manager and staff on safety requirements and recommends controls to minimize risks.
- Participates in all phases of the military decision-making process to ensure CRM follows the manager's intent.
- Assists all staffs in integrating the CRM process into other staff functions.
- Assists the command in supervising operations to ensure Application and adherence to imposed controls and provides feedback on the effectiveness of the program.

CREWS

7-21. Crewmembers are a critical part of the CRM process. They perform the mission and their involvement in the planning phase is crucial to identification of hazards and controls. Crewmembers must clearly understand the controls implemented to mitigate risks. During mission execution, crewmembers must perform tasks and implement control measures to standard. The employment of good crew coordination is paramount to identifying unexpected hazards (for example enemy situation, wires, and weather) and to continuously refine controls during the mission.

INDIVIDUALS

7-22. Self-discipline is critical to mission accomplishment and to an effective CRM program. The best CRM plan is worthless if the individuals performing the mission do not adhere to established controls or do not perform the tasks to standard. Individuals performing a mission are also responsible for performing CRM. While performing the mission, conditions, hazards and risks change and by necessity, CRM controls may change. The individual must constantly assess the conditions and continuously apply the principles of CRM to ensure minimum risk to themselves, fellow Soldiers, the aircraft, and the mission.

COMPOSITE RISK MANAGEMENT TRAINING

7-23. Managers must conduct CRM training for their team. Training should emphasize the process and must reinforce the philosophy that Soldiers—crewmembers and ground personnel—are responsible for performing CRM; without a full range of participation, managers may not make an informed decision.

COMPOSITE RISK MANAGEMENT PROCESS

7-24. The CRM process is comprised of the following actions: identify hazards, assess risks, develop controls and risk decisions, implement controls, and supervise and evaluate (figure 7-1, page 7-5).



#216297690

Composite risk management steps

STEP 1-IDENTIFY HAZARDS

7-25. Identify the major events in the mission and list chronologically. This will help identify all hazards associated with the specified as well as implied tasks.

7-26. Complete a preliminary hazard analysis of operational events. This identifies, as early as possible, the obvious hazards expected during the mission. Early identification provides more flexibility in addressing the hazards and allows more options for controls, which maximizes a leader's ability to complete the mission.

STEP 2-ASSESS RISKS

7-27. Determine the level of risk associated with each hazard. Managers should ask, "Can the hazard result in a fatality, damage to equipment, or mission failure?" The degree of risk associated with each particular hazard will help define the level of controls necessary. For example, risks associated with a single operator, night, tactical flight might include lack of situational awareness, inadvertent weather, over tasking, and degraded performance, while risks associated with a multi-ship mission in the same environment would include midair collision as well. (These are usually contained in the team SOP or designated by the command.) Controls for the previous example may include a y route reconnaissance to establish minimum weather requirements, change the crew mix, adjust the mission execution time, conduct crew awareness briefings on recovery procedures, and single operator launch training. For multi-ship operations, controls might also include a rehearsal to practice deconfliction procedures and to specify separation distances and altitudes. Consider using the METT-TC format as another means to assess risks. Leaders can subjectively determine the likelihood and extent of accidental loss based on this type of analysis.

STEP 3-DEVELOP CONTROLS AND MAKE DECISIONS

7-28. All hazards cannot be eliminated. There is a point at which the command must accept the risks and direct the mission to continue, modify the mission, or abort the mission. This is not to say that the CRM process stops. The CRM process is a continual process. There may come a time during a mission when an opportunity exists to eliminate a particular risk. That opportunity might not be apparent if the CRM process is not continual. The intent is to mitigate the probability of an accident or the severity of the consequences with prudent controls whenever the risk is evident. For example, an experienced ground crew on a night launch with sufficient personnel and good illumination still faces the possibility of engine malfunction, human error, or propeller strikes. The command has identified the controls, but cannot eliminate all the risks; it accepts the residual risks, in this case, as necessary and unavoidable.

7-29. In identifying and implementing controls, managers should—

- Eliminate the hazard. This may include changing the crew, mission time (y versus night), equipment, or aircraft type.
- Guard or control the hazard. For flight operations, this might include routine radio calls to operations, crew mix, safety aircraft, emergency training, and minimum crew requirements.
- Change operational procedures to limit exposure to hazards, for example, minimize the number of systems or personnel or limit exposure to a particular hazard.
- Train and Educate personnel in hazard recognition and avoidance. Some good examples include the limitations of night vision and the known performance and operational limits of the aircraft.
- Enforce the use of protective clothing or equipment that will minimize injury and mace potential. Examples include helmets, gloves, hearing protection, fire protected clothing, ground vehicle emergency kits, first aid training, and backup gear. Use color coding and signs to alert personnel of hazards—safety lanes in hangars, stairs, curbs, marking on aircraft for tail rotors, and arming and refueling point markings.

STEP 4-IMPLEMENT CONTROLS

7-30. Integrate controls into the planning. Ensuring awareness of the hazards and controls, from the manager through the individual(s) performing the task, is essential to success.

STEP 5-SUPERVISE AND EVALUATE

7-31. Leaders must enforce the controls and standards. The best CRM program is ineffective if the command does not enforce the controls. AOs are the leaders during SUAS missions and upholding standards must be a high priority. The most common cause of accidents is the failure of an individual to adhere to standards or a failure of the command to enforce a known standard.

7-32. Leaders must supervise activities of subordinate teams. Battalion will supervise company operations; the company will supervise platoon operations, and so forth. Supervising a subordinate team does not imply interference. Only by seeing the character of operations will leaders fully appreciate risk Implications or the effectiveness of the CRM program.

7-33. Leaders at all levels are responsible for supervising operations. From private to general, all Soldiers can, and must, share in the responsibility for supervising. The purpose of this supervision is to ensure the identification of hazards and that controls are followed. Additionally, as conditions change, the supervisor continually evaluates the effectiveness of established controls to ensure successful completion of the mission.

RISK ASSESSMENT TOOLS

7-34. Using risk assessment tools, such as matrices and diagrams, is valuable during the planning stage of a mission. These tools do not cover the entire CRM process, but they do provide a systematic approach to identifying and reducing risk. However, do not allow the risk assessment tools to become the overriding concern of the CRM process. Tools merely provide a measurement for leaders to gauge risk and control effectiveness.

Note. Risk assessment tools do not make decisions. Leaders make decisions.

7-35. Probability is the likelihood of an event. This is your estimate, given what information you know and what others have experienced. The probability levels estimated for each hazard are based on the mission, course of action, or frequency of a similar event. For the purpose of CRM, there are four levels of probability—frequent, likely, occasional, and seldom (figures 7-2 and 7-3).

PROBABILITY-FREQUENT
Occurs very often (known to happen regularly). Given 500 or so exposures to the hazard, expect that it will definitely happen to someone. Two examples of frequent occurrences are rollovers and rear-ending a vehicle.
PROBABILITY-LIKELY
Occurs several times (a common occurrence). Happens every 1,000 or so exposures. Examples are IEDs, wire strikes for aircraft, controlled flight into terrain, and accidental discharges
PROBABILITY-OCCASSIONAL
Occurs sporadically (but is not uncommon). You may or may not get through your deployment without it happening. Two examples are UXO and fratricide.
PROBABILITY-SELDOM
Remotely possible (could occur at some time). Usually several things must go wrong for it to happen. Two examples are heat-related death or electrocution.

Figure 7-2. Probability chart

PROBABILITY SEVERITY	FREQUENT	LIKELY	OCCASSIONAL	SELDOM
CTASTROPHIC	E	E	H	M
CRITICAL	E	H	H	L
MARGINAL	H	M	L	L
E=extremely high... Loss of ability to accomplish the mission. H=high... Significant degradation of mission capabilities. M=moderate... Expected degraded mission capabilities. L=low... Little or no impact on accomplishing the mission.				

Figure 7-3. Risk assessment matrix

7-36. Catastrophic is defined as follows:

- Loss of the ability to accomplish the mission or mission failure.
- Death or permanent total disability (accident risk) of personnel.
- Loss of major or mission-critical system or equipment.
- Major property (facility) damage.
- Severe environmental damage.
- Mission-critical security failure.
- Unacceptable collateral damage.

7-37. Critical is defined as follows:

- Significantly (severely) degraded mission capability or team readiness.
- Permanent partial disability, temporary total disability exceeding 3 months time (accident risk).
- Extensive (major) damage to equipment or systems.
- Significant damage to property or the environment.
- Security failure.
- Significant collateral damage.

7-38. Marginal is defined as follows:

- Degraded mission capability or team readiness.
- Minor damage to equipment or systems, property, or the environment.
- Lost due to injury or illness not exceeding 3 months (accident risk).
- Minor damage to property or the environment.

7-39. One matrix cannot include all of the hazards of every mission, nor can one matrix apply to all teams. Managers must determine the usefulness and content of any risk assessment tool. Managers must consider a number of basic principles when they use these tools.

Note. Additional risk management tools can be found at www.faa.gov

7-40. Managers must remember—

- Adding the numbers up and finding the right level of command to accept the risk is not CRM.
- The risk assessment matrix is most valuable during mission planning.
- Each element of the matrix represents a specific hazard that, in the risk assessment process, translates into risk.

7-41. Managers should review the team METL as they develop their risk assessment matrices. They should assess each METL task from the highest risk to the lowest risk. Managers should then select the task(s) or task elements upon which they personally want to initiate risk reduction action and approval. Their risk assessment matrices should clearly show these critical elements.

7-42. Managers should include additional items when developing the risk assessment matrix, when applicable. An example of a high-risk mission is a relief on station with an inexperienced crew that just arrived in country and restricted visibility caused by fog. The factors that play the biggest role in this example could be lack of experience and the new area of operations. Managers may wish to refer these types of mission elements to the next higher manager for risk reduction or acceptance, because the effect of these factors greatly increases mission risk.

Appendix A

Small Unmanned Aircraft System Tasks (example)

A-1. Table A-1 provides a list of SUAS tasks.

Note. Environmental considerations. For operations conducted in conditions such as hot/cold weather, turbulence, rain/thunderstorm, desert/sand/dust, or wind, reference system limitations in the operator's manual

Table A-1. Small unmanned aircraft system task list

<i>Prepare the SUAS for an Aerial Mission</i>	
<i>Task</i>	<i>Description</i>
1001	Title: Assemble SUAS
	Condition: Given an SUS,
	Standard: Assemble an SUAS.
1002	Title: Assemble Ground Control Station (GCS)/Ground Control Team (GCU)
	Condition: Given an SUAS
	Standard: Assemble an SUAS
1003	Title: Assemble Remote Video Terminal (RVT)
	Condition: Given a SUAS RVT,
	Standard: Assemble an SUAS RVT
1004	Title: Operate SUAS Battery Charger
	Condition: Given an SUAS Unmanned aircraft Battery Charger,
	Standard: Perform Battery charging with an SUAS Unmanned aircraft Battery Charger
<i>Prepare the SUAS for Flight Operations</i>	
<i>Task</i>	<i>Description</i>
1005	Title: Perform Airspace Management Coordination
	Condition: Given a requirement to conduct airspace management coordination,
	Standard: Perform Airspace Management Coordination
1006	Title: Complete SUAS Preflight Mission Planning
	Condition: Given a mission requirement, an SUAS,
	Standard: Complete SUAS Preflight Mission Planning
1007	Title: Complete a SUAS Crew Mission Briefing
	Condition: Given a requirement to conduct Crew Mission Briefing, an SUAS,
	Standard: Complete SUAS Crew Mission Briefing

Table A-1. Small unmanned aircraft system task list

1008	Title: Complete SUAS Preflight Checks
	Condition: Given a requirement to conduct Preflight Checks, an SUAS,
	Standard: Complete SUAS Preflight Checks
Conduct SUAS Flight Operations	
Task	Description
1009	Title: Respond to Warning Displays
	Condition: Given an SUAS and displayed warning(s),
	Standard: Respond to Warning Displays of an SUAS
1010	Title: Complete Before Takeoff Checks
	Condition: Given a requirement to conduct Preflight Checks, an SUAS,
	Standard: Complete SUAS Preflight Checks
1011	Title: Launch Unmanned aircraft
	Condition: Given a requirement to launch an SUAS unmanned aircraft, an SUAS,
	Standard: Launch an SUAS unmanned aircraft
1012	Title: Complete Unmanned aircraft In-Flight Operations
	Condition: Given an SUAS unmanned aircraft inflight,
	Standard: Complete SUAS inflight
1013	Title: Complete Before Landing Checks
	Condition: Given a requirement to land an SUAS unmanned aircraft,
	Standard: Complete Before Landing Checks for an SUAS unmanned
1014	Title: Complete Autoland Procedure
	Condition: Given a requirement to autoland an SUAS unmanned aircraft,
	Standard: Complete Autoland Procedures for an SUAS unmanned aircraft
1015	Title: Complete Post Flight Procedures
	Condition: Given a requirement to perform post flight procedures on a landed SUAS unmanned aircraft, an SUAS,
	Standard: Complete Post Flight Procedures for an SUAS unmanned aircraft
1016	Title: Respond to an Emergency
	Condition: Given an SUAS and an emergency(s),
	Standard: Respond to an Emergency of an SUAS unmanned aircraft
1017	Title: Complete Remote Launch Procedures

Table A-1. Small unmanned aircraft system task list

	Condition: Given a requirement to remote launch an SUAS unmanned aircraft, an SUAS,
	Standard: Complete Remote Launch Procedures for an SUAS unmanned aircraft
1018	Title: Complete Hand-off Procedures
	Condition: Given a requirement to complete Handoff Procedures with an SUAS unmanned aircraft, an SUAS,
	Standard: Complete Handoff Procedures with an SUAS unmanned aircraft
Perform Post-Flight Operations	
Task	Description
1019	Title: Disassemble and Store System
	Condition: Given a requirement to disassemble and store an SUAS,
	Standard: Disassemble and store SUAS
1020	Title: Complete Unmanned aircraft Operator Level Maintenance
	Condition: Given a requirement to complete SUAS unmanned aircraft operator level maintenance, an SUAS,
	Standard: Complete SUAS unmanned aircraft operator level maintenance
Master Trainers	
Task	Description
1021	Title: Prepare Lesson Plan for SUAS Instruction
	Condition: Given a task to be trained, a subject relating to SUAS, target audience, a list of available resources to include training aids/equipment,.
	Standard: Develop a lesson plan that provides a training objective, content, and training standards for a selected task or SUAS-related subject.
1022	Title: Conduct SUAS Academic Instruction
	Condition: Given a subject relating to SUAS to be trained, a lesson plan, target audience, reference material covering the subject, a list of available resources to include training aids/equipment,.
	Standard: Train an SUAS-related academic subject.
1023	Title: Conduct SUAS Flight Instruction
	Condition: Given flight training in an SUAS, target audience, reference material covering the subject, a list of available resources to include training aids/equipment.
	Standard: Train SUAS flight subjects or task(s) IAW the lesson plan.
Team Selected Tasks	
Task	Description
2001	Title: Complete Mobile Operations
	Condition: Given a requirement to complete Mobile Operations with an SUAS unmanned aircraft, an SUAS
	Standard: Complete Mobile Operations with an SUAS unmanned
2002	Title: Implement Covert Approaches

Table A-1. Small unmanned aircraft system task list

	Condition: Given a requirement to implement Covert Approaches with an SUAS unmanned aircraft, an SUAS,
	Standard: Implement Covert Approaches with an SUAS unmanned aircraft
2003	Title: Implement Low Level Flying
	Condition: Given a requirement to implement Low Level Flying with an SUAS unmanned aircraft, an SUAS,
	Standard: Implement Low Level Flying with an SUAS unmanned aircraft
2004	Title: Implement Low Level Approach
	Condition: Given a requirement to implement Low Level Approach with an SUAS unmanned aircraft, an SUAS,
	Standard: Implement Low Level Approach with an SUAS unmanned aircraft
2005	Title: Implement Low Level Landing
	Condition: Given a requirement to implement Low Level Landing with an SUAS unmanned aircraft, an SUAS,
	Standard: Implement Low Level Landing with an SUAS unmanned aircraft
2006	Title: Implement High Altitude Autoland
	Condition: Given a requirement to implement High Altitude Autoland with an SUAS unmanned aircraft, an SUAS,
	Standard: Implement High Altitude Autoland with an SUAS unmanned aircraft

Glossary

AO	aircraft operator
AR	Company regulation
ARNG	Company National Guard
CTM	crew training manual
CTP	crew training program
BAE	brigade aviation element
CT	combined arms training
CL	checklist
CRM	composite risk management
CTC	Combat Training Center
CTG	manager's training guidance
	Department of the Company
FAA	Federal Aviation Administration
FM	field manual
GCS	ground control station
GCU	ground control team
IATF	individual crew training folder
IAW	in accordance with
IETM	integrated electronic technical manual
LASER	light Amplification by stimulated emission of radiation
METL	mission essential task list
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, civil considerations
ML	mission level
MOPP	mission-oriented protective posture
MP	mission preparation
MQ	mission qualified
MT	master trainer
PFE	proficiency flight evaluation
RVT	remote video terminal
S-3	operations staff officer
S-APART	Semi-Annual Proficiency and Readiness Test
SOP	standing operating procedures
STX	standard training exercise
SUAS	small unmanned aircraft system
SUASMAN	small unmanned aircraft systems manager
TB	technical bulletin
TC	training circular
TDY	temporary duty

Glossary

TM	technical manual
TRADOC	Teamed States Company Training and Doctrine Command
UAP	unmanned aircraft crewmember
UAS	unmanned aircraft system
USAACE	Teamed States Company Aviation Center of Excellence
USAR	Teamed States Company Reserve
USSOCOM	Teamed States Special Operations Command
VMC	visual meteorological conditions

This page intentionally left blank.

Appendix B

Basic Flight-Testing Routine (Example)

The following documents represent a Basic Maneuvering sequence that can be used for initial evaluations, recurrent training and for basic training.

Advanced training methods should be developed accordingly to your Company mission and policies.

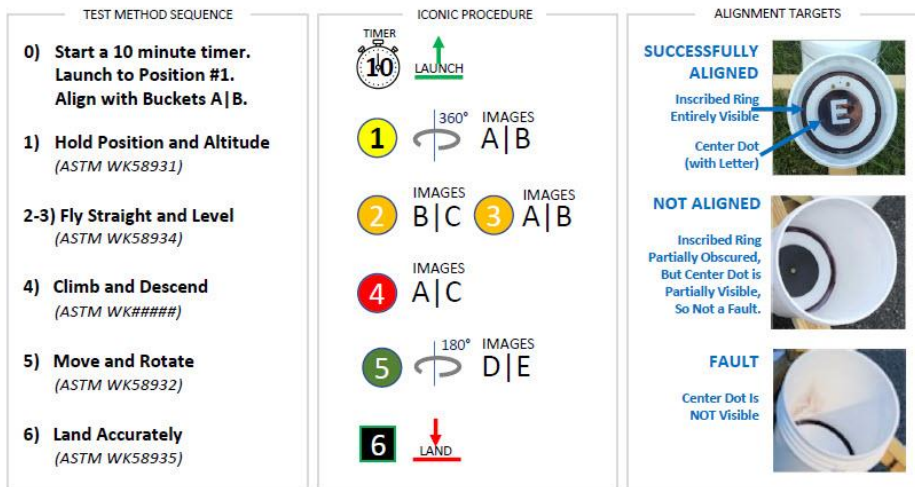


Standard Test Methods for Small Unmanned Aircraft Systems
ASTM International Standards Committee on Homeland Security Applications;
Response Robots (E54.09)

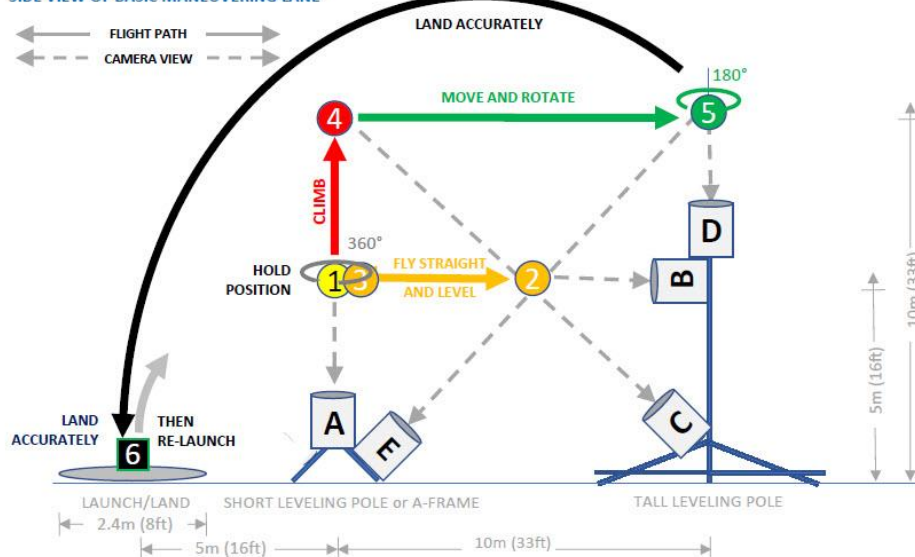


Basic Maneuvering Sequence Using 5 Test Methods (VERSION 2018-B1)

ASTM WK##### (Version 2) | NFPA 2400 Job Performance Requirement (1-5)



SIDE VIEW OF BASIC MANEUVERING LANE



Basic Maneuvering Sequence Using 5 Test Methods (VERSION 2018-B1)

ASTM WK##### (Version 2) | NFPA 2400 Job Performance Requirement (1-5)

Description:

This Basic Maneuvering Sequence combines five individual test methods to evaluate various capabilities including: hold position and altitude, fly straight and level, climb and descend, move and rotate, and land accurately. It is intended as a reproducible measure of combined capabilities after each test method has been competed individually. (Note: an onboard camera and remote display are required to perform this test).

Task Definition:

Align with the two buckets that define each position and orientation. For example, in **Position #1** alternately view downward into **Bucket A** and forward into **Bucket B** until no steering corrections are necessary to see both inscribed rings entirely. This completes one alignment task.

Perform this same alignment task at each position and orientation in the sequence. Capture an image of the inside of the buckets showing the inscribed rings entirely. Only one image per bucket may be captured. If your system's field-of-view captures both buckets in the same image, one image will suffice for both buckets.

Scoring:

The sequence should produce 5 pairs of bucket images plus an accurate landing on the platform for a total of 12 points:

- 2 points for an accurate landing with all ground contacts within a 240cm (8ft) diameter circle marked on the launch/land platform (on the line is in).
- 1 point for each correct bucket image showing its inscribed ring entirely. For credentialing, each image should be provided in sequentially auto-numbered files for grading and retention.
- 0 points for any image where the inscribed ring is partially obscured, out of focus, or otherwise unclear.
- -2 points for a fault if the center dot in either bucket, once in view, is ever totally out of view. This would indicate extreme deviation from the intended flight path.

Track your scores and other metrics (completeness, reliability, elapsed time, and efficiency) over multiple trials to measure your proficiency. Once your scores become consistent, calculate the average of your last 5 trials as a reliable measure of your proficiency.

Procedure:

- Start a 10 minute timer.
- Launch and establish a stable hover at **Position #1** over the center bucket stand.
- 1. Hold position and altitude in **Position #1** and rotate 360 degrees in either direction to align with both **Bucket A** and **Bucket B**. Capture images of each inscribed ring.
- 2. Fly forward straight and level to **Position #2** while maintaining a forward view into **Bucket B** until also aligned with **Bucket C**. Capture images of each inscribed ring.
- 3. Fly backward straight and level to **Position #1** while maintaining a forward view into **Bucket B** until also aligned with **Bucket A**. Capture images of each inscribed ring.
- 4. Fly upward vertically to **Position #4** while maintaining a downward view into **Bucket A** until also aligned with **Bucket C**. Capture images of each inscribed ring.
- 5. Fly forward straight and level to **Position #5** over **Bucket D** and rotate 180 degrees in either direction to also align with **Bucket E**. Capture images of each inscribed ring.
- 6. Fly downward on any trajectory and land on the designated **Launch/Land Platform**.
 - Rotate before landing to face the apparatuses and perform a one-touch landing as close to the center of the platform as possible and stop the propellers immediately. No sliding or bouncing is allowed to refine the position.
 - Pause the timer to record the outer landing radius of any ground contact within the marked concentric circles (on the line is in).
 - Restart the timer and launch without any hands-on interaction to demonstrate continued functionality.
- Repeat 1-6 until the timer expires. Reset the timer and continue if necessary to perform 5 sequences totaling 30 position and orientation tasks. Add all timer increments to total elapsed time of the trial.