

TC 1-211

**AIRCREW TRAINING MANUAL
UTILITY HELICOPTER,
UH-1H/V SERIES**

May 2007

DISTRIBUTION RESTRICTION: Approved for public release;
distribution is unlimited.

**HEADQUARTERS
DEPARTMENT OF THE ARMY**

This publication is available at
Army Knowledge Online (www.us.army.mil) and
General Dennis J. Reimer Training and Doctrine
Digital Library at (www.train.army.mil).

AIRCREW TRAINING MANUAL UTILITY HELICOPTER, UH-1H/V SERIES

Contents

	Page
PREFACE	vi
Chapter 1 Introduction.....	1-1
1-1. Crew Station Designation.....	1-1
1-2. Symbol Usage and Word Distinctions.....	1-1
Chapter 2 Training.....	2-1
2-1. Qualification Training.....	2-1
2-2. Refresher Training.....	2-3
2-3. Mission Training	2-4
2-4. Continuation Training	2-5
2-5. Task List	2-6
2-6. Currency Requirements	2-13
2-7. Nuclear, Biological, and Chemical Training Requirements	2-13
2-8. Night Unaided Training Requirements.....	2-14
Chapter 3 Evaluation.....	3-1
3-1. Evaluation Principles	3-1
3-2. Grading Considerations	3-2
3-4. Evaluation Sequence	3-4
3-5. Proficiency Flight Evaluation	3-8
3-6. Annual Night Vision Goggles Standardization Flight Evaluation	3-8
3-7. Post Accident Flight Evaluation.....	3-9
3-8. Medical Flight Evaluation	3-9
3-9. No-Notice Evaluation	3-9
3-10. Commander's Evaluation	3-9
Chapter 4 Crewmember Tasks	4-1
4-1. Task Contents	4-1
4-2. Tasks.....	4-6

Distribution Restriction: Approved for public release; distribution is unlimited.

*This publication supersedes TC 1-211, 9 December 1992.

Chapter 5	Maintenance Test Pilot Tasks.....	5-1
	5-1. Task Contents.....	5-1
	5-2. Task List.....	5-2
Chapter 6	Crew Coordination.....	6-1
	6-1. Crew Coordination Background.....	6-1
	6-2. Crew Coordination Elements.....	6-1
	6-3. Crew Coordination Basic Qualities.....	6-2
	6-4. Crew Coordination Objectives.....	6-6
	6-5. Standard Crew Terminology.....	6-6
Appendix A	Nonrated Crewmember Training.....	A-1
Appendix B	Power Management.....	B-1
	Glossary.....	Glossary-1
	References.....	References-1
	Index.....	Index-1

Tasks

Task 1000	Participate in a crew mission briefing.....	4-7
Task 1002	Conduct passenger briefing.....	4-10
Task 1004	Plan a visual flight rules flight.....	4-11
Task 1006	Plan an instrument flight rules flight.....	4-13
Task 1010	Prepare a performance planning card.....	4-15
Task 1011	Determine aircraft performance parameters using tabular data.....	4-21
Task 1012	Verify aircraft weight and balance.....	4-22
Task 1014	Operate aviation life support equipment.....	4-23
Task 1016	Perform internal load operations.....	4-24
Task 1020	Prepare aircraft for mission.....	4-26
Task 1022	Perform preflight inspection.....	4-27
TASK 1024	PERFORM BEFORE STARTING ENGINE THROUGH BEFORE LEAVING HELICOPTER CHECKS.....	4-29
TASK 1026	MAINTAIN AIRSPACE SURVEILLANCE.....	4-31
Task 1028	PERFORM HOVER POWER CHECK.....	4-33
Task 1030	PERFORM HOVER OUT-OF-GROUND EFFECT CHECK.....	4-35
Task 1032	Perform radio communications procedures.....	4-36
Task 1038	PERFORM HOVERING FLIGHT.....	4-38
Task 1040	PERFORM VISUAL METEOROLOGICAL CONDITIONS TAKEOFF.....	4-41
Task 1044	NAVIGATE BY PILOTAGE AND DEAD RECKONING.....	4-44
Task 1046	Perform electronically aided navigation.....	4-45
Task 1048	Perform fuel management procedures.....	4-46
Task 1052	PERFORM VISUAL METEOROLOGICAL CONDITIONS FLIGHT MANEUVERS.....	4-48
Task 1058	PERFORM VISUAL METEOROLOGICAL CONDITIONS APPROACH.....	4-50
Task 1062	PERFORM SLOPE OPERATIONS.....	4-54
Task 1066	PERFORM A RUNNING LANDING.....	4-56

Task 1070	Respond to emergencies	4-58
Task 1072	PERFORM SIMULATED ENGINE FAILURE AT A HOVER.....	4-60
Task 1074	PERFORM SIMULATED ENGINE FAILURE AT CRUISE FLIGHT	4-61
TASK 1076	PERFORM SIMULATED HYDRAULIC SYSTEM MALFUNCTION.....	4-63
TASK 1082	PERFORM AUTOROTATION.....	4-65
Task 1102	PERFORM MANUAL THROTTLE OPERATION.....	4-67
TASK 1155	NEGOTIATE WIRE OBSTACLES.....	4-69
Task 1162	Perform emergency egress	4-70
Task 1170	Perform instrument takeoff.....	4-72
Task 1172	Perform radio navigation	4-74
Task 1174	Perform holding procedures	4-76
Task 1176	Perform nonprecision approach	4-77
Task 1178	Perform precision approach	4-79
Task 1182	PERFORM UNUSUAL ATTITUDE RECOVERY	4-81
Task 1184	RESPOND TO INADVERTENT INSTRUMENT METEOROLOGICAL CONDITIONS.....	4-83
Task 1188	Operate aircraft survivability equipment.....	4-85
Task 1190	Perform hand and arm signals	4-86
Task 1194	Perform refueling operations	4-87
Task 1262	Participate in a crew-level after-action review.....	4-89
TASK 1321	PERFORM SIMULATED ANTITORQUE MALFUNCTION (FIXED PEDAL SETTING).....	4-91
Task 1323	PERFORM HOVERING AUTOROTATION	4-93
TASK 1327	PERFORM LOW-LEVEL AUTOROTATION	4-94
TASK 1335	PERFORM AUTOROTATION WITH TURN	4-96
Task 2000	Perform FM radio homing.....	4-98
TASK 2010	PERFORM MULTI-AIRCRAFT OPERATIONS.....	4-99
TASK 2012	Perform tactical flight mission planning.....	4-102
Task 2014	Perform electronic countermeasures/electronic counter-countermeasures procedures.....	4-104
Task 2022	Transmit tactical reports	4-106
TASK 2024	PERFORM TERRAIN FLIGHT NAVIGATION	4-107
TASK 2026	PERFORM TERRAIN FLIGHT	4-109
TASK 2034	PERFORM MASKING AND UNMASKING	4-111
TASK 2036	PERFORM TERRAIN FLIGHT DECELERATION.....	4-113
Task 2042	PERFORM ACTIONS ON CONTACT.....	4-114
TASK 2048	PERFORM SLING LOAD OPERATIONS	4-117
TASK 2050	Develop an emergency GPS recovery procedure	4-121
TASK 2051	Perform emergency global positioning system recovery procedure	4-128
TASK 2052	PERFORM WATER BUCKET OPERATIONS	4-130
TASK 2054	PERFORM FAST-ROPE INSERTION AND EXTRACTION OPERATIONS	4-135
TASK 2056	PERFORM RAPELLING OPERATIONS.....	4-137
TASK 2058	PERFORM SPECIAL PATROL INFILTRATION/EXFILTRATION OPERATIONS.....	4-139
TASK 2060	PERFORM INTERNAL RESCUE HOIST OPERATIONS.....	4-141
Task 2062	PREPARE PATIENT FOR HOIST OPERATIONS.....	4-144
TASK 2064	PERFORM PARADROP OPERATIONS.....	4-145

TC 1-211

Task 2067	SELECT LANDING ZONE /PICKUP ZONE AND HOLDING AREA RECONNAISSANCE	4-147
Task 2068	PERFORM SHIPBOARD OPERATIONS	4-150
TASK 2076	PERFORM CAVING LADDER OPERATIONS	4-153
TASK 2078	PERFORM HELOCAST OPERATIONS	4-155
TASK 2081	OPERATE NIGHT VISION GOGGLES	4-158
TASK 2090	PERFORM LANDING AREA RECONNAISSANCE FOR SIMULATED MAXIMUM GROSS WEIGHT	4-159
TASK 2092	RESPOND TO NIGHT VISION GOGGLE FAILURE	4-161
Task 2093	PERFORM SIMULATED MAXIMUM GROSS WEIGHT APPROACH AND LANDING	4-163
Task 2095	PERFORM SIMULATED MAXIMUM GROSS WEIGHT TAKEOFF	4-165
TASK 2098	Perform aerial radio relay	4-168
TASK 2112	OPERATE ARMAMENT SUBSYSTEM	4-169
Task 2116	Perform an aerial radiological survey	4-171
TASK 2118	Operate weather radar mapping system	4-172
Task 2120	Provide patient treatment at emergency medical technician—basic, intermediate, or paramedic—level	4-173
TASK 2125	PERFORM PINNACLE / RIDGELINE OPERATION	4-176
Task 2169	Perform aerial observation	4-179
Task 4000	Perform prior to maintenance test flight checks	5-3
Task 4004	Perform before starting engine checks	5-4
Task 4008	Perform starting engine checks	5-5
Task 4012	Perform engine run-up checks)	5-6
Task 4016	Perform before-takeoff checks	5-7
Task 4020	Perform baseline or normal engine health indicator test	5-8
Task 4024	Perform takeoff-to-hover check	5-9
Task 4028	Perform torquemeter/power check	5-10
Task 4032	Perform hovering turns check	5-11
Task 4036	Perform sideward hovering flight check	5-12
Task 4040	Perform forward hovering flight check	5-13
Task 4044	Perform pylon mount check	5-14
Task 4048	Perform engine response check	5-15
Task 4052	Perform power cylinder check	5-16
Task 4056	Perform low revolutions per minute hover check	5-17
Task 4060	Perform manual throttle operations, emergency governor mode check	5-18
Task 4064	Perform takeoff and climb checks	5-20
Task 4068	Perform level-off checks	5-21
Task 4072	Perform control rigging check	5-22
Task 4076	Perform autorotation revolutions per minute check	5-23
Task 4080	Perform hydraulics-off check	5-24
Task 4084	Perform turbine engine analysis check	5-25
Task 4088	Perform stabilizer bar check	5-26
Task 4092	Perform vibration analysis check	5-27
Task 4096	Perform cyclic rigging check	5-28
Task 4100	Perform flight instrument checks	5-29

Task 4104	Perform communication and navigation equipment checks.....	5-30
Task 4108	Perform special/detailed procedures checks	5-31
Task 4112	Perform after-landing and engine shutdown checks	5-32

Figures

Figure 2-1. Flight tasks for initial NVG qualification	2-2
Figure 2-2. Refresher flight training guide for RCM	2-3
Figure 2-3. Refresher flight training guide for NCM	2-4
Figure 2-4. Rated crewmember base task list.....	2-9
Figure 2-5. Nonrated crewmember (15T/15M) base task list.....	2-10
Figure 2-7. Crewmember (rated/nonrated) mission task list.....	2-12
Figure 2-8. Maintenance test pilot tasks	2-12
Figure 4-1. Suggested format of a crew mission briefing checklist.....	4-9
Figure 4-2(a). DA Form 7243-R, UH-1 Performance planning card (front).....	4-19
Figure 4-2(b). DA Form 7243-R, UH-1 Performance planning card (back)	4-20
Figure 4-3. Suggested format crew-level after-action review checklist.....	4-90
Figure 4-4. Standard words and phrases for sling load operations	4-120
Figure 4-5. MAHF altitude calculation diagram.....	4-122
Figure 4-6(a). MSA calculation diagram.....	4-123
Figure 4-6(b). Initial approach segment	4-125
Figure 4-6(c). Intermediate approach segment.....	4-125
Figure 4-6(d). Final approach segment.....	4-126
Figure 4-6(e). Missed approach segment	4-126
Figure 4-6(f). Sample of emergency GPS diagram.....	4-127
Figure A-1. Crew chief academic training subjects	A-1
Figure A-2. Flight medic academic training subjects.....	A-2
Figure A-3. Nonrated FI academic subjects	A-4

Tables

Table 4-1. Multi-aircraft operations briefing checklist (mandatory items)	4-100
Table 4-2: Height above landing (HAL) diagram.....	4-124
Table 6-1. Examples of standard words and phrases.....	6-6
Table B-1. Landing zone sequence checklist.....	B-4

Preface

The aircrew training manual (ATM) standardizes aircrew training programs and flight evaluation procedures. This manual provides specific guidelines for executing UH-1H/V aircrew training. It is based on the battle-focused training principles outlined in FM 7-1. This ATM establishes crewmember qualification standards; refresher, mission, and continuation training requirements; and evaluation requirements. This manual applies to all UH-1H/V series crewmembers and their commanders.

This is not a stand-alone document. All of the requirements of AR 600-105, AR 600-106, AR 95-1, NGR 95-210, and TC 1-210, must be met. If differences exist between the maneuver descriptions in TM 1-1520-210-10 and this manual, this manual is the governing authority for training and flight evaluation purposes only. TM 1-1520-210-10 is the governing authority for operation of the aircraft. Implementation of this manual conforms to AR 95-1 and TC 1-210. If a conflict exists between this manual and TC 1-210, the commander determines, based upon the requirement and the unit's mission, which manual takes precedence.

This manual (in conjunction with the ARs and TC 1-210) will help aviation commanders at all levels develop a comprehensive aircrew training program. By using the ATM, commanders ensure that individual crewmember and aircrew proficiency is commensurate with their unit's mission and that aircrews routinely employ standard techniques and procedures.

Crewmembers will use this manual as a "how to" source for performing crewmember duties. It provides performance standards and evaluation guidelines so crewmembers know the level of performance expected. Each task has a description that outlines steps for performing the task to meet the standard.

Standardization officers, evaluators, and unit trainers will use this manual and TC 1-210 as the primary tools to assist the commander in developing and implementing the aircrew training program.

This manual applies to the Active Army, the Army National Guard (ARNG)/the Army National Guard of the United States (ARNGUS), and the U.S. Army Reserve (USAR) unless otherwise stated.

The proponent of this publication is the United States Army Training and Doctrine Command (TRADOC). Send comments and recommendations on DA Form 2028 (*Recommended Changes to Publications and Blank Forms*) through the aviation unit commander to Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES (UH-1 Branch), Building 4503, Kingsman Avenue, Fort Rucker, AL 36362-5263. Recommended changes may also be e-mailed to ATZQES@rucker.army.mil.

This publication implements portions of STANAG 3114 (Edition Seven).

This publication has been reviewed for operations security considerations.

Chapter 1

Introduction

This ATM describes training requirements for UH-1H/V crewmembers. It will be used with AR 95-1, AR 600-105, AR 600-106, NGR 95-210, TC 1-210, and other applicable publications. The tasks in this ATM enhance training in both individual crewmember and aircrew proficiency. The training focuses on accomplishing tasks that support the unit's mission. The scope and level of training to be achieved individually by crewmembers and collectively by aircrews will be dictated by the mission essential task list (METL). Commanders must ensure that aircrews are proficient in mission-essential tasks.

1-1. CREW STATION DESIGNATION.

The commander will designate a crew station(s) for each crewmember. The individual's commander's task list (CTL) must clearly indicate all crew station designations. Training and proficiency sustainment for rated crewmembers is required in each designated crew station with access to the flight controls. Standardization instructor pilots (SPs), instructor pilots (IPs), instrument examiners (IEs) and maintenance evaluators (MEs) must maintain proficiency in both seats. Nonrated crewmembers' (NCM) designated station will be the cabin. Except for flying activity category (FAC) 3, aviators designated to fly from both pilots' seats will be evaluated in each seat during each phase of readiness level (RL) progression and annual proficiency and readiness test (APART) evaluations. This does not mean that both standardization and instrument flight evaluation need to be completed in both seats. As long as both seats have been evaluated while conducting the above evaluations, the requirement for a "both seat evaluation," has been met. Maintenance test pilot (MP)/ME RL progression/APART evaluations will be conducted in accordance with chapter 5 of this ATM.

1-2. SYMBOL USAGE AND WORD DISTINCTIONS.

a. Symbol usage.

(1) The diagonal (/) is used to indicate or/and. For example, SP/IP may mean SP or IP or may mean SP and IP.

(2) **P*** indicates pilot on the controls. **P** indicates pilot not on the controls.

b. Word distinctions.

(1) Warnings, cautions, and notes. These words emphasize important and critical instructions.

(a) **Warning:** An operating or maintenance procedure, practice, condition, or statement, which, if not strictly observed, could result in injury to, or death of personnel.

(b) **Caution:** An operating or maintenance procedure, practice, condition, or statement, which, if not strictly observed, could result in damage to, or destruction of, equipment, or loss of mission effectiveness.

(c) **Note:** Highlights an essential operating or maintenance procedure, condition, or statement.

TC 1-211

(2) Will, must, should, and may. These words distinguish between mandatory, preferred, and acceptable methods of accomplishment.

- (a) Will, shall, or must indicate a mandatory requirement.
- (b) Should is used to indicate a nonmandatory but preferred method of accomplishment.
- (c) May or can indicate an acceptable method of accomplishment.

(3) Night Vision Devices (NVD) .

- (a) A Night Vision System (NVS) refers to a system that is attached to the aircraft.
- (b) Night Vision Goggles (NVG) refers to any image intensifier system (for example, the AN/AVS-6 [ANVIS]).
- (c) NVD refers to NVS or NVG.

Chapter 2

Training

This chapter describes requirements for qualification, RL progression, and continuation training. Crewmember qualification requirements will be per AR 95-1, TC 1-210, and this ATM.

2-1. QUALIFICATION TRAINING.

a. Initial aircraft qualification.

(1) Rated crewmember. Initial aircraft qualification training in the UH-1H/V is conducted at the Eastern Army National Guard Aviation Training Site (EAATS), in accordance with a United States Army Aviation Warfighting Center (USAAWC)-approved program of instruction (POI).

(2) Nonrated crewmember. Military occupational specialty (MOS) qualification is conducted at DA-approved training sites. MOS transition training for NCMs (15T/15M) is conducted at the EAATS. Initial aircraft qualification training for NCMs (15T/15M and 68W) is conducted at the unit per this ATM (see appendix A, sections I and II), applicable regulations, and the commander's Aircrew Training Program (ATP). The NCMs must complete academic and flight training and pass the required written examinations within 90 consecutive days (USAR, 1 year; ARNG, refer to appropriate regulations). Commanders will determine qualification training requirements for Nonrated Crewmember Standardization Instructors (SIs) and Flight Instructors (FIs).

b. **NVG qualification.** Initial NVG qualification and aircraft NVG qualification will be per TC 1-210, the USAAWC NVG exportable training package (ETP), and this ATM. The ETP may be obtained by writing to Commander, U.S. Army Aviation Warfighting Center ATTN: ATZQ-TDS-O, Fort Rucker, Alabama 36362-5000.

(1) Initial NVG qualification. Initial NVG qualification training will be conducted according to TC 1-210, appendix B, and this ATM.

(a) Academic training. The crewmember will receive training and demonstrate a working knowledge of the topics outlined in the current USAAVNC NVG Training Support Package (TSP) and appropriate topics outlined in paragraph 3-4b of this ATM. Academic training must be completed prior to flight training.

(b) Flight training.

- Rated crewmember (RCM). RCMs will demonstrate proficiency in the tasks outlined in figure 2-1 of this ATM. There is no minimum flight hour requirement.
- Nonrated crewmember (NCM). NCMs will demonstrate proficiency in all tasks outlined for NCMs in figure 2-1 of this ATM. There is no minimum flight hour requirement.
- NVG progression. For progression to NVG RL 2, a crewmember must complete an NVG evaluation given at night by an NVG SP, IP, SI or FI, as appropriate.

(2) UH-1H/V NVG aircraft qualification. Each crewmember must complete the requirements outlined in paragraph 2-1b(1) above with the following exceptions.

Note: If Initial NVG qualification training is conducted in the UH-1H/V, then the NVG aircraft qualification is complete for the UH-1H/V.

(a) Academic training. The crewmember will receive training and demonstrate a working knowledge of the appropriate topics outlined in paragraph 3-4b of this ATM.

(b) Flight training. Crewmembers will demonstrate proficiency in the tasks outlined in figure 2-1 of this ATM. There is no minimum flight hour requirement.

<i>Task</i>	<i>Title</i>
1000	Participate in a crew mission briefing
1024	PERFORM BEFORE STARTING ENGINE THROUGH BEFORE LEAVING HELICOPTER CHECKS
1026	MAINTAIN AIRSPACE SURVEILLANCE
1028	PERFORM HOVER POWER CHECK*
1030	PERFORM HOVER OUT-OF-GROUND EFFECT (OGE) CHECK
1038	PERFORM HOVERING FLIGHT
1040	PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) TAKEOFF
1048	Perform fuel management procedures
1058	PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) APPROACH
1062	PERFORM SLOPE OPERATIONS
1066	PERFORM A RUNNING LANDING
1070	Respond to emergencies.
1072	PERFORM SIMULATED ENGINE FAILURE AT A HOVER
1074	PERFORM SIMULATED ENGINE FAILURE AT CRUISE FLIGHT
1102	PERFORM MANUAL THROTTLE OPERATION
1162	Perform emergency egress
1155	NEGOTIATE WIRE OBSTACLES
1184	RESPOND TO INADVERTENT INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)
1323	PERFORM HOVERING AUTOROTATION
2012	Perform tactical flight mission planning
2024	PERFORM TERRAIN FLIGHT NAVIGATION
2026	PERFORM TERRAIN FLIGHT
2036	PERFORM TERRAIN FLIGHT DECELERATION
2081	OPERATE NIGHT VISION GOGGLES
2092	RESPOND TO NVG FAILURE

* This task applies to RCMs only.

Figure 2-1. Flight tasks for initial NVG qualification

2-2. REFRESHER TRAINING.

The refresher training program is designed for crewmembers that have not flown for 180 days or more or are initially integrated into the ATP as RL 3. It enables crewmembers to regain proficiency in all base tasks. This chapter lists refresher training requirements and provides guidelines for developing refresher training programs. While undergoing refresher training the crewmember will be designated RL 3.

a. Aircraft refresher training requirements.

(1) Rated crewmember. The RCM completes RL 3 requirements when the criteria in TC 1-210 are met.

(a) Academic training. The crewmember will receive training and demonstrate a working knowledge of the applicable topics listed in paragraph 3-4b of this ATM and complete an operator's manual written examination.

(b) Flight training. The rated crewmember will receive training and demonstrate proficiency from his designated crew station(s) in all modes marked with an X in figure 2-4. Although technical tasks may be trained and/or evaluated in any condition and/or mode (refer to paragraph 2-5d(2) for guidance on technical tasks), the commander may require these tasks to be trained and evaluated in each mode during RL progression training. A task that may be performed from either crew station need not be evaluated from both. Figure 2-2 is a guide for developing a refresher training flight hour requirement for RCMs. Actual hours will be based on individual proficiency.

<i>Flight Instruction</i>	<i>Hours</i>
Day and night base task training	6.0
Flight evaluation	2.0
*Instrument base task training (aircraft and/or simulator)	8.0
Instrument evaluation	2.0
Total hours	18.0
* Minimum of 2 hours in the aircraft (may be the evaluation). When less than 2 hours are flown due to crewmember proficiency, all hours will be flown in the aircraft.	

Figure 2-2. Refresher flight training guide for RCM

(2) Nonrated crewmember. The NCM completes RL 3 requirements when the criteria in TC 1-210 are met. Nonrated crewmembers have minimum flying-hour requirements as specified in AR 600-106.

(a) Academic training. Topics listed in appendix A, sections I and II will be used as a guide for developing a refresher academic training program for NCMs.

(b) Flight training. The NCM will receive training and demonstrate proficiency from his designated crew station(s) in each base task in all modes marked with an X in figures 2-5 and 2-6 as appropriate. Although technical tasks may be trained and/or evaluated in any condition and/or mode (refer to paragraph 2-5d(2) for guidance on technical tasks), the commander may require these tasks to be trained and evaluated in each mode during RL progression training. NCMs must demonstrate crew coordination and airspace surveillance proficiency in all other flight tasks listed in figure 2-4. Figure 2-3 is a guide for developing a refresher training flight hour requirement for NCMs. Actual hours will be based on individual proficiency.

Flight Instruction	Hours
Day and night base task training	7.0
Flight evaluation	1.0
Total hours	8.0

Figure 2-3. Refresher flight training guide for NCM

b. **NVG refresher training.** The crewmember must complete the requirements in TC 1-210, appendix B, and the training outlined below. NVG considerations for each task, when applicable, are in chapter 4 of this ATM.

(1) Academic training. The crewmember will receive training and demonstrate a working knowledge of the appropriate topics listed in paragraph 3-4b of this ATM. Academic training must be completed prior to flight training.

(2) Flight training. Crewmembers will be trained and will demonstrate proficiency in all tasks outlined for the appropriate crewmember in figure 2-1 of this ATM. There is no minimum flight hour requirement; actual hours will be based on individual proficiency.

2-3. MISSION TRAINING.

Mission training develops the crewmember's ability to perform specific mission/additional tasks selected by the commander to support the unit's mission essential task list (METL). Mission training may be done during mission support or collective training, and may be conducted by the unit trainer (UT). The evaluation must be conducted by an SP, IP, SI, or FI as appropriate, and may be continuous.

a. Training requirements.

(1) Academic training. Academic training should focus on training a crewmember to operate as a proficient member of an aircrew and should include the doctrine for the current unit of assignment up to the battalion level. The crewmember must demonstrate a working knowledge of the topics listed in paragraph 3-4b, with special emphasis placed on sections (8) and (9). If the unit does not conduct door gunnery, section (9) may be deleted.

(2) Flight training. The crewmember will receive flight training and demonstrate proficiency from his designated crew station(s) in the mission and additional tasks, in each mode as specified on the CTL for the crewmember's position. Although technical tasks may be trained and/or evaluated in any condition and/or mode (refer to paragraph 2-5d(2) for guidance on technical tasks), the commander may require these tasks to be trained and evaluated in each mode during RL progression training. There is no minimum flight hour requirement; actual hours will be based on individual proficiency.

b. **NVG mission training.** NVG mission training will be per the commander's aircrew training program, TC 1-210, and this ATM. When commanders determine a requirement for using NVGs in mission profiles, they must develop a mission training program and specify mission/additional NVG tasks as required. Before undergoing NVG mission training, the aviator must complete qualification or refresher training and must be NVG current in the UH-1.

(1) Academic training. The crewmember will receive training and demonstrate a working knowledge of the appropriate subject areas listed in paragraph 3-4b of this ATM. Special emphasis should be placed on NVG considerations pertaining to subject areas 3-4b (8) and (10).

(2) Flight training. The crewmember will receive flight training and demonstrate proficiency from his designated crew station(s) in the mission/additional NVG tasks as specified on

the CTL for the crewmember's position. There is no minimum flight hour requirement; actual hours will be based on individual proficiency.

c. **MP and ME mission training.** MPs and MEs should be limited to duties in their primary aircraft only. They should be required to complete only those mission or additional tasks that the commander considers complementary to the mission. Commanders are not authorized to delete any maintenance test pilot tasks.

(1) Academic training. The crewmember will receive training and demonstrate a working knowledge of the subject areas in paragraph 3-4b that apply.

(2) Flight training. The MP/ME will receive training and demonstrate proficiency in the tasks in figure 2-8. There is no minimum flight hour requirement; actual hours will be based on individual proficiency.

2-4. CONTINUATION TRAINING REQUIREMENTS.

The RCM aircraft and simulation device flying-hour requirements apply only to RCMs whose primary aircraft is the UH-1H/V helicopter. For RCMs whose additional/alternate aircraft is the UH-1H/V helicopter, commanders will establish continuation training requirements per TC 1-210.

a. **Semiannual aircraft flying-hour requirements.** The minimum requirements are as follows:

(1) Rated crewmember.

(a) FAC 1 — 48 hours, from the pilot's or copilot's seat.

(b) FAC 2 — 30 hours, from the pilot's or copilot's seat.

Note: SPs, IPs, IEs, MEs, and UTs may credit those hours flown during the day and night unaided, while performing assigned duties at any crew station designated on the CTL, toward their semiannual flying-hour requirement.

(c) FAC 3 — no aircraft flying-hour requirements.

(d) NVG RL 1 RCMs and Department of the Army civilians (DACs) — 9 hours flown at night in the aircraft from a crew station with access to the flight controls while using NVGs.

Note: The 9 hour NVG requirement also applies to those RCMs and DACs who fly the UH-1H/V as an additional/alternate aircraft.

(2) Nonrated crewmember.

(a) 24 hours (12 hours USAR and ARNG) in the aircraft while performing crew duties and complying with AR 600-106 and DOD 7000.14-R.

(b) NVG RL 1 NCMs - 5 hours at night while performing crew duties and wearing NVG.

Note: SIs and FIs may credit those hours they fly while performing assigned duties in the cabin toward their semiannual flying-hour requirement.

b. **Annual simulation device flying-hour requirements.** The minimum requirements are as follows:

(1) FAC 1 and FAC 2 — Annual UH-1FS requirements for FAC 1 and FAC 2 active duty RCMs who are within 25 statute miles (SMs) of a UH-1FS are 20 hours and 12 hours, respectively. FAC 1 and FAC 2 active duty RCMs who are not within 25 SMs of a UH-1FS must refer to AR 95-1. The synthetic flight training system (SFTS) requirements for Reserve Component RCMs will be per applicable USAR or ARNG regulations. RCMs may apply 12 hours of UH-1FS time toward their semiannual aircraft flying-hour minimums.

(2) FAC 3 — All FAC 3 RCMs, despite their distance from a UH-1FS, will fly 20 hours annually in the simulator. This is authorized to be prorated in accordance with TC 1-210.

c. **Annual task and iteration requirements.** The minimum task and iteration requirements are as follows:

(1) The CTL in the crewmember's individual aircrew training folder (IATF) specifies the tasks and modes the crewmember must perform. Task iteration requirements will be in accordance with TC 1-210 except as stated below. The commander may require the crewmember to perform additional iterations of specific tasks based on crewmember proficiency. The commander should consider increasing task iteration requirements if the crewmember's proficiency is in question throughout the ATP year. The crewmember is responsible for maintaining proficiency in each task on his task list in the modes specified.

(2) The minimum iteration requirement for all performance tasks is one iteration in each mode or condition of flight listed in figures 2-4 through 2-6, and those tasks from figure 2-7 designated by the commander on the crewmember's CTL. Additional iterations should be added based on individual crewmember proficiency.

(3) The minimum iteration requirement for all technical tasks is one. Additional iterations should be added based on individual crewmember proficiency.

(4) MPs/MEs will perform a minimum of 4 iterations of MTF tasks annually. MEs will perform 2 iterations from each crew station with access to the flight controls annually.

2-5. TASK LISTS. Figures 2-4 through 2-8 list base and mission tasks.

a. **Base tasks.** Figures 2-4, 2-5 and 2-6 list the base tasks. Performance tasks are listed in **UPPERCASE** and **BOLD** throughout this manual and are indicated by a **BOLD "X"** in figures 2-4 through 2-6. A **BOLD "X"** under the mode of flight column (D, Night, NVG, or Instr) denotes the task as mandatory for RL progression and annual task iteration requirements in that mode of flight. Technical tasks, which are indicated by lowercase font and an unbold "X" may be performed in any mode of flight.

b. **Mission tasks.** Figure 2-7 lists mission tasks for RCMs and NCMs. The commander will select mission and any additional tasks that support the units METL. An "X" under the mode of flight column denotes the task as a mandatory task for RL progression in that mode of flight if the task is selected.

c. **Maintenance test pilot tasks.** Figure 2-8 lists the maintenance test pilot tasks. All tasks listed in figure 2-8 will be evaluated during APART.

d. **Task groups.**

(1) Performance tasks. An **ATM PERFORMANCE TASK** is defined as a task primarily designated to measure the crewmember's ability to perform, manipulate and respond to tasks primarily affected by the mode of flight. These tasks are significantly affected by the mode of flight and therefore the mode under which the task must be performed is specified. These tasks are listed in **UPPERCASE** and **BOLD** throughout this manual. The base tasks listed as performance tasks in figures 2-4 through 2-6 already have the applicable conditions and/or modes of flight specified. The mission tasks listed as performance tasks in figure 2-7 must have the conditions and/or modes of flight specified by the commander based on the unit METL. These specified conditions and/or modes of flight will be outlined in writing.

(2) Technical tasks. A technical task may be performed under any mode regardless of the listed task iteration requirements. Technical tasks are characterized as those tasks that measure the crewmember's ability to 1) plan; 2) preflight; 3) brief; 4) run-up; 5) shutdown; 6) debrief; or 7) operate onboard systems, sensors, avionics and etc, while in flight or on the ground. These tasks are

not significantly affected by the mode of flight and may be performed or evaluated in any mode or either seat. These tasks are in lower case and plain type throughout this manual.

e. Evaluation guidelines.

(1) Evaluations. APART evaluation tasks are those that are identified with an “S” or “I” in the Evaluation column of figures 2-4 through 2-6 and an “M” in the Evaluation column of figure 2-8. Annual NVG evaluation tasks are those tasks identified with an “NG” in the Eval column of figures 2-4 through 2-7. Tasks evaluated at night or while using night vision devices (NVD) will suffice for tasks required in day conditions.

(2) Night evaluation tasks must be evaluated in that mode if designated on the CTL by the commander.

(3) Tasks evaluated while wearing mission-oriented protective posture (MOPP) level 4 at night or while wearing NVD will suffice for CBRN tasks required in day conditions.

Legend for Figures 2-4 through 2-7.			
Day	Day mode of flight	Inst	Instrument mode of flight
Night	Night unaided mode of flight	NVG	NVG mode of flight
S	Standardization flight evaluation	I	Instrument flight evaluation
M	MP/ME flight evaluation		
Eval	Maneuver listed is required to be evaluated on the listed evaluation		
NG	NG Annual/NG Proficiency Flight Evaluation (PFE) evaluation		

Task	Task Title	Day	Inst	Night	NVG	Eval
1000	Participate in a crew mission briefing			X		S, I, M
1002	Conduct a passenger briefing			X		S
1004	Plan a visual flight rules (VFR) flight			X		S, M
1006	Plan an instrument flight rules (IFR) flight			X		I
1010	Prepare a performance planning card			X		S, I, M
1011	Determine aircraft performance parameters using tabular data			X		S
1012	Verify aircraft weight and balance			X		S
1014	Operate aviation life support equipment (ALSE)			X		S
1016	Perform internal load operations			X		
1020	Prepare aircraft for mission			X		S
1022	Perform preflight inspection			X		S, M
1024	PERFORM BEFORE STARTING ENGINE THROUGH BEFORE LEAVING HELICOPTER CHECKS	X	X	X	X	S, I, NG
1026	MAINTAIN AIRSPACE SURVEILLANCE	X		X	X	S, NG
1028	PERFORM HOVER POWER CHECK	X		X	X	S, I, NG
1030	PERFORM HOVER OUT OF GROUND EFFECT (OGE) CHECK	X			X	S, NG
1032	Perform radio communications procedures			X		S, I
1038	PERFORM HOVERING FLIGHT	X		X	X	S, NG
1040	PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) TAKEOFF	X		X	X	S, NG
1044	NAVIGATE BY PILOTAGE AND DEAD RECKONING	X		X	X	S
1046	Perform electronically aided navigation			X		S, NG
1048	Perform fuel management procedures			X		S, I, NG
1052	PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) FLIGHT MANEUVERS	X		X	X	NG
1058	PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) APPROACH	X		X	X	S, NG
1062	PERFORM SLOPE OPERATIONS	X		X	X	S, NG
1066	PERFORM A RUNNING LANDING	X		X	X	S, NG
1070	Respond to emergencies	X		X	X	S, NG
1072	PERFORM SIMULATED ENGINE FAILURE AT A HOVER	X		X	X	S, NG
1074	PERFORM SIMULATED ENGINE FAILURE AT CRUISE FLIGHT	X or	X	X		S or I
1076	PERFORM SIMULATED HYDRAULIC SYSTEM MALFUNCTION*	X			X	S, NG
1082	PERFORM AUTOROTATION*	X		X	X	S, NG
1102	PERFORM MANUAL THROTTLE OPERATION	X		X	X	S, NG
1155	NEGOTIATE WIRE OBSTACLES	X		X	X	S, NG
1162	Perform emergency egress			X		S
1170	Perform instrument takeoff		X			I
1172	Perform radio navigation		X			I
1174	Perform holding procedures		X			I

Task	Task Title	Day	Inst	Night	NVG	Eval
1176	Perform nonprecision approach		X			I
1178	Perform precision approach		X			I
1182	PERFORM UNUSUAL ATTITUDE RECOVERY	X	X	X		S OR I
1184	RESPOND TO INADVERTENT INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)	X			X	S, NG
1188	Operate aircraft survivability equipment	X				S
1190	Perform hand and arm signals	X				S
1194	Perform refueling operations	X				
1262	Participate in a crew-level after-action review	X				S, M
1321	PERFORM SIMULATED ANTI-TORQUE MALFUNCTION (FIXED PEDAL SETTING)*	X			X	S, NG
1323	PERFORM HOVERING AUTOROTATION*	X		X	X	S, NG
1327	PERFORM LOW-LEVEL AUTOROTATION*	X		X	X	S, NG
1335	PERFORM AUTOROTATION WITH TURN*	X		X	X	S, NG
* Task only authorized during aviator and instructor pilot qualification and transition training per formal POI at Department of the Army designated training bases. Task is required for annual proficiency and readiness test (APART) evaluation for those IPs / SPs designated to conduct touchdown emergency procedures training. Emergency procedures training criteria outlined in AR 95-1 must be met before this maneuver is performed.						

Figure 2-4. Rated crewmember base task list

Task	Task Title	Day	Night	NVG	Eval
1000	Participate in a crew mission briefing		X		S, NG
1002	Conduct passenger briefing		X		S
1014	Operate aviation life support equipment (ALSE)		X		S
1016	Perform internal load operations		X		S, NG
1020	Prepare aircraft for mission		X		S, NG
1022	Perform preflight inspection		X		S, NG
1024	PERFORM BEFORE STARTING ENGINE THROUGH BEFORE LEAVING HELICOPTER CHECKS	X	X	X	S, NG
1026	MAINTAIN AIRSPACE SURVEILLANCE	X	X	X	S, NG
1028	PERFORM HOVER POWER CHECK	X	X	X	S, NG
1030	PERFORM HOVER OUT OF GROUND EFFECT (OGE) CHECK	X		X	S, NG
1032	Perform radio communications procedures		X		S
1038	PERFORM HOVERING FLIGHT	X	X	X	S, NG
1040	PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) TAKEOFF	X	X	X	S, NG
1048	Perform fuel management procedures		X		S, NG
1052	PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) FLIGHT MANEUVERS	X	X	X	S, NG
1058	PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) APPROACH	X	X	X	S, NG
1062	PERFORM SLOPE OPERATIONS	X	X	X	S, NG
1066	PERFORM A RUNNING LANDING	X	X	X	S, NG
1070	Respond to emergencies	X	X	X	S, NG
1072	PERFORM SIMULATED ENGINE FAILURE AT A HOVER*	X	X	X	S, NG *
1074	PERFORM SIMULATED ENGINE FAILURE AT CRUISE FLIGHT *	X	X		S *
1102	PERFORM MANUAL THROTTLE OPERATION *	X	X	X	S, NG *
1155	NEGOTIATE WIRE OBSTACLES	X	X	X	S, NG
1162	Perform emergency egress		X		S, NG
1184	RESPOND TO INADVERTENT INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)	X		X	S, NG
1188	Operate aircraft survivability equipment		X		S
1190	Perform hand and arm signals		X		S
1194	Perform refueling operations		X		
1262	Participate in a crew-level after-action review		X		S
1323	PERFORM HOVERING AUTOROTATION*	X	X	X	S,NG*

* This task is recommended for evaluation during the APART. Commanders must use discretion since resources may not always allow for an IP during the NCM APART/NVG evaluations.

Figure 2-5. Nonrated crewmember (15T/15M/68W) base task list

Task	Task Title	D	N	NVG	EVAL
2000	Perform FM radio homing				
2010	PERFORM MULTI-AIRCRAFT OPERATIONS	X		X	
2012	PERFORM TACTICAL FLIGHT MISSION PLANNING	X		X	NG
2014	Perform electronic countermeasure (ECM)/electronic counter countermeasure (ECCM) procedures				
2022	Transmit tactical reports				
2024	PERFORM TERRAIN FLIGHT NAVIGATION			X	NG
2026	PERFORM TERRAIN FLIGHT			X	NG
2034	PERFORM MASKING AND UNMASKING				
2036	PERFORM TERRAIN FLIGHT DECELERATION			X	NG
2042	PERFORM ACTIONS ON CONTACT				
2048	PERFORM SLING LOAD OPERATIONS				
2050	Develop an emergency Global Positioning System (GPS) recovery procedure				
2051	PERFORM EMERGENCY GLOBAL POSITIONING SYSTEM (GPS) RECOVERY PROCEDURE				
2052	PERFORM WATER BUCKET OPERATIONS				
2054	PERFORM FAST ROPE INSERTION AND EXTRACTION (FRIES) OPERATIONS				
2056	PERFORM RAPPELLING OPERATIONS				
2058	PERFORM SPECIAL PATROL INFILTRATION / EXFILTRATION (SPIES) OPERATIONS				
2060	PERFORM INTERNAL RESCUE HOIST OPERATIONS				
2062*	PREPARE PATIENT FOR HOIST OPERATIONS				
2064	PERFORM PARADROP OPERATIONS				
2067	SELECT LANDING ZONE (LZ) /PICKUP ZONE (PZ) AND HOLDING AREA RECONNAISSANCE				
2068	PERFORM SHIPBOARD OPERATIONS				
2076	PERFORM CAVING LADDER OPERATIONS				
2078	PERFORM HELOCAST OPERATIONS				
2081	OPERATE NIGHT VISION GOGGLES (NVG)			X	NG
2090	PERFORM LANDING AREA RECONNAISSANCE FOR SIMULATED MAXIMUM GROSS WEIGHT				
2092	RESPOND TO NVG FAILURE			X	NG
2093	PERFORM SIMULATED MAXIMUM GROSS WEIGHT APPROACH AND LANDING				
2095	PERFORM SIMULATED MAXIMUM GROSS WEIGHT TAKEOFF				
2098	Perform aerial radio relay				
2112	OPERATE ARMAMENT SYSTEMS				
2116	Perform an aerial radiological survey				
2118	Operate weather radar mapping system				
2120	Perform patient evacuation and treatment				

Task	Task Title	D	N	NVG	EVAL
2125	PERFORM PINNACLE / RIDGELINE OPERATIONS				
2169	Perform aerial observation				
* This task applies to NCMs only.					

Figure 2-7. Crewmember (rated/nonrated) mission task list

Task	Task Title	Eval
4000	Perform prior to maintenance test flight checks	M
4004	Perform before starting engine checks	M
4008	Perform starting engine checks	M
4012	Perform engine run-up checks	M
4016	Perform before-takeoff checks	M
4020	Perform baseline or normal engine health indicator test	M
4024	Perform takeoff to a hover check	M
4028	Perform torquemeter / power check	M
4032	Perform hovering turns check	M
4036	Perform sideward hovering flight check	M
4040	Perform forward hovering light check	M
4044	Perform pylon mounts check	M
4048	Perform engine response check	M
4052	Perform power cylinder check	M
4056	Perform low revolutions per minute hover check	M
4060	Perform manual throttle operations, emergency governor mode check	M
4064	Perform takeoff and climb checks	M
4068	Perform level off checks	M
4072	Perform control rigging check	M
4076	Perform autorotation revolutions per minute check	M
4080	Perform hydraulics off check	M
4084	Perform turbine engine analysis check	M
4088	Perform stabilizer bar check	M
4092	Perform vibration analysis check	M
4096	Perform cyclic rigging check	M
4100	Perform flight instrument checks	M
4104	Perform communication and navigation equipment checks	M
4108	Perform special / detailed procedures checks	M
4112	Perform after landing and engine shutdown checks	M

Figure 2-8. Maintenance test pilot tasks

2-6. CURRENCY REQUIREMENTS

a. **Aircraft Currency.** Aircraft currency will be per AR 95-1 and this paragraph. A crewmember whose currency has lapsed must complete a proficiency flight evaluation given in the aircraft by an IP/SP. The commander will designate the tasks for this evaluation.

b. **NVG Currency.**

(1) To be considered NVG current, an aviator must take part every 60 consecutive days in at least a 1-hour flight in the aircraft, while wearing NVG.

(2) A crewmember whose currency has lapsed must complete, as a minimum, a 1-hour NVG proficiency evaluation given at night in the aircraft by an NVG IP or SP. Minimum tasks to be evaluated are listed below. To reestablish currency, an NVG IP may evaluate an NVG IP or SP. An IP may not evaluate an IP or SP for APART purposes.

(a) **TASK 1024, PERFORM BEFORE STARTING ENGINE THROUGH BEFORE LEAVING HELICOPTER CHECKS.**

(b) **TASK 1028, PERFORM HOVER POWER CHECK.**

(c) **TASK 1030, PERFORM HOVER OUT-OF-GROUND CHECK.**

(d) **TASK 1038, PERFORM HOVERING FLIGHT.**

(e) **TASK 1040, PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) TAKEOFF.**

(f) **TASK 1058, PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) APPROACH.**

(g) **TASK 1062, PERFORM SLOPE OPERATIONS.**

(h) Task 1070, Respond to emergencies.

(i) **TASK 1184, RESPOND TO INADVERTENT INSTRUMENT METEOROLOGICAL CONDITIONS (IIMC)**

(j) **TASK 2081, OPERATE NIGHT VISION GOGGLES.**

(k) **TASK 2092, RESPOND TO NIGHT VISION GOGGLE FAILURE.**

c. **Iteration Currency.** To maintain currency in Task 1074, Respond to Engine Failure at Cruise Flight, IP/SPs must perform one iteration of Task 1074 every 90 days. To reestablish currency, an IP may evaluate an IP or SP. An IP may not evaluate an IP or SP for APART purposes.

2-7. CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR TRAINING REQUIREMENTS. The commander evaluates the unit mission and determines if chemical, biological, radiological and nuclear (CBRN) training is required. If the unit requires CBRN training, the commander will train all FAC 1 and selected FAC 2 aviators. Crewmembers must wear full MOPP gear (MOPP level 4) during CBRN training.

a. **Crewmembers will receive CBRN training in the base tasks listed below and will perform at least one iteration annually.** The commander selects mission/additional tasks based on the unit's mission.

(1) Task 1022, Perform preflight inspection.

(2) **TASK 1024, PERFORM BEFORE STARTING ENGINE THROUGH BEFORE LEAVING HELICOPTER CHECKS.**

(3) **TASK 1028, PERFORM HOVER POWER CHECK.**

(4) **TASK 1038, PERFORM HOVERING FLIGHT.**

(5) **TASK 1040, PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) TAKEOFF.**

(6) **TASK 1058, PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) APPROACH.**

(7) **TASK 1062, PERFORM SLOPE OPERATIONS.**

(8) Task 1070, Respond to emergencies.

b. **While conducting CBRN training, the commander will ensure that—**

(1) Aircrews use extra care when performing flight duties or training in aircraft cockpits when the wet bulb globe temperature is above 75 degrees Fahrenheit.

(2) Aircrews will not receive emergency procedures training in flight while wearing MOPP gear. (They will complete this training in static aircraft.)

(3) CBRN training is coordinated closely with the local flight surgeon.

2-8. NIGHT UNAIDED TRAINING REQUIREMENTS. Annual night unaided training is mandatory for all crewmembers. The night tasks identified with an X in figures 2-4 through 2-7 will be evaluated during RL progression and a minimum of one iteration of each task will be performed annually. The commander may designate any of the night tasks identified with an X in Figures 2-4 through 2-7.

Chapter 3

Evaluation

This chapter describes evaluation principles and grading considerations. It also contains guidelines for conducting academic and hands-on performance testing. Evaluations are a primary means of assessing flight standardization and crewmember proficiency. Evaluations will be conducted per AR 95-1, TC 1-210, and this ATM.

3-1. EVALUATION PRINCIPLES. The value of any evaluation depends on adherence to fundamental evaluation principles. These principles are described below.

a. **Selection of evaluators.** The evaluators must be selected not only for their technical qualifications but also for their demonstrated performance, objectivity, and ability to observe and to provide constructive comments. These evaluators are the SPs, IPs, IEs, MEs, SIs, and FIs who assist the commander in administering the ATP.

b. **Method of evaluation.** The method used to conduct the evaluation must be based on uniform and standard objectives. In addition, it must be consistent with the unit's mission and must strictly adhere to the appropriate standing operating procedures (SOPs) and regulations. The evaluator must ensure a complete evaluation is given in all areas and refrain from making a personal "area of expertise" a dominant topic during the evaluation.

c. **Participant understanding.** All participants must completely understand the purpose of the evaluation.

d. **Participant cooperation.** All participants must cooperate to guarantee the accomplishment of the evaluation objectives. The emphasis is on all participants, not just on the examinee.

e. **Identification of training needs.** The evaluation must produce specific findings to identify training needs. Any crewmember affected by the evaluation needs to know what is being performed correctly and incorrectly and how improvements can be made.

f. **Purpose of evaluation.** The evaluation determines the examinee's ability to perform essential hands-on tasks to prescribed standards. Flight evaluations will also determine the examinee's ability to exercise crew coordination in completing these tasks.

g. **Crew coordination.** The guidelines for evaluating crew coordination are based on a subjective analysis of how effectively a crew performs together to accomplish a series of tasks. The evaluator must determine how effectively the examinee employs aircrew coordination as outlined in chapter 6 of this ATM.

h. **Evaluator role as crewmember.** In all phases of evaluation, the evaluator is expected to perform as an effective crewmember. However, at some point during the evaluation, circumstances may prevent the evaluator from performing as an effective crewmember. In such cases, a realistic, meaningful, and planned method should be developed to pass this task back to the examinee effectively. In all other situations, the evaluator must perform as outlined in the task description or as directed by the examinee. The examinee must know they are being supported by a fully functioning crewmember.

Note: When evaluating a pilot in command (PC), Unit Trainer (UT), IP, SP, ME, or IE, the evaluator must advise the examinee that, during role-reversal, the evaluator may deliberately perform some tasks or crew coordination outside the standards to check the examinee's diagnostic and corrective action skills.

3-2. GRADING CONSIDERATIONS.

a. **Academic evaluation.** The examinee must demonstrate a working knowledge and understanding of the appropriate subject areas in paragraph 3-4b.

b. **Flight evaluation.**

(1) Academic. In the TRAINING AND EVALUATION REQUIREMENTS section of a task, some tasks are identified as tasks that may be evaluated academically. For these tasks, the examinee must demonstrate a working knowledge of the task. Evaluators may use Computer Based Instruction (CBI), mock-ups, or other approved devices in determining the examinee's knowledge of the task.

(2) Aircraft or simulator. These tasks require evaluation in the aircraft or the UH-1FS simulator. Task standards are based on an ideal situation. Grading is based on meeting the minimum standards. The evaluator must consider deviations (high wind, turbulence, or poor visibility) from the ideal during the evaluation. If other than ideal conditions exist, the evaluator must make appropriate adjustments to the standards.

Note: During an evaluation, a task iteration performed in a more demanding mode of flight may suffice for an iteration performed in a less demanding mode of flight. The commander determines which mode of flight is more demanding.

3-3. CREWMEMBER EVALUATION. Evaluations are conducted to determine the crewmember's ability to perform the tasks on his CTL and check understanding of required academic subjects listed in the ATM. The evaluator will determine the amount of time devoted to each phase. When the examinee is an evaluator/trainer or a unit trainer, the recommended procedure is for the evaluator to reverse roles with the examinee. When the evaluator uses this technique, the examinee must understand how the role-reversal will be conducted and when it will be in effect. Initial validation of a crewmember's qualifications following a MOS producing course of instruction/school (such as UH-1H/V instructor pilot course, maintenance test pilot course, instrument flight examiners course, and nonrated instructor course) will be conducted in the aircraft upon return from that course and in the aircraft at each new duty station.

a. **Recommended performance and evaluation criteria.**

(1) Pilot (PI). The PI must demonstrate a working knowledge of the appropriate subjects in paragraph 3-4b. In addition, the PI must be familiar with their IATF and understand the requirements of the CTL.

(2) PC/MP. The PC/MP must meet the requirements in a paragraph 3-3a(1). In addition, PC/MP must demonstrate sound judgment and maturity in the management of the mission, crew, and assets.

(3) UT. The UT must meet the requirements in paragraph 3-3a(2). In addition, the UT must be able to instruct in the appropriate tasks and subjects, recognize errors in performance or understanding, make recommendations for improvement, train to standards, and document training.

(4) IP or IE. The IP or IE must meet the requirements in a paragraph 3-3a(2). In addition, they must be able to objectively train, evaluate, and document performance of the nonrated crewmembers (NCMs), SI, FI, PI, PC, UT and IE, using role-reversal for IP, IE, UT, PC, SI, and FI, as appropriate. This individual must possess a thorough knowledge of the fundamentals of instruction and evaluation, be able to develop and implement an individual training plan, and possess a thorough understanding of the requirements and administration of the ATP.

(5) SP. The SP must meet the requirements in paragraph 3-3a(2) and (4). The SP must be able to instruct and evaluate IPs, SPs, UTs, PCs, SIs, and FIs as appropriate, using role-reversal. The SP must also be able to develop and implement a unit-training plan and administer the commander's ATP.

(6) ME. The ME must meet the requirements in paragraph 3-3a(1) and (2). The ME must be able to instruct and evaluate other MEs and MPs using role reversal when required.

(7) Crew Chief (CE)/Fight Surgeon or Medical Personnel (MO)/ nonrated aircraft maintenance personnel, (OR). The CE/MO/OR must perform selected tasks to ATM standards, applying aircrew coordination principles. The CE/MO/OR must also demonstrate a basic understanding of the appropriate academic subjects listed in paragraph 3-4b. In addition, they must be familiar with their IATF, and understand the requirements of the CTL.

(8) FI. The FI must meet the requirements in paragraph 3-3a(7). In addition, the FI must be able to objectively train, evaluate and document performance of the FI, CE, MO, and OR as appropriate. The FI must be able to develop and implement an individual training plan, and have a thorough understanding of the requirements and administration of the ATP.

(9) SI. The SI must meet the requirements in paragraph 3-3a(7) and (8). In addition, the SI must be able to train and evaluate SIs, FIs, CEs, MOs, and ORs, using role-reversal as appropriate. The SI must also be able to develop and implement a unit-training plan and administer the commander's ATP.

Note: SP/IP/IE/ME/UT/SI/FI will be evaluated on their ability to apply the learning and teaching process outlined in paragraph 3-4b(12) and the Instructor Pilot Handbook.

b. Academic evaluation criteria.

(1) Proficiency flight evaluations. The commander or his representative will select applicable topics to be evaluated from paragraph 3-4b that apply.

(2) APART standardization evaluation. The SP/IP/SI/FI will evaluate a minimum of two topics from each applicable subject area in paragraphs 3-4b that apply.

(3) APART instrument evaluation. The IE will evaluate a minimum of two topics from the subject areas in paragraphs 3-4b(1) through (5) relative to IMC flight and flight planning. If the evaluated crewmember is an SP/IP/IE, the IE will evaluate the SP/IP/IE's ability to instruct instrument related tasks.

(4) NG annual evaluations. The NVG SP/IP/SI/FI will evaluate a minimum of two topics from each applicable subject area in paragraphs 3-4b.

(5) APART MP/ME evaluation. The ME will evaluate a minimum of two topics from the subject areas in paragraphs 3-4b(1) through (4) and (11) with specific emphasis on how they apply to maintenance test flights. Additionally, ME examinees must evaluate paragraph 3-4b(12).

(6) Other ATP evaluations. The SP/IP/SI/FI will evaluate a minimum of two topics from each subject area in paragraphs 3-4b that apply.

3-4. EVALUATION SEQUENCE.

The evaluation sequence consists of four phases. The evaluator will determine the amount of time devoted to each phase.

a. **Phase 1—Introduction.** In this phase, the evaluator—

(1) Reviews the examinee's individual flight record folder (IFRF) and IATF records to verify that the examinee meets all prerequisites for designation and has a current DA Form 4186 (*Medical Recommendation for Flying Duty*).

(2) Confirms the purpose of the evaluation, explains the evaluation procedure, and discusses the evaluation standards and criteria to be used.

Note 1: If the evaluation is for an evaluator, the individual conducting the evaluation must explain that the examinee's ability to apply the learning and teaching process outlined in the instructor pilot handbook will be evaluated.

Note 2: For UTs, the evaluation will include special emphasis on the examinee's performance in those areas in which UT duties are performed. The evaluation should ensure that the examinee can safely and effectively perform UT duties.

b. **Phase 2—Academic evaluation topics.** The tasks identified with an asterisk (*) apply to RCMs only.

(1) Regulations and publications (AR 95-1, AR 95-2, DA Pam 738-751, DOD FLIP, TC 1-210, appropriate aircraft operators manuals, TM 1-1500-328-23, ACTE Aircrew Guide, and local regulations and unit SOPs). Topics in this subject area are—

- Aircrew training program (ATP) requirements
- Crew coordination
- Airspace regulations and usage
- Flight plan preparation and filing
- Performance planning
- Inadvertent instrument meteorological conditions (IIMC) procedures
- Forms, records, and publications required in the aircraft
- Unit standing operating procedures (SOPs) and local requirements
- DOD flight information publications and maps
- Visual flight rules (VFR)/instrument flight rules (IFR) minimums and procedures
- Weight and balance requirements
- Maintenance forms and records
- Aviation life support equipment (ALSE)

(2) Aircraft systems, avionics, and mission equipment description and operation (TM 55-1520-210-10, chapters 2, 3, and 4). Topics in this subject are—

- Helicopter description
- Emergency equipment
- Engines and related systems
- Fuel system
- Flight control system
- Hydraulic system
- Power train system
- Rotors
- Utility systems
- Heating and ventilation
- Electrical power supply and distribution systems
- Lighting
- Flight instruments
- Servicing, parking, and mooring
- Avionics
- MARK XXII IFF
- Mission equipment
- Armament
- Mission avionics
- Aircraft survivability equipment (ASE)
- Cargo handling

(3) Operating limitations and restrictions (TM 55-1520-210-10). Topics in this subject area are—

- General *
- System limits*
- Power limitations*
- Loading limits
- Airspeed limits
- Maneuvering limits
- Environmental restrictions*
- Other limitations*
- Internal rescue hoist (Breeze Only)
- Other limitations
- CG limits
- Notes, cautions, and warnings*
- Air Worthiness Release (AWR) limitations*

(4) Aircraft emergency procedures and malfunction analysis (TM 55-1520-210-10). Topics in this subject area are—

- Emergency terms and their definitions
- Emergency exits and equipment
- Minimum rate of descent*
- Maximum glide distance*
- Engine malfunctions*
- Transmission malfunctions*
- Tail rotor malfunctions*
- Drive system malfunctions*
- Fire
- Hydraulic system malfunctions*
- Flight control malfunctions*
- Rotor system malfunctions*
- Fuel system malfunctions*
- Electrical system malfunctions*
- Landing and ditching procedures
- Caution segment lights*
- Autorotational glide characteristics*
- Height velocity diagram*
- Mission equipment malfunctions
- Caution and Warning emergency procedures*

TC 1-211

(5) Aeromedical factors (AR 40-8, FM 3-04.301, and TC 1-204). Topics in this subject area are—

- Flight restrictions due to exogenous factors
- Stress and fatigue
- Spatial disorientation
- Hypoxia
- Middle ear discomfort
- Principles and problems of vision

(6) Aerodynamics (FM 1-203 and TM 55-1520-210-10). Topics in this subject area are—

- Relative wind*
- Airflow during a hover*
- Total aerodynamic force*
- Dynamic rollover*
- Translating tendency*
- Dissymmetry of lift*
- Retreating blade stall*
- Effective translational lift*
- Settling with power*
- Transverse flow*
- Autorotation*

(7) Night mission operations (TC 1-204 and FM 3-04.301). Topics in this subject area are—

- Unaided night flight
- Visual illusions
- Distance estimation and depth perception
- Dark adaptation, night vision protection, and central night blind spot
- Night vision limitations and techniques
- Types of vision
- Use of internal and external lights
- Night terrain interpretation, map preparation, and navigation

(8) Tactical and mission operations (FM 1-112, FM 1-113, FM 1-400, FM 10-450-2, FM 10-450-3, FM 10-450-4, FM 10-450-5, FM 34-1, FM 3-52, FM -100.2, and FM 90-4; TC 1-201, TC 1-204, and TC 1-210; TM 55-1520-210-10; and unit SOP). Topics in this subject area are—

- Aircraft survivability equipment (ASE) employment*
- Downed aircraft procedures
- Communication security (COMSEC)
- Mission equipment
- Tactical reports
- High Intensity Radio Transmission Area (HIRTA)
- External load operations
- Tactical formation
- Fratricide prevention
- Tactical flight planning and safety*
- Actions on contact
- Internal load operations
- Chemical, biological, radiological, nuclear (CBRN) operations
- Fire support

(9) Weapon system operation and employment (FM 1-112 and FM 3-04.140, TM 55-1520-210-10 and unit SOP). Topics in this subject area are—

- Weapons initialization, arming, and safety
- Operation and function of the M60D/M240
- Visual search and target detection
- Weapons employment during night and NVD operations
- Range estimation
- Duties of the door gunner
- Techniques of fire and employment

(10) NVG operations (FM 3-04.301, TC 1-204, TM 55-1520-210-10, TM 11-5855-313-10 and unit SOP). Topics in this subject area are—

- Night vision goggles (NVG) nomenclature, characteristics, limitations, and operations
- NVG aircraft modifications
- NVG effects on distance estimation and depth perception
- Hemispherical illumination
- NVG ground and air safety
- Use of internal and external lights
- NVG tactical operations, to include lighting*
- NVG terrain interpretation, map preparation, and navigation

(11) ME and MP topics (DA Pam 738-751; TM 55-1520-210–23 series manuals, TM 55-1520-210-MTF and TM 55-1520-210-10). Topics in this subject area are for MEs and MPs only.

- Engine start
- Electrical system
- Power plant
- Power train
- Flight controls
- Fuel system
- Communications and navigation equipment
- Maintenance operational check (MOC)/maintenance test flight (MTF) requirements
- Instrument indications
- Turbine engine analysis check
- Engine performance check
- Hydraulic system
- Vibrations
- Baseline health indicator test (HIT) checks
- Warning systems indications
- MTF weather requirements

(12) Evaluator/trainer topics (Instructor Pilot Handbook). Topics in this subject area are —

- Learning process
- Effective communication
- Teaching methods
- Types of evaluations
- Planning instructional activity
- Flight instructor characteristics and responsibilities
- Human behavior
- Teaching process
- The instructor as a critic
- Instructional aids
- Techniques of flight instruction

c. **Phase 3—Flight Evaluation.** This phase consists of a crew briefing, a preflight inspection; engine-start, runup, hover procedures; flight tasks; engine shutdown and after-landing tasks.

(1) Briefing. The evaluator will explain the flight evaluation procedure and brief the examinee in the tasks to be evaluated. When evaluating an evaluator/trainer, the evaluator must advise the examinee that, during role-reversal, they may deliberately perform some tasks outside standards to check the examinee's diagnostic and corrective action skills. The evaluator will conduct or have the examinee conduct a crew briefing in accordance with task 1000.

(2) Preflight inspection, engine-start, and runup procedures. The evaluator will evaluate the examinee's use of the appropriate TMs, checklists (CLs), MTF procedures, and/or the integrated electronic technical manual as appropriate. The evaluator will have the examinee identify and discuss the function of at least two aircraft systems.

(3) Flight tasks. As a minimum, the evaluator will evaluate those tasks listed on the CTL as mandatory for the designated crew station(s) for the type of evaluation they are conducting and those mission or additional tasks selected by the commander. The evaluator, in addition to the commander selected tasks, may randomly select any tasks for evaluation listed on the mission or additional task list. An SP, IP, ME, IE, UT, SI and FI must demonstrate an ability to instruct and/or evaluate appropriate flight tasks. When used as part of the proficiency flight evaluation, the evaluation may include an orientation of the local area, checkpoints, weather, and other pertinent information. All MTF tasks are mandatory for an MTF standardization evaluation.

Note: During the conduct of any instrument flight evaluation, the aviator's vision will be restricted to the aircraft instruments. If the aircraft is not under actual IMC conditions then the vision will be restricted by wearing a vision limiting device and the appropriate flight symbol will be logged on DA Form 2408-12 (*Army Aviator's Flight Record*).

(4) Engine shutdown and after-landing tasks. The evaluator will evaluate the examinee's use of the appropriate TMs / CLs / MTFs, and/or the integrated electronic technical manual as appropriate.

d. **Phase 4—Debriefing.** During this phase, the evaluator will—

(1) Discuss the examinee's strengths and weaknesses.

(2) Offer recommendations for improvement.

(3) Tell the examinee whether they passed or failed the evaluation and discuss any tasks not performed to standards.

(4) Complete the applicable forms and ensure that the examinee reviews and initials the appropriate forms per instructions in TC 1-210.

Note: Inform the examinee of any restrictions, limitations, or revocations the evaluator will recommend to the commander following an unsatisfactory evaluation.

3-5. PROFICIENCY FLIGHT EVALUATION. This evaluation is conducted per AR 95-1. After the evaluation, the IP or SP will debrief the examinee and complete the applicable forms per instructions in TC 1-210.

3-6. ANNUAL NIGHT VISION GOGGLES STANDARDIZATION FLIGHT EVALUATION. This evaluation is conducted per TC 1-210, this manual, and the commander's task list. The evaluation will include all base tasks indicated by an NG in the Eval column of tables 2-4 thru 2-7 for those crewmembers in designated NVG positions and aviators who maintain NVG currency. After the

evaluation, the IP or SP will debrief the examinee and complete the applicable forms per instructions in TC 1-210.

3-7. POST ACCIDENT FLIGHT EVALUATION. This evaluation is required by AR 95-1. After the evaluation, the IP or SP will debrief the examinee and complete the applicable forms per instructions in TC 1-210.

3-8. MEDICAL FLIGHT EVALUATION. This evaluation is conducted per AR 95-1. The IP or SP, on the recommendation of the flight surgeon, will require the examinee to perform a series of tasks most affected by the examinee's disability. The evaluation should measure the examinee's potential to perform ATM tasks despite a disability. It should not be based on current proficiency.

a. After the examinee has completed the medical flight evaluation, the evaluator will prepare a memorandum. The memorandum will include—

(1) A description of the environmental conditions under which the evaluation was conducted (for example, day, night, or overcast).

(2) A list of tasks performed during the evaluation.

(3) A general statement of the individual's ability to perform with the disability and the conditions under which the individual can perform.

b. The unit commander will then forward the memorandum and the applicable forms to Commander, U.S. Army Aviation Warfighting Center, ATTN: HSXY-AER, Fort Rucker, AL 36362-5333.

3-9. NO-NOTICE EVALUATION. This evaluation is conducted per TC 1-210. After the evaluation, the evaluator will debrief the examinee and complete the applicable forms per instructions in TC 1-210.

3-10. COMMANDER'S EVALUATION. This evaluation is conducted per TC 1-210. After the evaluation, the evaluator will debrief the examinee and complete the applicable forms per the instructions in TC 1-210.

This page intentionally left blank.

Chapter 4

Crewmember Tasks

This chapter implements portions of STANAG 3114.

This chapter describes those maneuvers and procedures that are essential for maintaining crewmember skills. It does not contain all the maneuvers that can be performed in the aircraft. Some tasks that must be done during required training or evaluation flights may not be mandatory for other flights. (For example, Task 1010 is not mandatory for all flights.) However, aviators must complete the performance planning card when their training/mission involves this task or when the instructor or evaluator requires it.

4-1. TASK CONTENTS.

a. **Task number.** Each ATM task is identified by a 10-digit systems approach to training (SAT) number. The first three digits of each task in this ATM are 011 (U.S. Army Aviation School); the second three digits are 211 (UH-1H/V utility helicopter). (As an example, the full task number for task 1004, Plan a VFR flight, is 011-211-1004.) For convenience, only the last four digits are listed in this training circular. The last four digits of—

- Base tasks are assigned 1000-series numbers.
- Mission tasks are assigned 2000-series numbers.
- Maintenance tasks are assigned 4000-series numbers. (Maintenance tasks are in chapter 5).

Note: Additional tasks designated by the commander as mission essential are not included in this ATM. The commander will develop conditions, standards, and descriptions for those additional tasks.

b. **Task title.** The task title identifies a clearly defined and measurable activity. Titles may be the same in several ATMs, but tasks may be written differently for the specific airframe.

c. **Conditions.** The conditions specify the common conditions under which the task will be performed. Reference will be made to a particular helicopter within a design series when necessary. References to the UH-1FS in the conditions do not apply to nonrated crewmembers. All conditions must be met before task iterations can be credited. Normally, conditions are specified for wartime missions of the aircraft.

- (1) Common conditions are—
 - (a) In a mission aircraft with mission equipment and crew, items required by AR 95-1, and publications.
 - (b) Under visual or instrument meteorological conditions (VMC or IMC).
 - (c) Day, night, and night vision devices (NVD) employment.
 - (d) In any terrain or climate.
 - (e) CBRN, including MOPP equipment employment.
 - (f) Electromagnetic environmental effects (E3).

(2) Common training/evaluation conditions are—

(a) When an UT, IP, SP, IE, or ME is required for the training of the task, then that individual will be at one set of the flight controls while the training is performed. References to IP in the task conditions include SP. References to flight engineer instructor (FI) in the task conditions include SI. Evaluators/trainers who are evaluating/training nonrated crewmembers (NCMs) must be at a station without access to the flight controls except when evaluating crew coordination or conducting a no-notice evaluation.

(b) The following tasks require an IP, SP or IE, as appropriate, for training/evaluation in the aircraft:

- Task 1070, Respond to emergencies.
- **TASK 1072, PERFORM SIMULATED ENGINE FAILURE AT A HOVER.**
- **TASK 1074, PERFORM SIMULATED ENGINE FAILURE AT CRUISE FLIGHT.**
- **TASK 1076, PERFORM SIMULATED HYDRAULIC SYSTEM MALFUNCTION.**
- **TASK 1082, PERFORM AUTOROTATION.**
- **TASK 1102, PERFORM MANUAL THROTTLE OPERATION.**
- **TASK 1182, PERFORM UNUSUAL ATTITUDE RECOVERY. (AN IP, SP, OR IE MAY CONDUCT THE TRAINING/EVALUATION OF THIS TASK IN THE AIRCRAFT.)**
- **TASK 1321, PERFORM ANTITORQUE MALFUNCTION.**
- **TASK 1323, PERFORM HOVERING AUTOROTATION.**
- **TASK 1327, PERFORM LOW-LEVEL AUTOROTATION.**
- **TASK 1335, PERFORM AUTOROTATION WITH TURN.**

(3) Unless specified in the task considerations, a task may be performed in any mode of flight without modifying the standards or descriptions. When personal equipment (NVG, MOPP) or mission equipment (water bucket, Aux tanks, rescue hoist, etc.) is required for the performance of the task, the availability of that equipment becomes part of the conditions.

(4) Simulated IMC denotes flight solely by reference to flight instruments while wearing a vision-limiting device.

(5) Tasks requiring specialized equipment do not apply to aircraft that do not have the equipment installed.

(6) NVG use may be a condition for any flight task. When NVGs are listed as a condition, task standards will be the same as those described for performance of the task without using NVGs.

(7) The aircrew will not attempt the tasks listed below when performance planning or the hover power check indicates that out-of-ground effect (OGE) power is not available.

- (a) **TASK 1030, PERFORM HOVER OGE CHECK.**
- (b) Task 1170, Perform instrument takeoff.
- (c) **TASK 2026, PERFORM TERRAIN FLIGHT.**
- (d) **TASK 2034, PERFORM MASKING AND UNMASKING.**
- (e) **TASK 2036, PERFORM TERRAIN FLIGHT DECELERATION.**
- (f) **TASK 2042, PERFORM ACTIONS ON CONTACT.**
- (g) **TASK 2048, PERFORM SLING LOAD OPERATIONS.**
- (h) **TASK 2052, PERFORM WATER BUCKET OPERATIONS.**

- (i) **TASK 2054, PERFORM FAST ROPE INSERTION AND EXTRACTION (FRIES) OPERATIONS.**
- (j) **TASK 2056, PERFORM RAPPELLING OPERATIONS.**
- (k) **TASK 2058, PERFORM SPECIAL PATROL INFILTRATION/EXFILTRATION (SPIES) OPERATIONS.**
- (l) **TASK 2060, PERFORM INTERNAL RESCUE HOIST OPERATIONS.**
- (m) **TASK 2068, PERFORM SHIPBOARD OPERATIONS**
- (n) **TASK 2076, PERFORM CAVING LADDER OPERATIONS.**
- (o) **TASK 2078, PERFORM HELOCAST OPERATIONS.**
- (p) **TASK 2125, PERFORM PINNACLE / RIDGELINE OPERATION.**

d. **Standards.** The standards describe the minimum degree of proficiency to which the task must be accomplished. The terms, “without error,” “properly,” and “correctly” apply to all standards. The standards are based on ideal conditions. Task descriptions may contain required elements for satisfactory completion of a given task. Crew actions specified in the description are required to satisfactorily perform crew coordination. Many standards are common to several tasks. Unless otherwise specified in the individual task, the common standards below apply.

- (1) All tasks.
 - (a) Do not exceed aircraft limitations.
 - (b) Perform crew coordination actions per this ATM, chapter 6 and the task description.
- (2) Hover.
 - (a) Maintain heading ± 10 degrees.
 - (b) Maintain altitude, ± 1 foot (± 10 feet for OGE).*
 - (c) Do not allow drift to exceed 2 feet (10 feet for OGE hover).*
 - (d) Maintain ground track within 2 feet.
 - (e) Maintain a constant rate of movement appropriate for existing conditions.
 - (f) Maintain ground track with minimum drift.
 - (g) Maintain a constant rate of turn not to exceed 90 degrees within 4 seconds.

Note: * These standards require the NCM(s) to announce drift and altitude before exceeding the standard.

- (3) In flight.
 - (a) Maintain heading ± 10 degrees.
 - (b) Maintain altitude ± 100 feet.
 - (c) Maintain airspeed ± 10 knots indicated airspeed (KIAS).
 - (d) Maintain rate of climb or descent ± 100 feet per minute (FPM).
 - (e) Maintain selected bank angle ± 10 degrees.
 - (f) Maintain the aircraft in trim.
- (4) All tasks with the engine operating (RCMs and NCMs).
 - (a) Maintain airspace surveillance (Task 1026).
 - (b) Apply appropriate environmental considerations.

e. **Description.** The description explains the preferred method for accomplishing the task to meet the standards. This manual cannot address all situations and alternate procedures that may be required. Tasks may be accomplished using other methods, as long as the task is done safely and the standards are met. These actions apply in all modes of flight during day, night, IMC, NVG, or CBRN operations. When specific crew actions are required, the task will be broken down into crew actions and procedures as follows:

(1) Crew actions. These define the portions of a task performed by each crewmember to ensure safe, efficient, and effective task execution. The designations P* (pilot on the controls), and P (pilot not on the controls) do not refer to pilot in command (PC) duties. When required, PC responsibilities are specified. For all tasks, the following responsibilities apply.

(a) All crewmembers. Crewmembers perform crew coordination actions and announce malfunctions or emergency conditions. They monitor engine, systems, operations, and avionics (navigation and communication) as necessary. During VMC, crewmembers focus attention primarily outside the aircraft, maintain airspace surveillance, and clear the aircraft. They provide timely warning of traffic and obstacles by announcing the type of hazard, direction, distance, and altitude. Crewmembers also announce when attention is focused inside the aircraft, except for momentary scans, and announce when attention is focused back outside.

(b) PC. The PC is responsible for the conduct of the mission and for operating, securing, and servicing the aircraft. They command. The PC will ensure that a crew briefing is accomplished and that the mission is performed per the mission briefing, air traffic control (ATC) instructions, regulations and SOP requirements.

(c) PI / CE / MO / OR. Their responsibility is completing tasks as assigned by the PC.

(d) P*. The P* is responsible for aircraft control, obstacle avoidance, and the proper execution of emergency procedures. The P* will announce any deviation, and the reason, from instructions issued. The P* will announce changes in altitude, attitude, airspeed, or direction.

(e) P. The P is responsible for navigation, in-flight computations, and assisting the P* as requested, and the proper execution of emergency procedures. When duties permit, assist the P* with obstacle clearance.

(f) CE/MO/OR. The CE, MO, and OR are responsible for maintaining airspace surveillance, traffic, obstacle avoidance, safety, security of passengers, and equipment. Provide assistance to the P* and P as required. They are also responsible for maintaining the aircraft or mission equipment in accordance with their MOS.

(g) Trainer/evaluator. When acting as PI during training and evaluations, the trainer/evaluator will act as a functioning crewmember and perform as required, unless training or evaluating crewmember response to an ineffective crewmember. In the aircraft, They will ensure safe landing areas are available for engine failure training and that aircraft limits are not exceeded.

(2) Procedures. This section explains the portions of a task that an individual or crew accomplishes.

f. **Considerations.** This section defines consideration for task accomplishment under various flight modes (for example, night, NVG, environmental conditions, snow/sand/dust and mountain/pinnacle/ridgeline operations). Crewmembers must consider additional aspects of a task when performing it in different environmental conditions. The inclusion of environmental considerations in a task does not relieve the commander of the requirement for developing an environmental training program per TC 1-210. Specific requirements for different aircraft or mission equipment may also be addressed as a consideration. Training considerations establish specific actions and standards used in the training environment.

(a) Night and NVD. Wires and other hazards are much more difficult to detect at night and must be accurately marked and plotted on maps. Use proper scanning techniques to detect traffic and obstacles and to avoid spatial disorientation. The P should make all internal checks (for example, computations and frequency changes). Visual barriers (areas so dimly viewable that the existence of barriers or obstacles is uncertain) will be treated as physical obstacles. Altitude and ground speed are difficult to detect, and use of artificial illumination may sometimes be necessary. Determine the need for artificial lighting prior to descending below barriers. Adjust search/landing light for best illumination angle without causing excessive reflection into the cockpit. Entering IMC with artificial illumination may induce spatial disorientation. Cockpit controls will be more difficult to locate and identify. Take special precautions to identify and confirm the correct switches and levers.

(b) Night unaided. Use of the white light or weapons flash will impair night vision. The P* should not view white lights, weapons flash, or impact directly. Allow time for dark adaptation or, if necessary, adjust altitude and airspeed until adapted. Exercise added caution if performing flight tasks before reaching full dark adaptation. Dimly visible objects may be more easily detected using peripheral vision, but may tend to disappear when viewed directly. Use off-center-viewing techniques to locate and orient on objects.

(c) NVD. Use of NVDs degrades distance estimation and depth perception. Aircraft in flight may appear closer than they actually are, due to the amplification of navigation lights and the lack of background objects to assist in distance estimation and depth perception. Weapons flash may temporarily impair or shut down NVG.

g. **Training and evaluation requirements.** Training and evaluation requirements define whether the task will be trained /evaluated in the aircraft, simulator, or academic environment. Listing aircraft/simulator under the evaluation requirements does not preclude the evaluator from evaluating elements of the task academically to determine depth of understanding or planning processes. Some task procedures allow multiple ways to achieve the standards. Chapter 2, figures 2-4 thru 2-7 list the modes of flight in which the task must be evaluated. The commander may also select mission and/or additional tasks for evaluation.

h. **References.** The references listed are sources of information relating to that particular task. Certain references apply to many tasks. Besides the references listed with each task, the following common references apply as indicated.

- (1) All flight tasks (tasks with engine operating).
 - (a) AR 95-1.
 - (b) FM 1-201.
 - (c) FM 1-230.
 - (d) Appropriate aircraft operator's manual /CL /MTFs.
 - (e) DOD FLIP.
 - (f) FAR/host country regulations.
 - (g) Unit/local SOPs.
 - (h) Aircraft logbook (DA Form 2408 series).

TC 1-211

- (i) FM 3-04.301.
- (2) All instrument tasks.
 - (a) AR 95-1.
 - (b) FM 1-240.
 - (c) DOD FLIP
 - (d) Aeronautical Information Manual (AIM).
- (3) All tasks with environmental considerations.
 - (a) FM 1-202.
 - (b) TC 1-204.
- (4) All tasks used in a tactical situation.
 - (a) TC 1-201.
 - (b) TC 21-24.
 - (c) FM 1-113.
 - (d) FM 3-04.140.
 - (e) FM 3-04.111.
- (5) All medical tasks.
 - (a) FM 4-02.2
 - (b) JP 4-02.2
 - (c) TC 8-800 (MEDIC) AUG 2006.
 - (d) Appropriate aircraft operator's manual.
 - (e) Unit SOP and treatment protocol.

4-2. TASKS.

a. **Standards versus descriptions.** Standards describe the minimum degree of proficiency or standard of performance to which the task must be accomplished. Attention to the use of the words will, should, shall, must, or may throughout the text of a task standard is crucial. The description explains one or more recommended techniques for accomplishing the task to meet the standard. Descriptions contain preferred elements for satisfactory completion of a given task. Crew actions specified in the description are required to satisfactorily perform crew coordination. Attention to the use of the words, will, should, must, or may throughout the text of a task description is crucial when using the preferred method of accomplishment

- b. TASK LIST. The following numbered tasks are UH-1 tasks.

TASK 1000**Participate in a crew mission briefing**

CONDITIONS: Before flight in a UH-1 helicopter or UH-1FS, given DA Form 5484 (*Mission Schedule/Briefing*) and a unit-approved crew briefing checklist.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. The pilot in command (PC) will actively participate in and acknowledge an understanding of DA Form 5484 mission briefing.
2. The PC will conduct or supervise an aircrew mission briefing using figure 4-1 or a more detailed unit-approved crew briefing checklist.
3. Crewmembers will verbally acknowledge a complete understanding of the aircrew mission briefing.

DESCRIPTION:

1. Crew actions.
 - a. A designated briefing officer will evaluate and brief essential areas of the mission to the PC in accordance with AR 95-1. The PC will acknowledge a complete understanding of the mission brief and initial DA Form 5484.
 - b. The PC has overall responsibility for the crew mission briefing. The PC may direct other crewmembers to perform all or part of it.
 - c. Crewmembers will direct their attention to the crewmember conducting the briefing. They will address any questions to the briefer and acknowledge that they understand the assigned actions, duties, and responsibilities. Lessons learned from previous debriefings should be addressed as applicable during the crew briefing.

Note: An inherent element of the mission briefing is establishing the time and location for the crew level after-action review. (See Task 1262)

2. Procedures. Brief the mission using a unit-approved crew mission briefing checklist. Figure 4-1 shows a suggested format for the minimum mandatory crew-briefing checklist. Identify mission and flight requirements that will demand effective communication and proper sequencing and timing of actions by the crewmembers.

CREW BRIEFING CHECKLIST
<ol style="list-style-type: none"> 1. Mission overview. 2. Execution. <ol style="list-style-type: none"> a. Flight routes and altitudes. b. Estimated time en route c. Fuel and refuel requirements 3. Weather and NOTAMS. Departure, en route, destination, and void time. 4. Required items, mission equipment, and personnel. 5. Airspace surveillance procedures (Task 1026). <ol style="list-style-type: none"> a. Assign primary scan sectors. 6. Analysis of the aircraft. <ol style="list-style-type: none"> a. Logbook and preflight deficiencies. b. Performance planning. <ol style="list-style-type: none"> (1) Recompute PPC, if necessary. (2) Predicted hover torque. (3) Max torque available and GO / NO GO data. (4) VNE. c. Mission deviations required based on aircraft analysis. 7. Crew actions, duties, and responsibilities. <ol style="list-style-type: none"> a. Crew Coordination (two challenge rule, most conservative response, standard terminology). b. Transfer of flight controls (3-way positive). c. Emergency actions. <ol style="list-style-type: none"> (1) Mission considerations. (2) Inadvertent instrument meteorological conditions (IMC). (3) Egress procedures, removal of injured personnel and rendezvous point. (4) Actions to be performed by pilot on the controls (P*), pilot not on the controls (P), and nonrated crewmember (NCM). (5) NVG failure. d. Emergency coordination. <ol style="list-style-type: none"> (1) Aircraft control. (2) Engine failure. (3) Dynamic rollover. (4) Servo hardover. 8. General crew duties. <ol style="list-style-type: none"> a. Pilot on the controls (P*). <ol style="list-style-type: none"> (1) Fly the aircraft - primary focus outside when visual meteorological conditions (VMC), inside when IMC. (2) Avoid traffic and obstacles.

CREW BRIEFING CHECKLIST	
	(3) Crosscheck systems and instruments.
	(4) Monitor/transmit on radios as directed by the pilot in command (PC).
b.	Pilot not on the controls (P).
	(1) Assist in traffic and obstacle avoidance.
	(2) Tune radios and set transponder.
	(3) Navigate.
	(4) Copy clearances, automatic terminal information service (ATIS), and mission information.
	(5) Crosscheck systems and instruments.
	(6) Monitor/transmit on radios as directed by the PC.
	(7) Read and complete checklist items as required.
	(8) Set/adjust switches and systems as required.
	(9) Announce when focused inside for more than 2 to 3 seconds (VMC) and back outside.
c.	Crew chief, medic, and other assigned crewmembers.
	(1) Secure passengers and cargo.
	(2) Assist in traffic and obstacle clearance.
	(3) Perform other duties assigned by the PC.
9.	Risk assessment considerations.
10.	Crewmembers' questions, comments, and acknowledgment of mission briefing.

Figure 4-1. Suggested format of a crew mission briefing checklist

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references plus the following:

FM 3.04-300
DA Form 5484

TC 1-211

TASK 1002

Conduct passenger briefing

CONDITIONS: Given the operator's manual or unit approved passenger briefing and information about the mission.

STANDARDS: Appropriate common standards plus these additions/modifications:

Without omissions, conduct the briefing as directed by the pilot in command (PC) using an approved checklist.

DESCRIPTION: When directed by the PC, conduct applicable portions of the passenger briefing according to the checklist and the unit standing operating procedures (SOPs). Examples of briefing items are—

1. Proper direction to approach and depart the aircraft.
2. Location of emergency entrances, exits, and equipment.
3. Use of seat belts.
4. Location and general use of survival equipment.
5. Security of equipment.

Note: Chapter 8 of the operator's manual contains a detailed passenger briefing checklist.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft or academically.
2. Evaluation will be conducted in the aircraft or academically.

REFERENCES: Appropriate common references.

TASK 1004**Plan a visual flight rules flight**

CONDITIONS: Before visual flight rules (VFR) flight in a UH-1 helicopter and given access to weather information, notice to airmen (NOTAM), flight planning aids, necessary charts, forms, publications, and weight and balance information.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Determine if the aircrew and aircraft are capable of completing the assigned mission.
2. Determine if the flight can be performed under VFR.
3. Determine the correct departure, en route, and destination procedures.
4. Select route(s) and altitudes that avoid hazardous weather conditions and best ensure mission completion without exceeding aircraft or equipment limitations. If appropriate, select altitudes that conform to VFR cruising altitudes.
5. For cross-country flights, determine the distance ± 1 nautical mile, true airspeed ± 5 knots, ground speed ± 5 knots, and estimated time en route (ETE) ± 1 minute for each leg of the flight. Compute magnetic heading(s) ± 5 degrees.
6. Determine the fuel required ± 100 pounds.
7. Verify the aircraft will remain within weight and center of gravity (CG) limitations.
8. Verify aircraft performance data and ensure sufficient power is available to complete the mission.
9. Complete the flight plan.
10. Perform mission risk assessment per unit SOP.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will ensure that all crewmembers are current and qualified to perform the mission. The PC also will determine whether the aircraft is equipped to accomplish the assigned mission. The PC may direct the other crewmembers to complete some elements of the VFR flight planning.
 - b. The other crewmembers will complete the assigned elements and report the results to the PC.
2. Procedures. Using appropriate military, Federal Aviation Administration (FAA), or host-country weather facilities, obtain information about the weather. After ensuring that the flight can be completed under VFR per AR 95-1, check notices to NOTAMs, chart update manuals (CHUMS) and other appropriate sources for any restrictions that apply to the flight. Obtain navigational charts that cover the entire flight area, and allow for changes in routing that may be required because of the weather or terrain. Select the course(s) and altitude(s) that will best facilitate mission accomplishment. Determine the magnetic heading, ground speed, and ETE for each leg. Compute total distance, flight time, and calculate the required fuel using a CPU-26A/P computer/Weems plotter (or equivalent) or air mission planning station (AMPS). Determine if the duplicate weight and balance forms in the aircraft logbook apply to the mission per AR 95-1. Verify that the aircraft weight and CG will remain within allowable limits for the entire flight. Complete the appropriate flight plan and file it with the appropriate agency.

TC 1-211

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: More detailed planning is necessary at night because of visibility restrictions. Checkpoints used during the day may not be suitable for night or NVG use.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

TASK 1006**Plan an instrument flight rules flight**

CONDITIONS: Before instrument flight rules (IFR) flight in a UH-1 helicopter or a UH-1FS and given access to weather information; notice to airmen (NOTAM); flight planning aids; necessary charts, forms, and publications; and weight and balance information.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Determine if the aircrew and aircraft are capable of completing the assigned mission.
2. Determine if the flight can be performed under IFR.
3. Determine the proper departure, en route, and destination procedures.
4. Select route(s) and altitudes that avoid hazardous weather conditions, best ensure mission completion without exceeding aircraft or equipment limitations, and conform to IFR cruising altitudes. If off-airway, determine the course(s) ± 5 degrees.
5. Select an approach that is compatible with the weather, approach facilities, and aircraft equipment; and determine if an alternate airfield is required.
6. Determine distance ± 1 nautical mile, true airspeed ± 5 knots, ground speed ± 5 knots, and estimated time en route (ETE) ± 1 minute for each leg of the flight.
7. Determine the fuel required ± 100 pounds.
8. Verify the aircraft will remain within weight and center of gravity (CG) limitations.
9. Verify aircraft performance data and ensure sufficient power is available to complete the mission.
10. Complete and file the flight plan.
11. Perform mission risk assessment per unit SOP.

DESCRIPTION:

1. Crew actions.
2. The pilot in command (PC) will ensure that all crewmembers are current and qualified to perform the mission and will determine whether the aircraft is equipped to accomplish the assigned mission. The PC may direct the other rated crewmember (RCM) to complete some elements of the IFR flight planning.
3. The other RCM will complete the assigned elements and report the results to the PC.
4. Procedures. Using appropriate military, Federal Aviation Administration (FAA), or host-country weather facilities, obtain information about the weather. Compare destination forecast and approach minimums, and determine if an alternate airfield is required. Ensure that the flight can be completed per AR 95-1. Check the NOTAMs and other appropriate sources for any restrictions that apply to the flight. Obtain navigation charts that cover the entire flight area, and allow for changes in routing or destination that may be required because of the weather. Select the route(s) or course(s) and altitude(s) that will best facilitate mission accomplishment. When possible, select preferred routing. Determine the magnetic heading, ground speed, and ETE for each leg, including flight to the alternate airfield if required. Compute the total distance and flight time, and calculate the required fuel using a CPU-26A/P computer/Weems plotter (or equivalent) or air mission planning station (AMPS). Determine if the duplicate weight and balance forms in the aircraft logbook apply to the mission per AR 95-1. Verify that the aircraft weight and CG will

TC 1-211

remain within allowable limits for the entire flight. Complete the appropriate flight plan and file it with the appropriate agency.

Note: Global positioning system (GPS) instrument flight rule (IFR) navigation is authorized in the UH-1 utilizing the AN/ASN-175 with a current navigation database card installed. FAA-approved IFR GPS systems possess specific protected terminal instrument procedure data that cannot be altered by the aircrew.

Note: Crewmembers must be proficient in the use of all IFR navigation equipment installed in the aircraft they are operating (such as GPS, Distance Measuring Equipment (DME), and TACactical Air Navigation (TACAN). The proper use may include operating capabilities and restrictions that must be considered during the flight planning process.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

TASK 1010**Prepare performance planning card**

CONDITIONS: Given data on DD Form 365-4 (*Weight and Balance Clearance Form F-Transport/Tactical*), the aircraft operator's manual, the environmental conditions for the mission, the engine calibration factor and a blank DA Form 7243-R (*UH-1 Performance Planning Card*).

Note: The charts in the U.S. Army Aviation and Missile Command (AMCOM)-approved aircraft operator's manual, or the AMCOM approved performance planning software must be used for performance planning.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Determine performance planning data necessary to complete the mission.
2. Compute torque values ± 1 pound per square inch (psi).
3. Compute gross weight values ± 200 pounds.
4. Compute fuel flow ± 50 pounds per hour.
5. Compute airspeeds ± 5 knots indicated airspeed (KIAS).
6. Correctly determine maximum torque available, maximum allowable gross weight (GWT) Out of Ground Effect (OGE), and GO/NO-GO OGE using tabular data found in the operator's manual when an update is required.

DESCRIPTION:

1. Crew actions. The pilot in command (PC) will compute or direct other rated crewmembers to compute the aircraft performance data required to complete the mission. The PC will ensure aircraft performance meets mission requirements and aircraft limitations will not be exceeded. The most accurate performance data can be obtained by using existing conditions. Predicted hover torque should be determined using the conditions forecasted for the time of departure.

2. Procedures.

a. DA Form 7243-R may be used as an aid to organize performance planning data required for the mission; this form must be used for evaluations. Instructions for completing the performance planning card (PPC) are provided below; the numbered paragraphs coincide with the circled numbers on the PPC in figures 4-2(a) and 4-2(b). PPC items that have an asterisk (*) are mandatory for each flight. The PC will compute other data when required.

a. The same PPC data will suffice for consecutive takeoffs and landings when aircraft GWT or environmental conditions have not changed significantly, that is, an increase of 200 pounds GWT, an increase of 500 pounds pressure altitude (PA), or a change of ± 5 degrees Celsius.

Note: The current conditions section of the PPC, items (1) through (14), is based on conditions existing at initial takeoff (departure). Crewmembers use this information to validate the PPC by comparing the aircraft's actual performance to the planned performance. If the current conditions are the same as the maximum conditions for the mission period, the maximum condition section need not be completed.

(1) PA.* Record the current PA forecast for the time of departure.

(2) FAT.* Record the current free air temperature (FAT) forecast for the time of departure.

- (3) Takeoff GWT.* Record the current takeoff (GWT) for the time of departure.
- (4) Load.* Record the maximum weight of the load(s) expected during the mission.
- (5) Cal Factor.* Record the calibration factor (data plate torque)
- (6) Fuel. Record the takeoff fuel weight for the time of departure.
- (7) Max Torque Avail.* Using current conditions and the maximum torque available (30-minute operation) chart, record the chart value and compute and record the indicated maximum torque available.

Note: The torque correction value (chart value to indicated), obtained from (7) above, may be applied to all subsequent torque values on the PPC.

- (8) Max Allowable GWT (IGE).* Using current conditions and the hover ceiling chart, compute and record the maximum allowable GWT (IGE). If the 5-foot skid height line is not intersected, record the maximum allowable GWT (IGE) as 9,500 pounds.
- (9) Max Allowable GWT (OGE). Using current conditions and the hover ceiling chart, compute and record the maximum allowable GWT (OGE).
- (10) Predicted Hover Torque.* Using current conditions, the hover power required chart, and the takeoff gross weight, compute and record the torque required to hover at a 5-foot skid height (or as required).
- (11) Predicted Hover Torque (OGE). Using current conditions, the hover power required chart, and the takeoff gross weight, compute and record the torque required to hover at a 50-foot skid height (OGE).
- (12) GO/NO-GO Torque (IGE).* Using the hover power required chart, the maximum allowable gross weight (IGE), and a 5-foot skid height (or as required), record the GO/NO-GO torque (IGE).
- (13) GO/NO-GO Torque (OGE). Using the hover power required chart, the maximum allowable gross weight (OGE), and a 5-foot skid height, record the GO/NO-GO torque (OGE). (For external load operations, use a skid height line that will ensure a 5-foot load height.)
- (14) Directional Control Margin (DCM).* Using sheet 1 of the control margin chart and the takeoff gross weight, record the maximum right crosswind component (90 degrees) that may be encountered and still maintain a 10 percent DCM. If the highest reported or forecast wind (steady or gust) is above the DCM (right crosswind) value, the DCM may be less than 10 percent. During hover or slow-speed operations with a right cross wind approximately 35 to 150 degrees from the nose of the aircraft, a less than 10 percent DCM may be available. During flights with winds greater than 10 knots and approximately 100 to 260 degrees from the nose of the aircraft, a reduction of longitudinal cyclic control may be experienced. The crew should avoid hover or slow-speed operations with wind from these quadrants. (Sheet 2 of the control margin chart presents areas to avoid during crosswinds and tailwinds.)

Note: The maximum conditions section of the PPC, items (15) through (24), is used to predict the aircraft's performance capabilities under the maximum PA, temperature, and winds forecast for the mission.

- (15) PA.* Record the maximum PA forecast for the mission period.
- (16) FAT.* Record the maximum FAT forecast for the mission period.
- (17) Load.* Record the maximum weight of the load(s) (in pounds) expected during the mission.

- (18) Fuel. Record the takeoff fuel weight.
- (19) Max Torque Avail.* Using maximum conditions, compute the maximum torque available as described in (7) above.
- (20) Max Allowable GWT (IGE).* Using maximum conditions, compute the maximum allowable GWT (IGE) as described in (8) above.
- (21) Max Allowable GWT (OGE). Using maximum conditions, compute the maximum allowable GWT (OGE) as described in (9) above.
- (22) GO/NO-GO Torque (IGE).* Using the hover power required chart, the maximum allowable gross weight (IGE), and a 5-foot skid height (or as required), record the GO/NO-GO torque (IGE).
- (23) GO/NO-GO Torque (OGE). Using the hover power required chart, the maximum allowable gross weight (OGE), and a 5-foot skid height, record the GO/NO-GO torque (OGE). (For external load operations, use a skid height line that will ensure a 5-foot load height.)
- (24) DCM.* Using current conditions, compute the DCM as described in (14) above.

Note: The cruise data section, items (25) through (37), is used to predict the aircraft's performance at a planned cruise altitude and airspeed. For operations that involve several changes in conditions, the RCM is expected to use his best judgment in selecting performance criteria.

- (25) PA. Record the planned cruise PA.
- (26) FAT. Record the forecast FAT at cruise altitude.
- (27) GWT. Record the aircraft GWT for anticipated cruise conditions.
- (28) Cruise IAS.* Using the cruise chart, record the indicated airspeed (IAS) for anticipated cruise conditions.
- (29) Cruise IND Torque. Using the cruise chart, in record the indicated torque required to maintain the airspeed in (28) above.
- (30) Cruise Fuel Flow.* Using the cruise chart record the predicted fuel flow at cruise IAS.
- (31) Max End or R/C IAS. Using the cruise chart, record the maximum endurance or maximum rate of climb (R/C) IAS.
- (32) Max End or R/C IND Torque. Using the cruise chart, record the indicated torque required to maintain maximum endurance or maximum R/C IAS.
- (33) Max End or R/C Fuel Flow. Using the cruise chart, record the predicted fuel flow at maximum endurance or maximum R/C IAS.
- (34) Max Range IAS. Using the cruise chart, record the maximum range IAS.
- (35) Max Range Ind Torque. Using the cruise chart, record the indicated torque required to maintain maximum range IAS.
- (36) Max Range Fuel Flow. Using the cruise chart, record the predicted fuel flow at maximum range IAS.
- (37) Vne (velocity never to exceed) IAS.* Using the airspeed operating limits chart, record the maximum allowable airspeed at cruise altitude.

Note: The fuel management section, items (38) through (42), is used to record in-flight fuel consumption. The use of this section is not mandatory. (Task 1048 discusses fuel management procedures.)

(38) Start. Record the indicated fuel weight and clock time to initiate the fuel consumption check.

(39) Stop. Record the indicated fuel weight and clock time to close the fuel consumption check.

(40) PPH. Record the computed fuel consumption rate in pounds per hour (PPH).

(41) Reserve. Record the computed indicated fuel weight and clock time to meet the required fuel reserve.

(42) Burnout. Record the computed and clock time at zero fuel weight.

Note: The weight computation section, items (43) through (49), is used to compute an increase in aircraft weight and load. Critical mission requirements may require the addition of passengers or equipment during the flight. The use of this section is not mandatory. However, the PC must ensure that the weight and balance limits are not exceeded. (Task 1012 discusses the weight and balance limits.)

(43) Basic Weight. Record the basic aircraft weight from DD Form 365-4.

(44) Crew and Flt Equip Weight. Record the crew and flight equipment weight from DD Form 365-4 or as determined by the crew.

(45) Mission Equip Weight. Record the mission equipment weight (for example, weapons) from DD Form 365-4 or as determined by the crew.

(46) Operating Weight. Record the operating weight from DD Form 365-4 or as determined by the crew. (Add basic weight, crew and flight equipment weight, and mission equipment weight to obtain operating weight.)

(47) Fuel Weight. Record the fuel weight from DD Form 365-4 or the current fuel weight.

(48) Passenger (PAX), Baggage, Cargo, and Ammo Weight. Record the weight of these items from DD Form 365-4 or weight as determined by the crew.

(49) Takeoff GWT. Record the takeoff GWT by adding operating weight, fuel weight, and additional passengers, baggage, cargo, and ammunition weights.

Note: The Remarks section is used to record pertinent performance planning remarks.

Note: Tabular performance data charts are used to aid in performance planning. They provide an easy-to-use device in the cockpit and may be used during flights that require current data. (See Task 1011)

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

Note: During evaluations, at the discretion of the evaluator, the PPC will be computed in its entirety, utilizing the appropriate aircraft operator's manual.

REFERENCES: Appropriate common references.

UH-1 PERFORMANCE PLANNING CARD		
For use of this form, see TC 1-211; the proponent agency is TRADOC.		
CURRENT CONDITIONS		
PA	①	FAT
TAKEOFF GWT	③	LOAD
CAL FACTOR	⑤	FUEL
	②	④
	⑥	
	⑦	⑧
	⑨	⑩
	⑪	⑫
	⑬	⑭
	⑮	⑯
	⑰	⑱
	⑲	⑳
	㉑	㉒
	㉓	㉔
	㉕	㉖
	㉗	㉘
	㉙	㉚
	㉛	㉜
	㉝	㉞
	㉟	㊱
	㊲	㊳
	㊴	㊵
	㊶	㊷
	㊸	㊹
	㊺	㊻
	㊼	㊽
	㊾	㊿
	①	②
	③	④
	⑤	⑥
	⑦	⑧
	⑨	⑩
	⑪	⑫
	⑬	⑭
	⑮	⑯
	⑰	⑱
	⑲	⑳
	㉑	㉒
	㉓	㉔
	㉕	㉖
	㉗	㉘
	㉙	㉚
	㉛	㉜
	㉝	㉞
	㉟	㊱
	㊲	㊳
	㊴	㊵
	㊶	㊷
	㊸	㊹
	㊺	㊻
	㊼	㊽
	㊾	㊿

DA FORM 7243-R, NOV 92

Figure 4-2(a). DA Form 7243-R, UH-1 Performance planning card (front)

CRUISE DATA					
PA	(25)	FAT	(26)	GWT	(27)
CRUISE MAX END OR R/C MAX RANGE VNE	IAS	IND TRQ	FUEL FLOW		
	(28)	(29)	(30)		
	(31)	(32)	(33)		
	(34)	(35)	(36)		
(37)					
FUEL MANAGEMENT					
START	STOP	PPH	RESERVE	BURNOUT	
(38)	(39)	(40)	(41)	(42)	
WEIGHT COMPUTATION					
BASIC WEIGHT				(43)	
CREW AND FLT EQUIP WEIGHT				(44)	
MISSION EQUIP WEIGHT				(45)	
OPERATING WEIGHT				(46)	
FUEL WEIGHT				(47)	
PAX, BAGGAGE, CARGO, AND AMMO WEIGHT				(48)	
TAKEOFF GWT				(49)	
REMARKS					

REVERSE, DA FORM 7243-R, NOV 92

Figure 4-2(b). DA Form 7243-R, UH-1 Performance planning card (back)

TASK 1011**Determine aircraft performance parameters using tabular data**

CONDITIONS: In a UH-1 helicopter or in a classroom environment, given aircraft gross weight (GWT) and pressure altitude (PA) and free air temperature (FAT), compute the aircraft maximum GWT, out of ground effect (OGE) torque required and in-ground effect (IGE) torque required from tabular data.

STANDARDS:

1. Compute maximum torque TQ \pm 1 psi.
2. Compute maximum OGE GWT \pm 100 pounds.
3. Compute hover TQ \pm 1 psi.

DESCRIPTION:

1. Crew actions. The pilot in command (PC) will compute or direct other crewmembers to compute the aircraft performance data using the tab data from the operator's manual. The PC will verify the accuracy of the computations, and ensure aircraft performance meets mission requirements. Limitations will not be exceeded.

2. Procedures.

Note: When significant changes in the mission conditions occur, recompute the values. A significant change is defined as an increase of ± 5 degrees, +500 feet PA or +200 pounds.

Hover Data

- (1) PA – enter in the PA column.
- (2) FAT – enter in the FAT column.
- (3) Maximum OGE weight – read the maximum OGE weight.
- (4) OGE hover torque – read the OGE torque needed to lift the maximum OGE weight.

Note: If the OGE weight is less than the structural limit, then the OGE hover torque is also the maximum torque. The engine is limited by exhaust gas temperature.

- (5) IGE hover torque – read the IGE torque needed to lift the maximum OGE weight.
- (6) For training purposes your hover power will be 1 psi of TQ less/more for every 200 pounds difference between the OGE weight and the aircraft's actual GWT.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically or in the aircraft.
2. Evaluation will be conducted academically or in the aircraft.

REFERENCES: Tabular Data

TASK 1012

Verify aircraft weight and balance

CONDITIONS: Given crew weights, aircraft configuration, mission cargo, passenger data, the operator's manual, and completed DD Form 365-4 .

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Verify that aircraft center of gravity (CG) and gross weight (GWT) remain within aircraft limits for the duration of the flight.
2. Identify all mission or flight limitations imposed by weight and/or CG.
3. Ensure DD Form 365-4 is current.

DESCRIPTION:

1. Crew actions.
 - a. Pilot in command (PC) will brief crewmembers on any limitations.
 - b. Crewmembers will continually monitor aircraft loading during mission (for example, fuel transfers, sling loads, cargo load) to ensure CG remains within limits.
2. Procedures.
 - a. Using the completed DD Form 365-4, verify that aircraft GWT and CG will remain within the allowable limits for the entire flight. Note all GWT, loading task/maneuver restrictions/limitations. If there is no completed DD Form 365-4 that meets the requirements of AR 95-1, prepare a DD Form 365-4 in accordance with the operator's manual and TM 55-1500-342-23, and ensure the aircraft is capable of completing the assigned mission.
 - b. Verify the aircraft CG in relation to CG limits at predetermined times during the flight when an aircraft's configuration requires special attention, for example, when it is a critical requirement to keep a certain amount of fuel in a particular tank. Conduct CG checks for fuel, sling loads, and cargo loading operations.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references plus TM 55-1500-342-23 and DD Form 365-4

TASK 1014**Operate aviation life support equipment**

CONDITIONS: Given the appropriate aviation life support equipment (ALSE) for the mission.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Inspect/perform operational checks on ALSE.
2. Use personal and mission ALSE.
3. Brief passengers in the use of ALSE.
4. Verify that all required ALSE is onboard the aircraft prior to takeoff.

DESCRIPTION:

1. Crew actions. The pilot in command (PC) will verify that all required ALSE is onboard the aircraft before takeoff.
2. Procedures. Based on mission requirements, obtain the required ALSE. Inspect equipment for serviceability and perform required operational checks. Secure the required ALSE in the aircraft. Brief passengers in the use of ALSE.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft or academically.
2. Evaluation will be conducted in the aircraft or academically.

REFERENCES: Appropriate common references plus the following:

TM 5-4220-202-14
TM 55-1680-317-23&P

TASK 1016

Perform internal load operations

CONDITIONS: In a UH-1 helicopter loaded with passengers/cargo.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Perform or ensure that a thorough passenger briefing has been conducted and that a passenger manifest is on file, if applicable. (See Task 1002.)
 - b. Ensure that the passengers and cargo are restrained.
 - c. Ensure that floor-loading limits are not exceeded.
2. Nonrated.
 - a. Perform a thorough passenger briefing and ensure that a passenger manifest is on file, if applicable. Conduct the briefing per the appropriate aircraft operator's manual/checklist (CL) and unit standing operating procedures (SOPs).
 - b. Load the aircraft per the load plan, if applicable.
 - c. Ensure that floor-loading limits are not exceeded.
 - d. Secure passengers and cargo in accordance with the appropriate aircraft operator's manual.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will formulate a load plan, ensure that a DD Form 365-4 (Weight and Balance Form F-Transport/Tactical) is verified, if required, and ensure that the aircraft will be within gross weight (GWT) and center of gravity (CG) limits. The PC will ensure that the crew loads the cargo, proper tie down procedures are used, and any passengers receive a briefing. The PC will determine whether the aircraft is capable of completing the assigned mission and will ensure that aircraft limitations will not be exceeded.
 - b. The pilot on the controls (P*) will perform a hover power check before takeoff and ensure the maximum allowable GWT of the aircraft is not exceeded.
 - c. The nonrated crewmember (NCM) will ensure passengers are seated and are wearing seat belts before takeoff. The NCM will monitor passengers and cargo during the flight for security.
2. Procedures.
 - a. Load cargo per the cargo plan or DD Form 365-4, as appropriate. Secure and restrain all cargo to meet restraint criteria. For additional information, see Task 1012, Verify aircraft weight and balance.
 - b. Brief passengers for the flight and seat them according to the load plan or DD Form 365-4, as appropriate. Conduct the briefing per the appropriate aircraft operator's manual/CL, unit SOP and information about the mission. Ensure that the passengers understand each element of the briefing.

Note: If the aircraft is not shut down for loading, a passenger briefing may be impractical. Passengers may be prebriefed or passenger-briefing cards may be used per local directives or the unit SOP.

Note: Hazardous cargo will be handled, loaded, and transported per AR 95-27.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically.
2. Evaluation may be conducted in the aircraft or academically.

REFERENCES: Appropriate common references plus the following:

AR 95-27
FM 10-450-2
TM 55-1500-342-23
DA Pam 738-751

TASK 1020

Prepare aircraft for mission

CONDITIONS: In a UH-1 helicopter and given a warning order or mission briefing and available mission equipment.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Install, secure, inspect, and inventory all mission or required equipment.
2. Prepare the aircraft for the assigned mission.

DESCRIPTION: After receiving a mission briefing, determine the required mission equipment. Ensure that it is installed, secured, inventoried, and operational before flight. If an airworthiness release (AWR) is required for mission equipment, ensure that a current AWR is in the aircraft logbook and that all inspections and checks have been completed in accordance with the AWR. Check the equipment that requires aircraft power for operation per procedures in the appropriate aircraft operator's manual/checklist (CL) or appropriate mission equipment operator's manuals.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
Airworthiness Releases, if required.

TASK 1022**Perform preflight inspection**

CONDITIONS: Given a UH-1 helicopter and the appropriate aircraft operator's manual/checklist (CL).

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Complete all required items of the preflight.
 - b. Correctly enter appropriate information on DA Form 2408-12 (*Army Aviator's Flight Record*), DA Form 2408-13 (*Aircraft Status Information Record*), and DA Form 2408-13-1 (*Aircraft Maintenance and Inspection Record*).
2. Nonrated. Complete all before-preflight and preflight duties for the designated duty position.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) is responsible for ensuring that a preflight inspection is conducted using the appropriate aircraft operator's manual/CL. The PC may direct other crewmembers to complete elements of the preflight inspection as applicable, and will verify that all checks have been completed in accordance with the appropriate aircraft operator's manual/CL. The PC will report any aircraft discrepancies that may affect the mission and will ensure that the appropriate information is entered on DA Form 2408-12, DA Form 2408-13, and DA Form 2408-13-1.
 - b. The crewmembers will complete the assigned elements and report the results to the PC.
2. Procedures.
 - a. Ensure the preflight inspection is conducted per the appropriate aircraft operator's manual/CL. Verify that all preflight checks have been completed and ensure that the crewmembers enter the appropriate information on DA Form 2408-12, DA Form 2408-13, and DA Form 2408-13-1.
 - b. As applicable, the PC will ensure that all pertinent data has been loaded into the aircraft (for example, FM 1/FM 2, COMSEC fill, GPS keys).
 - c. If circumstances permit, accomplish preflight inspection during daylight hours.
 - d. The nonrated crewmember (NCM) if available, will ensure all cowlings and equipment are secured upon completion of preflight.
 - e. The PC will ensure that a walk-around inspection is completed prior to flight.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: If performing the preflight inspection during the hours of darkness, a flashlight with an unfiltered (white) lens to supplement available lighting should be used. Hydraulic leaks, oil leaks, and other defects are difficult to see using a flashlight with a colored lens. Ensure that internal and external lighting is operational.

TC 1-211

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted at the aircraft.
2. Evaluation will be conducted at the aircraft.

REFERENCES: Appropriate common references plus the following:
DA Pamphlet 738-751

TASK 1024**PERFORM BEFORE STARTING ENGINE THROUGH BEFORE LEAVING HELICOPTER CHECKS**

CONDITIONS: In a UH-1 helicopter or UH-1FS and given the appropriate aircraft operator's manual/checklist (CL).

STANDARDS: Appropriate common standards plus these additions/modifications.

1. Perform procedures and checks using the appropriate aircraft operator's manual/CL.
2. Enter appropriate information on DA Form 2408-12, DA Form 2408-13, DA Form 2408-13-1 and the health indicator test (HIT) log.

DESCRIPTION:

1. Crew actions.
 - a. Each crewmember will complete the required checks pertaining to his assigned crew duties per the appropriate aircraft operator's manual/CL.
 - b. The pilot not on the controls (P) will read the checklist.
 - c. All crewmembers will clear the area around the aircraft before engine start.
 - d. The nonrated crewmembers (NCMs) will perform duties as required by their duty position and as directed by the pilot in command (PC).
 - e. Enter appropriate information on DA Form 2408-12, DA Form 2408-13, DA Form 2408-13-1, and the HIT log.
 - f. Secure the aircraft after completion of the flight.
2. Procedures.
 - a. Perform the BEFORE STARTING ENGINES through BEFORE LEAVING HELICOPTER checks per the appropriate aircraft operator's manual/CL. The call and response method will be used. The crewmember reading the checklist will read the complete checklist item. The crewmember performing the check will answer with the appropriate response. From starting engine through engine shutdown, the P will perform both the call and response while the P* is monitoring the flight controls. Responses that don't clearly communicate action or information should not be used. For example, when responding to the call, "Systems – Check" replying with: "Check" doesn't clearly indicate that the systems are within the normal operating range. The response, "All in the normal operating range" communicates information that is more accurate. During engine start, the NCM will be outside of the aircraft, in sight of the pilot, to perform fireguard duties. The NCM will ensure that the aircraft is clear and ready for the engine start. Before leaving the helicopter, the crew will moor the aircraft and install required protective covers and security devices.
 - b. Perform the HIT check and when complete, record data on the HIT log. After flight enter all information required on the appropriate DA Forms.

Note: During single pilot operations, commanders will ensure crewmembers are briefed on responsibilities to safely complete starting engine thru engine shutdown checks.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Before starting the engine, ensure that internal and external lights are operational and set. Internal lighting levels must be high enough to easily see the instruments and avoid exceeding operating limitations.

TC 1-211

SNOW/SAND/DUST CONSIDERATIONS: Ensure all rotating components and inlets/exhausts are clear of ice and/or snow prior to starting engine.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or the simulator.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
DA Pamphlet 738-751

TASK 1026**MAINTAIN AIRSPACE SURVEILLANCE**

CONDITIONS: In a UH-1 helicopter in visual meteorological conditions (VMC) conditions.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Brief airspace surveillance procedures prior to flight and assign primary scan sectors for each crewmember.
2. Announce drift or altitude changes, clear the aircraft, and immediately inform other crewmembers of all air traffic or obstacles that pose a threat to the aircraft.
3. Announce when attention is focused inside the aircraft for more than 2 to 3 seconds and then announce when attention is focused back outside.
4. Maintain airspace surveillance in assigned scan sectors.
5. When landing, the crew will confirm the suitability of the area and that the aircraft is clear of barriers.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will brief airspace surveillance procedures prior to the flight. The briefing will include areas of responsibility and primary scan sectors.
 - b. The pilot on the controls (P*) will announce his intent to perform a specific maneuver and will remain focused outside the aircraft. The P* is responsible for clearing the aircraft and obstacle avoidance.
 - c. The pilot not on the controls (P) and nonrated crewmember (NCM), as duties permit, will assist in clearing the aircraft and will provide adequate warning of obstacles, unusual drift, or altitude changes. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
 - d. When landing, the crew will confirm the suitability of the area and that the aircraft is clear of barriers.
2. Procedures.
 - a. Maintain close surveillance of the surrounding airspace. Keep the aircraft clear from other aircraft and obstacles by maintaining visual surveillance (close, mid, and far areas) of the surrounding airspace. Inform the crew immediately of air traffic or obstacles that pose a threat to the aircraft. Call out the location of traffic or obstacles by the clock, altitude, and distance method. (The 12 o'clock position is at the nose of the aircraft.) Give distance in miles or fractions of miles for air traffic and in feet for ground obstacles. When reporting air traffic, specify the type of aircraft (fixed-wing or helicopter) and, if known, the model. The altitude of the air traffic should be reported as the same altitude, or higher, or lower than the altitude at which you are flying.
 - b. Prior to changing altitude, visually clear the aircraft for hazards and obstacles inclusive of what is ahead, above, below, and to the left and right of the aircraft.
 - c. Prior to performing a descending flight maneuver, it may sometimes be desirable to perform "S" turns to the left or right. The clearing "S" turns will provide the aircrew with a greater visual scan area.

TC 1-211

- d. During a hover or hovering flight, inform the P* of any unannounced drift or altitude changes. When landing, the crew will confirm the suitability of the area.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: The use of proper scanning techniques will assist in detecting traffic and obstacles, and in avoiding spatial disorientation. Hazards such as wires are difficult to detect.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1028**PERFORM HOVER POWER CHECK**

CONDITIONS: In a UH-1 helicopter at an appropriate hover height and with performance planning information available.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Determine if sufficient power is available to perform the mission.
2. Determine if wind condition exceeds directional control margin (DCM) or longitudinal cyclic values.
3. Determine when the approach can be terminated to the ground due to center of gravity (CG) limits, if applicable (using indicated fuel).

DESCRIPTION:

4. Crew actions.
 - a. The pilot on the controls (P*) will announce his intent to bring the aircraft to a hover. The P* will remain focused outside the aircraft during the maneuver and will announce when the aircraft is stabilized at the desired hover altitude.
 - b. The pilot not on the controls (P) and nonrated crewmember (NCM) will announce when ready for takeoff and will remain focused outside the aircraft to assist in clearing and to provide adequate warning of obstacles. They will acknowledge clear (left, right, rear, and above, as appropriate).
 - c. The P will monitor the aircraft instruments. If the IGE NO-GO torque value is indicated prior to reaching the planned hover height used during the performance planning, the P will tell the P* to stop the hover power check and land the aircraft. The PC will confirm the GO / NO-GO torque and adjust the mission as required.
 - d. The PC will determine whether the aircraft is capable of completing the assigned mission and will ensure that aircraft limitations will not be exceeded.
 - e. The P will announce when the hover power check is completed.
5. Procedures.
 - a. The P* should use a 5-foot stationary hover (2-foot stationary hover when using tabular data) when performing this task unless the mission or terrain constraints dictate otherwise. If another hover height is required, the P* should use that height to compute GO/NO-GO torque and predicted hover torque.
 - b. The P will monitor the aircraft instruments and verify the power check. The P will compare the actual performance data to that computed and announce the results to the P*. The crew will evaluate and determine why there are any differences between computed and actual performance data. Any time the load or environmental conditions change significantly (200 pounds gross weight increase, 500 feet PA increase, or ± 5 degrees Celsius), the crewmembers will perform additional hover power checks and, if necessary, recompute the PPC using tabular data. (See Task 1011.)

TC 1-211

Note: If the torque required to maintain a stationary hover does not exceed the GO/NO-GO torque out-of-ground effect (OGE), any maneuver requiring OGE/IGE power or less may be attempted. If the torque required to maintain a stationary hover exceeds the GO/NO-GO torque OGE but does not exceed the GO/NO-GO torque IGE, only IGE maneuvers may be attempted.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: The crew must use proper scanning techniques to avoid excessive drift.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1030**PERFORM HOVER OUT-OF-GROUND EFFECT CHECK**

CONDITIONS: In a UH-1 helicopter with hover out-of-ground effect (OGE) power available and the aircraft heading into the wind.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Establish a hover altitude of 50 feet or above surrounding obstacles whichever is higher.
2. Determine if aircraft power and controllability are sufficient for maneuvers requiring OGE hover power.

DESCRIPTION: The P* will announce his intent to ascend vertically to 50 feet or above surrounding obstacles whichever is higher. The P* will remain focused outside the aircraft during the entire maneuver to maintain obstacle clearance. The P* will execute a 360-degree left pedal turn. The pilot not on the controls (P) will monitor the exhaust gas temperature (EGT), torque, and other aircraft instruments, and the nonrated crewmember (NCM) will maintain airspace surveillance. During the pedal turn, the P* will check the controllability of the aircraft. The P* will announce their intent to descend vertically to an in-ground effect (IGE) hover or to the ground.

Note: Hover OGE power is required for this task.

Note: The crew should perform a hover OGE check anytime aircraft controllability or available power is in doubt.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. The P* may have difficulty maintaining altitude and position when hovering above 25 feet. (The barometric altimeter is not reliable for this maneuver.) If available, a radar altimeter should be used to assist in maintaining a constant altitude. Otherwise, references such as lights, tops of trees, or man-made objects above and to the front and sides of the aircraft should be used. By establishing a reference angle to these objects, the P* can detect changes in altitude by changes in their viewing perspective.
2. Hovering near ground features, such as roads, provides ideal references for judging lateral movement. The P* may become spatially disoriented when changing viewing perspective back and forth between high and low references. Therefore, the P* must rely on the P and NCM for assistance in maintaining orientation.
3. When wearing NVG, the crew must select an area with good ground contrast and several reference points at the same height, or at a greater height than the OGE hover. This will aid the P* in maintaining a constant altitude and position over the ground while making the required turns. The crew must use proper scanning techniques to ensure obstacle avoidance and tail rotor clearance. To prevent inadvertent aircraft movement while hovering OGE, the P* will remain focused outside the aircraft and the P will monitor all aircraft instruments.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1032

Perform radio communication procedures

CONDITIONS: In a UH-1 helicopter or UH-1FS.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Check and operate aircraft avionics.
 - b. Establish radio contact with the desired unit or air traffic control (ATC) facility.
 - c. When communicating with ATC facilities, use correct radio communication procedures and phraseology.
 - d. Operate the intercommunication system.
 - e. Perform or describe two-way radio failure procedures.
2. Nonrated.
 - f. Operate the intercommunication system to communicate with the crew.
 - g. Use the appropriate radio to communicate with the desired facility (as required for nonrated crewmembers [NCMs]).

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will determine radio frequencies per mission requirements during the crew briefing and will indicate whether the pilot on the controls (P*) or pilot not on the controls (P) will establish and maintain primary communications.
 - b. The P* will announce information not monitored by the P.
 - c. The P will adjust avionics to required frequencies. The P will copy pertinent information and announce information not monitored by the P*.
 - d. During normal operations, the NCM will monitor external communications so as not to interrupt when external communications are being transmitted or received. (Monitoring external communications may not be desirable during operations requiring extensive internal communication; for example, sling loads, hoist, rappelling, or emergencies.)
 - e. Certain operations may require that the NCM transmit on an aircraft radio (for example, MEDEVAC). The NCM will coordinate with the PC before using aircraft radios.
 - f. Crew actions for two-way radio failure:
 - (1) P* or P will announce two-way radio failure to all crewmembers.
 - (2) The PC will direct the efforts to identify and correct the avionics malfunction.
 - (3) The P* will focus outside the aircraft during visual meteorological conditions (VMC) or inside during instrument meteorological conditions (IMC) on the instruments, as appropriate, but should not participate in trouble-shooting the malfunction.
 - (4) The P will remain focused primarily inside the aircraft to identify and correct the avionics malfunction.
 - g. Crew actions for aircraft intercom failure: The PC will direct assistance from the crew to try to determine the malfunction and correct it. Actions may include switching to a different intercommunication system (ICS) box, changing microphone cords (if available), hooking

into a different ICS station if available, hand and arm signals, or passing notes. If the problem cannot be corrected, the PC will determine the best course of action, which may vary from landing as soon as practical to landing as soon as possible.

2. Procedures.

h. Adjust avionics to the required frequencies. Continuously monitor the avionics as directed by the PC. When required, establish communications with the desired facility. Monitor the frequency before transmitting. Transmit the desired/required information. Use the correct radio call sign when acknowledging each communication. When advised to change frequencies, acknowledge instructions. Select the new frequency as soon as possible unless instructed to do so at a specific time, fix, or altitude. Use radio communication procedures and phraseology as appropriate for the area of operations. Use standard terms and phraseology for all intercommunications

i. Procedures for two-way radio failure. Attempt to identify and correct the malfunctioning radio and announce the results. If two-way radio failure is confirmed, comply with procedure outlined in the flight information handbook (FIH).

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or simulator.
2. Evaluation may be conducted in the aircraft or simulator.

REFERENCES: Appropriate common references plus the following:
DOT/FAA 7110.65

TASK 1038

PERFORM HOVERING FLIGHT

CONDITIONS: In a UH-1 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will announce their intent to perform a specific hovering flight maneuver and will remain focused primarily outside the aircraft to monitor altitude and avoid obstacles. The P* will ensure and announce that the aircraft is cleared prior to turning or repositioning the aircraft. The P* will announce terminating the maneuver.
 - b. The pilot not on the controls (P) and nonrated crewmember (NCM) will assist in clearing the aircraft and provide adequate warning of obstacles, unannounced drift, or altitude changes. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures.
 - a. Takeoff to a hover. With the collective full down, place the cyclic in a neutral position. Increase the collective smoothly. Apply pedals to maintain heading, and coordinate the cyclic for a vertical ascent. As the aircraft leaves the ground, check for the proper control response and aircraft center of gravity (CG). Continue to increase collective for a smooth, controlled ascent to a hover.
 - b. Hovering flight. Adjust the cyclic to maintain a stationary hover or to move in the desired direction. Control heading with the pedals, and maintain altitude with the collective. The rate of movement and altitude should be appropriate for existing conditions. To return to a stationary hover, apply cyclic in the opposite direction while maintaining altitude with the collective and heading with the pedals.

Note: Air taxi is the preferred method for ground movements on airports provided ground operations and conditions permit. Unless otherwise requested or instructed, pilots are expected to remain below 100 feet above ground level (AGL). However, if a higher than normal airspeed or altitude is desired, the request should be made prior to lift-off. The pilot is solely responsible for selecting a safe airspeed for the altitude/operation being conducted. Use of air taxi enables the pilot to proceed at an optimum airspeed/altitude, minimize down wash effect, conserve fuel, and expedite movement from one point to another.

- c. Hovering turns. Apply pressure to the desired pedal to begin the turn. Use pressure and counter pressure on the pedals to maintain the desired rate of turn. Coordinate cyclic control to maintain position over the pivot point while maintaining altitude with the collective. Hovering turns can be made around any vertical axis; for example, the nose, mast, tail of the aircraft, or a point in front of the aircraft. However, turns other than about the center of the aircraft will increase the turn radius proportionately.
- d. Landing from a hover. Lower the collective to affect a smooth, controlled descent with minimal drift at touchdown. Ensure the aircraft does not move laterally or aft. Make necessary corrections with the pedals and cyclic to maintain a constant heading and position. On ground contact, ensure that the aircraft remains stable. Continue lowering the collective

smoothly and steadily while continuing to check aircraft stability. When the collective is fully down, neutralize the pedals and cyclic. If sloping conditions are suspected or anticipated, (see Task 1062).

Note: Cyclic turns should only be used when necessary.

Note: When landing from a hover to an unimproved area, the crew must check for obstacles under the aircraft.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Movement over areas of limited contrast, such as tall grass, water, or desert, tends to cause spatial disorientation. Seek hover areas that provide adequate contrast and use proper scanning techniques. If disorientation occurs, apply sufficient power and execute a takeoff. If a takeoff is not feasible, try to maneuver the aircraft forward and down to the ground to limit the possibility of touchdown with sideward or rearward movement.
2. When performing operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Use of the white light will impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

SNOW/SAND/DUST CONSIDERATIONS: During ascent to a hover, if visual references do not deteriorate to an unacceptable level, continue ascent to the desired hover altitude.

1. The 3 to 5-foot hover taxi. During takeoff to a hover, simultaneously accelerate the aircraft to a ground speed that keeps the snow/sand/dust cloud just aft of the main rotor mast.

Note: Maintain optimum visibility by observing references close to the aircraft. Exercise caution when operating in close proximity to other aircraft or obstacles.

Note: When visual references deteriorate making a 3-foot hover taxi unsafe, determine whether to abort the maneuver, air taxi, or perform an instrument takeoff (ITO) (Task 1170).

2. The 20- to 100-foot air taxi. Use this maneuver when it is necessary to move the aircraft over terrain that is unsuitable for hover taxi. Initiate air taxi the same as a 3-foot hover, but increase altitude to not more than 100 feet and accelerate to a safe airspeed appropriate for conditions, above effective translational lift (ETL).

Note: Ensure that an area is available to safely decelerate and land the aircraft. Under certain conditions, such as adverse winds, it may be necessary to perform a traffic pattern to optimize conditions at the desired termination point.

Note: Hovering out-of-ground effect (OGE) reduces available ground references and may increase the possibility of spatial disorientation. Be prepared to transition to instruments and execute an instrument takeoff (ITO) (Task 1170) or unusual attitude recovery (Task 1182) if ground reference is lost.

Note: At night, use of landing, search, or anti-collision light may cause spatial disorientation while in blowing snow/sand/dust.

Note: OGE power may be required for this maneuver.

CONFINED AREA CONSIDERATIONS: Select good references to avoid unanticipated drift. All crewmembers must be focused primarily outside for obstacle avoidance.

TC 1-211

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1040**PERFORM VISUAL METEOROLOGICAL CONDITIONS TAKEOFF**

CONDITIONS: In a UH-1 helicopter with the hover power and before-takeoff checks completed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain takeoff heading \pm 10 degrees below 50 feet above ground level (AGL).
2. Maintain desired ground track.
3. Maintain aircraft in trim above 50 feet AGL or as appropriate for transition to terrain flight.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will determine the direction of takeoff by analyzing the tactical situation, the wind, the long axis of the takeoff area, and the lowest obstacles. The PC will confirm that required power is available by comparing the information from the performance planning card (PPC) to the hover power check.
 - b. The pilot on the controls (P*) will remain focused primarily outside the aircraft throughout the maneuver to provide obstacle clearance. The P* will announce whether the takeoff is from the ground or from a hover and his intent to abort or alter the takeoff. The P* will select reference points to assist in maintaining the desired ground track.
 - c. The pilot not on the controls (P) and nonrated crewmember (NCM) will announce when ready for takeoff and will remain focused primarily outside the aircraft to assist in clearing and to provide adequate warning of obstacles. They will announce when their attention is focused inside the aircraft and again when their attention is reestablished outside.
 - d. The P will monitor the instruments and advise the P* if power limits are being approached.
2. Procedures.
 - a. From the ground. Select reference points to maintain the desired ground track. With the cyclic and pedals in the neutral position, increase collective. As the aircraft leaves the ground, maintain heading with pedals and apply forward cyclic as required to smoothly accelerate through effective transitional lift (ETL) at an appropriate altitude for the terrain and to avoid obstacles. Adjust the cyclic as necessary (approximately 5 degrees nose down), obtain the desired climb airspeed, and maintain the desired ground track. Position the collective as necessary to clear obstacles in the flight path, and obtain the desired rate of climb. Maintain heading with the pedals when below 50 feet AGL or until transitioning to terrain flight; place the aircraft in trim above 50 feet AGL. After obtaining the desired airspeed, adjust the cyclic as necessary to stop the acceleration. Adjust the collective to continue or stop the rate of climb as required.
 - b. From a hover. Select reference points to maintain desired ground track; maintain heading with the pedals. Apply forward cyclic to smoothly accelerate the aircraft through ETL while adjusting the collective to maintain the appropriate hover height. Perform the rest of the maneuver as for a takeoff from the ground.

Note: Avoid unnecessary nose-low accelerative attitudes. Do not exceed 10 degrees nose low.

TC 1-211

Note: Performing this maneuver in certain environments may require hover out-of-ground effect (OGE) power. Evaluate each situation for power required versus power available.

Note: The P* should determine the torque required for the planned takeoff technique and announce the value to the P and NCM(s).

Note: For training, recommended climb airspeed is 70 KIAS with a rate of climb of 500 FPM.

NIGHT OR NIGHT VISION CONSIDERATIONS:

1. If sufficient illumination exists to view obstacles, accomplish the takeoff in the same way as a visual meteorological conditions (VMC) takeoff during the day. Visual obstacles, such as shadows, should be treated the same as physical obstacles.
2. If sufficient illumination does not exist to view obstacles, perform an altitude-over-airspeed takeoff by applying takeoff power first followed by a slow acceleration to ensure obstacle clearance. The P* may perform the takeoff from a hover or from the ground.
 - a. Maintain the takeoff power setting until approximately 10 knots prior to reaching climb airspeed. Adjust power as required to establish the desired rate of climb and cyclic to maintain the desired airspeed.
 - b. The P* and NCM should maintain orientation outside the aircraft and concentrate on obstacle avoidance. The P should make all internal checks and announce when the instruments show a positive climb inside.
 - c. Reduced visual references during the takeoff and throughout the ascent at night may make it difficult to maintain the desired ground track. Knowledge of the surface wind direction and velocity will assist in maintaining the desired ground track.
3. When performing operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Use of the white light will impair night vision several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

SNOW/SAND/DUST CONSIDERATIONS: Adjust collective and cyclic as necessary to ascend vertically. As the aircraft leaves the surface, maintain heading with the pedals and a level attitude with the cyclic. As the aircraft clears the snow/sand/dust cloud and clears the barriers, accelerate to climb airspeed and trim the aircraft.

Note: In some cases, applying collective to blow away loose snow/sand/dust from around the aircraft is beneficial before performing this maneuver.

Note: Be prepared to transition to instruments and execute an ITO (Task 1075) if ground reference is lost.

Note: At night, use of the landing, search, or anti-collision lights may cause spatial disorientation while in blowing snow/sand/dust.

CONFINED AREA CONSIDERATIONS: Before departure, confirm the takeoff plan. Perform a hover power check as required. Reposition the aircraft, if desired, to afford a shallower departure angle and minimize power requirements. During departure, adjust the cyclic and the collective as required to establish a constant departure angle to clear obstacles. All crewmembers must be focused primarily outside for obstacle avoidance.

MOUNTAIN/PINNACLE/RIDGELINE CONSIDERATIONS: Analyze winds, obstacles, and density altitude. Perform a hover power check as required. Determine the best takeoff direction and path for conditions. After clearing any obstacles accelerate the aircraft to the desired airspeed.

Note: Where drop-offs are located along the takeoff path, the aircraft may be maneuvered down slope to gain airspeed.

MUD/MUSKEG/TUNDRA CONSIDERATIONS: Perform one of the following takeoff techniques:

1. From dry muskeg/tundra areas. A vertical takeoff may be best in drier areas where the aircraft has not sunk into the muskeg/tundra or where obstacles prohibit motion. Smoothly increase the collective until the crew confirms that the skids/skis are free. Adjust controls as necessary to perform a VMC takeoff.
2. From wet areas. In wet areas where the aircraft is likely to have sunk or is stuck in the mud/muskeg/tundra, the following technique may be best: With the cyclic in the neutral position, smoothly increase the collective. As hover power is approached, place the cyclic slightly forward of the neutral position and slowly move the pedals back and forth. Continue increasing the collective and "swim" the aircraft forward to break the suction of the skids/skis. When free, adjust the controls as necessary to perform a VMC takeoff.
3. Note: Before performing operations in a mud/muskeg/tundra environment, it is important to understand dynamic rollover characteristics.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1044

NAVIGATE BY PILOTAGE AND DEAD RECKONING

CONDITIONS: In an UH-1 helicopter and given the appropriate maps, plotter, flight computer, and flight log.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain orientation within 500 meters.
2. Arrive at check points/destination at estimated time of arrival (ETA) \pm 3 minutes.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will focus primarily outside the aircraft and respond to navigation instructions or cues given by the pilot not on the controls (P). The P* will acknowledge commands issued by the P for the heading, altitude, and airspeed changes necessary to navigate the desired course. The P* will announce significant surface features to assist in navigation.
 - b. The P will direct the P* to change aircraft heading, altitude, and airspeed as appropriate to navigate the desired course. The P will use rally terms, specific headings, relative bearings, or key terrain features to accomplish this task. The P will announce all plotted wires before approaching their location. The P and nonrated crewmember (NCM) will monitor aircraft instruments, assist in clearing the aircraft, and provide adequate warning to avoid traffic and obstacles. The P and NCM will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures.
 - a. Both pilotage and dead reckoning will be used to maintain the position of the aircraft along the planned route. Planned headings will be adjusted as necessary to compensate for the effects of the wind.
 - b. Perform a ground speed check as soon as possible by computing the actual time required to fly a known distance. Adjust estimated times for subsequent legs of the flight route using the computed ground speed. Compare planned ground speed with computed ground speed and adjust airspeed as required to arrive at each control point at its original ETA.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: More detailed flight planning is required when the flight is conducted at night. Interior cockpit lighting should be considered when selecting colors for preparing navigational aids such as maps and kneeboard notes.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1046**PERFORM ELECTRONICALLY AIDED NAVIGATION**

CONDITIONS: In a UH-1 helicopter with an electronically aided navigation system installed and operational.

STANDARDS: Appropriate common standards plus the following additions/modifications:

1. Operate the installed electronically aided navigational system per the appropriate TM.
2. Determine the position of the aircraft along the route of flight within 300 meters.
3. Use the NAV SEL per the appropriate aircraft operator's manual if coupled with an electronically aided navigational system.

DESCRIPTION:

1. Crew actions.
 - a. The P* will focus primarily outside the aircraft and respond to navigation instructions or cues given by the P. The P* will acknowledge commands issued by the P for the heading, altitude, and airspeed changes necessary to navigate the desired course. The P* will announce significant terrain features to assist in navigation.
 - b. The P will be the primary operator of the electronically aided navigation system. The P will direct the P* to change aircraft heading, altitude, and airspeed as appropriate to navigate the desired course. The P will use rally terms, specific headings, relative bearings, or key terrain features to accomplish this task. The P will announce all plotted wires before approaching their location. The P and NCM will monitor aircraft instruments, assist in clearing the aircraft, and provide adequate warning to avoid traffic and obstacles.

Note: Only the P will perform in-flight time/labor intensive NAV programming duties (for example, building routes).

2. Procedures. Perform the turn on, test, and programming procedures per the appropriate TM. If the electronically aided navigational system is coupled, the selected course may be flown using the NAV SEL. The proper updating and shutdown procedures will be performed per the appropriate TM.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1048

Perform fuel management procedures

CONDITIONS: In a UH-1 helicopter or UH-1FS with a CPU-26A/P computer (or equivalent) or calculator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated
 - a. Verify that the required amount of fuel is on board at the time of departure.
 - b. Initiate an alternate course of action if the actual fuel consumption varies from the planned value and the flight cannot be completed without the planned use of the required reserve.
 - c. Balance/manage fuel tank levels to maintain aircraft within center of gravity (CG) limits.
2. Rated/Nonrated.
 - a. Initiate an in-flight fuel consumption check within 10 minutes after leveling off or entering into the mission profile.
 - b. Compute the fuel consumption rate ± 50 pounds per hour and complete the fuel check 15 to 30 minutes after taking the initial readings.
 - c. Monitor the remaining fuel quantity and the continuing rate of consumption.

DESCRIPTION:

1. Crew actions.
 - a. The P or NCM will record the initial fuel figures, fuel flow computation, burnout, and reserve times. They will announce when initiating the fuel check and when completing the fuel check. The P or NCM also will announce the results of the fuel check.
 - b. The pilot on the controls (P*) will acknowledge the results of the fuel check.
 - c. The pilot in command (PC) will confirm the results of the fuel check.
 - d. If applicable, the P will announce when the fuel transfer switch or fuel selector lever(s) are repositioned and when the fuel transfer operation is completed.
 - e. The NCM will acknowledge and monitor the fuel transfer operation until the operation is completed.
2. Procedures.
 - a. Before-takeoff fuel check. Determine the total fuel on board, and compare it with fuel required for the mission. If the fuel on board is inadequate, add sufficient fuel or abort or revise the mission.
 - b. Initial airborne fuel reading. Within 10 minutes after leveling off or entering into the mission profile, record the total fuel quantity and the time of reading. Record the remaining fuel and the time of reading 15 to 30 minutes after taking the initial airborne fuel reading. Compute and record the consumption rate, burnout time, and reserve entry time. Determine if the remaining fuel is sufficient to complete the flight without the planned use of the required reserve. If the amount of fuel is inadequate, initiate an alternate course of action.

Note: Crews should verify ability to transfer fuel from auxiliary to internal tanks before using auxiliary tank fuel quantities in fuel reserve/burnout computations.

Note: Do not perform fuel consumption checks while transferring fuel from auxiliary tank(s) to internal fuel tanks.

- c. Fuel quantity and consumption. Periodically monitor the fuel quantity and consumption rate. If the fuel quantity or flow indicates a deviation from computed values, repeat the fuel consumption check to determine if the amount of fuel is adequate to complete the flight. Periodically check individual fuel tank indicators to determine that the system is operating properly.
- d. Auxiliary fuel management. The aircraft operator's manual outlines the procedures to be followed when auxiliary fuel tanks are used.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: The P should complete all duties associated with fuel management procedures. If the controls are transferred, the other aviator will verify fuel computations.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or simulator.
2. Evaluation may be conducted in the aircraft or simulator.

REFERENCES: Appropriate common references plus:
Manufacturer's operating manuals.

TASK 1052

PERFORM VISUAL METEOROLOGICAL CONDITIONS FLIGHT MANEUVERS

CONDITIONS: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Turns.
 - a. Clear the aircraft.
 - b. Rollout on desired heading \pm 10 degrees.
2. Climbs and descents.
 - a. Clear aircraft.
 - b. Stop climb/descent at desired altitude \pm 100 feet.
3. Traffic pattern flight.
 - a. Enter, operate in, and depart a traffic pattern.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused primarily outside the aircraft. They will announce and clear each turn, climb, and descent.
 - b. The pilot not on the controls (P) and nonrated crewmember (NCM) will assist in clearing the aircraft and will provide adequate warning of traffic and obstacles. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures. Adjust cyclic as required to maintain the desired airspeed, course, ground track, or heading as appropriate. Adjust collective as required to maintain the desired climb/descent rate or altitude and maintain aircraft in trim with the pedals. Perform traffic pattern operations per air traffic control (ATC) directives, local standing operating procedures (SOPs), and FM 1-203.

NIGHT OR NIGHT VISION CONSIDERATIONS:

1. The P* will focus primarily outside the aircraft and should concentrate on obstacle avoidance and aircraft control. The P will make all internal cockpit checks.
2. During periods of reduced illumination or marginal weather, the P* may reduce the recommended airspeed and bank angle. The turns from upwind to downwind and downwind to final may be continuous, coordinated turns.

TRAINING CONSIDERATIONS: For traffic pattern training, the recommended airspeed and rate of climb/descent on crosswind and base legs are 70 KIAS and 500 feet per minute (FPM). The recommended airspeed on downwind leg is 90 KIAS. Recommended bank angle for turns is 30 degrees.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1058

PERFORM VISUAL METEOROLOGICAL CONDITIONS APPROACH

CONDITIONS: In a UH-1 helicopter with the before-landing check complete.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Select a suitable landing area (analyze suitability, barriers, wind, approach path, touchdown point, escape routes, and takeoff direction).
2. Ensure that sufficient power exists for the type of approach/landing desired.
3. Maintain a constant approach angle clear of obstacles to desired point of termination (hover) or touchdown (surface).
4. Maintain rate of closure appropriate for the conditions.
5. Maintain ground track alignment with the landing direction, as appropriate.
6. Align aircraft with landing direction below 50 feet or as appropriate for transition from terrain flight.
7. Select departure path for go-around during approach.
8. Select tentative escape route.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will focus primarily outside the aircraft to provide obstacle clearance throughout the maneuver. The P* will announce when they begin the approach and whether the approach will terminate to a hover or to the surface. The P* also will announce the intended point of landing and any deviation to the approach to include go-around, if required.
 - b. The pilot not on the controls (P) and nonrated crewmember (NCM) will confirm the suitability of the area, assist in clearing the aircraft, and provide adequate warning of traffic and obstacles. The P and NCM will acknowledge any deviation during the approach. The P and NCM will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures. Evaluate winds. Select an approach angle that allows obstacle clearance while descending to the desired point of termination. Once the termination point is sighted and the approach angle is intercepted, adjust the collective as necessary to establish and maintain a constant angle. Maintain entry airspeed until the rate of closure appears to be increasing. Above 50-feet above ground level (AGL), maintain ground track alignment and the aircraft in trim. Below 50-feet AGL, align the aircraft with the landing direction. Progressively decrease the rate of descent and rate of closure until reaching the termination point (hover, touchdown), or until a decision is made to perform a go-around.
 - a. To a hover. The approach to a hover may terminate with a full stop over the planned termination point, or continued movement to transition to hovering flight. Progressively decrease the rate of descent and rate of closure until an appropriate hover is established over the intended termination point.
 - b. To the surface. The decision to terminate to the surface with zero speed or with forward movement will depend on the aircraft's loading or environmental conditions. Touchdown

with minimum lateral movement. After surface contact, ensure that the aircraft remains stable until all movement stops. Smoothly lower the collective to the full down position and neutralize the pedals and cyclic.

c. Go-around. This is a planned maneuver with the aircraft under control. The P* should perform a go-around if a successful landing is doubtful or if visual reference with the intended termination point is lost. Once climb is established, reassess the situation and develop a new course of action.

d. Escape route. This is an unplanned maneuver where in the aircraft may not be under complete control. Escape routes will normally be selected to the right-side of the approach path due to loss of tail rotor effectiveness (LTE) considerations.

Note: Performing this maneuver in certain environments may require hover out-of-ground effect (OGE) power. Evaluate each situation for power required versus power available.

Note: The P* should determine the torque required for the planned approach technique and announce the value to the P and NCM(s).

Note: A wind evaluation should be performed. Techniques for evaluating wind conditions are found in FM 1-202, Environmental Flight and appendix B of this ATM.

Note: Steep approaches can place the aircraft in potential settling-with-power conditions.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. The rate of descent during the final 100 feet should be slightly less than during the day to avoid abrupt attitude changes at low altitudes.
2. After establishing the descent during unaided flights, airspeed may be reduced to approximately 50 knots until apparent ground speed and rate of closure appear to be increasing. Progressively decrease the rate of descent and forward speed until termination of maneuver.
3. Surrounding terrain or vegetation may decrease contrast and degrade depth perception during the approach. Before descending below obstacles, determine the need for artificial lighting.
4. When performing operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Use of the white light may impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

SNOW/SAND/DUST CONSIDERATIONS:

1. Termination to a point OGE. This approach requires OGE power and may be used for some snow/sand/dust landings. Make the approach to a hover OGE over the intended landing location. Slowly lower the collective and allow the aircraft to descend. The rate of descent will be determined by the rate in which the snow/sand/dust is blown from the intended landing point. Remain above the snow/sand/dust cloud until it dissipates and visual references can be seen for touchdown. After ground contact, lower the collective to the full down position and neutralize the flight controls.
2. Termination to the surface with forward speed. This termination may be made to an improved landing surface or suitable area with minimal ground references. Once the appropriate approach angle is intercepted, adjust the collective as necessary to establish and maintain the angle. As the apparent rate of closure appears to increase, progressively reduce the rate of descent and closure to arrive at the touchdown area slightly above effective translational lift. At this point, maintain

the minimum rate of closure that ensures that the snow/sand/dust cloud remains behind the pilot's station. When the skids or heels of the skis contact the snow/ground, lower the collective and allow the aircraft to settle. Apply slight aft cyclic at touch down to prevent burying the skids or toes of the skis.

3. Termination to the surface with no forward speed. This termination should be made to landing areas where slopes, obstacles, or unfamiliar terrain precludes a landing with forward speed. It is not recommended when new or powder snow or fine dust is present because white/brown out conditions will occur. The termination is made directly to a reference point on the ground with no forward speed. After ground contact, lower the collective to the full down position and neutralize the flight controls.

Note: When landing in deep snow, the aircraft skids/skis may settle at different rates and the aircraft will normally terminate in a tail low attitude.

Note: During sand/dust landings, all doors and windows should be closed and vents closed.

Note: Hovering OGE reduces available ground references and may increase the possibility of spatial disorientation. Be prepared to transition to instruments and execute an instrument takeoff if ground reference is lost.

Note: At night, use of the landing, search, or anti-collision light may cause spatial disorientation while in blowing snow/sand/dust.

CONFINED AREA CONSIDERATIONS: An approach to the forward one-third of the useable area will reduce the approach angle and minimize power requirements. Prior to commencing the approach, the crew will determine and brief an escape route. During the approach, continue to determine the suitability of the area and the possible need for a go-around. If possible, make the decision to go-around before descending below the barriers or going below effective translational lift (ETL). After touching down, check aircraft stability as the collective is lowered.

MOUNTAIN/PINNACLE/RIDGELINE CONSIDERATIONS: Select a shallow to steep approach angle, depending on the wind, density altitude, gross weight, and obstacles. Before commencing the approach, the crew will determine and brief an escape route. During the approach, continue to determine the suitability of the intended landing point. The rate of closure may be difficult to determine until the aircraft is close to the landing area. Reduce airspeed to slightly above effective translational lift until the rate of closure can be determined. Before reaching the near edge of the landing area, the descent should be stopped and the rate of closure slowed. At this point, decide whether to continue the approach or make a go-around. If a go-around is required, it should be performed before decelerating below ETL. If the approach is continued, terminate in the landing area to a hover or to the surface. After touching down, check aircraft stability as the collective is lowered.

Note: To successfully operate into small areas, it may be necessary to place the nose of the aircraft over the edge of the landing area. This may cause a loss of important visual references when on final approach. All crewmembers must assist in providing information on aircraft position in the landing area.

MUD/MUSKEG/TUNDRA CONSIDERATIONS: Select a suitable area and terminate the approach to a 3-foot hover over the intended touchdown point. Begin a vertical descent until the aircraft touches down. Check aircraft stability while lowering the collective. If the area is suitable, lower the collective to the full down position and neutralize the cyclic and pedals.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. The evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1062

PERFORM SLOPE OPERATIONS

CONDITIONS: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated:
 - a. Select a suitable landing area.
 - b. Know the slope landing limitations.
 - c. Maintain heading ± 5 degrees.
 - d. Maintain drift ± 1 foot until touchdown and then no drift allowed.
2. Nonrated.
 - a. Confirm suitable landing area.
 - b. Announce drift and altitude.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will announce their intent to perform a slope operation and establish the helicopter over the slope. The P* will announce their intended landing area and any deviation from the intended maneuver. The P* should be aware of the common tendency to become tense and, as a result, to over control the aircraft while performing the slope operation. The P* will note the aircraft attitude at a hover, prior to starting descent to land on the slope.
 - b. The pilot not on the controls (P) and nonrated crewmember (NCM) will provide adequate warning of obstacles, unannounced drift, or altitude changes. The P will monitor the aircraft attitude on the attitude indicator, and notify the P* prior to exceeding aircraft slope limitations. The P and NCM will confirm the suitability of the intended landing area and announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures.
 - a. Landing. Select a suitable area for slope operations. If possible, orient the aircraft into the wind. Announce the initiation of the slope landing. Smoothly lower the collective until skids contact the ground. Adjust the cyclic to maintain the aircraft in a level attitude while maintaining heading with the pedals. Continue lowering the collective and simultaneously apply cyclic into the slope to maintain the position of the up slope skid until the landing gear is firmly on the ground. Coordinate the collective and cyclic to control the rate of attitude change when lowering the down slope skid to the slope. With the down slope skid on the ground, simultaneously lower the collective full down and neutralize the cyclic. If aircraft slope limits are reached before the aircraft is firmly on the ground, return the aircraft to a hover. Select a new area with less slope.
 - b. Takeoff. Before takeoff, announce initiation of an ascent. Apply the cyclic into the slope to maintain the position of the up slope skid and smoothly increase the collective. Continue to increase the collective to raise the down slope skid, maintain heading with the pedals, and

simultaneously adjust the cyclic to attain a hover attitude. As the aircraft leaves the ground, adjust the cyclic to accomplish a vertical ascent to a hover with minimum drift.

Note: Before performing slope operations, it is important to understand dynamic rollover characteristics.

Note: Crewmembers must be aware of the helicopter's normal hovering attitude prior to putting a skid on the ground.

Note: If the successful completion of the landing is in doubt at any time, abort the maneuver and return to a hover.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Select reference points to determine slope angles. (References probably will be limited and difficult to ascertain.)
2. When performing operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Use of the white light may impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1066

PERFORM A RUNNING LANDING

CONDITIONS: In a UH-1 helicopter with the before-landing check complete.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Select a suitable landing area.
2. Maintain ground track alignment with the landing direction.
3. Maintain a constant approach angle clear of obstacles to desired touchdown point.
4. Touchdown aligned with landing direction ± 5 degrees, at/slightly above effective translational lift (ETL).

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused outside the aircraft to clear the aircraft throughout the approach and landing. The P* will announce the intended point of landing and any deviation from the approach.
 - b. The pilot not on the controls (P) and nonrated crewmember (NCM) will confirm the suitability of the area, assist in clearing the aircraft, and provide adequate warning of traffic or obstacles. They will announce when their attention is focused inside the aircraft.
2. Procedure.
 - a. Determine a shallow approach angle that allows safe obstacle clearance to arrive at the intended point of landing. Once the approach angle is intercepted, adjust the collective as necessary to establish and maintain the angle. Maintain entry airspeed until apparent ground speed and rate of closure appear to be increasing. Maintain ground track alignment with the landing direction by maintaining the aircraft in trim above 50 feet above ground level (AGL) and aligning the aircraft with the landing direction below 50 feet AGL. Control the rate of descent at touchdown with the collective. Maintain aircraft attitude and landing alignment with the cyclic and heading with the pedals. The touchdown speed may vary from ETL to slightly above ETL as dictated by landing area conditions.
 - b. After ground contact, ensure the aircraft remains stable as the collective is lowered to reduce ground run. Once the aircraft has come to a complete stop, reduce the collective to the fully down position and neutralize the pedals and cyclic.

Note: This maneuver may be performed in an environment where obscurants (for example, sand, dust, or snow) are present.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. The rate of descent during the final 100 feet should be slightly less at night than during the day to avoid abrupt attitude changes at low altitudes.
2. After establishing the descent during unaided flights, airspeed may be reduced to approximately 50 knots until apparent ground speed and rate of closure appear to be increasing. Progressively decrease the rate of descent and forward speed until termination of maneuver.

3. Surrounding terrain or vegetation may decrease contrast and cause degraded depth perception during the approach. Before descending below obstacles, determine the need for artificial lighting.
4. When performing operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Use of the white light may impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

ROUGH/UNPREPARED SURFACE CONSIDERATIONS: Closely monitor touchdown speed when landing to a rough or unprepared surface. If the surface is soft, exercise care when lowering the collective until the aircraft comes to a complete stop.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. The evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1070

Respond to emergencies

CONDITIONS: In a UH-1 helicopter or UH-1FS; or academically and given a specific emergency condition or the indications of a specific malfunction.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Identify the malfunction, determine the appropriate emergency procedure, and perform or describe the appropriate immediate action procedures required.
 - b. Lock shoulder harness, make mayday call, and tune transponder to emergency, as required.
2. Nonrated.
 - a. Prepare the aircraft, crew, and passengers for an emergency landing. Ensure passenger seat belts are on and crew shoulder harnesses are locked.
 - b. Look for a suitable landing area and alert the crew to the landing area's location.
 - c. Assist in evacuating passengers to designated assembly area in accordance with the crew briefing.

DESCRIPTION:

1. Crew actions. Any crewmember detecting an emergency will immediately announce the emergency to the other crewmembers.
 - a. The pilot on the controls (P*) will perform the underlined and non-underlined steps as appropriate depending on the environmental or aircraft conditions as per the appropriate aircraft operator's manual/checklist (CL) and initiate the appropriate type of landing. During visual meteorological conditions (VMC), the P* will focus primarily outside the aircraft to maintain aircraft control and to provide adequate clearance from traffic or obstacles. During instrument meteorological conditions (IMC), the P* will remain focused inside the aircraft on the flight instruments to maintain aircraft control.
 - b. The pilot not on the controls (P) will perform as directed or briefed. The P will perform the underlined and non-underlined steps as per the appropriate aircraft operator's manual/CL. If time permits, the P will verify all emergency checks with the appropriate aircraft operator's manual/CL. They will request appropriate emergency assistance as described in the flight information handbook (FIH).
 - c. The nonrated crewmember (NCM) will prepare the passengers for an emergency landing. During the descent the NCM will look for a suitable landing area, alert the crew to the landing area's location and assist in clearing the aircraft. After landing, the NCM will assist in evacuating the passengers to the designated assembly area. If normal exits cannot be used, the NCM will use the nearest emergency exit to expedite the evacuation. The P will keep communications to a minimum to allow the P* or P to attempt communications outside the aircraft. After accounting for all crewmembers and passengers, the NCM will assist the other crewmembers in any follow-on action (fire fighting, first aid, emergency signaling, or survival equipment).
2. Procedures. Analyze the information given (for example, aircraft response, caution or advisory lights, and audio warnings). Determine the malfunction and select the appropriate

emergency procedure. Perform the emergency procedure per the appropriate aircraft operator's manual/CL.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Take special precautions to identify the correct switches when performing emergency procedures at night or while wearing NVGs.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft, simulator or academically.
2. Evaluation will be conducted in the aircraft, simulator or academically.

REFERENCES: Appropriate common references.

TASK 1072

PERFORM SIMULATED ENGINE FAILURE AT A HOVER

CONDITIONS: In a UH-1 helicopter with an instructor pilot (IP), in a locally approved touchdown area, and at hover altitude.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Recognize the emergency, determine the appropriate corrective action, and from memory, perform all immediate action procedures required.
2. Do not allow lateral drift to exceed 1 foot during the descent.
3. Do not allow any rearward drift during the descent.
4. Execute a smooth, controlled descent and touchdown with no lateral or rearward drift.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused outside the aircraft.
 - b. The pilot not on the controls (P) will assist in clearing the aircraft as directed by the P*.
 - c. The nonrated crewmember (NCM) will continually monitor the condition of the aircraft. The NCM will simulate preparing passengers for crash landing and perform any other duties as directed by the P*/P.
2. Procedure. Upon detecting engine failure, the P* will maintain heading with the pedals and correct any lateral or rearward drift with the cyclic. If the IP initiates the maneuver while the aircraft is moving forward, the P* will adjust the cyclic to establish a landing attitude while avoiding an excessive tail-low condition. When the helicopter is resting firmly on the ground, the P* will lower the collective smoothly to the fully down position while neutralizing the pedals and cyclic.

Note: The standardization instructor pilot (SP)/IP will initiate the maneuver by announcing “hovering autorotation.” When conducting training and/or evaluation for SPs or IPs, the maneuver may be initiated with no announcement.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: The crew must use proper scanning techniques to avoid excessive drift.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1074**PERFORM SIMULATED ENGINE FAILURE AT CRUISE FLIGHT**

CONDITIONS: In a UH-1 helicopter, with an instructor pilot (IP), and above 400 feet above ground level (AGL); or in a UH-1FS.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Recognize the emergency, determine the appropriate corrective action, and perform or simulate (as required) from memory all immediate action procedures required.
2. Select a suitable landing area.
3. Correctly terminate maneuver as directed by the IP.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*), upon detecting the engine failure, will initiate the immediate action steps in accordance with the operator's manual. He will remain focused outside the aircraft, select an appropriate landing area, and call for the checklist to verify his response.
 - b. The IP will announce: "Simulated engine failure" and provide adequate warning for corrective action, if engine operating limits may be exceeded. The IP will confirm the proper execution of immediate action steps.
 - c. The nonrated crewmember (NCM) will continually monitor the condition of the aircraft. He will simulate preparing passengers for crash landing and perform any other duties as directed by the P*/P (pilot not on the controls).
2. Procedures.
 - a. Upon detecting engine failure, the P* will lower the collective to maintain rotor revolutions per minute (RPM) within limits while adjusting the pedals to trim the aircraft. The P* will select a suitable landing area and, using turns and adjusting airspeed as necessary, maneuver the aircraft for a safe landing to the intended landing area. (The final approach should generally be into the wind.) The P* will direct the IP to simulate setting the governor switch to EMER. If time permits the P* will direct the IP to set the transponder to EMER and transmit a Mayday call on the GUARD frequency. The standardization instructor pilot (SP)/IP will monitor the rotor RPM, gas producer, and aircraft in trim through out the maneuver. The P* should plan each forced landing as if continuing to the ground.
 - b. Prior to reaching 400 feet AGL with the aircraft in a safe autorotative profile, the IP will state one of three commands: "power recovery," "Terminate with power," or "Touchdown." (The emergency procedures training criteria outlined in AR 95-1 must be met before touchdown autorotations are performed.) The P* performs the following actions during these autorotations.
 - (1) Power recovery. Upon receiving the command "Power recovery," immediately establish normal operating RPM by smoothly adjusting the throttle to the fully open position. Maintain the aircraft in trim with the pedals. After normal operating RPM has been regained, increase the collective to establish a normal climb prior to reaching 200 feet AGL.

(2) Terminate with power. Upon receiving the command "Terminate with power," continue the autorotative descent. Prior to reaching 100 feet AGL, reestablish normal operating RPM, adjust the collective as necessary trim the aircraft with the pedals, and maintain the autorotation. At approximately 100 feet AGL, apply aft cyclic to initiate a smooth, progressive deceleration. Using the cyclic and pedals, align the aircraft with the intended landing area. Adjust the collective, if required, to prevent excessive rotor RPM. At approximately 15 feet AGL, apply sufficient collective to control the rate of descent and ground speed. The rate of descent and ground speed should be zero at 3 to 5 feet AGL with the aircraft in a landing attitude.

(3) Touchdown. Upon receiving the command "Touchdown," continue the autorotative descent. At approximately 100 feet AGL, apply aft cyclic to initiate a smooth, progressive deceleration. Maintain aircraft alignment with the touchdown area by properly adjusting the pedals and cyclic. Adjust the collective as necessary to prevent excessive rotor RPM. At approximately 15 feet AGL, apply sufficient collective to control the rate of descent and ground speed. (The amount of collective applied and the rate at which it is applied will depend on the rate of descent and ground speed.) Adjust the cyclic to attain a landing attitude, and apply collective as necessary just prior to touch-down to cushion the landing. After touchdown, maintain ground track alignment with the pedals. When the aircraft has come to a complete stop, lower the collective and neutralize the pedals and cyclic.

Note: When the task is conducted in the aircraft, the IP will initiate the maneuver by announcing "Simulated engine failure." When conducting training and/or evaluation for SPs or IPs, the maneuver may be initiated with no announcement.

Note: The aircraft operator's manual contains details about the procedures outlined in the aircraft checklist.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. If performed in the aircraft, this task is prohibited at other than designated areas.
2. If the searchlight or landing light is used, it should be turned on prior to entering the maneuver. Ensure that the searchlight or landing light is in the desired position.
3. Use of the white light may impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1076**PERFORM SIMULATED HYDRAULIC SYSTEM MALFUNCTION**

CONDITIONS: In a UH-1 helicopter, with emergency procedures training criteria outlined in AR 95-1 met and the before-landing check completed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Perform emergency procedures for hydraulic power failure per the aircraft operator's manual.
2. Maintain altitude as directed.
3. Maintain airspeed as directed.
4. Maintain heading control and ground track alignment with landing direction.
5. Maintain a constant shallow approach angle.
6. Execute touchdown at or slightly above effective translational lift (ETL) with landing area alignment ± 5 degrees.

WARNING

Both aviators must guard the cyclic when the HYD CONTROL switch is moved.

DESCRIPTION:

1. Crew actions.
 - a. The P* will remain focused outside the aircraft to clear the aircraft throughout the approach and landing. The P* will announce the intended point of landing and any deviation from the approach.
 - b. The IP will identify the HYD CONTROL switch by placing their hand on it. The IP will guard the cyclic with the other hand, and inform the P* they are turning off the hydraulic system. The P* will confirm that the hydraulic pressure is off by control feel (cyclic and pedals). If no abnormal movement of the flight controls is detected, the IP will remove their hands from the cyclic and HYD CONTROL switch and reset the master caution light.
 - c. The NCM will continually monitor the condition of the aircraft, assist in aircraft clearance and obstacle avoidance, and perform other tasks as directed by the PC.
2. Procedures.
 - a. The P* will maintain the desired heading and altitude while simulating emergency procedures described in the aircraft operator's manual. When the P* calls for the checklist, the IP will use it to verify procedures.
 - b. Upon intercepting a shallow approach angle, the P* will decrease the collective, as required, to establish and maintain that angle. The P* will maintain airspeed until apparent ground speed and rate of closure appear to be increasing. The P* should progressively decrease the rate of descent and rate of closure to effect a touchdown at or slightly above ETL within the first one-third of the landing area. The P* should control the rate of descent at

touchdown with the collective and maintain aircraft attitude and landing area alignment with the cyclic and heading with the pedals.

c. After touchdown, the P* will maintain ground track alignment with the cyclic and heading with the pedals and decrease the collective to slow forward speed. Once the aircraft has stopped, the P* must lower the collective to the fully down position and neutralize the pedals and cyclic. To return the HYD CONTROL switch to the ON position, the IP will guard the cyclic while directing the P* to relax pressure on the controls.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. The rate of descent during the final 100 feet should be slightly less than during the day to avoid abrupt attitude changes at low altitudes. After establishing the descent during unaided flights, airspeed may be reduced to approximately 50 knots until apparent ground speed and rate of closure appear to be increasing. Progressively decrease the rate of decent and forward speed until termination of maneuver.
2. Surrounding terrain or vegetation may decrease contrast and degrade depth perception. Before descending below obstacles, determine the need for artificial lighting.
3. Use of the white light may impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or simulator.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1082**PERFORM AUTOROTATION**

CONDITIONS: In a UH-1 helicopter, with emergency procedures training criteria outlined in AR 95-1 met and before-landing check completed, and given the entry altitude and airspeed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Establish entry altitude as directed. Minimum entry altitude of 600 feet above ground level (AGL).
2. Establish entry airspeed as directed
3. Establish airspeed 80 knots indicated airspeed (KIAS), +10, -5 KIAS, before reaching 100 feet AGL.
4. Perform a smooth, progressive deceleration.
5. Apply initial pitch at approximately 15 feet AGL.
6. Maintain heading alignment at touchdown ± 5 degrees.

CAUTION

Do not lower collective pitch to provide braking action.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused outside the aircraft. The P* will announce entering the autorotation and acknowledge the rotor revolutions per minute (RPM), gas producer (speed) (N_1), and trim. If directed by the instructor pilot (IP) to perform go-around or terminate with power, the P* will smoothly and positively roll the throttle to the full open position and, with the “needles joined,” execute the appropriate maneuver.
 - b. The IP will acknowledge the entry, verify and call out whether rotor RPM remains within limits, whether N_1 remains stable, and the aircraft trim. If a steady state autorotation is not achieved, or if it becomes apparent it won’t be achieved, the IP will direct the P* to go around or terminate with power as appropriate.
 - c. The nonrated crewmember (NCM) will continually monitor the condition of the aircraft, assist in aircraft clearance and obstacle avoidance, and perform other tasks as directed by the pilot in command (PC).

2. Procedures.

a. Maintain entry altitude and airspeed as directed until reaching the entry point. Initiate the maneuver by lowering the collective to the fully down position. Retard the throttle to engine-idle stop, and adjust the pedals to maintain trim. Maintain ground track while crabbing (above 100 feet) and slipping (below 100 feet) the helicopter. Adjust the cyclic to attain an 80-knot attitude. Before reaching 100 feet AGL, ensure that a steady-state autorotation is attained. If it is not attained, execute a go-around or terminate with power as appropriate. A steady-state autorotation means that—

- (1) Rotor RPM is within limits.
- (2) Aircraft is at the correct airspeed.
- (3) Aircraft is descending at a normal rate.
- (4) Aircraft is in a position to terminate in the intended landing area.

b. At approximately 100 feet AGL, apply aft cyclic to initiate a smooth, progressive deceleration. Maintain aircraft alignment with the touchdown area by properly applying pedals and cyclic. Adjust the collective, if required, to prevent excessive rotor RPM. At approximately 15 feet AGL, apply sufficient collective to control the rate of descent and ground speed. (The amount of collective applied and rate of application will depend on the rate of descent and ground speed.) Adjust the cyclic to attain a landing attitude just before touchdown and apply collective as necessary to cushion the landing. After touchdown, maintain ground track alignment with the pedals. When the aircraft has come to a complete stop, lower the collective and neutralize the pedals and cyclic.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Attitude control is critical during night autorotations.
2. The lack of visual references at night reduces the aviator's ability to estimate airspeed and altitude. To compensate for the lack of visual references, the aviator will attain a steady-state autorotation before reaching 200 feet AGL.
3. Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. Crews must use proper scanning techniques.
4. The crew must be aware that the surrounding terrain or vegetation may decrease contrast and degrade depth perception. If the searchlight or landing light is used, it should be turned on prior to entering the maneuver. Ensure that the searchlight or landing light is in the desired position.
5. Use of the white light may impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.
6. NVG traffic patterns are normally lower than for day. To ensure steady-state autorotation minimum entry altitude will be 600 feet AGL.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1102**PERFORM MANUAL THROTTLE OPERATION**

CONDITIONS: In a UH-1 helicopter, with an instructor pilot (IP), with the aircraft heading into the wind.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Perform the procedure to change the governor to the emergency mode according to the description below.
2. Maintain 6,400 revolutions per minute (RPM), ± 200 RPM.
3. Change the governor to the automatic mode according to the procedure in the description.

CAUTION

Throttle and collective coordinated control movements must be smooth to prevent compressor stall, overspeed, over temperature or engine failure. Closely monitor gas producer (speed) (N_1), power turbine (speed) (N_2) and exhaust gas temperature (EGT).

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will acknowledge that the governor switch is in the EMER position and remain focused outside the aircraft. The P* will also acknowledge when the governor switch is returned to the AUTO position.
 - b. The pilot not on the controls (P) will announce moving the governor switch to the EMER position, verify the master caution and appropriate segment light are illuminated, and reset the master caution light. The P will also announce moving the governor switch to the AUTO position and verify the segment light is no longer illuminated.
 - c. The P and nonrated crewmember (NCM) will focus their attention primarily outside the aircraft to maintain airspace surveillance.
2. Procedures.
 - a. While the aircraft is on the ground, collective fully down, and with the RPM stabilized at 6,600 RPM, the P* will retard the throttle to engine idle. After noting a decrease in engine RPM, the P will move the governor switch to the EMER position. The P* will then smoothly adjust the throttle to 6,400 RPM. The P* will bring the aircraft to a stabilized 3-foot hover by smoothly increasing the collective and adjusting the throttle to maintain 6400 RPM. The P* will apply cyclic and pedals as necessary to remain stationary and to maintain a constant heading. The P* will clear the aircraft and perform a left hovering turn and a right hovering turn. Upon completion of both turns, the P* will land the aircraft by smoothly reducing the collective and adjusting the throttle to maintain 6400 RPM. After landing, the P* will reduce the throttle to engine idle. After noting a decrease in engine RPM, the P will move the governor switch to the AUTO position. The P* will slowly increase the throttle to the fully

TC 1-211

open position and adjust the RPM to 6,600. The P* will ensure that the fuel control is operating properly.

b. The P and NCM will inform the P* of all obstacles and will clear the aircraft verbally during the turns.

Note: In case of an actual in-flight emergency that requires emergency governor operations the crew will use the procedures outlined in the aircraft operator's manual.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: The crew must use proper scanning techniques to avoid excessive drift.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1155**NEGOTIATE WIRE OBSTACLES**

CONDITIONS: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Locate and estimate the height of wires.
2. Determine the best method to negotiate the wire obstacle.
3. Safely negotiate the wire obstacle, minimizing the time unmasked.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused primarily outside the aircraft and will announce visual contact with wires and supporting structures.
 - b. The pilot not on the controls (P) and nonrated crewmember (NCM) will announce visual contact with wires and supporting structures. They will also provide adequate warning to avoid hazards, wires, poles, or supporting structures. They will announce when the aircraft is clear and when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures.
 - a. Announce when wires are seen. Confirm the location of wire obstacles with other crewmembers. Announce the method of negotiating the wires and when the maneuver is initiated.
 - b. Discuss the characteristics of wires and estimate the amount of available clearance between them and the ground to determine the method of crossing. Locate guy wires and supporting poles.
 - (1) Overflight. Before crossing the wires, identify the highest wire. Cross near a pole to aid in visual perception and minimize the time that the aircraft is unmasked.
 - (2) Underflight/ground taxi. When under flying wires, there must be a minimum ground to wire clearance of hover height plus 25 feet. Ground speed should be no greater than that of a brisk walk. Ensure lateral clearance from guy wires and poles. If terrain is suitable, consideration should be given to ground taxiing under the wires.

Note: The crew must maintain proper scanning techniques to ensure obstacle avoidance and aircraft clearance.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Wires are difficult to detect at night and with NVGs. Underflight of wires should not be performed at night or while using NVGs, unless the location has been checked during daylight conditions and all hazards have been identified.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1162

Perform emergency egress

WARNING

Removing an injured crewmember or passenger may increase the severity of the injuries. Analyze the risk of additional injury versus the risk of leaving the crewmember passenger in the aircraft until assistance arrives.

CONDITIONS: In a UH-1 helicopter or academically.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Perform or describe the use of emergency exits on the aircraft.
2. Perform or describe the emergency egress of a pilot, nonrated crewmember (NCM), or passenger from his seat.
3. Perform or describe the emergency engine shutdown of the aircraft.
4. Assist in marshalling passengers to designated assembly area.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will direct an emergency egress. They will determine if the egress will be accomplished before the rotor blades have stopped. (If the PC is incapacitated, the next ranking rated crewmember RCM/NCM will perform this function.) The PC will also determine and announce if an emergency engine shutdown will be performed.
 - b. The pilot on the controls (P*) and pilot not on the controls (P) will egress their respective positions and assist with passenger egress.
 - c. The NCM will direct passenger egress.
 - d. All crewmembers will assist with the egress of incapacitated crewmembers and passengers if required.
2. Procedures.
 - a. If an emergency egress occurs, use the cabin/cockpit doors. If they are jammed, use the emergency release. If the emergency release does not work, kick out the windows with your boot or use some other suitable object. Once out, guide yourself and passengers to clear the aircraft in a safe direction and meet at the assembly point. Account for all personnel.
 - b. Perform the emergency egress of a pilot from his seat per the appropriate aircraft operator's manual. The instructions may also be found on the back of the seat.
3. Perform emergency engine shutdown procedures per TM 55-1520-210-10/TM 55-1520-210-CL.

OVERWATER CONSIDERATIONS: If egress must be made from an aircraft that has gone into the water, do not exit until rotor blades have stopped. Secure a handhold within cockpit to maintain orientation, employ SEA MARK II/helicopter emergency egress device (HEED) if equipped and wait

for cockpit and cabin area to fill with water. Once aircraft is full of water, use the cargo/cockpit doors. If they are jammed, use the emergency release. If the emergency release does not work, kick out the windows with your boot or use some other suitable object and swim clear of the aircraft. Do not activate life preserver until clear of aircraft.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft or academically.

REFERENCES: Appropriate common references.

TASK 1170

Perform instrument takeoff

CONDITIONS: In a UH-1 helicopter or UH-1FS in instrument meteorological conditions (IMC) or simulated IMC, with power and before take-off checks completed, and aircraft cleared.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Set attitude indicator as required.
2. Determine instrument takeoff power, hover power + 5 pounds torque.
3. Maintain required takeoff power as required, +3 psi, -0 psi torque.
4. Maintain accelerative climb attitude, 1 to 2 bar widths below the artificial horizon until climb airspeed is attained.
5. Maintain the aircraft in trim after effective translational lift (ETL).

DESCRIPTION:

6. Crew actions.
 - a. The pilot on the controls (P*) will focus primarily outside the aircraft during the visual meteorological conditions (VMC) portion of the maneuver. The P* will announce when the maneuver is initiated and any intent to abort or alter the takeoff. Before the aircraft enters simulated or actual IMC, the P* will make the transition to the flight instruments.
 - b. The pilot not on the controls (P) will announce when ready for takeoff and will focus primarily outside the aircraft to assist in clearing during the VMC portion of the maneuver and to provide adequate warning of obstacles. The P will announce when their attention is focused inside the aircraft. As the aircraft enters actual IMC, the P will announce when IMC and will monitor the flight instruments to assist in establishing coordinated flight within aircraft operating limits.
 - c. The nonrated crewmember (NCM) will maintain airspace surveillance during the VMC portion of the maneuver. During simulated IMC, the P and NCM will focus primarily outside the aircraft to provide adequate warning of traffic or obstacles. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
7. Procedures. On the runway or takeoff pad, align the aircraft with the desired takeoff heading. Set the attitude indicator for takeoff (wings level on the horizon). Initiate the takeoff by increasing the collective smoothly and steadily until takeoff power is reached. (Set power as required to accelerate to the desired climb airspeed and maintain the desired climb rate.) Adjust the pitch attitude 1 to 2 bar widths below the horizon to establish the initial accelerative climb attitude. Visually maintain takeoff clearance and alignment on takeoff and transition to the flight instruments before entering IMC. Maintain the heading/course required by the departure procedure or air traffic control (ATC) instructions. When the desired climb airspeed is reached, adjust cyclic to maintain airspeed and adjust collective to maintain the desired climb rate.

Note: The takeoff may be initiated from the ground or a hover.

Note: Hover out-of-ground effect (OGE) power is required for this task.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or simulator.
2. Evaluation may be conducted in the aircraft or simulator.

REFERENCES: Appropriate common references.

TASK 1172

Perform radio navigation

CONDITIONS: In a UH-1 helicopter or UH-1FS in instrument meteorological conditions (IMC) or simulated IMC, with navigation checks complete, and given appropriate navigational publications.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Tune and identify appropriate navigational aids (NAVAIDs).
2. Determine aircraft position.
3. Intercept and maintain the desired course.
4. Identify station passage.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused inside the aircraft and will monitor radios and air traffic control (ATC) information. The P* will announce any deviation not directed by ATC or the pilot not on the controls (P) and will acknowledge all directives given by ATC or the P.
 - b. The P will select and announce radio frequencies and will monitor radios and ATC information not monitored by the P*.
 - c. During visual meteorological conditions (VMC) or simulated IMC, the P and nonrated crewmember (NCM) will focus primarily outside the aircraft to provide adequate warning of traffic or obstacles. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures.
 - a. Before flight, when the use of the automatic direction finder (ADF) is expected, ensure that the ADF will receive on the desired band and the Number 1 bearing pointer points in the direction of the selected station.
 - b. Before flight when the use of the very high frequency omni-directional range (VOR)/instrument landing system (ILS) receiver is expected, ensure that the VOR is operational and the vertical speed indicator (VSI) and course deviation indicator (CDI) are providing the proper indications per the appropriate aircraft operator's manual.
 - c. Before using a selected NAVAID for navigation, tune and identify the NAVAID. After identifying the desired station and the position of the aircraft in relation to the desired course, turn to an appropriate intercept heading. Maintain the intercept heading until approaching an on-course indication. Depending on the rate of closure, start a turn to intercept the desired course.
 - d. Maintain heading to track the desired course. If the navigational instruments show an off-course condition, turn as necessary toward the course to re-intercept. If navigational instruments do not indicate movement toward the course within a reasonable time, increase the intercept angle. When re-intercepting the course, turn toward the course and apply the appropriate drift correction (normally one-half of the intercept angle). Continue to bracket the course by decreasing corrections until obtaining a heading that will maintain the aircraft on course. Determine arrival at radio intersections per procedures in FM 1-240 or aeronautical

information manual (AIM). Identify station passage by observing the first complete reversal of the bearing pointer and/or the TO-FROM indicator on the CDI.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may and be conducted in the aircraft or simulator.
2. Evaluation may be conducted in the aircraft or simulator.

REFERENCES: Appropriate common references.

TASK 1174

Perform holding procedures

CONDITIONS: In a UH-1 helicopter or UH-1FS, in instrument meteorological conditions (IMC) or simulated IMC and given holding instructions and appropriate DOD FLIP.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Tune and identify the appropriate navigational aids (NAVAIDs).
2. Enter the holding pattern.
3. Time and track holding pattern legs.
4. Send the appropriate report to air traffic control (ATC).

DESCRIPTION:

1. Crew actions.
 - a. Before arrival at the holding fix, the pilot in control (PC) will analyze the holding instructions and determine the holding pattern and proper entry procedures. The PC will brief the other crewmembers on the proposed entry, outbound heading, and inbound course. (The PC may delegate this task to another rated crewmember [RCM].)
 - b. The pilot not on the controls (P) will select radio frequencies and monitor radios. The P will announce ATC information not monitored by the pilot on the controls (P*). The P will compute outbound times and headings to adjust for wind and direct the P* to adjust the pattern as necessary.
 - c. The P* will fly headings and altitudes and will adjust inbound and outbound times as directed by ATC or the P. The P* will announce any deviation as well as ATC information not monitored by the P.
 - d. During simulated IMC, the P and nonrated crewmember (NCM) will focus primarily outside the aircraft to provide adequate warning of traffic or obstacles. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures. Upon arrival at the holding fix, turn (if required) to the predetermined outbound heading or track and check the inbound course. Maintain the outbound heading or track per the DOD FLIP or as directed by ATC. After the appropriate time outbound, turn to the inbound heading and apply normal tracking procedures to maintain the inbound course. Note the time required to fly the inbound leg and adjust outbound course and time if necessary. When holding at a NAVAID, begin timing over or abeam the holding station, whichever occurs later. When holding at an intersection, begin timing when the outbound turn is completed and is wings level on the outbound heading.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or simulator.
2. Evaluation may be conducted in the aircraft or simulator.

REFERENCES: Appropriate common references.

TASK 1176**Perform nonprecision approach**

CONDITIONS: In a UH-1 helicopter or UH-1FS, in instrument meteorological conditions (IMC) or simulated IMC, given approach information and appropriate DOD flight information publication (FLIP), approach clearance, and before-landing checks complete.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Perform the approach as published.
2. Intercept and maintain non-directional beacon (NDB) courses per FM 1-240 and aeronautical information manual (AIM), ± 5 degrees of course centerline.
3. Intercept and maintain very high frequency omni-directional range (VOR) or global positioning system (GPS) courses per FM 1-240 and/or AIM and within one half scale deflection using the course deviation indicator (CDI) or ± 5 degrees when using the radio magnetic indicator (RMI).
4. Intercept and maintain localizer (LOC) courses within a full-scale deflection of the CDI.
5. During airport surveillance radar (ASR) approaches, make immediate heading and altitude changes issued by air traffic control (ATC) and maintain heading ± 5 degrees.
6. Comply with descent minimums prescribed for the approach.
7. Perform the correct missed approach procedure upon reaching the missed approach point (MAP) if landing cannot be accomplished.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will review the approach with the other crewmembers before initiating the procedure. The PC will confirm with the crew the specific approach to be flown, that the correct navigational aid (NAVAID)/communication frequencies are set, and that the CDI course is selected as required. The PC may assign other crewmembers to perform these duties.
 - b. The pilot on the controls (P*) will focus primarily inside the aircraft on the instruments and perform the approach. The P* will follow the heading/course, altitude, and missed approach directives issued by the pilot not on the controls (P). The P* will announce any deviation not directed by ATC or the P and will acknowledge all navigation directives given by the P.
 - c. The P will call out the approach procedure to the P* and will advise the P* of any unannounced deviations. The P will monitor outside for the landing environment, announce when they make visual contact suitable to complete the landing per AR 95-1, and if directed by the P*, take the controls to complete the landing. The P will announce if they do not make visual contact by the MAP and call out the missed approach procedures. During visual meteorological conditions (VMC), the P and nonrated crewmember (NCM) will focus primarily outside the aircraft to provide adequate warning of traffic or obstacles. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures. Perform the desired approach procedures per AR 95-1, DOD FLIP, FM 1-240, AIM, and the appropriate aircraft operator's manual.

TC 1-211

Note: The AN/ASN-175 GPS is instrument flight rules (IFR) rated and can be used as the primary source of navigation information for IFR operations in controlled airspace if a current navigation database card is installed.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or simulator.
2. Evaluation may be conducted in the aircraft or simulator.

REFERENCES: Appropriate common references.

TASK 1178**Perform precision approach**

CONDITIONS: In a UH-1 helicopter or UH-1FS, in instrument meteorological conditions (IMC) or simulated IMC, given approach information and appropriate DOD FLIP approach clearance, and before-landing checks complete.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Perform the approach as published.
2. For an instrument landing system (ILS) approach, intercept and maintain the localizer (LOC) and glide slope. Maintain the LOC course within a full-scale deflection of the course deviation indicator (CDI) and for final approach, maintain the glide slope indicator within full-scale deflection.
3. For a precision approach radar (PAR) approach, make immediate heading and altitude changes issued by air traffic control (ATC) and maintain heading ± 5 degrees; for final approach, maintain glide slope as directed by ATC.
4. Comply with the decision height (DH) prescribed for the approach.
5. Perform the correct missed approach procedure upon reaching the DH if landing cannot be accomplished.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will review the approach with the other crewmembers before initiating the procedure. The PC will confirm with the crew the specific approach to be flown, that the correct navigational aid (NAVAID)/communication frequencies are set. The PC may assign other crewmembers to perform these duties.
 - b. The pilot on the controls (P*) will focus primarily inside the aircraft on the instruments and perform the approach. The P* will follow the heading/course, altitude, and missed approach directives issued by the pilot not on the controls (P). The P* will announce any deviation not directed by ATC or the P and will acknowledge all navigation directives given by the P.
 - c. The P will call out the approach procedure to the P* and will advise the P* of any unannounced deviations. The P will monitor outside for the landing environment, announce when they make visual contact suitable to complete the landing per AR 95-1, and if directed by the P*, will take the controls to complete the landing. If visual contact is not made by DH, the P will announce such and call out the missed approach procedures.
 - d. During visual meteorological conditions (VMC), the P and nonrated crewmember (NCM) will focus primarily outside the aircraft to provide adequate warning of traffic or obstacles. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures.
 - a. Perform the desired approach procedures per AR 95-1, DOD FLIP, FM 1-240, AIM, and the appropriate aircraft operator's manual.

TC 1-211

Note: The AN/ASN-175 GPS is instrument flight rules (IFR) rated and can be used as the primary source of navigation information for IFR operations in controlled airspace if a current navigation database card is installed.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or simulator.
2. Evaluation may be conducted in the aircraft or simulator.

REFERENCES: Appropriate common references.

TASK 1182**PERFORM UNUSUAL ATTITUDE RECOVERY**

CONDITIONS: In a UH-1 helicopter with a unit trainer (UT), an instructor pilot (IP), or an instrument examiner (IE) in visual meteorological conditions (VMC) or simulated instrument meteorological conditions (IMC), or in a UH-1FS. The UT may only perform this maneuver in the UH-1FS.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Analyze aircraft attitude.
2. Without delay, use correct recovery procedures with minimum loss of altitude.
3. Attitude – Level the wings and pitch attitude while maintaining the aircraft in trim.
4. Heading – Establish and maintain appropriate heading.
5. Torque – Adjust torque to cruise or climb power setting.
6. Airspeed – Maintain the desired airspeed.
7. Altitude – Return to the appropriate/desired altitude after establishing aircraft control.
8. Recover without exceeding aircraft operating limitations.

DESCRIPTION:

1. Crew actions.
 - a. The trainer or evaluator will place the aircraft in unusual attitude and transfer aircraft controls to the pilot not on the controls (P). The P will acknowledge the transfer of controls, the unusual attitude, and recover the aircraft as the pilot on the controls (P*).
 - b. During the recovery the P* will remain focused inside the aircraft.
 - c. The P will assist in monitoring the aircraft instruments and call out attitude, torque, and trim as necessary.
 - d. If performed in the aircraft, the P and nonrated crewmember (NCM) will focus primarily outside the aircraft to provide adequate warning of traffic or obstacles. The NCM will position himself on the P* side of the aircraft.
2. Procedures.
 - a. To recover from an unusual attitude, correct the pitch and roll attitude, adjust power, and trim the aircraft as required to return to level flight. All components are changed simultaneously with little lead of one over the other.
 - b. The displacement of controls used in recoveries may be greater than those for normal flight. Care must be taken in making adjustments as straight-and-level flight is approached. The instruments must be observed closely to avoid over controlling.

NIGHT OR NVD CONSIDERATIONS: IMC is not a prerequisite for an unusual attitude. Low-level ambient light may induce visual illusions and spatial disorientation. During NIGHT VISION GOGGLE operations, video noise may contribute to loss of visual cues.

TC 1-211

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or simulator.
2. Evaluation will be conducted in the aircraft or simulator.

REFERENCES: Appropriate common references.

TASK 1184**RESPOND TO INADVERTENT INSTRUMENT METEOROLOGICAL CONDITIONS**

CONDITIONS: In a UH-1 helicopter, in visual meteorological conditions (VMC) or a UH-1FS in simulated instrument meteorological conditions (IMC) or orally in a classroom environment.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Announce “IMC”, maintain proper aircraft control, and make the transition to instrument flight immediately.
2. Immediately initiate a climb.
3. Continue inadvertent instrument meteorological conditions (IIMC) recovery procedures as follows:
 - a. Attitude – Level the wings and adjust pitch for the desired airspeed on the attitude indicator while maintaining the aircraft in trim.
 - b. Heading – Maintain heading; turn only to avoid known obstacles or as briefed for multiship operations.
 - c. Torque – Maintain climb power until reaching appropriate cruise altitude.
 - d. Airspeed – Adjust to appropriate climb airspeed.
4. Complete the IIMC recovery per local regulations and policies.

DESCRIPTION:

1. Crew actions.
 - a. The P* will announce “Inadvertent IMC,” transition to the instruments, and immediately initiate a climb while establishing aircraft control. The P* will immediately announce if they becomes disoriented.
 - b. The P will announce “Inadvertent IMC” and monitor the cockpit instruments to assist in recovery. The P will announce when the aircraft is in a positive climb, the altitude and altitude climbing to, and the aircraft heading (and desired heading when required for obstacle avoidance and multiship operations). The P will adjust the transponder to emergency, tune navigation radios as appropriate, and make the appropriate radio calls. The P will perform any other tasks as directed by the P* and remain prepared to take the controls should the P* become disoriented.
 - c. The NCM will focus primarily outside the aircraft to provide adequate warning for avoiding terrain or obstacles and will announce if VMC conditions are encountered. The NCM will perform any other crew tasks as directed by the P* or P.
2. Procedures. The crew should consider establishing a torque and airspeed appropriate for the mission environment to use in the event of encountering IIMC. If briefed during the crew briefing, this can help eliminate confusion during the actual emergency. The most important action upon encountering IIMC is to immediately begin climbing while establishing aircraft control via the instruments. Once this is accomplished, the transponder should be set to emergency to alert ATC. Tuning navigational radios or making radio calls will be determined by local procedures. The crew should contact ATC on Guard and allow ATC to assign an appropriate altitude and heading/course, and, if necessary, an appropriate frequency. If radio

TC 1-211

contact cannot be established first, the crew must ensure that navigational radios are tuned as quickly as possible to determine the aircraft's position and appropriate course for recovery.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. When using NVGs, it may be possible to see through a thin obscuration, such as fog and drizzle, with little or no degradation.
2. If IMC conditions are entered with the searchlight or landing light on, spatial disorientation may occur.
3. The NVGs may be removed or flipped up once stable flight is established. It may be beneficial for the P not to completely remove his NVGs. The NVGs may assist in recovery by allowing the P to see through a thin obscuration that would otherwise prevent him from seeing the landing environment.

SNOW/SAND/DUST CONSIDERATIONS: Obscurants other than weather can induce loss of visual contact. At low altitudes where these conditions would be encountered it is extremely important that these procedures be initiated immediately to prevent ground contact.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or simulator.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1188**Operate aircraft survivability equipment**

CONDITIONS: In a UH-1 helicopter equipped with aircraft survivability equipment (ASE) or academically.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Describe the purpose of installed ASE.
 - b. Perform/describe preflight inspection, turn-on, test, operation, emergency procedures, and shut down of installed ASE.
 - c. Employ/describe use of installed ASE.
2. Nonrated. Prepare equipment for operation.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will ensure that crewmembers understand the employment of installed ASE during the conduct of the mission. The PC will also ensure that all ASE payloads and settings are in accordance with the mission briefing.
 - b. When the crew encounters a radar directed threat, the pilot on the controls (P*) will remain primarily focused outside to avoid obstacles, perform the required evasive maneuver, reposition the aircraft as necessary to break lock, and then avoid the threat.
 - c. The pilot not on the controls (P) and nonrated crewmember (NCM) will assist in clearing the aircraft and provide adequate warning of obstacles.
2. Procedures. Perform or describe preflight inspection, turn-on, test, operation, emergency procedures, and shutdown of installed ASE equipment. Evaluate and interpret the ASE visual and aural indications.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft, simulator, or academically.
2. Evaluation may be conducted in the aircraft, simulator, or academically.

REFERENCES: Appropriate common references plus the following:

CBAT Programs
Unit S-2
MCM 3-1 series
Equipment operator manuals:
TM 11-5841-283-12
TM 11-5841-291-12
TM 11-5865-200-12
TM 11-5865-202-12
TM 11-5865-229-12

TC 1-211

TASK 1190

Perform hand and arm signals

CONDITIONS: Given a list of hand and arm signals from FM 21-60 to identify or perform.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated. Identify at a minimum the hand and arm signals required for moving an aircraft left, right, forward, or backward and those for takeoff, landing, sling load hooked, and release sling load, as appropriate.
2. Nonrated. Identify and perform at a minimum the hand and arm signals required for moving an aircraft left, right, forward, or backward and those for takeoff, landing, sling load hooked, and release sling load as appropriate.

DESCRIPTION: Identify or perform the hand and arm signals required to move an aircraft from one point to another.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references plus the following:

FM 21-60

TASK 1194**Perform refueling operations**

CONDITIONS: With a UH-1 helicopter and refueling equipment.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Ensure that safety procedures are complied with.
2. Ensure that the aircraft is at engine idle (when appropriate) and that the external lighting and radios are as specified in the unit standing operating procedure (SOP).
3. Ensure that all doors, windows, and vents are closed on the refueling side (for hot refueling operations).
4. Ensure that the aircraft is properly refueled.
5. Enter the appropriate information on DA Form 2408-12 (*Army Aviator's Flight Record*).

DESCRIPTION:

1. Crew actions: cold refueling.
 - a. A crewmember will guide the refueling vehicle to the aircraft. Ensure that the driver parks the vehicle the proper distance from the aircraft per FM 10-67-1. Verify that all personnel not involved with the refueling operations are a safe distance away.
 - b. Ground and refuel the aircraft per FM 10-67-1, the appropriate aircraft operator's manual, and the unit SOP. Ensure that the tanks are filled to the required level. When the refueling is completed, ensure that all caps are secured and remove the ground connection if the aircraft will not remain parked. Make the appropriate entries on DA Form 2408-12.
2. Crew actions: hot refueling.
 - a. The pilot not on the controls (P) and nonrated crewmember (NCM) will assist the pilot on the controls (P*) in positioning the aircraft. Ensure that the proper separation is maintained between the fuel source, the aircraft, and the refueling equipment. Before refueling the aircraft, the pilot in command (PC) will verify that personnel not involved with the refueling operation are a safe distance away.
 - b. The crewmember outside will ensure that the aircraft is grounded, refuel the aircraft per FM 10-67-1, the appropriate aircraft operator's manual, the unit SOP, and assist with the refueling operation. Ensure that the tanks are filled to the required level. When the refueling is completed, ensure that all caps are secured and remove the ground connection.
 - c. The crewmember outside will inform the PC when the refueling is completed. Assist passengers in boarding the aircraft and in securing their seat belts. Assist the P* and P in clearing the aircraft during the departure from the refueling area. Make the appropriate entries on DA Form 2408-12.

Note: If open port hot refueling of the aircraft is to be accomplished, take added safety precautions. (These precautions should be included in the unit SOP.)

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Supplement aircraft lighting at the refueling station by using an explosion-proof flashlight with an unfiltered (white) lens to check for leaks and fuel venting.

TC 1-211

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

DA Pamphlet 738-751
FM 10-67-1
FM 21-60
FM 1-113

TASK 1262**Participate in a crew-level after-action review**

CONDITIONS: After flight in a UH-1 helicopter or a UH-1FS and given a unit approved crew level after action review checklist.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Pilot in command (PC) will conduct a detailed crew-level after-action review using figure 4-3 or a unit-approved crew-level after-action review checklist.
2. All crewmembers will actively participate in the review.

DESCRIPTION:

1. Crew actions.
 - a. The PC will conduct a crew-level after-action review and use a unit-approved checklist similar to the one shown in figure 4-3. The PC will actively seek input from all crewmembers and ensure that the results of the review are passed to unit operations and flight standards.
 - b. All crewmembers will actively participate in the review. The intent is to constructively review the mission and apply lessons learned into subsequent missions.
2. Procedures. Using an after-action review checklist, participate in a crew-level after-action review of the mission. The review should be an open and frank discussion of all aspects of the mission. It should include all factors of the mission and incorporate all crewmembers. The results of the review should be passed to operations and flight standards.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

Crew-Level After-Action Review Checklist	
1.	Restate mission objectives with mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC) considerations.
2.	Conduct review for each mission segment: <ol style="list-style-type: none"> a. Restate planned actions/interactions for the segment. b. What actually happened? <ol style="list-style-type: none"> (1) Each crewmember states in own words. (2) Discuss impacts of crew coordination requirements, aircraft/equipment operation, tactics, commander's intent, etc. c. What was right or wrong about what happened? <ol style="list-style-type: none"> (1) Each crewmember states in own words. (2) Explore causative factors for both favorable and unfavorable events. (3) Discuss crew coordination strengths and weaknesses in dealing with each event. d. What must be done differently the next time? <ol style="list-style-type: none"> (1) Each crewmember states in own words. (2) Identify improvements required in the areas of team relationships, mission planning, workload distribution and prioritization, information exchange, and cross monitoring of performance. e. What are the lessons learned? <ol style="list-style-type: none"> (1) Each crewmember states in own words. (2) Are changes necessary to: <ol style="list-style-type: none"> (a) Crew coordination techniques? (b) Flying techniques? (c) SOP? (d) Doctrine, ATM, TMs? f. Effect of segment actions and interactions on the overall mission. <ol style="list-style-type: none"> (1) Each crewmember states in own words. (2) Lessons learned. <ol style="list-style-type: none"> (a) Individual level. (b) Crew level. (c) Unit level.
3.	Advise unit operations of significant lessons learned.

Figure 4-3. Suggested format crew-level after-action review checklist

TASK 1321**PERFORM SIMULATED ANTITORQUE MALFUNCTION (FIXED PEDAL SETTING)**

CONDITIONS: In a UH-1 helicopter; with the emergency procedure training criteria in AR 95-1 met and the before-landing check completed; and given the entry altitude and airspeed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Establish entry altitude as directed ± 100 feet.
2. Establish entry airspeed as directed ± 10 knots indicated airspeed (KIAS).
3. Maintain a constant approach angle.
4. Maintain ground track alignment with the landing direction.
5. Maintain landing area alignment at touchdown ± 10 degrees.
6. Perform a smooth, controlled termination.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused outside the aircraft to clear the aircraft throughout the approach and landing. The P* will announce the intended point of landing and any deviation from the approach.
 - b. The instructor pilot (IP) will monitor the N_2 and N_1 while the mechanical slack is removed from the throttle. The IP will announce any reduction in engine revolutions per minute (RPM).
 - c. The IP will monitor the pedals during the approach.
 - d. The nonrated crewmember (NCM) will continually monitor the condition of the aircraft, assist in aircraft clearance and obstacle avoidance, and perform other tasks as directed by the pilot in command (PC).

2. Procedures.

Note: In case of an in-flight emergency that results in fixed tail rotor pitch settings, the crew should use the procedures outlined in the aircraft operator's manual.

- a. Right pedal setting. On the downwind leg, the P* will remove the mechanical slack from the throttle while maintaining 6600 RPM. On the base leg, the P* will descend to the appropriate altitude. On the final leg, the P* will ensure the aircraft is at the proper altitude and airspeed and in trim with cruise power applied. The IP will then establish a nose-right, out-of-trim condition (maximum 10 degrees), not to exceed 20 degrees from the runway heading. After intercepting the shallow approach angle, the P* will adjust the collective, as necessary, to maintain the angle. The P* will maintain entry airspeed until the apparent ground speed and rate of closure appear to be increasing. The P* will progressively decrease the rate of descent and rate of closure. The P* must plan to arrive over the first one-third of the landing area approximately 2 feet above the ground at the minimum airspeed for directional control. The P* will then reduce the throttle as necessary to overcome the yaw effect (nose right). When the aircraft is aligned with the intended landing direction, the P* will adjust the collective as necessary to cushion the landing. After ground contact, the P* will adjust the collective, cyclic, and throttle to maintain aircraft alignment with the landing

direction. When the aircraft has come to a complete stop, the P* will reduce the collective to the fully down position and neutralize the pedals and cyclic.

b. Left pedal setting. On the downwind leg, the P* will remove the mechanical slack from the throttle while maintaining 6600 RPM. On the base leg, the P* will descend to the appropriate altitude. On the final leg, the P* will ensure that the aircraft is at the proper altitude and airspeed and in trim with cruise power applied. The IP will then establish a nose-left, out-of-trim condition (maximum 10 degrees), not to exceed 20 degrees from the runway heading. After intercepting the shallow approach angle, the P* will adjust the collective as necessary to maintain the angle. The P* will maintain entry airspeed until apparent ground speed and rate of closure appear to be increasing, then progressively decrease the rate of descent and rate of closure. The P* will plan to arrive over the first one-third of the landing area approximately 2 feet above the ground at or slightly above ETL). (If the nose of the aircraft is aligned with the landing direction at a higher ground speed, the P* will allow the aircraft to touch down at that speed.) If the nose is to the left, the P* will maintain altitude with the collective while decreasing forward speed until the aircraft is aligned with the landing area. The P* will continue the rest of the maneuver as stated in paragraph 2a above. If the aircraft comes to a complete stop and the nose is still aligned to the left, terminate the maneuver at a hover.

Note: After touchdown, aircraft heading may not be controllable with the throttle and collective. If this happens, the P* will position the cyclic to follow the turn until the aircraft has come to a complete stop. If heading control becomes unsafe, abort the maneuver.

Note: For training, airspeeds of 70 knots on crosswind and base legs and 90 knots on the downwind leg are recommended.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. The rate of descent during the final 100 feet should be slightly less than during the day to avoid abrupt attitude changes at low altitudes. After establishing the descent during unaided flights, airspeed may be reduced to approximately 50 knots until apparent ground speed and rate of closure appear to be increasing. Progressively decrease the rate of descent and forward speed until termination of maneuver.
2. Surrounding terrain or vegetation may decrease contrast and cause degraded depth perception during the approach. Before descending below obstacles, determine the need for artificial lighting.
3. Use of the white light may impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1323**PERFORM HOVERING AUTOROTATION**

CONDITIONS: In a UH-1 helicopter with an instructor pilot (IP), in a locally approved touchdown area, with the aircraft heading into the wind.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain position over the ground within 1 foot.
2. Touchdown with no lateral or rearward drift.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused outside the aircraft and announce when initiating the maneuver.
 - b. The pilot not on the controls (P) and nonrated crewmember (NCM) will remain focused outside the aircraft to monitor any drift.
2. Procedure.
 - a. The P* will, from a stationary 3-foot hover, retard the throttle to the engine idle stop. The P* will simultaneously apply the right pedal to maintain heading and adjust the cyclic to maintain position over the ground. (While retarding the throttle, the P* must not raise or lower the collective.) As the helicopter settles, The P* will apply sufficient collective to make a smooth descent and touchdown. The P* will not stop the descent by over-applying the collective and will be alert for lateral or rearward drift. When the helicopter is resting firmly on the ground, the P* will smoothly lower the collective to the fully down position while neutralizing the pedals and cyclic.
 - b. The P and NCM will notify the P* of any drift.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: The crew must use proper scanning techniques to avoid excessive drift.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1327

PERFORM LOW-LEVEL AUTOROTATION

CONDITIONS: In a UH-1 helicopter; with the emergency procedures training criteria in AR 95-1 met and the before-landing check completed; given the entry altitude and airspeed; and with the aircraft aligned with the touchdown area.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Establish entry altitude as directed.
2. Establish entry airspeed as directed.
3. Perform a smooth, progressive deceleration.
4. Apply initial pitch at approximately 15 feet above ground level (AGL).
5. Maintain heading alignment at touchdown ± 5 degrees.

CAUTION

Do not lower collective pitch to provide braking action.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused outside the aircraft and announce entering the autorotation. If directed by the instructor pilot (IP) to perform go-around or terminate with power, the P* will smoothly and positively roll the throttle to the full open position and, with the “needles joined,” execute the appropriate maneuver.
 - b. The IP will acknowledge the entry and visually confirm that the rotor revolutions per minute (RPM) and N_1 remain within limits. If the rotor RPM does not remain within limits, the IP will immediately direct the P* to terminate with power or go around if appropriate.
 - c. The nonrated crewmember (NCM) will continually monitor the condition of the aircraft, assist in aircraft clearance and obstacle avoidance, and perform other tasks as directed by the pilot in command (PC).
2. Procedures.
 - a. On the base leg, establish an angle of descent to arrive at an altitude of 50 feet above highest obstacle (AHO) prior to the entry point while maintaining visual contact with the landing area. Establish an entry point that ensures touchdown in the intended landing area. At the point of entry, ensure that the aircraft is at the proper altitude and airspeed and in trim with cruise power applied. Simultaneously, lower the collective to the fully down position, retard the throttle to engine-idle stop, and apply aft cyclic to maintain entry altitude. Maintain rotor RPM within limits, and adjust the pedals to maintain aircraft alignment with the landing area. Apply cyclic to maintain entry altitude until intercepting a standard autorotation descent profile.
 - b. As the aircraft begins to descend, terminate the maneuver the same as for an autorotation (Task 1082).

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Attitude control is critical during night autorotations.
2. Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. Crews must use proper scanning techniques.
3. The crew must be aware that the surrounding terrain or vegetation may decrease contrast and degrade depth perception. If the searchlight or landing light is used, it should be turned on prior to entering the maneuver. Ensure that the searchlight or landing light is in the desired position.
4. Use of the white light may impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1335

PERFORM AUTOROTATION WITH TURN

CONDITIONS: In a UH-1 helicopter with emergency procedure training criteria outlined in AR 95-1 met and the before-landing check completed, and given the entry altitude and airspeed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Establish entry altitude as directed. Minimum entry altitude is 800 feet above ground level (AGL).
2. Establish entry airspeed as directed.
3. Maintain 80-knot attitude during the turn.
4. Complete the final turn, and align the aircraft with the landing area above 200 feet AGL.
5. Establish 80-knot attitude before reaching 100 feet AGL.
6. Perform a smooth, progressive deceleration.
7. Apply initial pitch at approximately 15 feet AGL.
8. Maintain heading alignment at touchdown ± 5 degrees.

CAUTION

Do not lower collective pitch to provide braking action.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused outside the aircraft. The P* will announce entering the autorotation and acknowledge the rotor RPM, N_1 , and trim. If directed by the instructor pilot (IP) to perform a go-around or terminate with power, the P* will smoothly and positively roll the throttle to the full open position and, with the “needles joined,” execute the appropriate maneuver.
 - b. The IP will acknowledge the entry, verify during the turn and call out that rotor RPM remains within limits, N_1 remains stable, and the aircraft trim. If the aircraft is not aligned by 200 feet above ground level (AGL), a steady state autorotation is not achieved, or if it becomes apparent it won’t be achieved, the IP will direct the P* to go around or terminate with power as appropriate.
 - c. The nonrated crewmember (NCM) will continually monitor the condition of the aircraft, assist in aircraft clearance and obstacle avoidance, and perform other tasks as directed by the pilot in command (PC).
2. Procedures.
 - a. Maintain entry altitude and airspeed until reaching the entry point. Initiate the maneuver by lowering the collective to the fully down position. Retard the throttle to engine-idle stop, and adjust the pedals to maintain trim. Apply cyclic in the direction of the turn, and attain an 80-knot attitude. (Disregard the airspeed indicator while establishing the turn.) Adjust the collective as required to maintain rotor RPM Within limits. Adjust bank as necessary to ensure that the turn is completed and the aircraft is aligned with the landing area direction

before descending below 200 feet AGL. Before reaching 100 feet AGL, ensure that a steady-state autorotation is attained. If it is not attained, execute a go-around or terminate with power as appropriate. For this maneuver, a steady-state autorotation means that—

- (1) Rotor RPM is within limits.
- (2) Aircraft is at the correct attitude.
- (3) Aircraft is descending at a normal rate.
- (4) Aircraft is in a position to terminate in the intended landing area.

b. At approximately 100 feet AGL, apply aft cyclic to initiate a smooth, progressive deceleration. Maintain aircraft alignment with the touchdown area by properly applying pedals and cyclic. Adjust the collective, if required, to prevent excessive rotor RPM. At approximately 5 feet AGL, apply sufficient collective to control the rate of descent and ground speed. (The amount of collective applied and the rate of application will depend on the rate of descent and ground speed.) Adjust the cyclic to attain a landing attitude, and apply collective, as necessary, just before touchdown to cushion the landing. After touchdown, maintain ground track alignment with the pedals. When the aircraft has come to a complete stop, lower the collective and neutralize the pedals and cyclic.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Attitude control is critical during night autorotations.
2. The lack of visual references at night reduces the aviator's ability to estimate airspeed and altitude. To compensate for the lack of visual references, the aviator will attain a steady-state autorotation before reaching 200 feet AGL.
3. Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. Crews must use proper scanning techniques.
4. The crew must be aware that the surrounding terrain or vegetation may decrease contrast and degrade depth perception. If the searchlight or landing light is used, it should be turned on prior to entering the maneuver. Ensure that the searchlight or landing light is in the desired position.
5. Use of the white light may impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.
6. NVG traffic patterns are normally lower than for day. To ensure steady state autorotation minimum entry altitude will be 800 feet AGL.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 2000

Perform FM radio homing

CONDITIONS: In a UH-1 helicopter and given a radio frequency.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Tune and identify the station.
2. Turn to the homing station.
3. Use the correct homing procedures.
4. Identify station passage.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused primarily outside the aircraft throughout the maneuver for aircraft control and obstacle avoidance.
 - b. The pilot not on the controls (P) will tune and identify the station, assist in setting up the course deviation indicator (CDI), and provide turning guidance. The P and nonrated crewmember (NCM) will remain focused primarily outside the aircraft and clear the aircraft. They will provide adequate warning of traffic or obstacles. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures.
 - a. Establish radio contact with the homing station and specify definite transmission and pause periods. Set the frequency modulation (FM) radio per the appropriate aircraft operator's manual. (Set the mode selector switch on the FM control panel to HOME.)
 - b. The P* will fly the aircraft to the station by heading in a direction that will cause the course deviation pointer in the radio magnetic indicator (RMI) to center. The P* will solve ambiguity by changing the heading when the pointer centers and by checking that the pointer drifts in the opposite direction. While homing to the station, the P* will change heading slightly (10 to 15 degrees) during the transmissions and observe that the vertical pointer continues to deflect in the opposite direction. If the pointer shows a turn in the same direction, it indicates that the aircraft has passed the station. The P* will continue the turn and attempt to identify the station visually or verify the position.
 - c. The P and NCM will assist in clearing the aircraft and provide adequate warning of traffic or obstacles. They will announce when their attention is focused inside the aircraft.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 2010**PERFORM MULTI-AIRCRAFT OPERATIONS**

CONDITIONS: In an UH-1 helicopter and given a unit standing operating procedure (SOP).

STANDARDS:

1. Participate in a formation flight briefing in accordance with unit SOP and the mandatory items per the multi-aircraft operations briefing checklist.
2. Perform formation flight and techniques of movement as briefed.
3. React to loss of visual contact in accordance with the unit SOP.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will focus primarily outside the aircraft, maintaining contact with the other aircraft in the formation. The P* will announce any maneuver or movement before execution and inform the pilot not on the controls (P) if visual contact is lost with other aircraft. If visual contact is lost with other the aircraft, the crew will immediately notify the flight and begin reorientation procedures. If instrument meteorological conditions (IMC) are encountered execute IIMC breakup as briefed.
 - b. The P will provide adequate warning of traffic or obstacles detected in the flight path and/or identified on the map. The P will assist in maintaining aircraft separation. They will inform the P* if visual contact is lost with other the aircraft, and if threat elements are detected or sighted. The P will perform duties as briefed and will notify the P* when attention is focused inside the aircraft. The P should frequently assist the P* by communicating his situational awareness perceptions and formation / multiship observations. Additionally the P should assist the P* by monitoring aircraft systems, operating the navigation system, and by scanning the air route for possible enemy activity or other hazards and obstacles that could impact the integrity and security of the flight.

Note: When an aircraft has lost visual contact with the flight, immediately notify the flight and execute reorientation procedures. Except for enemy contact, all mission requirements are subordinate to this action.

2. Procedures. Maneuver into the flight formation, changing position as required. Maintain horizontal and vertical separation for the type of formation being flown. If the tactical situation requires, perform techniques of movement as briefed. The following procedures will be performed unless otherwise established in unit SOPs.
 - a. **Takeoff:** All helicopters should leave the ground simultaneously. The trailing aircraft must remain at a level altitude or stack up 1 to 10 ft vertically to remain out of the disturbed air of the aircraft in front of them. In the event an aircraft in the flight loses visual contact with the formation, The aircrew will immediately make a radio call to the formation and the P* will initiate a climb above the briefed cruise altitude and attempt reorientation of the formation.
 - b. **Cruise:** Free cruise formation should be employed when operating at terrain flight altitudes or in a combat environment. This will allow the individual aircraft more flexibility to move within the formation, avoiding terrain, obstacles, and enemy threat. During periods

of degraded visibility, crews are more susceptible to losing other aircraft in the formation. Crews should consider flying a close formation to maintain orientation on the flight. In the event an aircraft in the flight loses visual contact with the aircraft they are following, they will immediately make a radio call to lead. Lead will announce heading, altitude, and airspeed. Lead must maintain this heading, altitude, and airspeed until all aircraft have rejoined the flight. The aircraft that has lost visual contact with the flight will immediately assume the flight's heading and airspeed in order to maintain horizontal separation as briefed. If enemy and terrain allow, the aircraft that has lost visual contact will also maintain vertical separation by initiating a climb to a briefed altitude. When a flight becomes separated, immediate altitude separation is a quick and efficient way to prevent an accident. Unit SOPs must state the procedures for reestablishing contact with the flight. Considerations should include but are not limited to rallying to an inflight link-up, rallying to a known point, use of covert/overt lighting, and ground rally. Mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC), power available, and ambient light will influence how contact is reestablished. When a flight rallies to a known point, the point may be an Air Check Point ACP along the route, a position sent by lead, or a terrain feature. Situations may occur when an aircraft rejoins the flight in a position other than the position briefed. Mission commanders should use altitude, a Way Point/Target (WPT/TGT), cardinal direction, or other method (manmade or natural features) to maintain separation. Only after the entire flight is formed should the mission commander proceed with the mission.

c. **Approach:** The lead aircraft must maintain a constant approach angle so other aircraft in the formation will not have to execute excessively steep, shallow, or slow approaches. Aircraft should not descend below the aircraft ahead of them in the formation and enter their rotor-wash. This could result in an over-torque, loss of aircraft control, or entering a settling with power condition. In the event an aircraft in the flight loses visual contact with the formation, the aircrew will immediately make a radio call to the formation and execute a go-around in the briefed direction.

d. **Aircrew Briefing:** All multi-aircraft operations will be briefed using a unit approved multi-aircraft/mission briefing checklist. Table 4-1 lists mandatory briefing items that must be included in all multi-aircraft briefings.

Table 4-1. Multi-aircraft operations briefing checklist (mandatory items)

- | |
|--|
| <ol style="list-style-type: none"> 1. Formation type(s): Takeoff, Cruise, Approach 2. Altitude 3. Airspeed: Outbound to Start Point (SP), Cruise, Inbound from Release Point (RP) 4. Aircraft lighting 5. Loss communications procedures 6. Lead change procedures 7. Loss of visual contact/in-flight link-up / Rally points 8. Actions on contact 9. IIMC procedures 10. Downed aircraft procedures / Personnel Recovery / Combat Search and Rescue (CSAR) |
|--|

NIGHT OR NIGHT VISION DEVICE (NVD) CONSIDERATIONS: Increase the interval between aircraft to a minimum of three to five rotor disks. Keep changes in the formation to a minimum. All crewmembers must avoid fixation by using proper scanning techniques.

1. Night. During unaided night flight, the crew should use formation and position lights to aid in maintaining the aircraft's position in the formation. Lighting will be in accordance with AR 95-1 and unit SOP.
2. NVG. When conducting NVG formation flight, the crew should use the formation lights and if equipped the infrared (IR) anti-collision and position lights to maintain the aircraft's position in the formation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 2012

Perform tactical flight mission planning

CONDITIONS: Before flight in a UH-1 helicopter and given a mission briefing, navigational maps, a navigational computer, and other flight planning materials as required.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Analyze the mission using the factors of mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC).
2. Perform a map/photo reconnaissance using the available map media, video map, or photos. Ensure that all known hazards to terrain flight are plotted.
3. Select the appropriate terrain flight modes.
4. Select appropriate primary and alternate routes and enter all of them on a map or route sketch.
5. Determine the distance ± 1 kilometer, ground speed ± 5 knots, and estimated time en route (ETE) ± 1 minute for each leg of the flight.
6. Determine the fuel required ± 100 pounds.
7. Obtain and analyze weather briefing to determine that weather and environmental conditions are adequate to complete the mission.
8. Conduct a thorough crew mission briefing.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC)/air mission commander (AMC) will delegate mission tasks to crewmembers, and have the overall responsibility for mission planning, and will conduct a thorough crew mission briefing. The PC/AMC will analyze the mission in terms of METT-TC.
 - b. The pilot not on the controls (P) and nonrated crewmember (NCM) will perform the planning tasks directed by the PC/AMC. They will report the results of their planning to the PC/AMC.
2. Procedures. Analyze the mission using the factors of METT-TC. Conduct a map or aerial photo reconnaissance. Obtain a thorough weather briefing that covers the entire mission. Include sunset and sunrise times, density altitudes, winds, and visibility restrictions. If the mission is to be conducted at night, the briefing would also include moonset and moonrise times and ambient light levels, if available. Determine primary and alternate routes, terrain flight modes, and movement techniques. Determine time, distance, and fuel requirements using the navigational computer. Annotate the map or overlay with sufficient information to complete the mission in accordance with unit standing operating procedure (SOP). This includes waypoint coordinates that define the routes for entry into the global positioning system (GPS) if installed. Consider such items as hazards, check points, observation posts, friendly, and enemy positions. Review contingency procedures.

Note: Evaluate weather impact on the mission. Considerations should include aircraft performance and limitations.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: More detailed flight planning is required when the flight is conducted in reduced visibility, at night, or in the NVG environment. NVG navigation with standard maps can be difficult because of map colors, symbology, and colored markers used during map preparation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

TASK 2014

Perform electronic countermeasures/electronic counter-countermeasures procedures

CONDITIONS: In a UH-1 helicopter and given a signal operating instructions (SOI).

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Test and operate aircraft avionics and voice security equipment.
2. Maintain radio discipline.
3. Use the SOI.
4. Recognize and respond to enemy electronic countermeasures.
5. Operate Mark XII identification, friend or foe (IFF) system.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will ensure assigned radio frequencies are briefed during the crew briefing. The PC will indicate whether the pilot on the controls (P*) or pilot not on the controls (P) will establish and maintain primary communications.
 - b. The P* will announce mission information not monitored by the P and any deviation from directives.
 - c. The P will manage and announce radio frequencies and copy and decode pertinent information. They will announce mission information not monitored by the P*.
2. Procedures. Electronic communications should not be used in a tactical environment except when absolutely necessary. If electronic communication is required, the preferred method is to operate in the secure voice mode. To eliminate confusion and reduce transmission time, the crew must use approved communication words, phrases, and codes. Plan what to say before keying the transmitter. Transmit information clearly, concisely, and slowly enough to be understood by the receiving station. Ideally, keep transmissions under 10 seconds. Do not identify a unit or an individual by name during non-secure radio transmissions. Follow procedures listed below.
 - a. Authentication. Use proper SOI procedures to authenticate all in-flight mission changes, artillery advisories, when entering or departing a radio net, and when challenged or when requesting authentication.
 - b. Meaconing, interference, jamming, and intrusion (MIJI)/joint spectrum interference resolution (JSIR) procedures. Keep accurate and detailed records of any MIJI incidents. Report an incident as soon as possible when a secure communications capability exists. (See Task 2022 for information on transmitting a tactical report.)
 - c. Visual methods. Use other visual communication methods such as flags, lights, panels, pyrotechnics, hand and arm signals, and aircraft maneuvers.
 - d. Mark XII IFF. Turn on, test, and operate the IFF per the appropriate aircraft operator's manual. Operate the IFF per the tactical situation. During shutdown, hold or zeroize the code, as required.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

FM 1-120
TM 11-5895-1199-12

TASK 2022

Transmit tactical reports

CONDITIONS: In a UH-1 helicopter or academically and given sufficient information to compile a tactical report.

STANDARDS: Appropriate common standards plus these additions/modifications:

Transmit the appropriate report using the current signal operating instructions (SOI).

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) and nonrated crewmember (NCM) will focus primarily outside the aircraft to clear the aircraft and provide adequate warning of traffic or obstacles. The P* will announce any maneuver or movement before execution.
 - b. The P will assemble and transmit the report. The P will use the correct format as specified in the SOI and transmit the report to the appropriate agency. The NCM(s) must also be able to transmit the report if the P is unable due to so.
2. Procedures. To save time, minimize confusion, and ensure completeness, report information in an established format. Assemble the report in the correct format and transmit it to the appropriate agency. Standard formats may be found in the SOI or other sources.

Note: Encryption is required only if information is transmitted by non-secure means.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

FM 2-0
SOI

TASK 2024**PERFORM TERRAIN FLIGHT NAVIGATION**

CONDITIONS: In a UH-1 helicopter and given a mission briefing and required maps and materials.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. During nap of the earth (NOE) flight (surface to 25 feet above highest obstacle [AHO]), know the en route location within 200 meters.
2. During contour flight (25 to 80 feet AHO) or low-level flight (80 to 200 feet AHO) know the en route location within 500 meters.
3. Locate each objective within 100 meters.
4. Arrive at each objective at the planned time ± 1 minute (if an objective arrival time was given in the mission briefing).

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused outside the aircraft and respond to navigation instructions and cues given by the pilot not on the controls (P). The P* will acknowledge commands issued by the P for heading and airspeed changes necessary to navigate the desired course. The P* will announce significant terrain features to assist the P in navigation.
 - b. The P will furnish the P* with the information required to remain on course and will announce all plotted wires before approaching their location. The P will use rally terms and terrain features to convey instructions to the P*. Examples of these terms are "Turn left to your 10 o'clock," "Stop turn," and "Turn down the valley to the left." If using the radio magnetic indicator (RMI) during low-level flight, the P may include headings. The P should use electronically aided navigation (if installed) to help arrive at a specific checkpoint or turning point.
 - c. The P*, P, and nonrated crewmember (NCM) should use standardized terms to prevent misinterpreting information and unnecessary cockpit conversation. The crew must look far enough ahead of the aircraft at all times to assist in avoiding traffic and obstacles.
2. Procedures.
 - a. During NOE and contour flight, identify prominent terrain features that are located some distance ahead of the aircraft and which lie along or near the course. Using these terrain features to key on, the P* maneuvers the aircraft to take advantage of the terrain and vegetation for concealment. If this navigational technique does not apply, identify the desired route by designating a series of successive checkpoints. To remain continuously oriented, compare actual terrain features with those on the map. An effective technique is to combine the use of terrain features and rally terms when giving directions. This will allow the P* to focus his attention outside the aircraft.

Note: The P must avoid giving headings to the P* during NOE and contour flight.

- b. For low-level navigation, the time and distance can be computed effectively. This means that the P* can fly specific headings and airspeeds.

TC 1-211

Note: Each of the methods for stating heading information is appropriate under specific conditions. When a number of terrain features are visible and prominent enough for the P* to recognize them, the most appropriate method is navigation instruction toward the terrain feature in view. When forward visibility is restricted and frequent changes are necessary, controlled turning instructions are more appropriate. Clock headings are recommended when associated with a terrain feature and with controlled turning instructions.

Note: For additional information, see Task 1044 (Navigate by pilotage and dead reckoning), Task 2049 (Perform electronically aided navigation), and Task 1172 (Perform radio navigation).

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Conducting the flight in reduced visibility or at night requires more detailed and extensive flight planning and map preparation. NVG navigation with standard maps can be difficult because of map colors, symbology, and colored marker use during map preparation.
2. Use proper scanning techniques to ensure obstacle avoidance.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
FM 3-25.26.

TASK 2026**PERFORM TERRAIN FLIGHT**

CONDITIONS: In a UH-1 helicopter with tactical flight mission planning completed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain altitude and airspeed appropriate for the selected mode of flight, terrain, weather, visibility; and mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC).
2. Maintain aircraft in trim during contour and low-level flight and when appropriate for nap of the earth (NOE) flight.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will focus primarily outside the aircraft and acknowledge all navigational and obstacle clearance instructions given by the pilot not on the controls (P). The P* will announce the intended direction of flight or any deviation from instructions given by the P. During terrain flight, the P* is primarily concerned with threat and obstacle avoidance.
 - b. The P will provide adequate warning to avoid obstacles detected in the flight path or identified on the map. The P and nonrated crewmember (NCM) will assist in clearing the aircraft and provide adequate warning of obstacles, unusual attitudes, altitude changes, or threat. The P and NCM will announce when their attention is focused inside the aircraft and again when attention is re-established outside.
 - c. During contour flight, the P will advise the P* whenever an unannounced descent is detected. If the descent continues without acknowledgement or corrective action, the P will again advise the P* and be prepared to make a collective control input. The P will raise the collective when it becomes apparent that the aircraft will descend below 25 feet above highest obstacle (AHO).
 - d. During NOE flight, the P will advise the P* whenever an unannounced descent is detected. The P will immediately raise the collective when it becomes apparent that the P* is not taking corrective action and that the aircraft will descend below 10 feet AHO.
2. Procedures.
 - a. Terrain flight involves flight close to the earth's surface. The modes of terrain flight are NOE, contour, and low-level. Crewmembers will seldom perform purely NOE or contour flight; instead, they will alternate modes while maneuvering over the desired route.
 - b. NOE flight. Perform NOE flight at varying airspeeds and altitudes as close to the earth's surface as vegetation, obstacles, and ambient light will permit.
 - c. Contour flight. Perform contour flight by varying altitude while maintaining a relatively constant airspeed, depending on the vegetation, obstacles, and ambient light. Generally follow the contours of the earth.
 - d. Low-level flight. Perform low-level flight at a constant airspeed and altitude. To prevent or reduce the chance of detection by enemy forces, fly at the minimum safe altitude that will allow a constant altitude.

TC 1-211

Note: Terrain flight is considered sustained flight below 200 feet above ground level (AGL) (except during takeoff and landing).

Note: Hover out-of-ground effect (OGE) power is required for this task.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Wires are difficult to detect with NVGs.
2. Use proper scanning techniques to avoid obstacles.
3. During NVG terrain flight, observe the NVG speed and altitude restrictions in TC 1-210.

OVERWATER CONSIDERATIONS: Overwater flight, at any altitude, is characterized by a lack of visual cues, and therefore, has the potential of causing visual illusions. Be alert to any unannounced changes in the flight profile and be prepared to take immediate corrective actions. The radar altimeter low bug should be set to assist in altitude control. Hazards to terrain flight such as harbor lights, buoys, wires, and birds must also be considered during overwater flight. These considerations may also apply to flight over desert or broad expanses of snow, especially under low ambient lighting.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
FM 3-25.26

TASK 2034**PERFORM MASKING AND UNMASKING**

CONDITIONS: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Perform a thorough map reconnaissance of the desired observation area.
 - b. Mask the aircraft from enemy visual and electronic detection.
 - c. Ensure that aircraft exposure time does not exceed 10 seconds during the unmasking.
 - d. Observe assigned scan sector during unmasking.
 - e. Maintain a sufficient distance behind obstacles to allow for safe maneuvering.
 - f. Move to a new location before subsequent unmasking.
 - g. Report observations, if required.
2. Nonrated.
 - a. Scan assigned sector.
 - b. Announce if or when the lateral sides of the aircraft are exposed or unmasked.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will assign scanning sectors to all crewmembers to maximize the area scanned during the time unmasked.
 - b. The pilot on the controls (P*) will focus primarily outside the aircraft to clear the aircraft throughout the maneuver. The P* will announce the type of unmasking before executing the maneuver.
 - c. The pilot not on the controls (P) and nonrated crewmember (NCM) will focus primarily outside the aircraft. They will warn the P* of obstacles and unusual or unanticipated drift and altitude changes. The NCM(s) will announce when the sides of the aircraft are exposed or unmasked. The P and NCM will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
 - d. The crew must clear directly below the aircraft if descending vertically or the flight path if moving laterally.
2. Procedures.
 - a. Masking is a technique utilizing terrain to mask (cover or conceal) the aircraft from threat detection and weapons employment. Unmasking is a maneuver used when it becomes necessary to observe points of interest that are obscured while in a masked position. Before unmasking, a thorough map reconnaissance should be completed so that all eyes can be focused outside during the unmasking. The three general types of unmasking are as follows:
 - b. Unmasking in flight. This type is used when the aircraft has forward speed and can best be described as a quick "pop up and peek" at the desired point or area of observation. It is usually used while flying behind a ridgeline or other linear barrier.
 - c. Unmasking at a hover (vertically). After the entire crew selects reference points, the P* will announce his intent to unmask. The crew will acknowledge that they are prepared to

execute the maneuver. Ensure that sufficient power is available to unmask. Increase the collective to obtain sufficient altitude to see over the mask without exceeding aircraft limitations. Maintain horizontal main rotor blade clearance from the mask in case of a power loss or a tactical need to mask the aircraft quickly. When possible, unmask at a safe distance from the mask to allow a rapid descent to a masked condition if the aircraft is detected or fired upon. Be aware of a common tendency to move forward or rearward while vertically unmasking and remasking. Establish reference points to assist in maintaining position during ascents and descents. Keep aircraft exposure time to a minimum.

d. Unmasking at a hover (laterally). Sometimes, the aircraft may be unmasked by moving laterally from the mask. After the entire crew selects reference points, the P* will announce his intent to hover the aircraft sideward to provide the smallest silhouette possible to enemy observation or fire. The crew will acknowledge that they are prepared to execute the maneuver. Keep aircraft exposure time to a minimum.

Note: Hover out-of-ground effect (OGE) power is required for this maneuver.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. The P* may have difficulty maintaining altitude and position when hovering above 25 feet. (The barometric altimeter is not reliable for this maneuver.) If available, a radar altimeter should be used to assist in maintaining a constant altitude. Otherwise, references such as lights, tops of trees, or man-made objects above and to the front and sides of the aircraft should be used. By establishing a reference angle to these objects, the P* can detect changes in altitude by changes in the viewing perspective.
2. Hovering near ground features, such as roads, provides ideal references for judging lateral movement. The P* may become spatially disoriented when changing the viewing perspective back and forth between high and low references. Therefore, the P* must rely on the P and NCM for assistance in maintaining orientation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 2036**PERFORM TERRAIN FLIGHT DECELERATION**

CONDITIONS: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain heading alignment with the selected flight path.
2. Maintain the tail clear of all obstacles.
3. Decelerate to the desired airspeed or to a full stop.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will focus primarily outside the aircraft to clear the aircraft throughout the maneuver. The P* will announce any intention to decelerate or come to a full stop, any deviation from the maneuver, and completion of the maneuver.
 - b. The pilot not on the controls (P) and nonrated crewmember (NCM) will provide adequate warning to avoid obstacles detected in the flight path and will announce when their attention is focused inside the cockpit and again when attention is reestablished outside.
2. Procedures.
 - a. Coordinate application of cyclic and collective to establish a decelerative attitude that keeps the tail clear of all obstacles. Consider variations in the terrain and obstacles when determining tail clearance. Apply aft cyclic as required to slow to the desired airspeed or to a full stop while adjusting the collective to maintain the altitude of the tail. Maintain heading and make all control movements smoothly.
 - b. If the aircraft attitude is changed excessively or abruptly, it may be difficult to return the aircraft to a level attitude and overcontrolling may result.

Note: Hover out-of-ground effect (OGE) power is required for this maneuver.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Because of the limited field of view of the NVG, avoid making abrupt changes in aircraft attitude. An extreme nose-high attitude limits the forward field of view.
2. Maintain proper scanning techniques to ensure obstacle avoidance and tail rotor clearance.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 2042

PERFORM ACTIONS ON CONTACT

CONDITIONS: In an UH-1 helicopter.

STANDARDS:

1. Use correct actions on contact consistent with the tactical situation.
2. Perform evasive maneuvers (if necessary) appropriate for the type of threat.

DESCRIPTION:

1. Crew actions. The first crewmember to recognize the threat will immediately announce enemy contact (visual or electronic), type (hostile fire), and location of threat.

a. The pilot on the controls (P*) will remain focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. The P* will deploy to cover or position the aircraft to return suppressive fire, if so equipped and when necessary/briefed. The P* will announce the direction of flight to evade detection and will direct the P to remain focused outside the aircraft for clearing.

b. The P will remain focused on locating threat and helping clear the aircraft and will announce warning to avoid obstacles and when attention is focused inside the aircraft.

c. The crew will transmit a report, as required.

2. Procedures. Actions on contact are a series of combat actions taken on contact with the enemy to develop the situation. Obstacles are treated like enemy contact since they are assumed to be covered by fire. The element making contact initiates these actions and they occur at each level of command, often simultaneously. Units perform these actions whether or not the enemy has detected their presence. Actions on contact are as follows:

- Deploy to cover and report.
- Maintain contact and develop the situation.
- Recommend or execute a COA.

a. Deploy to cover and report. Upon encountering an obstacle or enemy force, the aircraft making contact deploys to a covered position affording observation. If necessary, the aircraft uses direct fire, if so equipped, or indirect fire to suppress the enemy, allowing freedom to maneuver. An immediate contact report is submitted with whatever information is available. The immediate contact report is first transmitted to team members and then to the appropriate commander. A format for an immediate contact report is as follows:

- Target – brief description of the target
- Azimuth – azimuth either magnetic or clock direction from the observing aircraft
- Range – distance from the observing aircraft in meters
- *“Contact, BMP, 090 degrees, 500 meters. breaking right.”*

b. Maintain contact and develop the situation. The PC of the aircraft in contact develops the situation to define the threat being faced, using various aerial observation techniques as appropriate. Once a clearer picture of the situation is developed, detailed spot reports are forwarded.

- c. Recommend or execute a COA. Once the aircraft in contact has gathered enough information to make a decision, the PC selects a course of action. Once the PC has selected a course of action, the PC reports it to the higher command. The higher command approves or disapproves the course of action based upon its impact on the overall mission. The standing operating procedure (SOP) or rules of engagement (ROE) may provide automatic approval of certain actions to avoid unnecessary delay. If the higher commander assumes responsibility to continue developing the situation, the aircraft in contact supports actions as ordered. The course of action should adhere to the intent of the commander, be within the capability of the unit, and allow the unit to resume the mission as soon as possible.
3. If an evasive maneuver is required to evade enemy fire, use the procedures described below for each type of weapon encountered.
 - a. Tanks and small arms. Immediately turn away from the fire toward an area of concealment. If concealment is unavailable, make sharp turns of unequal magnitude and unequal intervals and small changes in altitude to provide the best protection until beyond the effective range of hostile weapons. If the situation permits, employ immediate suppressive fire, if so equipped.
 - b. Large caliber, antiaircraft fire (radar-controlled). Immediately execute a 90-degree turn. Do not maintain a straight line of flight or the same altitude for more than ten seconds before initiating a second 90-degree turn (ensure this turn is away from the threat). An immediate descent to nap of the earth (NOE) altitude will reduce the danger.
 - c. Fighters. When in an area where threat fighters are known or suspected to be operating, fly the helicopter at NOE altitude as much as possible. Upon sighting or sensing a fighter, try to mask the helicopter. If the fighter is alone and executes a dive, turn the helicopter toward the attacker, gain airspeed quickly and descend. This maneuver will cause the fighter pilot to increase attack angle. Make an approximately 60-degree-course change away from the attacker. As soon as the attacker is committed to follow the turn, make an approximately 60-degree-course change in the opposite direction. The fighter pilot will then have to break off the attack to recover from the maneuver. Once the fighter breaks off his attack, maneuver the helicopter to take advantage of terrain, vegetation, and shadow for concealment. If the engaging fighters are a multiple element, the P* and P must maintain contact with all the fighters as they maneuver to ensure that countering one fighter attack does not make them an easy target for the second fighter.
 - d. Helicopters. Use the appropriate terrain flight maneuvers to break contact with or to evade threat helicopters.
 - e. Heat-seeking missiles. Try to keep helicopter heat sources away from the threat. If a missile is sighted, turn the tail of the helicopter away from the missile and mask the helicopter.
 - f. Antitank-guided missiles. Some missiles fly relatively slowly and can be avoided by rapidly repositioning the helicopter. If terrain or vegetation is not available for masking, remain oriented on the missile as it approaches. As the missile is about to impact, rapidly change the flight path or altitude to evade it.
 - g. Artillery. Depart the impact area and determine chemical, biological, radiological, and nuclear (CBRN) requirements.

TC 1-211

Note: If hit by hostile fire, rapidly assess the situation and determine an appropriate course of action. The most important consideration in an emergency is aircraft control. Therefore, the first step is to assess aircraft controllability. Then check all instruments and warning and caution messages. If a malfunction is indicated, initiate the appropriate emergency procedure. If continued flight is possible, take evasive action. Make a radio call (Mayday or Pan) to report your situation, location, and action. Also request assistance if desired. Continue to be alert for unusual control responses, noises, and vibrations. Monitor all instruments for an indication of a malfunction. Fly the aircraft to the nearest secure location. Then land and inspect the aircraft to determine the extent of damage and whether flight can be continued to a medical or maintenance facility.

Note: Hover out-of-ground effect (OGE) power is required for this maneuver.

NIGHT OR NIGHT VISION GOGGLES (NVG) CONSIDERATIONS: Threat elements will be harder to detect. Rapid evasive maneuvers will be more hazardous. Crewmembers must maintain situational awareness. Aircraft control is the primary concern.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references and:
FM 1-114

TASK 2048**PERFORM SLING LOAD OPERATIONS****WARNING**

When performing this task with cabin doors open, ensure that any personnel in the cabin area are wearing a safety harness secured to a tie-down ring or are seated in a seat with seat belt on.

CAUTION

A static electricity discharge wand will be utilized in accordance with FM 4-20.197

Note: Prior to external load operations, a qualified external load inspector will inspect all non-training sling loads. Certification must be recorded on a DA Form 7382-R (*Sling Load Inspection Record*) and a copy provided to the aircrews.

CONDITIONS: In a UH-1 helicopter with an operational cargo hook, sling load, completed DA Form 7382-R, or training load in accordance with FM 4-20.197.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Before hookup. Verify that DA Form 7382-R is complete and on file and that the aircraft will remain within gross weight (GWT) and center of gravity (CG) limitations.
 - b. Hookup and hover.
 - (1) Ensure that the aircraft remains clear of the load and any obstacles.
 - (2) Perform a vertical ascent with the load to a load height of 5 feet \pm 3 feet.
 - (3) Determine power sufficient to complete the maneuver without exceeding aircraft limitations.
 - c. Takeoff. Maintain aircraft in trim (above 100 feet AGL).
 - d. Approach and load release.
 - (1) Maintain a constant approach angle to ensure the load safely clears obstacles and terminate over the intended point of landing with a load height of 5 feet \pm 3 feet.
 - (2) Perform a vertical descent with the load to the desired touchdown point \pm 5 feet.
2. Nonrated.
 - a. The nonrated crewmember (NCM) will ensure that the aircraft is prepared for external load operations. The NCM will also ensure that all slings have been properly inspected and all sling equipment is secured in the aircraft before takeoff.
 - b. Provide aircraft guidance for hook up and release.

TC 1-211

- c. Clear the aircraft and sling load during the operation.
- d. Confirm load is hooked and secure.
- e. Ensure load is free of entanglements.
- f. Continue to monitor load for oscillation.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will conduct a thorough crew briefing and ensure all crewmembers are familiar with sling load operations, emergency, and communication procedures. The PC will ensure that DA Form 7382-R has been completed. The PC will determine the direction of takeoff by analyzing the tactical situation, the wind, the long axis of the takeoff area, and the lowest obstacles and will confirm that required power is available by comparing the information from the performance planning card (PPC) to the hover power check.
 - b. The pilot on the controls (P*) will remain primarily focused primarily outside the aircraft throughout the maneuver. The P* will monitor altitude and avoid obstacles.
 - c. The pilot not on the controls (P) will monitor the cockpit instruments and assist the P* in clearing the aircraft. The P will set cargo hook switches, as required, and should make all radio calls. When directed by the P* during the approach, the P will place the cargo hook arming switch to the ARMED position. The P or NCM will release the load.
 - d. The P and NCM will assist in clearing the aircraft and will provide adequate warning of obstacles.
 - e. The NCM will remain primarily focused on the load. The NCM will guide the P* during the load pickup, advise of the load condition in flight, and direct the P* when setting down the load.
2. Procedures.
 - a. Hookup and hover. Set cargo hook control switches per the appropriate aircraft operator's manual. Follow hand and arm signals from the signalman and commands from the NCM to hover over the load. Remain vertically clear of and centered over the load. When the load is hooked up, remove slack from the sling and ascend vertically to a load height of 5 feet AGL. Ensure aircraft limitations are not exceeded.
 - b. Takeoff. Establish a constant angle of climb that will permit safe obstacle clearance. When above 100 feet AGL or when clear of obstacles, adjust attitude and power as required to establish the desired rate of climb and airspeed. Smoothly adjust flight controls to prevent load oscillation. After passing above 300 feet AGL, place the cargo hook-arming switch to the SAFE position.

Note: Ensure that the cargo hook-arming switch is in the ARMED position when operating at altitudes below 300 feet above highest obstacle (AHO).

 - c. En route. Maintain the desired altitude, flight path, and airspeed. Make smooth control applications to prevent load oscillation. If a lateral load oscillation occurs, reduce airspeed. If a fore-and-aft oscillation occurs, begin a shallow turn while reducing airspeed.
 - d. Approach and load release. Establish and maintain an approach angle that will keep the load clear of obstacles to the desired point of termination. Establish a rate of closure appropriate for the conditions and the load. When passing below 300 feet AGL, place the cargo hook-arming switch to the ARMED position. Terminate the approach at a stationary

hover with the load 5 feet above the intended release point. Confirm with the NCM that the release point is clear. Descend vertically until the load rests completely on the ground. Continue descent to obtain slack in the sling, and then hover laterally to ensure the clevis is clear of the load before releasing the load. Confirm that the load is released before moving away from the release point.

Note: Hover out-of-ground effect (OGE) power is required for this task.

Note: Loads will meet external air transportability (EAT) requirements in accordance with FM 4-20.197. Procedures for air transportation of hazardous material will be in accordance with AR 95-27.

Note: Avoid flight over populated areas.

Note: Before the mission, the PC will ensure that all crewmembers are familiar with the hand and arm signals shown in FM 21-60 and with forced landing procedures. In case of a forced landing, the aviator will land the aircraft to the left of the load. The hookup man will move to his left, which is to the right of the aircraft and lie facedown on the ground. The signalman will remain in place and lie facedown on the ground.

Note: Control switches will not be moved without verbal announcement first. If the crewmember pendant is used, the crewmember must be trained in accordance with the unit SOP.

Note: Figure 4-4 is a list of standard words and phrases to be used for external load operations.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. For unaided night flight, the landing light and searchlight should be operational. If an NVG filter is installed, it should be removed.
2. When NVGs are used, hovering with minimum drift is difficult and requires proper scanning techniques and crewmember coordination. If possible, an area with adequate ground contrast and reference points should be used. Visual obstacles such as shadows should be treated the same as physical obstacles.
3. The rate of descent and rate of closure should be slightly slower to avoid abrupt attitude changes at low altitudes.
4. Sling loads should be marked with chemical stick lighting.

"Hook is armed"	"Hook up crew clear left"
"Load under the nose"	"Slings coming tight"
"Load in sight"	"Slings tight"
"Forward"	"Load is off the ground"
"Back"	"Cleared for flight"
"Left"	"Load on ground"
"Right"	"Slack in the slings"
"Down"	"Release the load"
"Up"	"Load is released"
"Hold"	"Clear to reposition"
"Load is hooked"	"Hook is OFF"
"Hookup crew clear right"	

Figure 4-4. Standard words and phrases for sling load operations

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

FM 21-60
FM 4-20.197
FM 10-450-4
AR 95-27

TASK 2050**Develop an emergency global positioning system recovery procedure****WARNING**

This procedure is designed strictly for recovery under visual meteorological conditions (VMC) and for inadvertent instrument meteorological conditions (IIMC). This procedure will not be used for a planned IFR flight unless approved by USAASA. This emergency recovery procedure is only authorized to be flown when the situation prevents the use of an approved navigational aid.

Note: This task should be selected for instrument examiners.

CONDITIONS: With a tactical or aeronautical map with current obstruction information. A mission planning system with digital maps and recent chart update manual (CHUM) may be used to aid in developing this procedure.

STANDARDS:

1. Select a suitable recovery/landing area and coordinate, if required, airspace deconfliction.
2. Select an approach course (degrees magnetic), a missed approach course, final approach fix (FAF), missed approach point (MAP), intermediate approach fix (IF), initial approach fix (IAF) and missed approach holding fix (MAHF).
3. Determine obstacle clearance for the FAF, MAHF, MAP, IF, IAF segments, and the minimum safe altitude (MSA).
4. Determine altitudes based on obstacle clearance for FAF, MAHF, MAP, IF, IAP, and MSA.
5. Determine the appropriate obstacles in the missed approach segment and determine 20:1 slope penetration.
6. Establish a 3-nautical mile (nm) holding pattern at the MAHF.
7. Prepare an emergency recovery procedure diagram per the example.
8. Complete a suitability/flyability check, to include loading waypoints, under VMC to validate the procedure.

Note: All altitudes are in feet MSL, all waypoints are LAT/LONG, all distances are NM and visibility is SM. All obstacles are MSL unless otherwise noted. The flight information handbook (FIH) has the necessary conversion tables.

WARNING:

Ensure coordinates for maps and GPS are the same datum (i.e., WGS-84) or points on the ground may be off significantly and obstacle clearance will be questionable.

Note: PPS refers to the GPS precise positioning service. It is DOD policy that military aircraft operate with the GPS in the PPS mode.

Note: Complete the enclosed figures for determining approach criteria. The width cannot be adjusted.

DESCRIPTION:

1. **Select the most suitable recovery/landing area.**
 - a. Select an area based on METT-TC and obstacles. Ensure proper coordination for airspace deconfliction has been accomplished.
2. **Identify the final approach segment (figure 4-6(d)).**
 - a. The final approach segment begins at the FAF and ends at the MAP.
 - b. Determine the MAP (normally associated with the landing area or threshold).
 - c. Determine the FAF. The minimum distance is 3 NM from the MAP. The maximum length is 10 NM. The optimum length is 5 NM. The width is 2.4 nm (1.2 nm on either side of centerline).
3. **Determine the missed approach holding fix (MAHF) (figure 4-5).**
 - a. Determine the MAHF for the landing area.
 - b. The minimum distance is 3 NM and the maximum distance is 7.5 NM from the MAP. The optimum distance is 5 NM. The holding pattern leg will not exceed 3 NM. The width is 4 nm (2 nm on either side).

Solution: (A) _____ (rounded up nearest 100 ft) + (B) 1000' = (C) _____ (MAHF Altitude)

(A) = Highest obstacle within 10 nm centered on the MAHF

Figure 4-5. MAHF altitude calculation diagram.

4. **Identify the missed approach segment (figure 4-6(e)).**
 - a. The missed approach segment starts at the MAP and ends at a holding point designated by a MAHF.
 - b. Optimum routing is straight ahead (within 15 degrees of the final approach course) to a direct entry. A turning missed approach may be designated if needed for an operational advantage, but it is not discussed in this task due to the complexity of determining obstacle clearance.
 - c. The area of consideration for missed approach surface and the 20 to 1 obstacle clearance evaluation for all rotary-wing.
5. **Identify the intermediate approach segment (figure 4-6(c)).**
 - a. The intermediate segment begins at the IF and ends at the FAF.
 - b. Determine the IF. The minimum distance is 3 NM and the maximum distance is 5 NM from the IF to the FAF. The width is 4 nm (2 nm on either side).
6. **Identify the initial approach segment (figure 4-6(b)).**
 - a. The initial approach segment begins at the IAF and ends at the IF.
 - b. Determine the IAF. Up to three IAFs are allowed. The minimum distance is 3 NM from the IF and the maximum distance is 10 NM. The width is 4 nm (2 nm on either side).

7. **Determine the MSA for the landing area.**

- a. Use the off route obstruction clearance altitude–CONUS (OROCA) or off route terrain clearance altitude–OCONUS (ORTCA) elevation from the enroute low altitude (ELA) chart for the area of operations, if available.
- b. Select the highest altitude within 30 NM of the MAP.
 - (1) If an ELA is not available, the minimum sector altitude will be determined by adding 1000 feet to the maximum elevation figures (MEF). When a MEF is not available, apply the 1000-foot rule to the highest elevation within 30 NM of the MAP.
 - (2) Minimum sector altitudes can be established with sectors not less than 90 degrees and with sector obstacle clearance having a 4 NM overlap. Use figure 4-6(a) below for determining MSA.

Solution: (A) _____ (rounded up nearest 100 ft) + (B) <u>1000'</u> = (C) _____ (MSA)

(A) = Highest obstacle within 30nm centered on the MAP

Figure 4-6(a). MSA calculation diagram.

8. **Create the procedures diagram.**

- a. The procedures diagram may be computer generated or hand sketched. The diagram need not be as detailed as a DOD-approved chart, but must provide all data as outlined in the example to execute the procedure.
- b. The plan view will include the following:
 - (1) The highest obstacle altitude (MSL) in BOLD.
 - (2) The approach course (degrees magnetic), IAF, IF, FAF, MAP, MAHF holding pattern, obstacles, and MSA. It also includes the terms:
 - “FOR VFR TRAINING and EMERGENCY USE ONLY” twice.
 - “PPS REQUIRED.”
- c. The minimums section will include the following: the minimum descent altitude, visibility, and the height above landing (HAL). Use table 4-2 to compute the landing visibility minimum based on the HAL.
- d. The landing area sketch includes a drawing/diagram of the landing area and the elevation of the highest obstacle within the landing area (if applicable).
- e. Prior to publication, the diagram will include, as a minimum, all items included in the example diagram.

Table 4-2. Height above landing (HAL) diagram

<i>HAL</i>	250 – 475 ft	476 – 712 ft	713 – 950 ft
Landing Visibility Minimum (SM)	½	¾	1.0

9. **Flight Check.** Complete a flight check under VMC in an aircraft to finalize the procedure and validate the diagram. Once a successful flyability/suitability check has been completed, the diagram will be validated by the developer in the lower marginal data area. Once validated by the developer the procedure must be approved by the appropriate authority in the lower marginal data area prior to publication. The flight should validate the following:

- Locations – IAF, IF, FAF, MAP, and MAHF.
- Obstacles.
- Approach course.
- Obstacle clearance.
- Altitudes – MDA, FAF, IF, IAF, MSA/holding pattern altitude.

Note: All waypoints (IAF, IF, FAF, MAP, and MAHF) will be verified by two separate GPS navigation systems, i.e. DGNS, EGI, PLGR. At least one will have PPS. If unable to complete a suitability/flyability check due to the operational environment, the commander should consider an elevated risk when using this recovery procedure.

REFERENCES:

FAA Handbook 8260.3 (Terminal Instrument Procedures [TERPS] Manual)
 FAA Order 8460.42A (Helicopter GPS Nonprecision Approach Criteria)
 FAA Order 7130.3 (Holding)

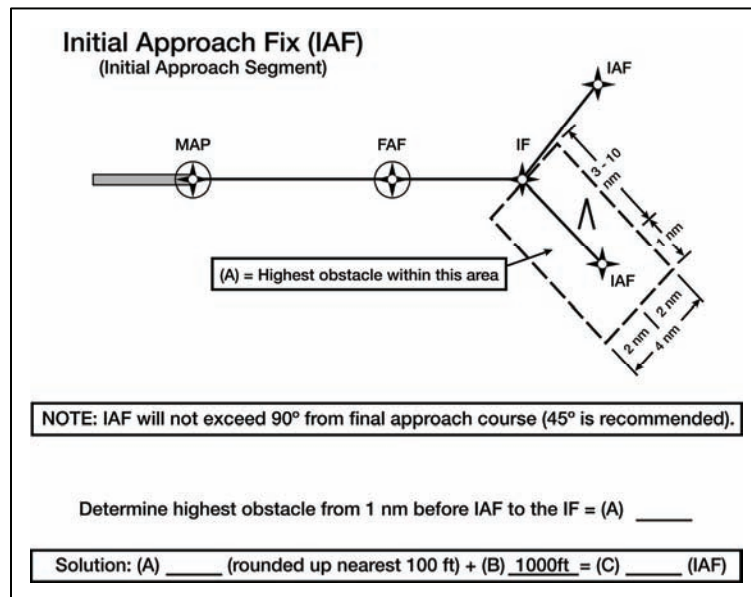


Figure 4-6(b). Initial approach segment

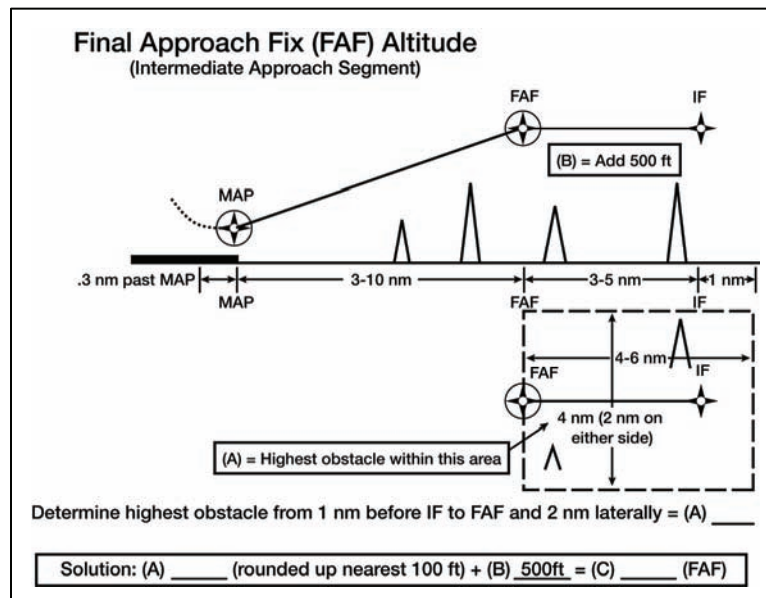


Figure 4-6(c). Intermediate approach segment

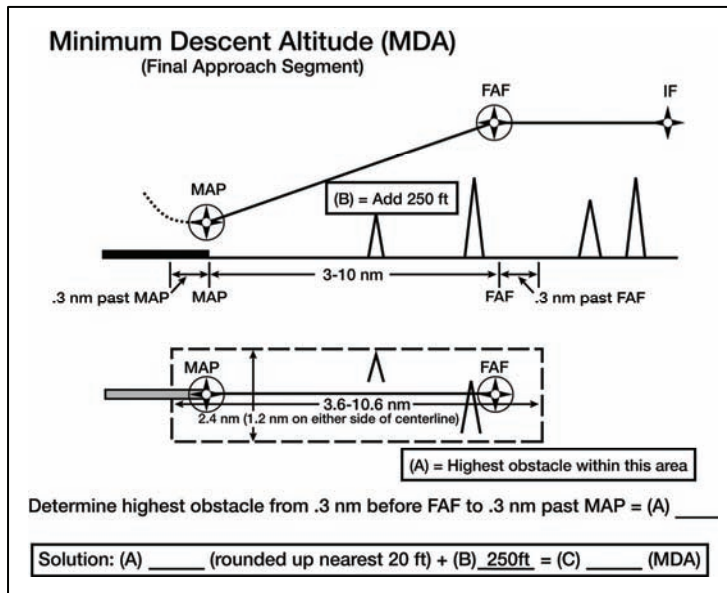


Figure 4-6(d). Final approach segment

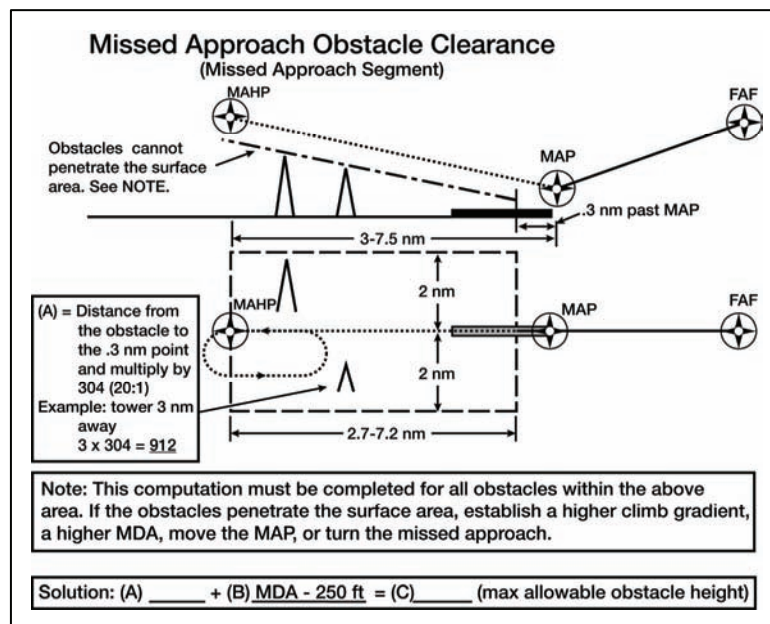


Figure 4-6(e). Missed approach segment

F co. 159th Avn Regt. Date Developed: 5 Jan 05 Expire: 5 Jan 06

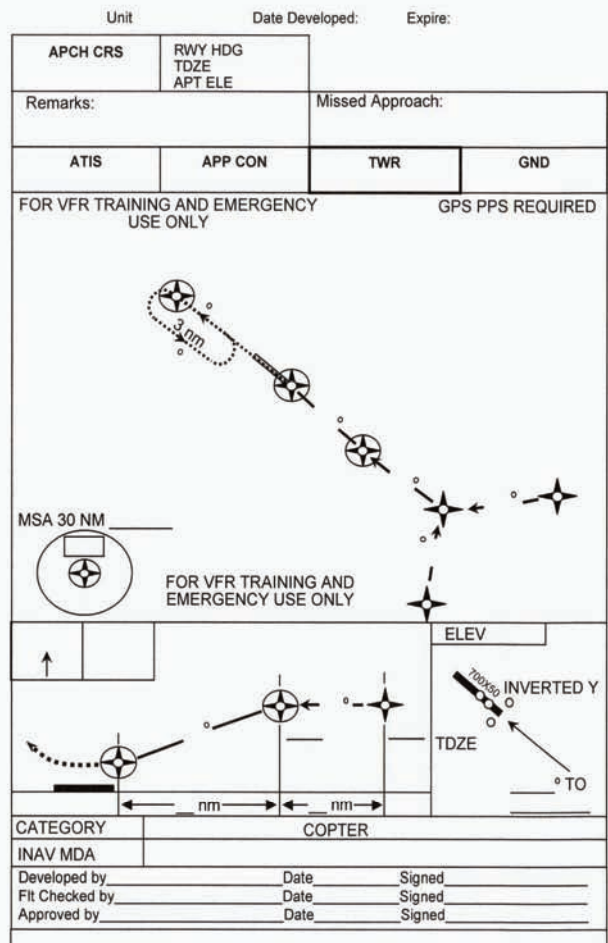
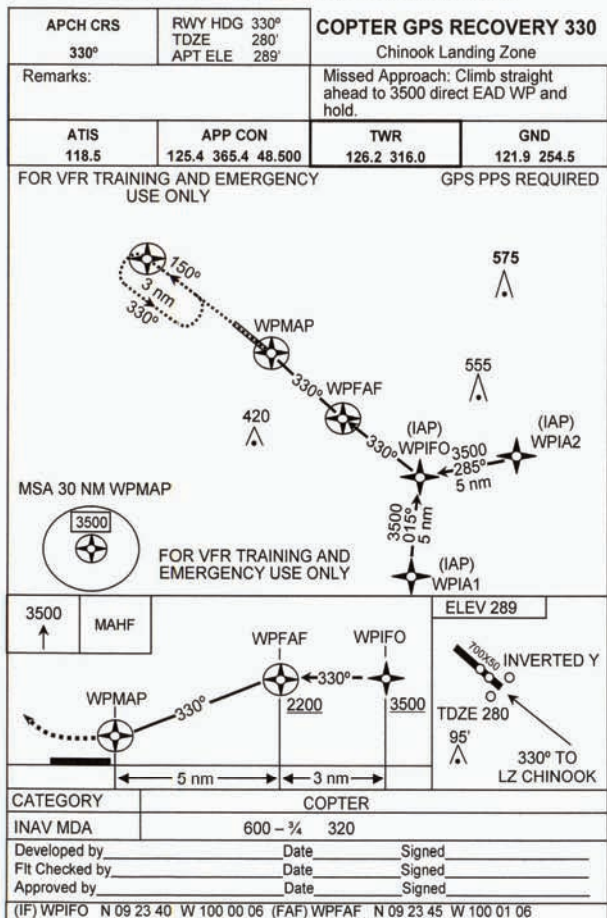


Figure 4-6(f). Sample of emergency GPS diagram

TASK 2051

Perform emergency global positioning system recovery procedure

CONDITIONS: In a UH-1 helicopter in visual meteorological conditions (VMC) or simulated instrument meteorological conditions (IMC), given an approved emergency global positioning system (GPS) recovery procedure, with procedure clearance received and the before-landing check completed with an AN/ASN-175 GPS installed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Enter and/or confirm the appropriate waypoints (initial approach fix [IAF], intermediate approach fix [IF], final approach fix [FAF], or missed approach point [MAP]) into the navigation system.
2. Execute the procedure in accordance with an approved recovery procedure.
3. Maintain 90 knots indicated airspeed (KIAS), +0, -10, during all segments of the approach.
4. Maintain the prescribed course +5 degrees.
5. Arrive at the minimum descent altitude (MDA) prior to reaching the MAP.
6. Execute a missed approach upon reaching the MAP if a safe landing cannot be accomplished.
7. During the missed approach, immediately establish a climb utilizing an appropriate rate of climb airspeed, until established at the minimum safe altitude (MSA).

DESCRIPTION:

1. Prior to flight the crew should review the recovery procedure in conjunction with the map to familiarize themselves with the procedure, local terrain, and obstructions in the vicinity of the procedure. The pilot in command (PC) performs a thorough map reconnaissance to determine the highest obstruction in the area of operations.
2. Prior to initiating the procedure, the pilot on the controls (P*) must climb to the prescribed MSA, proceed toward the IAF, and make the appropriate radio calls. During the procedure, the P* will focus primarily inside the aircraft on the instruments. Adjust the aircraft ground track to cross the IAF, IF, and then the FAF on the prescribed course. When over the FAF, begin the final descent as appropriate.
 - a. The pilot not on the controls (P) remains primarily focused outside the aircraft to provide adequate warning for avoiding obstacles/hazards and will announce when their attention is focused inside the cockpit. The P and nonrated crewmember (NCM) will monitor the aircraft instruments during the procedure and the P should tune the communication and navigation radios and transponder as required. The P will be prepared to call out the procedure to the P*, if asked, and be in a position to assume control of the aircraft and land the aircraft if VMC is encountered.
 - b. The NCM will position themselves on the P* side of the aircraft for obstruction clearance and airspace surveillance. Alert the crew immediately if VMC is encountered.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: The P should be in a position to assume control of the aircraft at any time when a landing environment can be determined visually (aided/unaided). During night unaided flight, consider using the searchlight to identify the landing area.

TRAINING CONSIDERATIONS: This task will ONLY be performed under VMC or simulated IMC in a training environment.

Note: The IAF, IF, FAF, and MAP may be programmed into the navigation system as an additional route for the mission.

Note: It is not necessary to hold after a missed approach. The PC may elect to return to the IF at the MSA and attempt to complete the approach after coordination with air traffic control (ATC) or with other aircraft utilizing the approach procedure.

Note: Inadvertent IMC multiship operations must be thoroughly briefed in the mission brief as a minimum on the following topics: individual aircraft holding altitudes/separation, when individual aircraft are allowed to depart their assigned altitude, missed approach procedure with aircraft in the holding pattern, frequencies, and command/control procedures.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
Unit SOP

TASK 2052

PERFORM WATER BUCKET OPERATIONS

WARNING

Never dump water onto ground personnel as the water impact could result in injury.

WARNING

Minimize hovering or flying slowly over fires. The rotor wash fans the flames which may cause more hazards to ground crews.

WARNING

When performing this task with cabin doors open, ensure that any personnel in the cabin area are wearing a safety harness secured to a tie-down ring or are seated in a seat with seat belt on.

CONDITIONS: In a UH-1 helicopter with an operational cargo hook and water bucket; required briefings and checks completed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Conduct permission planning to determine fuel and bucket cinching requirements. Verify the aircraft will remain within gross weight (GWT) and center of gravity (CG) limitations for the duration of the flight.
 - b. Conduct a thorough crew briefing.
 - c. In conjunction with the nonrated crewmembers (NCMs) complete the required checks to ensure proper system operation prior to mission departure.
 - d. Operate the water bucket system per manufacturer's specifications.
 - e. Recognize and respond to a water bucket system malfunction.
 - f. Use dipping procedures appropriate for the water bucket type.
 - g. Hook-up and hover:
 - (1) Maintain vertical ascent heading ± 10 degrees.
 - (2) Maintain altitude of load 5 feet above ground level (AGL), +1 foot.
 - (3) Complete hover power and GO/NO-GO checks.

- h. En route: Maintain safe load obstacle clearance (minimum of 50 feet above highest obstacle [AHO]).
 - i. Approach and water release:
 - (1) Maintain a constant approach angle to ensure load safely clears obstacles.
 - (2) Maintain ground track alignment with selected approach path.
 - (3) Execute a smooth and controlled pass or termination over the intended point/area of water drop.
 - j. Deploy water as directed in proper location, orientation, and/or length.
2. Nonrated.
- a. In conjunction with the rated crewmember(s), complete required water bucket checks to ensure proper system operation prior to mission departure and attach water bucket to the aircraft.
 - b. Ensure water bucket is configured for the condition and mode of flight.
 - c. Recognize and respond to a water bucket system malfunction.

DESCRIPTION:

- 1. Crew actions.

Note: The water bucket, when loaded, is a high-density load with favorable flight characteristics. Reduced velocity never to exceed (Vne) and bank angle limits must be kept in mind. Much of the mission profile is flown at high GWT and low airspeed. Also, density altitude is greatly increased in the vicinity of a major fire. Performance planning must receive special emphasis.

- a. The pilot in command (PC) will conduct a thorough crew briefing and ensure all crewmembers are familiar with water bucket operations, emergency, and communication procedures. The PC will ensure that DA Form 7382-R has been completed. The PC will confirm that required power is available by comparing the information from the performance planning card (PPC) to the hover power check.
- b. The pilot on the controls (P*) will remain primarily focused outside the aircraft throughout the maneuver. The P* will monitor altitude and avoid obstacles.
- c. The pilot not on the controls (P) will monitor the cockpit instruments and assist the P* in clearing the aircraft. The P will set cargo hook switches, as required, and should make all radio calls. When directed by the P* during the approach, the P will place the cargo hook arming switch to the ARMED position. The P will release the water on command from the P* or in accordance with the crew briefing.
- d. The P and NCM will assist in clearing the aircraft and will provide adequate warning of obstacles. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
- e. The NCM will remain primarily focused on the bucket. The NCM will guide the P* during the bucket pickup, advise of the bucket condition in flight, provide directions and assistance on when to dump the water, and direct the P* when setting down the bucket.
- f. The NCM will advise the P* of any water bucket faults or failures.
- g. External load procedures in accordance with Task 2048 will be used for normal external load techniques and load call outs; the NCM will advise the P* when the water bucket is in the water, filling, full, water deploying, and empty. The NCM will instruct the P* as necessary to keep the electrical attachment assembly from entering the water.

2. Procedures.

a. Preflight:

(1) The PC will analyze the mission using mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC) and determine the amount of water required to conduct the mission and the initial profile to be used during the water emplacement.

(2) The NCM(s) will ensure the water bucket is installed and that all installation checks are completed in accordance with unit standing operating procedure (SOP) and the water bucket operator's manual.

(3) The crew will conduct the ground checks in accordance with manufacture procedures to confirm the proper operation of the water bucket prior to takeoff.

b. Hook-up and hover: Once the water bucket is placed on the ground beside the aircraft and all associated wiring is installed, place the cargo release switch in the ARM position. Follow verbal signals from the NCM to hover over the water bucket. Apply control movements as necessary to remain vertically clear and centered over the water bucket. Once in this position, smoothly apply collective input until all slack is removed from the suspension cable. Maintain heading with pedals. Apply additional collective to raise the bucket to 5 feet AGL. Monitor aircraft instruments to ensure aircraft limitations are not exceeded.

c. Water pickup: Arrive over water source with minimal forward speed and a bucket height of 10 feet above water level. Slowly reduce collective until the bucket makes contact with the water. Once the bucket has inverted and submerged in the water, follow verbal signals from the NCM to remain centered over the bucket as it fills, applying cyclic, collective, and pedals as necessary. The pilot can vary the bucket's capacity by varying the speed at which it is pulled from the water. A slow lift gives minimum fill. A fast lift gives maximum fill. When the NCM indicates the bucket is ready, or full, increase collective until all slack is removed from the suspension cable and the lip of the bucket is clear of the water. Maintain heading with pedals. Apply additional collective to raise the filled bucket clear of the water's surface to a height of 5 feet. Ensure the bucket is holding the water and monitor aircraft instruments to ensure aircraft limitations are not exceeded.

Note: Crew should consider performing a test release of the first water load at the pickup site to ensure proper operation.

d. Takeoff: Establish a constant angle of climb that will permit safe obstacle clearance. When above 100 feet AGL or when clear of obstacles, adjust attitude and power as required to establish the desired rate of climb and airspeed. Smoothly adjust flight controls to prevent bucket oscillation.

Note: Ensure that the cargo hook-arming switch is in the ARMED position when operating at altitudes below 300 feet AHO and in the SAFE position above 300 feet AHO.

e. En route: Maintain the desired altitude, flight path, and airspeed. Make smooth control applications to prevent bucket oscillation. If a lateral bucket oscillation occurs, reduce airspeed. If a fore-and-aft oscillation occurs, begin a shallow turn while reducing airspeed.

Note: Recommended en route airspeed with loaded or unloaded water bucket is 80 knots indicated airspeed (KIAS).

Note: When flying with the bucket empty, open the bucket to allow streamlining. This prevents the bucket from twisting and pinching the cables.

f. Approach and water release: Altitude and airspeed affect the dump pattern. It is most concentrated at lower altitudes (AGL) and at a hover. The pattern will spread with altitude and speed. The PC will determine the most appropriate height and speed for the pattern desired or in accordance with mission briefing. When the approach angle is intercepted, decrease the collective to establish the descent. When passing below 300 feet AGL, place cargo hook in ARM position. Maintain entry airspeed until apparent ground speed and rate of closure appear to be increasing. Progressively decrease the rate of descent and forward airspeed until a momentary hover is attained with the water bucket between 20 to 50 feet above intended release point. This method is effective for spot fires. For water release on a fire line or large area, maintain water bucket at 20 to 50 feet above intended release point and airspeed between slightly above effective translational lift not to exceed 50 KIAS for more effective coverage. Confirm all water releases with NCM.

Note: The bucket manufacturer does not recommend dumping at airspeeds above 50 KIAS.

Note: There is a delay of appropriately 0.5 to 1.0 second between the activation of the dump switch and the discharge of the water.

Note: If the bucket fails to open, attempt to establish a hover. Lightly “bounce” the bottom of the bucket on the ground and then repeat the water drop release procedure. If the bucket still does not open, establish a hover. Gently lower the bucket to the ground. With the bucket resting on the ground, move the aircraft laterally to dump the water out of the bucket and repeat the fill-up procedure.

Note: Avoid flight over populated areas.

Note: A go-around should be initiated if visual contact with the water release area is lost or any crewmember announces “climb, climb, climb.” This phrase will only be used when there is not enough time to give detailed instructions to avoid obstacle.

g. Post mission:

(1) Ensure water bucket is serviceable.

(2) De-rig aircraft and water bucket. Ensure all documentation is complete on water bucket usage and inspection.

Note: Hover out-of-ground effect (OGE) power is required for this maneuver.

SAND/DUST/SMOKE CONSIDERATIONS: If during the approach, visual reference with the water release area or obstacles is lost, initiate a go-around or ITO as required, immediately. Be prepared to transition to instruments. Once VMC is regained, continue with the go-around. (If required, releasing the water reduces the GWT significantly and minimizes power demand.)

MOUNTAINOUS AREA CONSIDERATIONS: If at any time during an approach, if sufficient power is not available, or turbulent conditions or wind shift creates an unsafe condition, perform a go-around immediately. (If required, releasing the water reduces the GWT significantly and minimizes power demand.)

OVERWATER CONSIDERATIONS: All crewmembers will wear floatation devices. Overwater flight, at any altitude, is characterized by a lack of visual cues, and, therefore, has the potential of causing visual illusions. Be alert to any unannounced changes in the flight profile and be prepared to take immediate corrective actions. The radar altimeter (if installed) low bug should be set to assist in altitude control. Operations become increasingly more hazardous as references are reduced (open

TC 1-211

water versus a small lake), water state increases (calm to chop to breaking condition with increasing wave height), and visibility decreases (horizon becomes same color as water, water spray, or rain on windshield; sunny midday versus twilight).

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. During water bucket operations the P*'s attention will be divided between the aircraft instruments (altitude and ground speed) and the outside. It is critical during NVG operations that the P's and NCM's focus be primarily outside to provide warning to the P* of obstacles or hazards during the entire operation.
2. Spatial disorientation can be overwhelming during overwater operations at night. Proper scanning techniques are necessary to avoid spatial disorientation. If there are visible lights on the horizon or if the shoreline can be seen, the pilot may opt to approach and hover the aircraft so it is pointed toward these references, if the wind permits. If no other references exist, deploy chemlights to assist in maintaining a stable hover during the water pick-up.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
Water Bucket Airworthiness Release
AR 70-62

TASK 2054**PERFORM FAST ROPE INSERTION AND EXTRACTION OPERATIONS****WARNING**

Ensure that crewmembers in the cabin area are wearing a safety harness secured to a tiedown ring anytime the cabin doors are open. Also ensure that all ropers are on the ground before any ropes are released.

CONDITIONS: In a UH-1 helicopter with fast rope insertion and extraction (FRIES) equipment installed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Conduct a thorough crew and passenger briefing.
 - b. Maintain entry altitude as directed ± 10 feet.
 - c. Maintain entry airspeed of 80 knots indicated airspeed (KIAS), ± 5 KIAS.
 - d. Maintain track aligned with landing direction.
 - e. Perform a smooth, controlled termination to a hover over the insertion point. Deceleration attitude not to exceed 30 degrees.
 - f. Maintain appropriate hover height ± 5 feet (not to exceed rope height).
2. Nonrated. Ensure that the aircraft is configured for FRIES.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will conduct a crew and passenger briefing and ensure personnel are familiar with normal and emergency procedures. The PC will ensure the aircraft is rigged.
 - b. The pilot on the controls (P*) will remain focused primarily outside the aircraft throughout the maneuver and will announce when beginning the maneuver. The P* will also announce the intended point of insertion.
 - c. The pilot not on the controls (P) and nonrated crewmember (NCM) will assist in clearing the aircraft and will provide adequate warning of obstacles. They will also assist the P* in maintaining a stable hover. The NCM will inspect the rigging to ensure that the aircraft is configured for FRIES operations.
2. Procedures.
 - a. To perform a FRIES assault, execute a terrain flight approach to the insertion point. On final adjust airspeed and altitude during the approach to stop over the insertion point at a predetermined hover height (not to exceed rope length). At a stabilized hover the FRIES operation begins. Remain over the area at a stabilized hover until all ropers and ropes are clear.

TC 1-211

- b. After ropers are clear, crewmembers will pull the ropes back inside the aircraft or release them by pulling the locking device and detaching the rope. Keep the aircraft stationary until the “ropes clear” signal is given.

Note: Hover out-of-ground effect (OGE) power is required for this maneuver.

Note: Task 1038 (Perform hovering flight) and Task 2036 (Perform terrain flight deceleration) contain procedures that may be used in performing this task.

Note: A high hover, especially if a 90-foot rope is used, may cause the loss of all normal visual hover cues.

NIGHT OR NIGHT VISION DEVICE CONSIDERATIONS: Due to loss of forward references during decelerations, recommend maximum pitch attitude of 15 degrees. Use infrared (IR) bypass band filter searchlight as necessary to maintain position and hover altitude for night vision goggle (NVG) operations. Proper scanning techniques are necessary to detect aircraft drift and to avoid spatial disorientation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
FRIES Airworthiness Release

TASK 2056**PERFORM RAPPELLING OPERATIONS****WARNING**

Ensure the rappel master and crew chief are wearing a safety harness secured to a tiedown ring anytime the cabin doors are open. Also ensure that all rappellers are on the ground before any rappel ropes are released.

CONDITIONS: In a UH-1 helicopter with rappelling equipment installed.

STANDARDS: Appropriate common standards plus these additions/modification:

1. Rated.
 - a. Conduct a thorough crew and passenger safety briefing.
 - b. Maintain appropriate hover altitude ± 10 feet allowing at least 20 feet of rope to remain on the ground.
 - c. Do not allow drift to exceed ± 5 feet from the intended hover point.
 - d. Maintain ropes in continuous contact with the ground.
2. Nonrated. Ensure that the aircraft is configured for rappelling operations.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will conduct a crew and passenger briefing and ensure personnel understand their responsibility during rappelling operations, including aircraft safety and action in the event of an emergency. The PC will ensure the aircraft is rigged and emphasize procedural techniques for clearing, recovery, and/or jettison of ropes.
 - b. The pilot on the controls (P*) will remain focused primarily outside the aircraft throughout the maneuver for aircraft control and obstacle avoidance. The P* will announce the intended point of insertion and remain centered over the target with corrections from the rappel master and nonrated crewmember (NCM) as required.
 - c. The pilot not on the controls (P) and NCM will assist in clearing the aircraft and will provide adequate warning of obstacles. They will also assist the P* in maintaining a stable hover by providing the P* with information regarding drift of the aircraft. The P will also monitor cockpit indications.
 - d. The NCM will ensure that the aircraft is configured per TC 21-24. The NCM will also ensure that all rappelling ropes are dropped or retrieved and secured in the aircraft before takeoff.

TC 1-211

2. Procedures.

a. Make the approach into the wind if possible and plan to terminate the approach at an altitude that will clear the highest obstacle. Select an appropriate reference point to maintain heading and position over the ground. Ensure the aircraft is at an altitude that allows approximately 20 feet of the rappelling ropes to be on the ground.

b. During the rappelling operation, use the collective to maintain altitude and be prepared to correct for CG changes as the rappellers depart the aircraft.

Note: Hover out-of-ground effect (OGE) power is required for this maneuver.

ADVERSE WEATHER/TERRAIN CONDITIONS: Rappel operations will not be conducted under the following conditions:

1. Lightning strikes within 1 nautical mile of rappelling operations.
2. Water or ice on the rope inhibits the ability of the rappellers to control their descent.
3. The rope is exposed to the elements for a sufficient length or time to freeze, thereby reducing its tensile strength.
4. Blowing particles produced by rotor wash causes the aircrew or the rappel master to lose visual contact with the ground.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Proper scanning techniques are necessary to avoid spatial disorientation. One chemlight will be attached to the end of the rope and one to the attachment point of the rope. One chemlight will be on each rappeller. NVG lighting will be in accordance with unit standing operating procedure (SOP) or the tactical environment.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
Rappelling Airworthiness Release

TASK 2058**PERFORM SPECIAL PATROL INFILTRATION/EXFILTRATION OPERATIONS****WARNING**

Ensure that the SPIES master and crew chief wear a safety harness secured to a tiedown ring anytime cabin doors are opened.

CAUTION

Ensure that SPIES rope remains secured to the cargo hook until the aircraft has landed. If recovery of SPIES rope is impossible, execute a running landing to avoid entanglement in the rotor system.

CONDITIONS: In a UH-1 helicopter with special patrol infiltration/exfiltration (SPIES) equipment installed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Conduct a thorough crew and passenger safety briefing.
 - b. Maintain obstacle clearance between team members, obstacles, and the ground.
 - c. Maintain airspeed ± 5 knots. (Maximum airspeed with team members attached is 70 knots indicated airspeed [KIAS] in moderate climates and 50 KIAS in cold climates).
 - d. Maintain appropriate bank angle, not to exceed 30 degrees.
2. Nonrated. Ensure that the aircraft is prepared for SPIES operations.

DESCRIPTION:

3. Crew actions.
 - a. The pilot in command (PC) will conduct a thorough crew briefing and ensure all crewmembers are familiar with SPIES operations, emergency and communication procedures. The PC will ensure the aircraft is rigged.
 - b. The pilot on the controls (P*) will remain focused primarily outside the aircraft throughout the maneuver for aircraft control and obstacle avoidance. The P* will announce the intended point of extraction and remain centered over the target with corrections from the SPIES master as required.
 - c. The pilot not on the controls (P) and nonrated crewmember (NCM) will assist in clearing the aircraft and will provide adequate warning of obstacles. They will assist the P* during the pickup phase of the operation. They will advise the P* when the slack is out of the rope and when the SPIES members are off the ground and above the highest obstacle. During forward

flight, the NCM must constantly monitor the SPIES team members and keep the P* informed of their stability and height above obstacles.

4. Procedures.
 - a. Ascend at a rate that will ensure the safety of the SPIES members. To avoid “jerking” the SPIES members off the ground, the slack in the rope must be removed cautiously. Do not start forward flight until all obstacles are cleared.
 - b. Maximum en route airspeed will be no faster than 70 KIAS in moderate climates and 50 KIAS in cold climates while team members are attached to the SPIES rope. Maximum aircraft bank angle will be no greater than 30 degrees. During forward flight the NCM must constantly monitor the SPIES members and keep the P* informed of their stability. In may be necessary to reduce airspeed if SPIES personnel begin to spin, or if the cone angle exceeds 30 degrees.
 - c. Upon arrival at the dismount area, transition into hovering flight at an altitude of 250 feet above ground level (AGL). Start a vertical descent with the rate not to exceed 100 foot per minute at touchdown. Maintain a stable hover until SPIES team members clear the rope.

Note: Hover out-of-ground effect (OGE) power is required for this maneuver.

WATER EXTRACTION CONSIDERATIONS: The SPIES is suitable for extracting teams from the water. For this procedure three inflatable life vests or any type of floatation device is tied to the SPIES rope to provide buoyancy for the rope while in the water. Takeoff, en route, and landing are the same as over land. The dismounting procedures differ when landing on a ship. Once on board, the team members take their orders from personnel in charge of the deck.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. For unaided night flight, the landing light and searchlight should be operational. If an NVG filter is installed, it should be removed.
2. Due to the high hover altitude of SPIES operations, it is very difficult to determine altitudes and relative position over the ground. The barometric altimeter is not reliable for this maneuver but can be used as an aid to help maintain a constant altitude. References, such as tops of trees, lights, and manmade objects can be used to help prevent drift by lining up the objects and maintaining their relative position once the aircraft is at a stable altitude.
3. If possible, select an area with good contrast and several reference points at the same or greater height as the SPIES hover altitude. Proper scanning techniques are necessary to avoid spatial disorientation.
4. Spatial disorientation can be overwhelming during overwater operations at night. If lights are visible on the horizon or if the shoreline can be seen, the pilot may opt to approach the survivor(s) so the aircraft is pointed toward these references, if the wind permits. If no other references exist, deploy chemlights to assist in maintaining a stable hover.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
SPIES Airworthiness Release

TASK 2060**PERFORM INTERNAL RESCUE HOIST OPERATIONS****WARNING**

Ensure that crewmembers in the cabin area are wearing a safety harness secured to a tiedown ring anytime the cabin doors are open. The crewmember riding the hoist will either be secured to the aircraft or the jungle penetrator.

CONDITIONS: In a UH-1 helicopter with high-speed rescue hoist, given appropriate hoisting equipment, and with actual or simulated patient.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Perform a preflight inspection of the high-speed rescue hoist.
 - b. Perform appropriate high-speed rescue hoist procedures.
 - c. Do not allow drift to exceed ± 5 feet.
 - d. Perform postflight procedures per the appropriate aircraft operator's manual/checklist (CL).
2. Nonrated.
 - a. Perform a preflight inspection of the high-speed rescue hoist.
 - b. Operate the high-speed rescue hoist pendant.
 - c. Prepare the appropriate hoisting equipment for the required mission.
 - d. Perform postflight procedures.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will conduct a thorough crew briefing and ensure all members of the crew are familiar with emergency procedures and high-speed rescue hoist operations.
 - b. The pilot on the controls (P*) will remain focused primarily outside the aircraft throughout the maneuver. The P* will monitor altitude and avoid obstacles.
 - c. The pilot not on the controls (P) and nonrated crewmembers (NCM) will assist in clearing the aircraft and will provide adequate warning of obstacles.
 - d. The P will clear the aircraft and if necessary be able to operate the control panel for the high-speed rescue hoist.
 - e. The NCM will conduct the hoist operation per FM 8-10-6, TC 1-201, unit standing operating procedure (SOP), and the appropriate aircraft operator's manual/CL.

2. Procedures.

a. General recovery procedures over land. Crewmembers should be alerted approximately 5 minutes prior to arrival at pickup site. Crewmembers complete all required checks (for example, rescue hoist control panel switches set, hoist circuit breakers set, intercommunication system (ICS) selector switches set, and crewmembers reposition for hoist operations). Make the approach into the wind if possible and plan to terminate the approach at an altitude that will clear the highest obstacle. Select an appropriate reference point to maintain heading and position over the ground. Once stabilized over pickup site, perform hoist operations in accordance with FM 8-10-6, TC 1-201, the appropriate aircraft operator's manual/CL, and the unit SOP.

b. Inert patient recovery. General procedure is the same as over land except for the following: The medical officer (MO) is lowered on the hoist and secures the patient to the recovery device. Prior to deploying, all crewmembers will be briefed on method of recovery (simultaneous or singular recovery of the patient and MO) and a radio communications check should be made between the pilot and MO.

c. General recovery procedures overwater. General format is the same as over land except for the following: A smoke device may be used to determine wind direction and velocity; terminate the approach at a 100-foot hover, 20 feet prior to reaching the patient; deploy the recovery device and allow to contact the water before reaching the patient. All crewmembers will wear floatation devices. Operations become increasingly more hazardous as references are reduced (open water versus a small lake, or a ship versus a small boat), sea state increases (calm to chop to breaking condition with increasing wave height), and visibility decreases (horizon becomes same color as water, water spray or rain on windshield, sunny midday versus twilight).

Note: Hover out-of-ground effect (OGE) power is required for this maneuver.

Note: The NCM will advise the P* when the person/equipment is in position on the jungle penetrator. The NCM will perform hoist operations using the standard words and phrases in the unit SOP. The NCM will secure jungle penetrator or STOKES litter upon completion of the hoisting operation. If difficulties in maintaining a stable hover occur, the NCM will extend additional cable as "slack" to preclude inadvertent jerking of the cable.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. For unaided night flight, the landing light and searchlight should be operational. If an NVG filter is installed, it should be removed.
2. When NVGs are used, hovering with minimum drift is difficult and requires proper scanning techniques and crewmember coordination. If possible, an area with adequate ground contrast and reference points should be used.
3. Visual obstacles such as shadows should be treated the same as physical obstacles.
4. Spatial disorientation can be overwhelming during overwater operations at night. If there are visible lights on the horizon or if the shoreline can be seen, the pilot may opt to approach the survivor(s) so the aircraft is pointed toward these references, if the wind permits. If no other references exist, deploy chemlights to assist in maintaining a stable hover.
5. Use proper scanning techniques to ensure obstacle avoidance, maintain aircraft control, and avoid spatial disorientation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

FM 4-02.2

TD 97-001

TC 1-211

TASK 2062

PREPARE PATIENT FOR HOIST OPERATIONS

CONDITIONS: In a UH-1 helicopter with hoist, given appropriate hoisting equipment, and with actual or simulated patient.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Prepare the appropriate hoisting equipment for the required mission (overwater, rapid river, jungle, mountain, or desert operations).
2. Prepare the patient for recovery.
3. Secure the patient and equipment for departure.

DESCRIPTION:

Prepare the patient for recovery and departure per FM 4-02.2 and local directives. The SKED, STOKES litter, and pole-less semirigid litter must be used with a tag line and weak link.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 2064**PERFORM PARADROP OPERATIONS****WARNING**

Ensure that any personnel in the cabin area not wearing a parachute are wearing a safety harness secured to a tiedown ring or are seated in a seat with seat belt on.

WARNING

If parachutes use automatic ripcord releases, ensure that the automatic release is disconnected before descent is initiated. For an in-flight emergency, if altitude cannot be maintained, notify the jumpmaster immediately so automatic ripcord releases can be disconnected.

WARNING

Ensure that static lines remain secured to the anchor point until they are recovered or the aircraft has landed. If recovery of static lines is impossible, execute a running landing to avoid entangling deployment bags in the rotor system.

CONDITIONS: In a UH-1 helicopter with a jumpmaster.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Conduct a thorough crew and passenger safety briefing.
 - b. Maintain maximum airspeed of 70 knots indicated airspeed (KIAS) or less ± 5 knots during jumper deployment or as briefed by the jumpmaster.
 - c. Maintain appropriate ground track over the drop zone.
2. Nonrated. Ensure that the aircraft is prepared for paradrop operations.

DESCRIPTION:

3. Crew actions.
 - a. The pilot in command (PC) will conduct a thorough crew briefing and ensure all crewmembers are familiar with paradrop operations, emergency, and communication procedures. The PC will ensure the aircraft is rigged.
 - b. The pilot on the controls (P*) will remain focused primarily outside the aircraft throughout the maneuver.
 - c. The pilot not on the controls (P) and nonrated crewmember (NCM) will assist in clearing the aircraft and will provide adequate warning of obstacles and traffic.
 - d. The P will ensure that the jumpmaster or crew chief retrieves the static lines as soon as the last parachutist has cleared the aircraft.
 - e. The NCM will ensure that the aircraft is prepared for paradrop operations. The NCM or the jumpmaster will acknowledge all communications from the P* and P. The NCM will inform the P* or P when all parachutists have exited the aircraft and when the deployment bags have been recovered.
4. Procedures.
 - a. Maintain altitude, airspeed, and ground track as determined during pre-mission planning and jumpmaster's instructions.
 - b. Perform in-flight procedures per FM 3-05.211(FM 31-19) and FM 3-21.220.
 - c. The crew will conduct the paradrop per the procedures covered in the briefing and the references listed below.
 - d. The PC will check that the jumpmaster or NCM retrieves the static lines as soon as the last parachutist has cleared the aircraft.

Note: If the jumpmaster cannot communicate directly with the P*/P, they will communicate with the NCM via hand-and-arm signals. The CE will relay necessary information to the P*/P via the intercom.

Note: When parachutists are equipped with automatic parachute openers and the mission is aborted, ensure that the openers are disarmed before the aircraft begins the descent.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

FAR, Part 105
FM 3-05.211
FM 3-21.220

TASK 2067**SELECT LANDING ZONE /PICKUP ZONE AND HOLDING AREA RECONNAISSANCE****WARNING**

Not all hazards will be depicted on a map. When using a map reconnaissance to determine suitability, the added risk of unknown hazards must be addressed during the mission risk assessment process.

CONDITIONS: In a UH-1 helicopter given a map or photo data.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Perform map, photo, or visual reconnaissance.
2. Determine that the landing zone (LZ) is suitable for operations and provide accurate and detailed information to supported unit if applicable.
3. Confirm suitability on initial approach.

DESCRIPTION:

1. Crew actions. The crew will confirm location of plotted hazards and call out location of unplotted hazards.
 - a. The pilot in command (PC) will confirm suitability of the area for the planned mission.
 - b. The pilot on the controls (P*) will remain focused primarily outside the aircraft throughout the maneuver for aircraft control and obstacle avoidance. The P* will announce any intent to deviate from the maneuver.
 - c. The pilot not on the controls (P) and nonrated crewmember (NCM) will assist in reconnaissance of the LZ, clearing the aircraft, and will provide adequate warning of obstacles. They will acknowledge the P*'s intent to deviate from the maneuver.
2. Procedures.
3. Gather map or photo data on potential LZ(s) or conduct an in-flight suitability check if map or photo data is unreliable. Determine the suitability by evaluating size, long axis, barriers, surface conditions, tactical situation, and effects of the wind. Select a flight path, altitude, and airspeed that afford the best observation of the landing area, as required. Determine an approach, desired touchdown point, and departure path. The tactical, technical, and meteorological elements must be considered in determining suitability.

Note: If wind conditions will be a factor, a wind evaluation should be performed. Techniques for evaluating wind conditions are found in FM 1-202.

Note: Depending on the mission, an in-flight suitability check may not be feasible. Suitability may be determined by a map reconnaissance. Make a final determination of suitability upon arrival to the LZ/pickup zone (PZ).

- (1) Tactical.
 - (a) Mission. Determine if the mission can be accomplished from the selected LZ. Consider flight time, fuel, number of sorties, and access route.
 - (b) Location. To reduce troop fatigue, consider distance of PZ or LZ from supported unit or objective, and supported unit's mission, equipment, and method of travel to/from PZ/LZ.
 - (c) Security. Consider size and proximity of threat elements versus availability of security forces. The supported unit normally provides security. Consider cover and concealment, key terrain, and avenues of approach and departure. The area should be large enough to provide dispersion.
- (2) Technical.
 - (a) Number and type of aircraft. Determine if the size of the LZ can support all the aircraft at once, or if they must rotate into LZ for in-flight link-up.
 - (b) Landing formation. Plan landing formation for the shape and size of the LZ.
 - (c) Sling loads. For missions requiring sling loads at or near maximum gross weight (GWT) of the helicopter, select larger LZs where barriers have minimum vertical development.
 - (d) Surface conditions. Consider slopes, blowing sand, snow, or dust. Be aware that vegetation may conceal surface hazards (for example, large rocks, ruts, or stumps). Areas selected should also be free of sources of rotor wash signature.
 - (e) Obstacles. Hazards within the LZ that cannot be eliminated must be plotted. Plan the approach and departure routes over the lowest obstacles.
- (3) Meteorological.
 - (a) Ceiling and visibility. Ceiling and visibility are critical when operating near threat elements. Inadvertent instrument meteorological conditions (IMC) recovery can expose the aircraft and crew to radar-guided and heat-seeking weapons, with few options for detection and avoidance. If one aircrew of a multiship operation must respond to inadvertent IMC the element of surprise will be lost, the assets on board will not be available for the mission, and the entire mission may be at risk.
 - (b) Winds. Determine approach and departure paths.
 - (c) Pressure altitude (PA). High PA may limit loads and therefore require more sorties.

Note: Avoid planning approach or departure routes into a rising or setting sun or moon.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Unimproved and unlit areas are more difficult to evaluate at night because of low contrast. Knowledge of the various methods for determining the height of obstacles is critical to successfully completing this task. Visual obstacles such as shadows should be treated the same as physical obstacles.
2. When performing operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Use of the white light will impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

CONFINED AREA CONSIDERATIONS: Determine a suitable axis and path for a go-around. For multi-aircraft operations, determine the number of aircraft that the area can safely accommodate.

SNOW/SAND/DUST CONSIDERATIONS: Evaluate surface conditions for the likelihood of encountering a whiteout/brownout. Determine a suitable axis and path for a go-around.

MOUNTAIN/PINNACLE/RIDGELINE CONSIDERATIONS: When practical, position the aircraft on the windward side of the area. Evaluate suitability, paying particular attention to pressure altitude and winds. Determine a suitable axis and escape route for a go-around. Operations at high altitudes are more likely to expose the crews to visual detection, radar, or heat-seeking weapons.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 2068

PERFORM SHIPBOARD OPERATIONS

WARNING

Do not move the cyclic with the pitch and roll of the ship. Do not allow the rotor to dip down to a low position, as it could be fatal to deck crews and those exiting the aircraft.

CONDITIONS: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus the following additions/modifications:

1. Rated.
 - a. Comply with arrival and departure and landing signal enlisted (LSE)/controller instructions.
 - b. Ensure a green deck before landing.
 - c. Perform a visual meteorological conditions (VMC) approach.
 - d. Perform a VMC takeoff.
2. Nonrated.

Ensure aircraft is chained or moored before exiting.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will focus primarily outside the aircraft to provide obstacle clearance throughout the maneuver. The P* will announce when initiating the approach and whether the approach will terminate to a hover or to the surface. The P* also will announce the intended point of landing and any deviation to the approach, including go-around. The P* will announce intentions to takeoff.
 - b. The pilot not on the controls (P) will call out "crossing the wake" and will complete the before-landing check. The P will verbally relay the signalman's signals if the P* loses visual contact with the LSE.
 - c. The P and the nonrated crewmember (NCM) will assist in clearing the aircraft and will provide adequate warning of obstacles, unannounced drift, and changes in altitude. They will announce when their attention is focused inside and again when attention is reestablished outside the aircraft and will acknowledge all P* directions. They will assist the P* in ensuring that the skids are within the landing deck circle before touchdown.

2. Procedures.

Note. The deck landing area may have a perimeter safety net, perimeter markings, and red lights outlining the landing area. Two white lineup lines form an "X" through the landing area. These lines contain white lights, which are only visible when the aircraft is aligned on the approach path. Around the center of the "X" is a white circle with a centered amber light. The landing gear will normally be in the forward portion of this circle but landing will be as directed by the LSE/controller. Most ships have floodlights to illuminate the landing area for unaided operations but the lights can be turned down or off for night vision goggle (NVG) operations.

- a. Before the approach. When cleared to land, adjust airspeed as necessary, descend to 200 feet above ground level (AGL), and enter the landing pattern. (The LSE will expect the pilot in the seat nearest the bow of the ship upon landing to be at the flight controls for the first landing.) Make a standard rate turn or less in the appropriate direction, cross perpendicular to the ship's wake, and then begin the turn to final. When the ship is underway, it will be necessary to make lateral corrections to maintain alignment with the landing deck lineup lines. An alternate technique is to lead the ship by initiating the approach to a point forward of the flight deck.
- b. During the approach. Cross the deck edge no faster than a brisk walk at an altitude of 5 to 10 feet above the landing surface. (Higher altitudes make it difficult to maintain good visual references.) Keep the LSE in sight. Stop all aircraft movement over the center of the deck and ensure the main landing gear is within the landing circle.

Note. The LSE will assist during the last part of the approach with hand and arm signals.

- (1) Hovering. Maintain a hover until the LSE gives the signal to set the aircraft down. Follow the LSE's signal to move left, right, aft, or forward. Control drift using the ship's superstructure and the horizon, if visible, for attitude reference while hovering.
- (2) Landing. In rough seas, attempt to land when the ship is at the apex of a pitch up. Watch the LSE and listen to guidance from the ship's tower. Lower the collective and perform a controlled touchdown with the skids inside the landing deck circle. When the landing gear is on the deck, smoothly lower the collective to the full down position. Maintain the cyclic centered and ignore aircraft motion. Wait until the aircraft is chained or moored before exiting the aircraft.
- (3) Takeoff. The P will show his hands during the day or will flash a light at night to indicate to the LSE which aviator is at the controls. When cleared for takeoff, increase power and smoothly ascend to a hover height of 5 feet, keeping the LSE in sight. Slide left or right as directed to clear any obstruction and depart the ship at a 45-degree angle from the bow. The ship can be used for an attitude reference during acceleration. During conditions of reduced visibility, it may be necessary to transition to instruments for most of the takeoff.

Note. Hover out of ground effect (OGE) power may be required for this task.

NIGHT OR NIGHT VISION GOGGLE (NVG) CONSIDERATIONS: At night and during periods of reduced visibility, fly instruments or cross-check the flight instruments while in the holding pattern. The P will advise when they have the lineup line in sight. The P* will transition outside and make flight control adjustments as necessary to lineup on final and to remain aligned with the lineup line. The P will continue to assist by monitoring the flight instruments, calling out airspeed, and calling out altitude as necessary.

TC 1-211

OVERWATER CONSIDERATIONS: Overwater flight, at any altitude, is characterized by a lack of visual cues and, therefore, may cause visual illusions. Be alert to any unannounced changes in the flight profile and be prepared to take immediate corrective actions. If available, the radar altimeter low bug should be set to assist in altitude control. Hazards to terrain flight such as harbor lights, buoys, wires, and birds must also be considered during overwater flight.

TRAINING AND EVALUATION REQUIREMENTS:

Training and evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

JP 3-04.1

Joint Tactics, Techniques, and Procedures for Shipboard Helicopter Operations

Shipboard Aviation Facilities Resume

TASK 2076**PERFORM CAVING LADDER OPERATIONS**

CONDITIONS: In a UH-1 helicopter with caving ladder equipment installed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Conduct a thorough crew briefing.
 - b. Maximum airspeed with caving ladder deployed is 40 knots indicated airspeed (KIAS) with personnel attached to the ladder and no faster than a brisk walk with no personnel attached.
 - c. Maintain appropriate hover altitude ± 5 feet.
 - d. Do not allow drift to exceed ± 5 feet from the intended hover point.
 - e. Deploy light markers as required.
 - f. Deploy caving ladder, extract survivor(s), and secure caving ladder equipment.
2. Nonrated.
 - a. Ensure that the aircraft is configured for caving ladder operations.
 - b. Advise the P* when the survivors are in sight.
 - c. Inform the pilots when the ladder is being deployed/recovered.
 - d. Direct the P* to a stabilized hover over the survivors.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will conduct a thorough crew briefing and ensure all crewmembers are familiar with caving ladder operations, emergency procedures, and communication procedures. The PC will ensure the aircraft is rigged.
 - b. The pilot on the controls (P*) will remain focused primarily outside the aircraft throughout the maneuver for aircraft control and obstacle avoidance. The P* will announce the intended point of extraction and remain centered over the target with corrections from the pilot not on the controls (P) and nonrated crewmember (NCM) as required.
 - c. The P and NCM will assist in clearing the aircraft and will provide adequate warning of obstacles. They will assist the P* during the pickup phase of the operation. They will advise the P* when the ladder is on the ground or in the water. If forward flight is required, the NCM must constantly monitor the survivor(s) and keep the P* informed of their stability.
2. Procedures.
 - a. Caving ladder operations is a method used by search and rescue (SAR) aircraft to retrieve downed crewmembers from the water when no watercraft are in the area or when time constraints will not allow the aircrew to wait for such craft to arrive for the rescue operations.
 - b. The PC will ensure the ladder is inspected, serviceable, and secured to the aircraft. The NCM will inspect and secure a serviceable ladder to the aircraft cabin floor. Chemlights will be attached to the bottom of the ladder and ten feet from the bottom for operations conducted at night. Proper flotation will be attached to the ladder as necessary.

c. The PC will inform the NCM when to deploy the ladder and establish the maximum hover height that can be achieved with the ladder safely on the ground or in the water. Use a radar altimeter for more precise readings of maximum hover height, if installed.

d. Once personnel in the water are located, plan the approach into the wind as much as possible. The approach should terminate to a hover approximately 20 feet above the personnel. The crewmember in the cabin area will lower the caving ladder when directed to do so by the PC. The crewmember will advise when the caving ladder has been deployed and that it is in the water. The ladder must touch the water before any personnel in the water touch it, to avoid electrical static discharge shock. Due to lack of visual references it will be difficult to detect drift over the water. Crewmembers must help the P* maintain a constant position over the personnel in the water.

e. Personnel to be extracted will grasp the ladder after it has entered the water and comes within reach. Personnel will then climb the ladder into the aircraft. Crewmembers will assist the entry into the aircraft as much as possible. If personnel are injured and cannot climb into the aircraft, they will attach themselves to the ladder with a snap link attached to the front of the survival vest. These personnel will be flown to the nearest landing area, lowered to the ground, and then moved into the aircraft.

Note: Hover out-of-ground effect (OGE) power is required for this maneuver.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. For night operations attach one chemlight to the bottom of the ladder. This will aid the crewmembers in identifying when the ladder enters the water. Attach one more chemlight 10 feet up from the bottom of the ladder so the person can still see the ladder when the bottom is in the water.

2. Spatial disorientation can be overwhelming during overwater operations at night. Proper scanning techniques are necessary to avoid spatial disorientation. If there are visible lights on the horizon or if the shoreline can be seen the pilot may opt to approach the survivor(s) so the aircraft is pointed toward these references, if the wind permits. If no other references exist, deploy chemlights to assist in maintaining a stable hover.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

FM 3-05.212

Caving Ladder Airworthiness Release

TASK 2078**PERFORM HELOCAST OPERATIONS****WARNING**

Ensure that crewmembers and the Helocast master in the cabin area are wearing a safety harness secured to a tiedown ring any time the cabin doors are open.

CONDITIONS: In a UH-1 helicopter with Helocast equipment installed, a Helocast team, and a Helocast master.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Conduct a thorough crew and passenger briefing.
 - b. Maintain altitude ± 3 feet.
 - c. Maintain airspeed ± 3 knots.
 - d. Maintain heading ± 10 degrees.
2. Nonrated.

Ensure aircraft is configured for Helocast operations.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will conduct a crew and passenger briefing and ensure personnel are familiar with emergency procedures. The PC will also ensure all participants in the Helocast are briefed in accordance with the unit standing operating procedure (SOP).
 - b. The pilot on the controls (P*) will make the approach into the wind if possible, slowing to the desired airspeed and altitude (5 knots at 5 feet or 10 knots at 10 feet).

WARNING

Anything faster or higher could result in injury to personnel. The pilot cannot rely on the airspeed indicator below 20 knots indicated airspeed (KIAS); the airspeed should not exceed that of a brisk walk.

- c. The pilot not on the controls (P) will provide the P* with information regarding airspeed and altitude. The P will also monitor the cockpit indications. The P and nonrated

crewmember (NCM) will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.

d. The NCM will assist the Helocast master as necessary.

2. Procedures.

a. Hover checks will be made prior to beginning Helocast operations to verify power available, aircraft controllability, and accuracy of the radar altimeters.

b. The PC will give the Helocast master “10 minutes out,” “5 minutes out,” and “one minute out” alert calls. The PC at “one minute out” will announce “AT THE READY LINE.” The Helocast master will relay these alert calls to the swimmers. Upon receiving the command “AT THE READY LINE” the Helocast master will announce “AT THE READY LINE” at which time all participants will remove the restraint devices and position themselves in the door for the jump.

c. The approach should be made into the wind. Approach speed is 80 KIAS maximum from the release point to the area of cast operations. The approach is situational dependent and may be either a visual meteorological condition (VMC), or a terrain flight approach. After arrival at the cast location slow to the desired airspeed and altitude (5 knots at 5 feet or 10 knots at 10 feet).

d. When the aircraft has established the proper position, airspeed, and altitude, and has arrived at the jump location, the PC will give the Helocast master the command “AT THE START LINE.” The Helocast master will confirm the position, airspeed, and altitude are safe, and give the command “GET SET” to the swimmers. At the command “GET SET” the swimmers will position their legs to hang out the cabin door. The Helocast master will then tap each swimmer on the shoulder and give the command “GO.” On the command “GO,” each swimmer will exit the aircraft per the instruction received during the safety briefing. The Helocast master may also jump, but must always exit last. After entering the water all swimmers will indicate that they are unhurt by raising one arm overhead. The aircraft will not leave the area until all swimmers report that they have no injuries.

OVERWATER CONSIDERATIONS: Overwater flight, at any altitude, is characterized by a lack of visual cues, and therefore, has the potential of causing visual illusions. Be alert to any unannounced changes in the flight profile and be prepared to take immediate corrective actions. The radar altimeter (if installed) low bug should be set to assist in altitude control. Hazards to terrain flight such as harbor lights, buoys, wires, and birds must also be considered during overwater flight.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Spatial disorientation can be overwhelming during overwater operations at night. If there are visible lights on the horizon or if the shoreline can be seen, the pilot may opt to approach the cast area so the aircraft is pointed toward these references, if the wind permits. Proper scanning techniques are necessary.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus:
SOCOM REG 350-6
FM 3-05.212
FM 10-542
TC 31-25

TASK 2081

OPERATE NIGHT VISION GOGGLES

CONDITIONS: In a UH-1 helicopter or UH-1FS.

STANDARDS: Appropriate common standards plus the following additions/modifications:

1. Preflight the night vision goggles (NVGs).
2. Mount and adjust NVGs.
3. Store unit after use.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will monitor the controls and remain focused outside the aircraft during goggle up procedures.
 - b. The pilot not on the controls (P) will announce when his attention is focused inside the cockpit. Upon completion of the aviator's night vision imaging system (ANVIS) checks and adjustments, the P will announce the status of his NVGs.
 - c. The nonrated crewmember (NCM) will announce when their attention is focused inside the aircraft. Upon completion of the ANVIS checks and adjustments, the NCM will announce the status of his NVGs.
2. Procedures.
 - a. Each crewmember will use the checklist in the appropriate operator's manual to preflight the NVGs.
 - b. Ensure the NVGs are within inspection dates and check for serviceability.
 - c. Adjust for proper fit, focus, and diopter setting.
 - d. After use, ensure batteries are removed and store unit.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus:

- TM 11-5855-263-10
- TM 11-5855-313-10
- GEN-06-ASAM-02(or current)

TASK 2090**PERFORM LANDING AREA RECONNAISSANCE FOR SIMULATED MAXIMUM GROSS WEIGHT**

Note: Tasks 2090, 2093, and 2095 are power management tasks. While listed individually in this aircrew training manual (ATM), performance of these tasks is interrelated and should be taught and trained as such. Refer to appendix B of this ATM for more detailed information.

CONDITIONS: In a UH-1 helicopter, given a map or photo data.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Complete landing zone sequence (LZS) in the order depicted (see appendix B).
2. Correctly calculate power and hover torque.
3. Do not exceed hover torque during reconnaissance.
4. Describe a three-dimensional wind picture centered on the landing zone (LZ) and prove wind predictions during the low reconnaissance using cockpit indicators (CI).
5. Do not lose effective translational lift (ETL) during the low reconnaissance.
6. Establish predicted torques for the approach and departure.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will focus primarily outside the aircraft to provide obstacle clearance throughout the maneuver. The P* will announce when beginning the low reconnaissance, the intended approach, and the departure path. The P* also will announce any deviation to the selected paths to include go around, if required.
 - b. The pilot not on the controls (P) and nonrated crewmember (NCM) will confirm the suitability of the area, assist in clearing the aircraft, and provide adequate warning of traffic and obstacles. The P and NCM will acknowledge any deviation during the maneuver. The P and NCM will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.
2. Procedures.
 - a. On approaching the operational area, the crew will identify the LZ and determine its suitability for landing and takeoff. The P* will establish a landing area reconnaissance pattern appropriate for terrain and wind. Using tabular data, the P will determine if out-of-ground effect (OGE) capability exists, the maximum power available, and the hover torque. The P*/P will assess the wind in and around the LZ using wind terrain analysis, visible indications, and cockpit indicators (CI). The P*/P will determine the best possible route into and out of the LZ and select the precise landing point. The routing should reflect power available, wind conditions, and escape options for an aircraft at maximum gross weight (GWT).
 - b. The low reconnaissance is performed to confirm or refute information determined during the landing area reconnaissance. It is performed as low and slow as good judgment dictates but not below ETL. The P*/P must use CI to confirm wind predictions, verify the suitability of the precise landing point, as well as verify that environmental conditions are the same as those selected in tabular data. The P* will thoroughly brief the maneuver and crew duties, including those duties required if the escape plan is implemented.

TC 1-211

c. The P and NCM will confirm suitability of the area, and provide adequate warning of traffic and obstacles.

Note: It is critical to understand the difference between a go-around and an escape. The former is a proactive maneuver with full control of the aircraft available while the latter is a reactive maneuver without full control. Usually the collective must be either maintained or reduced during an escape maneuver, resulting in a rapid loss of altitude.

Note: Predicted torque is not a limit. All actual power available may be used if an unsafe condition is detected. Pilots should not attempt to set the predicted power and accept a hard or roll on landing. Proper execution will result in a smooth, controlled landing while achieving predicted torque values.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Extra caution should be used during the wind drift circle to ensure orientation is maintained. Proper scanning techniques must be used.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
TC 1-211, appendix B

TASK 2092**RESPOND TO NIGHT VISION GOGGLE FAILURE**

CONDITIONS: In a UH-1 helicopter or UH-1FS given an academic or a visual cue that the night vision goggles (NVGs) have failed.

STANDARDS: Appropriate common standards plus the following:

1. Identify or describe indications of impending NVG failure.
2. Perform or describe emergency procedures for NVG failure.

DESCRIPTION:**WARNING**

Impending NVG failure may be indicated by one or both tubes flickering or blanking, or illumination of the low-battery indicator.

1. Crew actions.
 - a. If the pilot on the controls' (P*'s) NVGs fail or indicate impending failure, they will announce goggle failure and transfer the controls to the P if necessary.
 - b. If the pilot not on the controls' (P's) NVGs fail or indicate impending failure, they will announce goggle failure and switch batteries or troubleshoot the goggles.
 - c. If the nonrated crewmember's (NCM's) NVGs fail or indicate impending failure, they will announce goggle failure and switch batteries or troubleshoot the goggles.
2. Procedures.
 - a. During nape of the earth (NOE) or contour flight. Immediately announce "goggle failure" and begin a climb at a rate that will ensure obstacle avoidance. Transfer the flight controls if necessary, discontinue the mission and attempt to restore the goggles. If NVGs are restored, continue the mission. If not restored, lock the NVGs in the up position and proceed as briefed.
 - b. During low-level flight or flight conducted at higher altitude, use the procedure described above. A climb is not required.
 - c. If the NVGs are not restored to operation, make the appropriate report and modify the mission as briefed.

Note: NVG tube failure is infrequent and usually provides ample warning. Only occasionally, will a tube fail completely in a short time. Rarely will both tubes fail at the same time. There is no remedy for in-flight tube failure.

TC 1-211

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus:

TM 11-5855-263-10

TM 11-5855-313-10

TASK 2093**PERFORM SIMULATED MAXIMUM GROSS WEIGHT APPROACH AND LANDING**

Note: Tasks 2090, 2093, and 2095 are power management tasks. While listed individually in this aircrew training manual (ATM), performance of these tasks is interrelated and should be taught and trained as such. Refer to appendix B of this ATM for more detailed information.

CONDITIONS: In a UH-1 helicopter with the before-landing check complete.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Determine the approach angle requiring the least amount of power without compromising a viable escape plan.
2. Correctly predict the maximum torque required for the maneuver (see appendix B – Four Torques of Power Management.).
3. Maneuver as necessary to intercept approach angle.
4. Call out torque, airspeed, and vertical speed on approach.
5. Achieve transverse flow shudder and a speed of 300 feet per minute (FPM) or less within last 50 feet of approach.
6. Correctly interpret cockpit indicators (CI) to monitor wind conditions.
7. Execute a smooth, controlled termination to the ground or the hover height determined in the reconnaissance.
8. Correctly determine wind direction and velocity in the landing zone (LZ) after landing, and perform post-task analysis (PTA).

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will maintain their primary focus outside the aircraft while cross-referencing CI and aircraft instruments during the maneuver (airspeed (A/S) indicator, torque, and vertical speed indicator (VSI). During the approach, the P* will announce any deviations in the briefed approach, particularly any deviations in escape routing. The pilot not on the controls (P) will cross-monitor CI and aircraft instruments and alert the P* when briefed parameters are being approached or exceeded. The P will note the maximum torque used during the approach as well as when it was used referenced from the termination point (expended torque).
 - b. Upon completion of the approach, the P* will confirm actual torque, determine expended torque, verify wind conditions, and then conduct the PTA.
 - c. The P and nonrated crewmember (NCM) will assist in clearing the aircraft throughout the maneuver using distance callouts and will provide adequate warning of traffic and obstacles. The P will acknowledge any deviation during the approach. The P will announce when their attention is focused inside the aircraft.
2. Procedures.
 - a. To a hover. Determine an approach angle that allows obstacle clearance and provides a viable escape route. Once the approach angle is intercepted, progressively decrease airspeed and the rate of descent until a hover is established at the height, precise location, and heading determined in the reconnaissance. Maintain ground track alignment with the landing

direction, in trim above 50 feet above ground level (AGL), and heading aligned with ground track below 50 feet AGL. Apply predicted torque early enough for it to have the desired effect in arresting the approach.

b. To the surface. Proceed as for an approach to a hover but continue to the ground. The decision to terminate with forward movement or zero ground run results from the crew's determination of surface conditions and power available. The ground track and heading must be aligned at touchdown with minimum lateral movement. After surface contact, ensure that aircraft remains stable until all movement stops. Smoothly lower collective and neutralize controls if possible.

Note: The pilots must cross-monitor CI and aircraft instruments (A/S indicator, torque, and VSI) to determine the need to execute a go-around. The parameters at 50 feet AGL for an aircraft are A/S – transverse flow shudder (TFS), rate of descent – 300 FPM or less, and power within 2 to 3 pounds of predicted torque applied. If the aircraft is not within these parameters, execute a go-around. If a go-around is required due to the belief that predicted torque will be exceeded, the go-around must be conducted using no more than predicted torque. If a go-around is required due to the development of an unsafe situation, all actual available power may be used.

Note: Escape routing must address the invisible hazards of rotor droop, settling with power, and downdrafts close to the surface.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Altitude, apparent ground speed, and rate of closure are difficult to estimate externally at night and emphasis is required on CI and aircraft instruments parameters found in the first note above .
2. Surrounding terrain or vegetation may decrease contrast and degrade depth perception during the approach. Before descending below obstacles, determine the need for artificial lighting.
3. When performing operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Use of the white light may impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

Note: The standards for this maneuver have no \pm figures assigned. The reason for this is to enhance power management skills and flying techniques. When evaluating this maneuver, the standardization instructor pilot (SP)/instructor pilot (IP) will determine, after the PTA is conducted, whether or not to perform additional maneuvers.

REFERENCES: Appropriate common references.
TC 1-211, appendix B

TASK 2095**PERFORM SIMULATED MAXIMUM GROSS WEIGHT TAKEOFF**

Note: Tasks 2090, 2093, and 2095 are power management tasks. While listed individually in this aircrew training manual (ATM), performance of these tasks is interrelated and should be taught and trained as such. Refer to appendix B of this ATM for more detailed information.

CONDITIONS: In a UH-1 helicopter with the hover power and before-takeoff checks completed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly select the type of takeoff requiring the minimum amount of power to safely complete the maneuver.
2. Accurately predict the torque/power required for the maneuver.
3. The pilot on the controls (P*) will determine the point where the aircraft will enter effective translational lift (ETL) for the type of takeoff being performed.
4. Establish abort point and reconfirm escape plan determined in the reconnaissance.
5. Use the minimum power necessary for the takeoff being performed.
6. Conduct post-task analysis (PTA) after takeoff.

DESCRIPTION:

1. Crew actions.
 - a. After reassessing the landing zone (LZ) surface, winds, and obstacles, the P* will select the type of takeoff: level acceleration (best angle of climb or best rate of climb), constant angle, or vertical. The P* will then determine the ETL point for the takeoff, reaffirm the predicted torque for the takeoff, and announce the abort plan.
 - b. The pilot not on the controls (P)/nonrated crewmember (NCM) will announce when ready for takeoff and will focus their attention primarily outside the aircraft to assist in clearing obstacles. The P will cross-monitor torque and note the amount of power used (expended torque) as well as when it was used. The crew will select reference points to assist in maintaining ground track.
 - c. Upon completion of the maneuver the P* will conduct post-task analysis of the takeoff. Causes of any differences in the actual ETL point and the prediction of that point will be determined. Discrepancies between predicted torque and expended torque will be analyzed for cause and the maneuver will be repeated as necessary to validate assumptions.

Note: In having to correctly determine the ETL point, the P* is forced to accurately consider the effects of his control inputs, wind conditions, and surface considerations. Any under- or over-estimation of the point must be explained in the PTA following the takeoff maneuver.

Note: The predicted torque determined for the maneuver would also be the hypothetical limit for establishing the takeoff escape plan. If it becomes apparent that the power selected for the maneuver is insufficient for obstacle clearance, the abort will be executed or additional power will be applied beyond predicted torque and noted by the P. In considering a nap of the earth (NOE) deceleration as part of the abort plan, the P* must consider the amount of power for the abort and the amount of airspeed at the time of the abort.

2. Procedures.

a. Level acceleration: This is a simulated maximum power situation where the power determined to be required (predicted torque) is the power required to hover in the LZ at a given altitude. The first objective is to achieve ETL without allowing the aircraft to settle to the surface. If it becomes apparent that the aircraft will contact the surface, apply sufficient aft cyclic to prevent contact or abort the maneuver and analyze for cause. As the transverse flow shudder develops, increase left and then forward cyclic. When the aircraft enters ETL, apply additional forward cyclic to prevent blowback. Maintain altitude and allow the aircraft to accelerate until the appropriate climb airspeed is attained. Best angle airspeed is approximately 30 to 35 knots indicated airspeed (KIAS). As the airspeed indicator will not be reliable, one bar width above the horizon on the vertical speed indicator (VSI) is used to approximate the speed. This attitude will provide the best angle of climb for the power applied. Best rate of climb is attempted when the predetermined best rate of climb airspeed is achieved on the indicator. When the desired speed is achieved, begin a cyclic climb until the obstacles are cleared and then adjust controls for a normal climb.

b. Constant angle: In this maneuver, the angle may range from near vertical to flat. In this type of takeoff, more power than hover power is required. The angle is initiated from the point of hover or ground to a point in space. The goal is for the P* to accurately predict the power required for the angle selected as well as the ETL point on the angle, and the maintenance of the angle as precisely as possible. The P* initiates the takeoff by coordinating all the controls as necessary to begin a constant angle over a predetermined path. Expended torque is noted by the P as well as when it was used.

c. Vertical: Vertical takeoffs can be classified as constant angles but are treated separately to emphasize two critical issues. First, when compared to lesser angles, vertical departures can often be executed with less power when wind is present. Power should be monitored during the climb to note the effects of the wind. Second, better escape options are available when the principle hazards to takeoff are related to high gross weight situations. In vertical departures, the entire LZ is available for recovery in the event of an aborted takeoff. The P* predicts the power and ETL entry point as in the other departures.

Note: To maximize training value, all three types of takeoffs should be executed and compared for ETL entry points, power required, control input coordination, and timing as well as abort/escape options.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. If sufficient illumination exists to view obstacles, accomplish the takeoff in the same way as a visual meteorological conditions (VMC) takeoff during the day. Visual obstacles, such as shadows, should be treated the same as physical obstacles.
2. If sufficient illumination or depth perception does not exist to adequately judge hover height or view obstacles, additional altitude should be used for level acceleration departures.
3. When conducting operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Use of the white light will impair night vision several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

Note: The standards for this maneuver have no \pm figures assigned. The reason for this is to enhance power management skills and flying techniques. When evaluating this maneuver the SP/IP will determine, after the PTA is conducted, whether or not to perform additional maneuvers.

REFERENCES: Appropriate common references.
TC 1-211, appendix B

TASK 2098

Perform aerial radio relay

CONDITIONS: In a UH-1 helicopter equipped with a retransmission control panel.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Identify and tune the appropriate frequency.
2. Establish contact with the message sender.
3. Authenticate, if required.
4. Establish contact with the message receiver.
5. Configure the aircraft radios for radio relay.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused primarily outside the aircraft to provide obstacle clearance.
 - b. The pilot not on the controls (P) will configure the required radios and establish contact with the desired stations for retransmission.
 - c. The P and nonrated crewmember (NCM) will monitor aircraft instruments, assist in clearing the aircraft, and provide adequate warning to avoid traffic and obstacles.
2. Procedures. Set aircraft radio for retransmit: either set mode selector to RETRAN or set appropriate receiver-transmitter to the desired retransmit frequency. Set the radio retransmission selector switch to radios used. Establish communication between each relay radio station by using appropriate ICS TRANS selector. If audio monitoring is desired, adjust audio control for a suitable output. Follow the radio operation procedures outlined in the appropriate aircraft operator's manual to configure each radio for retransmission. (For additional information, see Task 2014.)

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
SOI

TASK 2112**OPERATE ARMAMENT SYSTEM****WARNING**

To prevent accidental firing, do not retract bolt and allow it to go forward if belted ammunition is in the feed tray or a live round is in the chamber. Move cocking handle forward by hand.

CONDITIONS: In a UH-1 helicopter with one or two M60D/M240 B machineguns installed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Install and preflight the M60D/M240 B.
2. Load and safe the weapon.
3. Acquire and identify target.
4. Estimate range to target.
5. Engage target(s) in accordance with weapon control measures, mission briefing, and rules of engagement (ROE).
6. Apply appropriate firing techniques.
7. Suppress, neutralize, or destroy target as applicable.
8. Describe or perform emergency procedures for misfire, hangfire, cookoff, runaway gun, ruptured cartridge, and double feeding.
9. Clear and safe the weapon.

DESCRIPTION:

1. Crew actions. The nonrated crewmember (NCM) will coordinate with and brief any additional ground support personnel prior to installation and loading of the weapon system. Perform installation and preflight inspection of the M60D/M240 B. The NCM will brief all concerned personnel on procedures to be followed in the event of an emergency. The NCM will direct assistance from any additional ground support personnel to aid in installation and loading of the weapon. The NCM will ensure that the proper amount of ammunition is loaded on board the aircraft in accordance with the mission briefing.
2. Procedures.
 - a. Brief additional ground support personnel as necessary. Perform installation and preflight inspection of the weapon ensuring that the gun is safetied to the pintle. Ensure that the ejector control bag and ammunition can is installed. During loading of ammunition, observe all safety precautions while loading. After loading the ammunition, ensure the safety button is in (S) position.
 - b. To initiate the firing sequence, push the safety button to the (F) position, press the trigger fully and hold. Low cycle rate of fire of the machinegun allows firing of single rounds or short bursts. The trigger must be completely released for each shot. Conduct weapons engagement in accordance with the mission briefing, rules of engagement (ROE), and crew

briefing. After acquiring and identifying the target, estimate range, ensuring that the target is within the weapon's field of range and the kill zone is within the weapon's effective range. Use correct firing techniques and ballistic corrections to successfully suppress, neutralize, or destroy the threat. Consideration must be given to the intervisibility of friendly and enemy positions and try to avoid any undesirable collateral damage or fratricide incidents.

c. Perform any firing malfunction emergency procedures as required for misfire, hangfire, cookoff, runaway gun, ruptured cartridge, or double feeding of cartridges. Firing malfunctions and corrective actions must be committed to memory.

d. After target engagement, clear and safe the weapon. Ensure the safety button is in the (S) position. After completion of the mission, record any information as required on DA Form 2408-12, DA Form 2408-13, or DA Form 2408-13-1. Refer to FM 1-140 for details on helicopter gunnery qualification.

MULTIHELICOPTER DOOR GUNNER EMPLOYMENT: Aircrews and door gunners in the formation must use effective crew coordination procedures to visually acquire, identify, and engage targets. Both aircraft and passengers are vulnerable to attack during air movement operations and throughout all phases of air assault operations. Therefore, it is imperative that door gunners respond by delivering direct and indirect fires on these targets. The unit must develop standing operating procedures (SOPs) for door gunners during formation flights.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: During night or NVG operations, range estimations will be more difficult and will require using proper scanning techniques. Correct firing techniques and ballistic corrections will be more critical for target suppression or destruction. During firing, while wearing NVGs, crewmembers may lose targets due to muzzle blast and the brightness of the tracers.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 2116**Perform an aerial radiological survey**

CONDITIONS: In a UH-1 given a tactical map, atmospheric conditions in the area to be surveyed, DA Form 1971-R (*Radiological Data Sheet—Monitoring or Point Technique*) or DA Form 1971-1-R (*Radiological Data Sheet—Route Technique or Course Leg Technique*).

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Plan and conduct a simplified or detailed aerial survey using a route, course-leg, or point technique.
2. Select a specific location for the survey meter in the aircraft to obtain accurate dose-rate readings for determining the air-ground correlation factor.
3. Record and report information determined from the aerial survey.

DESCRIPTION:

1. The two types of aerial surveys used by the crew are simplified and detailed. The techniques used to conduct these surveys are point, route, and course-leg.
 - a. Point technique. The procedure for using the point technique depends on the situation. When the situation permits, readings are taken by dismounting from the aircraft. When the situation does not permit, the ground dose is estimated by using the air-ground correlation factor and an aerial dose-rate reading.
 - b. Route technique. The route technique involves the pilot on the controls (P*) flying between two checkpoints, following a route or a prominent terrain feature such as a road.
 - c. Course-leg technique. The course-leg technique involves the P* flying a straight-line course between two checkpoints. The procedure for obtaining dose-rate information between two checkpoints is the same for both the route and the course-leg techniques.
2. The crew must select a specific location in the aircraft for the survey meter. All dose-rate readings must be made with the meter in that location. Dose-rate readings are used to determine the air-ground correlation factor. The air-ground correlation factor is the ratio of a ground dose-rate reading to a reading taken at approximately the same time in an aircraft over the same spot on the ground.
3. Information obtained by using the point technique is recorded on DA Form 1971-R. Information obtained by using the route or course-leg technique is recorded on DA Form 1971-1-R. Information collected during the survey is delivered to the control party by physical drop or electronically.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically.
2. Evaluation will be conducted in the aircraft or academically.

REFERENCES: Common standard references.

TASK 2118

Operate weather radar mapping system

CONDITIONS: In a UH-1 helicopter with installed radar weather mapping system.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Operate the installed radar weather mapping system.
2. Select 360-degree or 120-degree forward sector and nautical mile distance for best weather representation.
3. Select and utilize the appropriate screen (self-test, main menu, time date, options presentation).
4. Interpret weather data and adjust mission to avoid severe weather.

DESCRIPTION:

1. Crew actions.
 - d. The pilot on the controls (P*) will focus primarily outside the aircraft and respond to navigation cues given by the pilot not on the controls (P). The P* flies the mission profiles at the appropriate airspeeds, altitudes, and headings as directed by the P.
 - e. The P monitors all mission equipment and utilizes the radar weather mapping system.
 - f. The P will direct the P* with heading changes or request route changes from air traffic control (ATC).
2. Procedures. Perform the turn-on, and select operational modes as per the airworthiness release (AWR) and/or manufacturer's manual. Consider the flight planning factors utilizing the radar weather mapping system. Know and understand factors and or weather adversely affecting the aircraft, which could result in degraded mission performance or the mission being changed or aborted. The proper shutdown procedures will be performed as per the manufacturer's manual.

NIGHT OR NVGNIGHT VISION GOGGLE CONSIDERATIONS: Ensure the radar weather mapping system lighting adjustment is set at an acceptable level for night or NVG operations.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training. Training will be conducted in the aircraft.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:
Manufacturer's manual.

TASK 2120**Perform patient evacuation and treatment**

CONDITIONS: In a medical evacuation (MEDEVAC) configured H-1 helicopter, given a medical equipment set (air ambulance), with an actual or simulated patient(s), additional equipment according to local medical treatment protocols, manufacturer's instructions, medical equipment preflight checklist, TC 8-800 (MEDIC) skill evaluation conditions, STP 8-91W15-SM-TG and standing operating procedure (SOP).

Note. The commander will establish written unit treatment protocols. These protocols should be in cooperation with the unit's wartime mission, peacetime operations, local emergency medical services (EMS), and flight surgeon's directives.

Note. The commander will establish written inspection criteria covering security, amounts of equipment required (IV fluids, oxygen, etc) and serviceability requirements of equipment. The must also specify the documentation and reporting requirements for the medical equipment preflight checklist.

STANDARDS: Flight Medic-

1. Perform preflight inspection of all assigned medical equipment, identify and correct deficiencies, annotate inspection results on medical equipment checklist
2. Configure the aircraft for loading patients
3. Perform casualty triage and care
4. Brief litter teams and passengers on procedures for approaching, loading and leaving the aircraft
5. Load and secure litter and ambulatory patients, equipment and baggage/Unload at destination
6. Relay essential patient information and ETA to the medical treatment facility
7. Respond to medical control's directives

NCM-

1. Configure the aircraft for loading patients
2. Load and secure litter and ambulatory patients, equipment and baggage/Unload at destination

Note. This task encompasses many individual subtasks and must be evaluated using the skill set sheets in TC 8-800 (MEDIC) and STP 8-91W-SM-TG. Tables I-VII can be completed prior to the APART, but must be evaluated prior to completing Table VIII. Scenarios should be developed to reflect the unit's mission and flight surgeon's directives. DA Forms 7440-R and 7441-R (TC 8-800, June 2002) will be used to evaluate these tasks and DA Form 7442-R will be used to track to record the results of this evaluation which will then be kept in the miscellaneous section of the crewmember's IATF.

DESCRIPTION:

1. Preflight/Prior to patient contact

- a. Visually check the assigned equipment for accountability, cleanliness and serviceability. Check the battery charge level and test all battery-operated equipment. Familiarize assisting crewmembers on the use and location of all assigned medical equipment.
- b. Identify deficiencies and document results of the preflight inspection on the medical equipment checklist and replace any unserviceable equipment
- c. Configure the aircraft for loading patients

2. Patient contact

- a. Perform triage as necessary and treat injuries and illnesses per local medical treatment protocols , TC 8-800 (MEDIC) and STP 8-91W15-SM-TG
- b. Use all medical equipment required for appropriate patient treatment and monitoring per the manufacturer's instructions
- c. Coordinate loading procedures

3. Movement to aircraft

- a. Direct/escort ambulatory patients to seats and ensure they have been briefed. Load and secure litter patients, medical equipment and baggage as required. Advise the PC when prepared for departure

Note. If aircraft is equipped with extended range fuel system (ERFS) tanks, loading and unloading of patients should be performed from both sides of the aircraft because the litter support unit may need to be placed at a 45 degree angle from the load position

- b. Additional patient restraint: Always try to identify the need to restrain a patient before loading. If possible, have the requesting agency "chemically restrain" the patient. Restraining a patient in flight is difficult and dangerous. Tell the patient gently and repeatedly why the devices are being used-that they are for the patient's safety and to prevent further injury, whether the patient seems able to respond or not. Reassure the patient that someone will always be near to help and care for them. The normal reaction of a confused patient is to resist restriction of movement. Restrain the patient according to current patient treatment protocols.

Note. Physical restraints pose potential risk for injury to the patient in the form of musculoskeletal, vascular and nerve injury by both overzealous application and the patient's resistance to the restraints.

- c. Additional Enemy Prisoner of War (EPW) restraint: Be aware of local protocols and requirements (i.e. Rules of Engagement, Detainee Operations) when using restraints from confinement units or when EPW's are received from units that have field expedient restraints placed on them. Ensure they do not interfere with medical treatment.

4. In-flight care

- a. Continue treatment and monitoring of all patients
- b. Relay patient information and ETA using correct radio procedures
- c. Comply with instructions from medical control and advise them of any pertinent changes in patient(s).

5. Unloading aircraft

- a. Upon landing, direct/escort ambulatory patients away from the aircraft
- b. Unload litter patients as required
- c. Give appropriate documentation and patient information to the receiving medical authorities

TRAINING AND EVALUATION REQUIREMENTS

3. Training. Training to include Tables I-VII of TC 8-800 may be conducted in the aircraft or academically by a 68W FI/SI.
4. Evaluation. Evaluation to include Table VIII evaluations will be conducted in the aircraft by a 68W FI/SI.

REFERENCES:

- Appropriate common references
- Medical equipment manufacturer's instructions
- Medical equipment checklist
- Unit standing operating procedures (SOP)
- TC 8-800 (MEDIC), August 2006
- DA Form 7440-R, (Blank Scenarios and Nuclear, Biological, and Chemical [NBC] Development Tool); DA Form 7441-R, (Coordinators Checklist—[Table VIII]); and DA Form 7442-R, (Table VIII—Tracking Sheet) (TC 8-800, June 2002)
- FM 4-02.2
- JP 4-02
- STP 8-91W15-SM-TG (Health Care Specialist Levels 1/2/3/4/5)
- Local medical treatment protocols

TASK 2125

PERFORM PINNACLE / RIDGELINE OPERATION

CONDITIONS: In a UH-1 helicopter with the before-landing check completed.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Rated.
 - a. Reconnaissance.
 - (1) Establish desired altitude ± 100 feet.
 - (2) Establish desired airspeed, ± 10 knots indicated airspeed (KIAS).
 - (3) Properly perform a continuous reconnaissance.
 - b. Approach.
 - (1) Maintain ground track alignment with the selected approach path with minimum drift.
 - (2) Maintain a constant approach angle.
 - (3) Maintain an appropriate rate of closure.
 - (4) Execute a smooth, controlled termination in the forward, usable one-third of the landing area.
 - c. Takeoff.
 - (1) Perform a hover power check, if required, and complete a before-takeoff check without error.
 - (2) Perform an airspeed-over-altitude takeoff while maintaining heading ± 10 degrees.
2. Nonrated Ensure all passengers and cargo are secure prior to final approach.

DESCRIPTION:

1. Crew actions.
 - a. The pilot on the controls (P*) will remain focused outside the aircraft to evaluate the suitability of the area; determine the effects of the wind; and clear the aircraft throughout the approach, landing, and takeoff. The P* will announce any deviation from the approach, to include go around. The P* will focus attention outside the aircraft during the takeoff maneuver, announce intent to take off, and give the direction of takeoff.
 - b. The pilot not on the controls (P) will acknowledge any intent to deviate from the approach or takeoff. The P and nonrated crewmember (NCM) will acknowledge when ready for takeoff and remain focused outside the aircraft to assist in clearing and to provide adequate warning of obstacles. They will announce when their attention is focused inside the aircraft (for example, when monitoring cockpit instruments, performing map navigation, or verifying the security of passengers or equipment).
 - c. The NCM will perform the following actions:
 - (1) During the approach, assist the aviator in conducting a low reconnaissance of the landing area to determine its suitability. Advise the P* when the aircraft is clear of obstacles.

(2) If requested by the P*, call out the altitude down to 25 feet in 25-foot increments beginning at 100 feet AGL). Then call out altitude from 25 feet to 5 feet in 5-foot increments and from 5 feet to touchdown of the skids in 1-foot increments.

(3) After the aircraft is stabilized on the ground, conduct a ground reconnaissance as directed by the PC. Note obstacles and evaluate the suitability of the pinnacle or ridgeline for future operations.

(4) If requested by the P*, call out the skid height up to 5 feet in 1-foot increments during the takeoff. Then call out the skid height to 25 feet in 5-foot increments and to 100 feet in 25-foot increments. Advise the aviator when the aircraft is clear of obstacles.

Note: If two nonrated crewmembers are assigned to the flight, the crewmember not engaged in calling out the aircraft height should keep the P* informed of obstacles to the rear.

2. Procedures.

a. The P* will select a flight path, an airspeed, and an altitude that allows them to observe the landing area. When practical, the P* will position the aircraft on the windward side of the pinnacle or ridgeline. The P* will select a touchdown point in the forward, usable one-third of the landing area, announce termination of the approach to a hover or to the ground, and announce the tentative takeoff path. The approach angle can vary from a shallow to a steep angle, depending on the wind (demarcation line), density altitude, gross weight (GWT), and availability of forced landing areas. The crew will continue the reconnaissance on the final approach to confirm information previously gained. The rate of closure on the final approach may be difficult to determine because of motion parallax, until the aircraft is close to the landing point. The P* will reduce airspeed to slightly above effective translational lift (ETL) until the rate of closure can be determined. The P* will then adjust the rate of closure to not faster than that of a brisk walk. The P* will execute a go-around if the reconnaissance reveals that a safe landing cannot be accomplished.

b. The P and NCM will confirm the suitability of the area, assist in clearing the aircraft, and provide adequate warning of traffic or obstacles.

c. After touchdown, the P* will check aircraft stability as they lowers the collective and, if aircraft movement is detected, will reposition the aircraft. The crew will perform a ground reconnaissance and clear the aircraft. The P will perform the before-takeoff check and verify a hover power check if required. The crew will clear the aircraft prior to and during takeoff.

d. The P* will execute an airspeed-over-altitude takeoff and announce his intent to abort or alter the takeoff if required. If the takeoff requires clearing obstacles, the P* will use power as necessary to clear the obstacles while maintaining a constant climb angle and ground track. After clearing the obstacles, the P* will adjust the aircraft's pitch attitude to gain forward airspeed.

Note: To successfully operate in small areas, it may be necessary to place the nose of the aircraft over the edge of the landing area. This may cause a loss of important visual references when on final approach. All crewmembers must assist in providing information on aircraft position in the landing area.

Note: Hover out-of-ground effect (OGE) power is required for this task.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Awareness of the various methods of making a suitable evaluation at night (for example, lines of contrast) is essential. Crews should treat visual obstacles the same as physical obstacles.

TC 1-211

2. When flying above terrain flight altitudes, crews should keep in mind the inherent limitations of the NVG. They should also be aware of the increased difficulty in estimating the rate of closure and make the approach more slowly.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft. Academic and flight training may be conducted at the High Altitude Army Aviation Training Site (HAATS), or utilizing the HAATS Mountain Training program of instruction (POI) if available, or using the recommended program of instruction in FM 1-202, chapter 4.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 2169**Perform aerial observation**

CONDITIONS: In a UH-1 helicopter or orally in a classroom environment.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Use correct visual search techniques.
2. Accurately locate the position of the target.
3. Accurately identify the target.
4. Without error, make appropriate spot reports.

DESCRIPTION:

1. Crew actions.
 - a. The pilot in command (PC) will complete a thorough crew and mission briefing.
 - b. The pilot on the controls (P*) will focus attention primarily outside the aircraft and respond to navigation instructions or cues given by the pilot not on the controls (P). The P* will acknowledge commands issued by the P for the heading and airspeed changes necessary to navigate the desired course(s). The P* will also announce significant terrain features to the P to assist in navigation.
 - c. The P will be responsible for navigation to the desired area and all aerial observation except for the stationary technique.
 - d. The P and course examiner (CE) will assist in clearing the aircraft and provide adequate warning of traffic or obstacles. They also will announce when their attention is focused inside the aircraft.
2. Procedures.
 - a. During missions involving direct observation, the aircrew is concerned with detection, identification, location, and reporting.
 - (1) Detection. Detection requires determination that an object or an activity exists.
 - (2) Identification. Major factors in identifying a target are size, shape, and type of armament. Targets are classified as friendly or enemy.
 - (3) Location. The exact location of targets is the objective of the mission. Depending on the nature of the targets, the observer may be required to locate the center of mass.
 - (4) Reporting. Spot reports provide commanders with critical information during the conduct of missions. The method of spot reporting is specified by the requesting agency. Reports of no enemy sightings are frequently just as important as actual enemy sightings. (Task 2022 shows the standard format for a spot report.)
 - b. Visual search is the systematic visual coverage of a given area so that all parts of the area are observed. The purpose of visual search is to detect objects or activities on the ground. The ability of an observer to search a given area effectively depends on several factors. In addition to the limitations of the human eye itself, the most important of these factors are altitude, airspeed, terrain and meteorological conditions, and visual cues.
 - (1) Altitude. Higher altitudes offer greater visibility with less detail. Lower altitudes are usually used because they increase survivability.

(2) Airspeed. Selection of the airspeed is determined by the altitude, terrain, enemy situation, and meteorological conditions.

(3) Terrain and meteorological conditions. The type of terrain can vary from dense jungle to barren wasteland and will affect the size and details of the area that can be effectively covered. The prevailing terrain and meteorological conditions often mask objects and allow only a brief exposure period, especially at nape of the earth (NOE) altitudes.

(4) Visual cues. In areas where natural cover and concealment make detection difficult, visual cues may indicate enemy activity. Some of these cues are as follows:

- (a) Color. Foliage used to camouflage will differ from the color of natural foliage.
- (b) Texture. Smooth surfaces, such as glass windows or canopies, will shine and reflect light. Rough surfaces do not reflect light.
- (c) Shadows. Manmade objects cast distinctive shadows that are characterized by regular shapes and contours as opposed to random patterns that occur naturally.
- (d) Trails. Trails leading into an area should be observed for cues as to type, quantity, and recentness of traffic.
- (e) Smoke. Smoke should be observed for color, smell, and volume.
- (f) Movement and light. Movements during daylight and light at night are the most easily detectable signs of enemy activity. Movement may include disturbance of foliage, snow, soil, or birds.
- (g) Obvious sightings. The enemy is skillful in the art of camouflage. The aircrew must be aware that obvious sightings may be intentional because of high concentrations of antiaircraft weapons.

c. Systematic methods for conducting visual aerial observation include side-scan, motive, and stationary techniques. The technique used depends on the altitude flown and the terrain encountered.

(1) Side-scan technique. This technique normally is used when the aircraft is operating at an altitude of 100 feet above ground level (AGL) or higher. Over most terrain, the observer systematically—

- (a) Looks out to the visible horizon and searches in toward the aircraft.
- (b) Looks out one-half the distance to the visible horizon and searches in toward the aircraft.
- (c) Looks out one-fourth the distance to the visible horizon and searches in toward the aircraft.

(2) Motive technique. This technique is used when the aircraft is operating at terrain flight altitudes and generally at airspeeds of 10 knots indicated airspeed (KIAS) or faster. The entire area on either side of the aircraft is divided into two major sectors: the nonobservation sector and the observation work sector.

- (a) The nonobservation sector is the area where the aircrew's field of vision is restricted by the physical configuration of the aircraft.
- (b) The observation work sector is that portion of the field of vision to which search activity is confined. The observation work sector is subdivided into two smaller sectors: the acquisition sector and the recognition sector.

- The acquisition sector is the forward 45-degree area of the observation work sector. This is the primary search area. In using the motive technique, the

observer looks forward of the aircraft and through the center of the acquisition sector for obvious sightings. The observer then scans through the acquisition sector, gradually working back toward the aircraft.

- The recognition sector is the remainder of the observation work sector.

(3) Stationary technique. This technique is used at NOE altitudes with the aircraft hovering in a concealed position. When using the stationary technique, the crew makes a quick overall search for sightings unnatural colors, outlines, or movements. The P* starts scanning from the 12 o'clock position through 90 degrees on their side of the aircraft, searching an area approximately 50 meters in depth. This scan continues outward from the aircraft, increasing the depth of the search area by overlapping 50-meter intervals until the entire search area has been covered. The P will duplicate the same technique on his side of the aircraft. The CE and other crewmembers, if assigned, will perform as directed by the PC.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically.
2. Evaluation will be conducted in the aircraft or academically.

REFERENCES: Appropriate common references plus the following:
FM 17-95

This page intentionally left blank.

Chapter 5

Maintenance Test Pilot Tasks

This chapter describes the tasks that are essential for maintaining maintenance crewmember skills. It defines the task title, number, conditions, and standards by which performance is measured. A description of crew actions, along with training and evaluation requirements is also provided. Tasks described in this chapter are to be performed by qualified UH-1 maintenance test pilots in accordance with AR 95-1. This chapter contains tasks and procedures to be used by contractor maintenance test pilots in accordance with AR 95-20, volume 1 (DLAM 8210.1) section 3.4 (publications). Commanders will program six annual flight hours into the flying hour program they execute to support training and evaluations of all maintenance test pilots (MP)/maintenance examiners (MEs) in their aircrew training program (ATP). If discrepancies are found between this chapter and the TM 55-1520-210-23 series maintenance manuals or TM 55-1520-210 – MTF, the task as written in TM 55-1520-210– MTF takes precedence.

5-1. TASK CONTENTS.

a. **Task number.** Each aircrew training manual (ATM) task is identified by a ten-digit systems approach to training number that corresponds to the maintenance test pilot tasks listed in chapter 2 (figure 2-8). For convenience, only the last four digits are referenced in this training circular.

b. **Task title.** This identifies a clearly defined and measurable activity. Task titles may be the same in many ATMs, but task content will vary with the airframe.

c. **Conditions.** The conditions specify the common wartime or training/evaluation conditions under which the MP tasks will be performed. At no time will MPs or MEs log hood time while performing actual maintenance test flights.

d. **Standards.** The standards describe the minimum degree of proficiency or standard of performance to which the task must be accomplished. Standards are based on ideal conditions to which the task must be accomplished. The following common standards apply to all tasks.

(1) Perform procedures and checks in sequence per the appropriate aircraft maintenance test flight (MTF), as required.

(2) Brief the rated crewmember (RCM) and/or nonrated crewmember (NCM) on the applicable procedures, warnings, and cautions for the task to be performed (as denoted in the task description).

(3) Perform crew coordination actions per the task description and chapter 6.

(4) Assess and address any malfunctions or discrepancies as they occur and apply appropriate corrective actions or troubleshooting procedures.

(5) Use the oral callout and confirmation method and announce the initiation and completion of each check.

(6) All tasks require an MP to occupy the pilot crew station. This restriction does not apply to ME training/evaluations.

e. **Description.** The description explains how the elements of the task should be done to meet the standards. When specific crew actions are required, the task will be broken down into crew actions and procedures as follows:

(1) Crew actions. These define the portions of a task to be performed by each crewmember to ensure safe, efficient, and effective task execution. The pilot on the controls (P*) designation does not imply MP duties. When required, P* or MP responsibilities are specified. All tasks in this chapter are to be performed only by qualified MPs/MEs, as outlined in AR 95-1. The MP is the pilot in command (PC) in all situations, except when undergoing training or evaluation by an ME. For all tasks, MP actions and responsibilities are applicable to MEs. When two MEs are conducting training/evaluation together, or two MPs are jointly performing test flight tasks, the mission brief will designate the aviator assuming PC responsibilities.

(2) Procedures. This section describes the actions that the MP/ME performs or directs the RCM/NCM to perform in order to execute the task standard.

f. **Considerations.** This section defines training, evaluation, and other considerations for task accomplishment under various conditions.

g. **Training and evaluation requirements.** Some of the tasks incorporate more than one check from the appropriate aircraft MTF. This section defines the checks in each task that, as a minimum, must be evaluated on an evaluation flight. Figure 2-8 defines readiness level (RL) progression and APART evaluation tasks. The evaluator may select additional checks for evaluation. Training and evaluation requirements define whether the task will be trained or evaluated in the aircraft, simulator, or academic environment. Training and evaluations will be conducted only in the listed environments but may be done in any or all combinations.

h. **References.** The references are sources of information relating to that particular task. In addition to the common references listed in chapter 6, the following references apply to all tasks:

- (1) Aircraft historical records.
- (2) TM 1-1328-23.
- (3) DA Pamphlet 738-751.
- (4) TM 55-1520-210-23 series manuals.
- (5) TM 1-6624-13&P.

(6) Applicable airworthiness directives or messages from U.S. Army Aviation and Missile Command (AMCOM).

5-2. TASK LIST. The following numbered tasks are UH-1 maintenance tasks.

TASK 4000**Perform prior to maintenance test flight checks**

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus the following:

1. Perform the preflight inspection.
2. Determine the suitability of the aircraft for flight and the mission to be performed.
3. Determine the maneuvers, checks, and tasks required during the test flight.
4. Brief the rated crewmember (RCM) and nonrated crewmember (NCM) on the mission and their duties.
5. Make appropriate logbook entries.

DESCRIPTION:

1. Crew actions.
 - a. The maintenance test pilot (MP) will ensure that a thorough preflight inspection is conducted. The appropriate aircraft operator's manual/checklist (CL) may be used to conduct the preflight inspection in lieu of conducting the preflight using the appropriate aircraft operator's manual; however, the inspection will be conducted to the detail level of chapter 8 of the appropriate aircraft operator's manual. The MP may direct the RCM, if available, to complete such elements of the aircraft preflight inspection as are appropriate, but the MP will confirm with the RCM that all checks have been completed. The MP will ensure that the aircraft logbook forms and records are reviewed and appropriate entries made as per DA Pam 738-751. The MP will determine the checks necessary for the maintenance test flight, or tasks to be performed, and conduct a mission briefing for additional crewmembers and required support personnel. The MP will brief the RCM or NCM and any additional support personnel concerning operation on or around the helicopter during ground operations and will ensure that ground communication capability is adequate. The MP will stress any applicable ground or airborne safety considerations or procedures during the briefing. The MP will ensure that a final walk-around inspection is completed prior to flight.
 - b. The RCM should complete the assigned elements and report the results to the MP.
2. Procedures. Review the aircraft forms and records to determine the necessary checks and tasks to be performed. Use additional publications and references as necessary. Conduct a risk assessment of the mission. Preflight the aircraft with special emphasis on areas or systems where maintenance was performed. Verify all test equipment is correctly installed and secured as applicable. Conduct a thorough mission briefing for additional crewmembers and required support personnel. The briefing will include crew coordination responsibilities and conduct of the mission, with special emphasis on safety procedures to be performed during maintenance tasks or maneuvers the additional crewmembers or required support personnel may not be familiar with.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TC 1-211

TASK 4004

Perform before starting engine checks

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
 - a. Each crewmember will complete and record the required checks pertaining to the assigned crew station according to TM 55-1520-242-MTF.
 - b. The aircrew and, if available, the ground crew will announce when their checks are completed.
2. Procedures. Crewmembers will perform, at a minimum, all checks required for flight per TM 55-1520-210-10 or TM 55-1520-210-CL. The type of test flight to be performed (general/limited) will determine the detailed checks required.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4008**Perform starting engine checks**

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
 - a. The maintenance test pilot (MP) will brief the pilot not on the controls (P), nonrated crewmember (NCM), and other crewmembers, as required, to assist in completing the task. The briefing may vary depending on pilot preference, maintenance performed, and crew experience. In the briefing, the MP will include, at a minimum, crew duties in an emergency.
 - b. Each crewmember will complete and record the required checks pertaining to the assigned crew station according to TM 55-1520-210-CL or TM 55-1520-242-MTF.
2. Procedures.
 - a. The MP will announce initiation of engine start.
 - b. The aircrew and, if available, the ground crew will clear the area around the aircraft prior to each engine start.
 - c. Before starting the engines, the crew will ensure that all appropriate internal and external lights are operational and properly set and tiedowns and covers are removed and secured.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TC 1-211

TASK 4012

Perform engine run-up checks

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions. Crewmembers will perform, at a minimum, all checks required for flight per TM 55-1520-210-10 or TM 55-1520-210-CL. The type of test flight to be performed (general/limited) will determine the detailed checks required.
2. Procedure. Each crewmember will complete and record the required checks pertaining to the assigned crew station. The aircrew and, if available, the ground crew will announce when their checks are completed.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4016

Perform before-takeoff checks

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions. Each crewmember will complete the required checks pertaining to the assigned crew station. The maintenance test pilot (MP) will ensure that the before-takeoff checks are completed according to TM 55-1520-242-MTF.
2. Procedures.
 - a. The MP will direct the pilot not on the controls (P) or nonrated crewmember (NCM) to call out the before-takeoff checks per TM 55-1520-242-MTF.
 - b. The P or NCM will call out the before-takeoff checks when directed.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4020

Perform baseline or normal engine health indicator test

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus the following:

Correctly complete the health indicator test (HIT) baseline worksheet (this may be conducted orally).

DESCRIPTION:

1. Crew actions.
 - a. All crewmembers will clear the area around the aircraft.
 - b. The pilot on the controls (P*) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist him by monitoring the aircraft systems and flight instruments, providing obstacle clearance, and performing other duties as directed.
2. Procedures.
 - a. The maintenance test pilot (MP) will assign duties to the P or NCM while performing this check. The P* will position the helicopter heading into the wind. The aircrew will perform the procedure as outlined in TM 55-1520-242-MTF or TM 55-2840-229-23-1.
 - b. The P or NCM will record the aircraft hours, free air temperature, and indicated exhaust gas temperature (EGT) for the appropriate gas turbine speed. He will then compute the EGT difference and record it on the aircraft HIT log.
 - c. If the check is actual for record, it is recommended that 3 checks be done to verify accuracy. The MP will ensure the historical records are updated accurately.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4024**Perform takeoff to hover check**

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Determine proper cyclic, collective, and pedal control responses.
2. Establish a 5-foot hover, ± 1 foot.
3. Correctly determine proper center of gravity.
4. Determine proper droop cam operation.

DESCRIPTION:

CAUTION

Any excessive control displacement during this maneuver will require a static rigging check prior to continuation of the flight.

1. Crew actions.
 - a. All crewmembers will clear the area around the aircraft.
 - b. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing obstacle clearance, and performing other duties as directed.
 - c. The MP will announce his intent to bring the aircraft to a hover.
2. Procedures.
 - a. With the collective fully down, the MP will place the cyclic in the neutral position. The MP will then increase the collective with a smooth, positive pressure. The MP will apply pressure to the pedals to maintain heading and coordinate the cyclic to achieve a vertical ascent. The MP will adjust the collective to maintain the desired altitude and check that the N_2 speed remains constant within ± 40 revolutions per minute (RPM). While the aircraft is hovering into the wind, the MP will ensure that the cyclic is nearly centered and the pedal position is normal.
 - b. The P or NCM will remain focused primarily inside the aircraft. When clear of the parking area, the P or NCM will check the area for indications of fuel and oil leaks.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TC 1-211

TASK 4028

Perform torquemeter / power check

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain aircraft into the wind ± 10 degree.
2. Maintain a stabilized 5-foot hover, ± 1 foot.
3. Correctly compare torque indication with performance planning card (PPC) data.

DESCRIPTION:

1. Crew actions.
 - a. All crewmembers will clear the area around the aircraft.
 - b. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing obstacle clearance, and performing other duties as directed.
2. Procedures. The MP will call out the observed torque. The P or NCM will compare the indicated torque with the predicted torque and will advise the MP of the difference.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4032**Perform hovering turns check**

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain a stabilized 5-foot hover, ± 1 foot.
2. Establish aircraft heading into the wind. ± 10 degrees.
3. Correctly perform left and right turns of 90 degrees to either side of the wind direction.
4. Correctly determine aircraft controllability and tail rotor response.

DESCRIPTION:

CAUTION

Do not exceed 90-degree rate of turn in less than four seconds.

1. Crew actions.
 - a. All crewmembers will clear the area around the aircraft.
 - b. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing obstacle clearance, and performing other duties as directed.
2. Procedures. The MP will apply pressure on the desired pedal to begin the turn. Using pressure and counterpressure on both pedals to maintain a constant rate of turn, the MP will note that excessive pedal pressures are not required and pedal positions are normal.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TC 1-211

TASK 4036

Perform sideward hovering flight check

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus the following.

1. Maintain a stabilized 5-foot hover, ± 1 foot.
2. Establish aircraft heading into the wind and the flight path perpendicular to the wind direction.
3. Correctly determine aircraft controllability and tail rotor response.
4. Maintain hover speed consistent with autorotational capacities.

DESCRIPTION:

1. Crew actions.
 - a. All crewmembers will clear the area around the aircraft.
 - b. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing obstacle clearance, and performing other duties as directed.
2. Procedure. The MP will apply cyclic in the desired direction of flight, noting that no excessive inputs are required. After the MP neutralizes the cyclic, the aircraft should coast to a stabilized hover.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4040**Perform forward hovering flight check**

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain a stabilized 5-foot hover, ± 1 foot.
2. Maintain aircraft heading into the wind, ± 10 degrees.
3. Correctly determine aircraft controllability and tail rotor response.
4. Correctly accelerate forward to effective translational lift (ETL).

DESCRIPTION:

1. Crew actions.
 - a. All crewmembers will clear the area around the aircraft.
 - b. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing obstacle clearance, and performing other duties as directed.
2. Procedures. The MP will apply sufficient forward cyclic to accelerate to ETL. The MP will note that no excessive control inputs are required and the aircraft controls respond normally.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TC 1-211

TASK 4044

Perform pylon mounts check

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain a stabilized 5-foot hover, ± 1 foot.
2. Maintain aircraft heading into the wind, ± 10 degrees.
3. Correctly induce pylon rock.

DESCRIPTION:

1. Crew actions.
 - a. All crewmembers will clear the area around the aircraft.
 - b. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing obstacle clearance, and performing other duties as directed.
2. Procedure.
 - a. The MP will move the cyclic fore-and-aft not to exceed 2 to 3 inches, at a rate and stroke(s) sufficient to induce pylon rock. The MP will then neutralize the cyclic and record the number of cycles (beats) required to dampen pylon rocking. Bumping must dampen out within five cycles (beats). The MP will note that no abnormal vibrations or engine surges occur. The hydraulic caution light must not illuminate.
 - b. The P or NCM will advise the MP if the hydraulic caution light illuminates or the torque meter fluctuates abnormally.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4048**Perform engine response check**

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Initiate the check from a 5-foot hover ± 1 foot.
2. Maintain aircraft heading into the wind ± 10 degrees.
3. Correctly determine engine response.

DESCRIPTION:

1. Crew actions.
 - a. All crewmembers will clear the area around and above the aircraft.
 - b. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing obstacle clearance, and performing other duties as directed.
2. Procedures.
 - a. The MP will make a positive application of collective pitch. The engine must respond smoothly and rapidly and not stall. If power turbine (speed) (N_2) droops during the collective application, N_2 must recover before the aircraft is 50 feet above ground level (AGL) or before the MP reduces the collective.
 - b. The P or NCM will advise the MP if N_2 droop occurs. The MP will ensure that airframe and engine limitations are not exceeded.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4052

Perform power cylinder check

CONDITION: In a UH-1 helicopter, with a rated crewmember (RCM) in the left seat with access to the flight controls.

STANDARDS: Appropriate common standards plus the following:

1. Maintain a stabilized 15-foot hover, ± 5 feet.
2. Maintain aircraft heading into the wind, ± 10 degrees.
3. Maintain position over starting point within a 10-foot radius.

DESCRIPTION:

Note: Requires briefing in accordance with TM 55-1520-242-MTF.

1. Crew actions.
 - a. All crewmembers will clear the area around and above the aircraft.
 - b. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The rated crewmember (RCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing obstacle clearance, and performing other duties as directed.
2. Procedure.
 - a. The MP will brief the RCM on the emergency procedure for induced control lockup. After establishing a 15-foot hover, the MP will move the cyclic smoothly and progressively up 6 to 8 inches along a 45-degree line from the left rear to the right forward quadrant at least five strokes. The MP will note the proper operation of the right cyclic servo and ensure that the hydraulic pump will function normally when the controls are moved faster than a normal rate. The MP will check the left servo similarly by moving the cyclic from the right rear to the left forward quadrant at least five strokes. The RCM will ensure that the hydraulic segment caution light does not illuminate.
 - b. The RCM will be prepared to recycle the hydraulic control switch upon the command "Recycle" or to turn the hydraulics off upon the command "Hydraulics OFF" from the MP.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4056**Perform low revolutions per minute hover check**

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain a stabilized 5-foot hover, ± 1 foot.
2. Establish aircraft heading into the wind, ± 10 degrees.
3. Correctly perform 45-degree left and right turns to either side of the wind direction.
4. Correctly determine aircraft controllability, and tail rotor response.

DESCRIPTION:

1. Crew actions.
 - a. All crewmembers will clear the area around the aircraft.
 - b. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing obstacle clearance, and performing other duties as directed.
2. Procedure.
 - a. When the aircraft is stabilized at a 5-foot hover, the MP will slowly decrease the N_2 to 6,000 revolutions per minute (RPM) with the governor increase/decrease switch. (If aircraft controllability or control responses become abnormal during RPM reduction the maneuver will be terminated and static control rigging will be checked.) The MP will check anti-torque controllability by performing 45-degree hovering turns to the left and right of the initial heading. While the aircraft is stabilized at 6000 RPM and a 5-foot hover, the MP will ensure that no excessive lateral vibrations are evident. While maintaining a 5-foot altitude, the MP will then increase the RPM to 6600 with the governor increase/decrease switch.
 - b. The P or NCM will reset the low RPM warning switch on the command of the MP.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4060

Perform manual throttle operations, emergency governor mode check

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Without error, perform the procedure to change the governor to the emergency mode according to the description below.
2. Maintain aircraft heading into the wind ± 10 degrees.
3. Maintain 6400 revolutions per minute (RPM), ± 200 .
4. Correctly establish 5-foot hover, ± 1 foot.

DESCRIPTION:

CAUTION

Throttle and collective coordinated control movements must be smooth to prevent compressor stall, overspeed, overtemperature or engine failure. Closely monitor gas producer (speed) (N_1), power turbine (speed) (N_2) and exhaust gas temperature (EGT).

Note: A fluctuation of the torquemeter may occur between 6300 and 6500 RPM as a result of the transient opening and closing of the bleed band; this is normal. If bleed band cycling cannot be controlled, the governor decrease switch may be depressed (beeped down) to eliminate the cycling effect.

1. Crew actions.
 - a. All crewmembers will clear the area around the aircraft.
 - b. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing obstacle clearance, and performing other duties as directed.
2. Procedure.
 - a. While the aircraft is on the ground with RPM stabilized at 6600 and the collective fully down, the MP will retard the throttle to the engine idle stop. After the engine stabilizes at engine idle RPM, the MP will move the governor control switch to the emergency position. The MP will note a decrease in engine RPM and proper operation of the caution light. The MP will adjust the throttle to 6400 RPM and bring the aircraft to a stabilized 5-foot hover by smoothly increasing the collective and adjusting the throttle to maintain 6400 RPM. The MP will apply cyclic and pedals as necessary to remain stationary and to maintain a constant heading. Upon completion of the hover, the MP will land the aircraft by smoothly reducing the collective and adjusting the throttle to maintain 6400 RPM. After landing the aircraft, the MP will reduce the throttle to the engine idle position. After noting a decrease in engine RPM, the MP will move the governor control switch to the automatic position. After

verifying that the N_1 is stabilized at engine idle RPM, the MP will increase the throttle to the fully open position and verify the proper N_2 RPM setting.

b. The P or NCM will ensure that airframe and engine limitations are not exceeded.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TC 1-211

TASK 4064

Perform takeoff and climb checks

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

Correctly perform visual meteorological conditions (VMC) takeoff.

DESCRIPTION:

1. Crew actions.
 - a. All crewmembers will clear the area around the aircraft.
 - b. The maintenance test pilot (MP) will remain focused outside the aircraft throughout the maneuver to provide obstacle clearance. The MP will announce whether the takeoff is from the ground or from a hover and the intent to abort or alter the takeoff.
2. Procedure.

The MP will determine the direction of takeoff by analyzing the wind, the long axis of the takeoff area, and the lowest obstacles. The pilot not on the controls (P) or nonrated crewmember (NCM) will select reference points to assist in maintaining the takeoff flight path. The MP will coordinate the cyclic and collective as necessary to attain a constant angle of climb that will ensure obstacle clearance. The P or NCM will monitor power requirements and advise the MP if power limits are being approached. Without exceeding aircraft limitations, the MP will use the power necessary to clear obstacles. After clearing obstacles, he will smoothly adjust the flight controls to continue climbing to the test altitude.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4068**Perform level off checks**

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain predetermined altitude, ± 100 feet.
2. Determine airspeed indicator accuracy using a 2-foot hover torque.
3. Correctly record instrument readings.
4. Initiate a fuel consumption check.

DESCRIPTION:

1. Crew actions. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist him by monitoring the aircraft systems and flight instruments, providing cloud clearances, and performing other duties as directed.
2. Procedures.
 - a. The MP will initiate a climb to the level-off altitude and establish 100 knots indicated airspeed (KIAS). After allowing the instruments to stabilize for one minute, the MP will direct the P or NCM to record the engine oil temperature and pressure, transmission oil temperature and pressure, exhaust gas temperature, fuel quantity, and time.
 - b. The MP will apply the prerecorded 2-foot hover power torque and will note the airspeed indicators at 100 KIAS, ± 5 KIAS.
 - c. At the direction of the MP, the P or NCM will call out and record the appropriate items on the maintenance test flight check sheet.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TC 1-211

TASK 4072

Perform control rigging check

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing cloud clearances, and performing other duties as directed.
2. Procedures.
 - a. The MP will initiate a climb to the level-off altitude. Using 30-psi torque, the MP will establish airspeed of 100 KIAS with force trim switch on. With the aircraft in trim, the cyclic should be centered laterally and the right pedal will be 1 to 2 inches forward of the left. The force trim should hold the cyclic and pedals in position. The MP will ensure that the collective does not creep up or down.
 - b. At the direction of the MP, the P or the NCM will verify that the cyclic and pedal positions on the copilot's station are in the same configuration or position as those on the pilot's station.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4076**Perform autorotation revolutions per minute check**

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Establish airspeed of 60 knots indicated airspeed (KIAS), +5, -0 KIAS.
2. Correctly perform autorotation entry procedures.
3. Correctly call out rotor revolutions per minute (RPM), torque, gas producer (speed) (N1), and vibrations.
4. Correctly perform power recovery procedures prior to descending below 500 feet above ground level (AGL).

DESCRIPTION:

1. Crew actions. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing cloud clearances, and performing other duties as directed.
2. Procedure. The MP will initiate a climb to his entry altitude. The MP will initiate autorotation by reducing the collective to the fully down position and retarding the throttle to the engine idle position. When the MP has established a stabilized autorotational descent, he will call out the main rotor RPM, torque, and N1 instrument readings. There should be no increase in vibrations, and some right pedal should be available. The MP will initiate a power recovery prior to descending below 500 feet AGL. The MP will smoothly increase the throttle to the fully open position and check that the engine and rotor RPM needles are joined. The MP will then increase collective to establish a positive rate of climb.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4080

Perform hydraulics off check

CONDITION: In a UH-1 helicopter, with a rated crewmember (RCM) in the left seat with access to the flight controls.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Establish an airspeed of 80 knots indicated airspeed (KIAS), ± 10 KIAS.
2. Correctly determine aircraft controllability.
3. Correctly determine collective forces.

DESCRIPTION:

Note: Requires briefing in accordance with TM 55-1520-242-MTF.

1. Crew actions. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The rated crewmember (RCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing cloud clearances, and performing other duties as directed.
2. Procedures.
 - a. The MP will instruct the RCM to identify the hydraulic control switch and back him up at the controls. The RCM will be instructed and prepared to place the hydraulic control switch in the opposite position (ON or OFF) if a servo hard-over occurs. When directed by the MP, the RCM will place the switch in the OFF position. The RCM will verify that the appropriate caution lights have illuminated and then reset the master caution light.
 - b. The MP will check cyclic forces by making cyclic inputs to the left and right forward quadrants. The cyclic forces should be approximately equal. The MP will check the collective forces by reducing the collective to attain a 10 to 13 psi torque reading for metal blades (10 psi for composite blades), then increase the collective to attain a 33 to 35 psi torque reading for metal blades (40 psi for composite blades). The pressure required to reduce and increase the collective should be approximately equal. Throughout the maneuver, the MP will maintain the aircraft in trim with the antitorque pedals and ensure that all control forces are not excessive.
 - c. After checking the collective forces, the MP will adjust the collective to attain level flight and direct the RCM to back him/her up at the controls, and be prepared to place the hydraulic control switch in the opposite position (ON or OFF) if a servo hard-over occurs. When directed by the MP, the RCM will place the hydraulic control switch in the ON position. The RCM will confirm that the appropriate caution lights extinguish.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4084**Perform turbine engine analysis check**

CONDITION: In a UH-1 helicopter, with a rated crewmember (RCM) in the left seat with access to the flight controls.

STANDARDS: Appropriate common standards plus the following:

1. Correctly determine normal/baseline check requirements.
2. Establish an airspeed of 70 knots indicated airspeed (KIAS), ± 10 KIAS.
3. Correctly determine the topping altitude.
4. Correctly record and analyze engine topping data.

DESCRIPTION:

Note: Requires briefing in accordance with TM 55-1520-242-MTF.

1. Crew actions. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The RCM will assist the MP by monitoring the aircraft systems and flight instruments, providing cloud clearances, recording data values associated with the check, and performing other duties as directed.

2. Procedures. The MP will initiate a climb to an altitude of 1,000 to 500 feet below the estimated, predetermined topping altitude. The MP will then increase the collective to the indicated maximum torque without exceeding gas producer (speed) (N1) or EGT limitations. The MP will maintain this power setting until the power turbine (N2) droops to 6,400 revolutions per minute (RPM) or until reaching a 10,000-foot pressure altitude. When the N2 droops to 6,400 RPM, the MP will adjust the collective to maintain 6,400 RPM and continue to climb to the next whole 1,000-foot altitude (or 10,000 pressure altitude [PA]). The MP will then call out the torque, N1, exhaust gas temperature (EGT), and altitude while maintaining 6,400 RPM. The RCM will record the torque, N1, EGT, and altitude. The MP will further increase the collective until the N2 droops to 6,200 RPM, verifying that the N1 has not increased. The MP will then reduce the collective slowly and smoothly and descend to the topping altitude. The MP will maintain this altitude for one minute and then have the RCM read and record the free air temperature.

Note: If 10,000 PA is reached prior to the N₂ droop or if the topping altitude cannot be reached because of environmental conditions, the crew will perform a power performance check per TM 55-2840-229-23-1.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

Note: Actual engine topping is not required during training and evaluation. The intent of this task is to demonstrate maneuver proficiency.

REFERENCES: Appropriate common references.

TASK 4088

Perform stabilizer bar check

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus the following:

1. Establish an airspeed of 80 knots indicated airspeed (KIAS), ± 10 KIAS.
2. Maintain predetermined altitude, ± 100 feet.
3. Verify that the force trim is on.

DESCRIPTION:

1. Crew actions. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments providing cloud clearances, and performing other duties as directed.
2. Procedures. The MP performs the stabilizer bar check using one of the following methods:
 - a. **Method 1.** The MP will maintain level flight, depress the force trim release button on the cyclic grip, and apply lateral cyclic (left or right) to obtain a 10- to 20-degree angle of bank. When the angle of bank is established, simultaneously the MP will release the force trim button and note the number of seconds required for the angle of bank to increase. The stabilizer bar dampers should allow the bank angle to begin increasing at 5 seconds, ± 1 second.
 - b. **Method 2.** The MP will establish and maintain a constant 10- to 20-degree angle of bank (left or right) for a minimum of 10 seconds. When the angle of bank is established, the MP will depress the force trim release button on the pilot's cyclic grip and apply lateral cyclic to level the aircraft. After neutralizing the cyclic to level the aircraft, the MP will release the force trim button and note the number of seconds required for the angle of bank to begin to increase. The stabilizer bar dampers should allow the bank angle to begin increasing at 5 seconds, ± 1 second.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4092**Perform vibration analysis check**

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly compute the velocity never to exceed (Vne).
2. If appropriate, identify types of vibrations encountered.
3. Prescribe corrective action.
4. If appropriate, perform aviation vibration analyzer (AVA) procedures outlined in TM 1-6625-724-13&P, appendix L.

DESCRIPTION:

1. Crew actions. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing cloud clearances, and performing other duties as directed.
2. Procedure.
 - a. The MP will maintain level flight starting at 70 knots indicated airspeed (KIAS) and then increase the airspeed until a 1:1 vertical vibration becomes noticeable. The MP will have the P or NCM record the airspeed. While maintaining that airspeed, the MP will reduce power to a 10-psi torque and begin a descent. The MP will note and have the P or NCM record any change (increase/decrease) in the 1:1 vertical vibration levels experienced during the low-power descent. The MP will then adjust the collective to reestablish level flight.
 - b. The MP will maintain level flight and increase airspeed slowly to the computed Vne in 10-knot increments (unless vibrations become severe). The MP will note the changes in 1:1 vertical vibrations levels and have the P or NCM record the airspeeds at which the vibrations become evident.
 - c. If AVA equipment is installed, the MP will brief the P or NCM in the procedures to be followed. The MP will designate the P or NCM to operate the control and display unit (CADU).

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TC 1-211

TASK 4096

Perform cyclic rigging check

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly compute the Vne.
2. Correctly measure the cyclic position.

DESCRIPTION:

1. Crew actions. The maintenance test pilot (MP) will remain focused primarily outside the aircraft. The pilot on the controls (P) or nonrated crewmember (NCM) will assist the MP by monitoring the aircraft systems and flight instruments, providing cloud clearances, and performing other duties as directed.
2. Procedure. The MP will maintain level flight and accelerate to the computed Vne. The MP will ensure that a minimum clearance of 2 inches remains between the pilot's cyclic stick and the instrument panel.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4100**Perform flight instrument checks**

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions. The pilot on the controls (P*) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the P* by monitoring the aircraft systems and flight instruments, providing cloud clearances, and performing other duties as directed.

2. Procedures. The P* will perform climbing and descending turns, while the P or NCM records the operation of the flight instruments. The instruments checked are the attitude indicators altimeters, gyro compass indicators, vertical speed indicators, standby compass, turn-and-slip indicator, and clock. The P* also will note that the instrument panel does not vibrate excessively.

Note: Use standard rate turns and 500 feet per minute (FPM) rates of climb/descent. Perform 180-degree turns and 500-foot climbs and descents. Compare instrument indications and reactions against time.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TC 1-211

TASK 4104

Perform communication and navigation equipment checks

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly check installed navigation equipment.
2. Correctly check installed communication equipment

DESCRIPTION:

1. Crew actions. The pilot on the controls (P*) will remain focused primarily outside the aircraft. The pilot not on the controls (P) or nonrated crewmember (NCM) will assist the P* by monitoring the aircraft systems and flight instruments, providing cloud clearances, and performing other duties as directed.
2. Procedures. The MP will check the operation of installed communication and navigation equipment per TM 55-1520-242-MTF, section IV, or other appropriate manuals.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4108

Perform special / detailed procedures checks

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions. Crewmembers will check any special equipment installed in the aircraft.
2. Procedures. Crewmembers will demonstrate knowledge of the system and published operational checks, charts, graphs, and worksheets.

Note: A complete check of all special/detailed procedures is not required for an evaluation.

Note: Selected checks may be performed orally.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TC 1-211

TASK 4112

Perform after-landing and engine shutdown checks

CONDITION: In a UH-1 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
 - a. Each crewmember will complete and record the required checks pertaining to the assigned crew station according to TM 55-1520-242-MTF.
 - c. The aircrew and, if available, the ground crew will announce when their checks are completed.
2. Procedures. The maintenance test pilot (MP) will ensure that the postflight inspection is completed and the test flight check sheet and aircraft logbook are completed and signed.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically as required.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

Chapter 6

Crew Coordination

This chapter describes the background of crew coordination development. It also describes the crew coordination elements, basic qualities, and objectives, as found in the Army aircrew coordination enhanced (ACT-E) training program.

Note: Digitization of the crew compartments has expanded and redefined the lines of responsibility for each crewmember. The ability for either crewmember to perform most aircraft/system functions from his crew station breaks down the standard delineation of duties and has added capabilities in training and in combat. This could mean that during an unforeseen event, one crewmember may attempt to resolve the situation rather than seek assistance from the other crewmember. It is essential for the pilot in command (PC) to brief specific duties prior to stepping into the aircraft. Effective sharing of tasks relies on good crew coordination and information management.

6-1. CREW COORDINATION BACKGROUND.

An analysis of U.S. Army aviation accidents revealed that a significant percentage of these accidents resulted from one or more crew coordination errors committed before or during the mission flight. Often an accident was the result of a sequence of undetected crew errors that combined to produce a catastrophic result. Additional research showed that even when accidents are avoided, these same errors could result in degraded mission performance. A systematic analysis of these error patterns identified specific areas where crew-level training could reduce the occurrence of such errors and break the error chains leading to accidents and poor mission performance.

6-2. CREW COORDINATION ELEMENTS.

Broadly defined, aircrew coordination is the interaction between crewmembers necessary for the safe, efficient, and effective performance of tasks. The essential elements of crew coordination are described below.

a. **Communicate positively.** Communication is positive when the sender directs, requests, announces, or offers. The receiver acknowledges and the sender confirms (based on received acknowledgement) or corrects action. Communications should be quick and clearly understood using limited vocabulary of explicit terms and phrases so actions can be made in a timely manner.

b. **Direct assistance.** Crewmembers will direct assistance when unable to maintain aircraft control or unable to troubleshoot aircraft systems without assistance. The pilot on the controls (P*) will divert his attention from outside the aircraft to inside for momentary cross-check of aircraft systems.

c. **Announce actions.** To ensure effective and well-coordinated actions in the aircraft, all crewmembers must be aware of the expected movements and unexpected individual actions. Each crewmember will announce any actions that affect the actions of the other crewmembers.

d. **Offer assistance.** When the P* demonstrates difficulty in aircraft control or deviates from normal or expected actions, crewmembers will offer assistance. This includes anytime information or assistance is requested or anytime a crewmember sees or recognizes anything that poses a hazard to flight.

e. **Acknowledge actions.** Similar to positive communication this must include supportive feedback to ensure crewmembers correctly understand. The preferred method of acknowledgement is to repeat critical parts of the message.

f. **Be explicit.** Crewmembers should use clear terms and phrases and positively acknowledge critical information. They must avoid using terms that have multiple meanings, such as “Right,” “Back up,” or “I have it.” Crewmembers must also avoid using indefinite modifiers such as, “Do you see that tree?” or “You are coming in a lie fast.”

g. **Provide aircraft control and obstacle advisories.** Although the P* is responsible for aircraft control, the other crewmembers may need to provide aircraft control information regarding altitude, airspeed, and heading. Hazard identification and avoidance is the responsibility of all crewmembers.

h. **Coordinate action sequence and timing.** The proper sequencing, timing, and interaction of machine, crew, and environment help ensure that the actions of one crewmember mesh with the actions of the other crewmembers to successfully execute a task or mission.

6-3. CREW COORDINATION BASIC QUALITIES.

The crew coordination elements are further broken down into a set of 13 basic qualities. Each basic quality is defined in terms of observable behaviors. The paragraphs below summarize these basic qualities.

a. **Flight team leadership and crew climate are established and maintained.** This quality addresses the relationships among the crew and the overall climate of the flight deck. Aircrews are teams with a designated leader and clear lines of authority and responsibility. The PC sets the tone for the crew and maintains the working environment. Effective leaders use their authority but do not operate without the participation of other crewmembers. When crewmembers disagree on a course of action, they must be effective in resolving the disagreement. Specific goals include the following:

(1) The PC actively establishes an open climate where crewmembers freely talk and ask questions.

(2) Crewmembers value each other for their expertise and judgment. They do not allow differences in rank and experience to influence their willingness to speak up.

(3) Alternative viewpoints are a normal and occasional part of crew interaction. Crewmembers handle disagreements in a professional manner, avoiding personal attacks or defensive posturing.

(4) The PC actively monitors the attitudes of crewmembers and offers feedback when necessary. Each crewmember displays the proper concern for balancing safety with mission accomplishment.

b. **Pre-mission planning and rehearsal are accomplished.** Pre-mission planning includes all preparatory tasks associated with planning the mission. These tasks include planning for visual flight rules (VFR), instrument flight rules (IFR), and terrain flight. They also include assigning crewmember responsibilities and conducting all required briefings and brief-backs. Pre-mission rehearsal involves the crew’s collectively visualizing and discussing expected and potential unexpected events for the entire mission. Through this process, all crewmembers think through contingencies and actions for difficult segments or unusual events associated with the mission and develop strategies to cope with contingencies. Specific goals include the following:

(1) The PC ensures that all actions, duties, and mission responsibilities are partitioned and clearly assigned to specific crewmembers. Each crewmember actively participates in the mission planning process to ensure a common understanding of mission intent and operational sequence. The

PC prioritizes planning activities so that critical items are addressed within the available planning time.

(2) The crew identifies alternate courses of action in anticipation of potential changes in METT-TC and is fully prepared to implement contingency plans as necessary. Crewmembers mentally rehearse the entire mission by visualizing and discussing potential problems, contingencies, and responsibilities.

(3) The PC ensures that crewmembers take advantage of periods of low workload to rehearse upcoming flight segments. Crewmembers continuously review remaining flight segments to identify required adjustments. Their planning is consistently ahead of critical lead times.

c. **Appropriate decision-making techniques are applied.** Decision-making is the act of rendering a solution to a problem and defining a plan of action. It must involve risk assessment. The quality of the decision making and problem solving throughout the planning and execution phases of the mission depends on the information available, time constraints, and level of involvement and information exchange among crewmembers. The crew's ability to apply appropriate decision-making techniques based on these criteria has a major impact on the choice and quality of their resultant actions. Although the entire crew should be involved in the decision-making and problem-solving process, the PC is the key decision maker. Specific goals include the following:

(1) Under high-time stress, crewmembers rely on a pattern-recognition decision process to produce timely responses. They minimize deliberation consistent with the available decision time. Crewmembers focus on the most critical factors influencing their choice of responses. They efficiently prioritize their specific information needs within the available decision time.

(2) Under moderate- to low-time stress, crewmembers rely on an analytical decision process to produce high-quality decisions. They encourage deliberation when time permits. To arrive at the most unbiased decision possible, crewmembers consider all important factors influencing their choice of action. They consistently seek all available information relative to the factors being considered.

d. **Actions are prioritized and workload is equitably distributed.** This quality addresses the effectiveness of time and workload management. It assesses the extent to which the crew, as a team, avoids distractions from essential activities, distributes and manages workload, and avoids individual task overload. Specific goals include the following:

(1) Crewmembers are always able to identify and prioritize competing mission tasks. They never ignore flight safety and other high-priority tasks. They appropriately delay low-priority tasks until those tasks do not compete with more critical tasks. Crewmembers consistently avoid nonessential distractions so that these distractions do not impact on task performance.

(2) The PC actively manages the distribution of mission tasks to prevent overloading any crewmember, especially during critical phases of flight. Crewmembers watch for workload buildup on others and react quickly to adjust the distribution of task responsibilities.

e. **Unexpected events are managed effectively.** This quality addresses the crew's performance under unusual circumstances that may involve high levels of stress. Both the technical and managerial aspects of coping with the situation are important. Specific goals include the following:

(1) Crew actions reflect extensive rehearsal of emergency procedures in prior training and pre-mission planning and rehearsal. Crewmembers coordinate their actions and exchange information with minimal verbal direction from the PC. They respond to the unexpected event in a composed, professional manner.

(2) Each crewmember appropriately or voluntarily adjusts individual workload and task priorities with minimal verbal direction from the PC. The PC ensures that each crewmember is used effectively when responding to the emergency and that the workload is efficiently distributed.

f. **Statements and directives are clear, timely, relevant, complete, and verified.** This quality refers to the completeness, timeliness, and quality of information transfer. It includes the crew's use of standard terminology and feedback techniques to verify information transfer. Emphasis is on the quality of instructions and statements associated with navigation, obstacle clearance, and instrument readouts. Specific goals include the following:

(1) Crewmembers consistently make the required callouts. Their statements and directives are always timely.

(2) Crewmembers use standard terminology in all communications. Their statements and directives are clear and concise.

(3) Crewmembers actively seek feedback when they do not receive acknowledgment from another crewmember. They always acknowledge understanding intent and request clarification when necessary.

g. **Mission situational awareness is maintained.** This quality addresses the extent to which crewmembers keep each other informed about the status of the aircraft and the mission. Information reporting helps the aircrew maintain a high level of situational awareness. The information reported includes aircraft position and orientation, equipment and personnel status, environmental and battlefield conditions, and changes to mission objectives. Awareness of the situation by the entire crew is essential to safe flight and effective crew performance. Specific goals include the following:

(1) Crewmembers routinely update each other and highlight and acknowledge changes. They take personal responsibility for scanning the entire flight environment, considering their assigned workload and assigned scan sectors.

(2) Crewmembers actively discuss conditions and situations that can compromise situational awareness. These include, but are not limited to, stress, boredom, fatigue, and anger.

h. **Decisions and actions are communicated and acknowledged.** This quality addresses the extent to which crewmembers are kept informed of decisions made and actions taken by another crewmember. Crewmembers should respond verbally or by appropriately adjusting their behaviors, actions, or control inputs to clearly indicate that they understand when a decision has been made and what it is. Failure to do so may confuse crews and lead to uncoordinated operations. Specific goals include the following:

(1) Crewmembers announce decisions and actions, stating their rationale and intentions as time permits. The P verbally coordinates the transfer of or inputs to controls before action.

(2) Crewmembers always acknowledge announced decisions or actions and provide feedback on how these decisions or actions will affect other crew tasks. If necessary, they promptly request clarification of decisions actions.

i. **Supporting information and actions are sought from the crew.** This quality addresses the extent to which supporting information and actions are sought from the crew by another crewmember, usually the PC. Crewmembers should feel free to raise questions during the flight regarding plans, revisions to plans, actions to be taken, and the status of key mission information. Specific goals include the following:

(1) The PC encourages crewmembers to raise issues or offer information about safety or the mission. Crewmembers anticipate impending decisions and actions and offer information as appropriate.

(2) Crewmembers always request assistance from others before they become overloaded with tasks or before they must divert their attention from a critical task.

j. **Crewmember actions are mutually cross-monitored.** This quality addresses the extent to which a crew uses cross-monitoring as a mechanism for breaking error chains that lead to accidents or degraded mission performance. Crewmembers must be capable of detecting each other's errors. Such redundancy is particularly important when crews are tired or overly focused on critical task elements and thus more prone to make errors. Specific goals include the following:

(1) Crewmembers acknowledge that crew error is a common occurrence and the active involvement of the entire crew is required to detect and break the error chains that lead to accidents. They constantly watch for crew errors affecting flight safety or mission performance. They monitor their own performance as well as that of others. When they note an error, they quickly and professionally inform and assist the crewmember committing error.

(2) The crew thoroughly discusses the two-challenge rule before executing the mission. When required, they effectively implement the two-challenge rule with minimal compromise to flight safety.

Note: The two-challenge rule allows one crewmember to automatically assume the duties of another crewmember who fails to respond to two consecutive challenges. For example, the P* becomes fixated, confused, task overloaded, or otherwise allows the aircraft to enter an unsafe position or attitude. The pilot not on the controls (P) first asks the P* if he/she is aware of the aircraft position or attitude. If the P* does not acknowledge this challenge, the P issues a second challenge. If the P* fails to acknowledge the second challenge, the P assumes control of the aircraft.

k. **Supporting information and actions are offered by the crew.** This quality addresses the extent to which crewmembers anticipate and offer supporting information and actions to the decision maker—usually the PC—when apparently a decision must be made or an action taken. Specific goals include the following:

(1) Crewmembers anticipate the need to provide information or warnings to the PC or P* during critical phases of the flight. They provide the required information and warnings in a timely manner.

(2) Crewmembers anticipate the need to assist the PC or P* during critical phases of flight. They provide the required assistance when needed.

l. **Advocacy and assertion are practiced.** This quality concerns the extent to which crewmembers are proactive in advocating a course of action they consider best, even when others may disagree. Specific goals include the following:

(1) While maintaining a professional atmosphere, crewmembers state the rationale for their recommended plans and courses of action when time permits. They request feedback to make sure others have correctly understood their statements or rationale. Time permitting, other crewmembers practice good listening habits; they wait for the rationale before commenting on the recommended plans or courses of action.

(2) The PC actively promotes objectivity in the cockpit by encouraging other crewmembers to speak up despite their rank or experience. Junior crewmembers do not hesitate to speak up when they disagree with senior members; they understand that more experienced aviators can sometimes commit errors or lose situational awareness. Every member of the crew displays a sense of responsibility for adhering to flight regulations, operating procedures, and safety standards.

m. **Crew-level after-action reviews are conducted.** This quality addresses the extent to which crewmembers review and critique their actions during or after a mission segment, during periods of low workload, or during the mission debriefing. Specific goals include the following:

- (1) The crew critiques major decisions and actions. They identify options and factors that should have been discussed and outline ways to improve crew performance in future missions.
- (2) The critique of crew decisions and actions is professional. “Finger pointing” is avoided; the emphasis is on education and improving crew performance.

6-4. CREW COORDINATION OBJECTIVES.

The crew coordination elements and basic qualities are measured to determine if the objectives of the crew coordination program have been met. The objectives of the program have been defined by five crew coordination objectives. The five objectives are follows:

- a. **Establish and maintain team relationships.** Establish a positive working relationship that allows the crew to communicate openly and freely and to operate in a concerted manner.
- b. **Plan and Rehearse the mission.** Explore, in concert, all aspects of the assigned mission and analyze each segment for potential difficulties and possible reactions in terms of the commander’s intent.
- c. **Establish and maintain workloads.** Manage and execute the mission workload in an effective and efficient manner with the redistribution of task responsibilities as the mission situation changes.
- d. **Exchange mission information.** Establish intracrew communications using effective patterns and techniques that allow for the flow of essential data between crewmembers.
- e. **Cross-monitor performance.** Cross-monitor each other’s actions and decisions to reduce the likelihood of errors impacting mission performance and safety.

6-5. STANDARD CREW TERMINOLOGY.

To enhance communication and crew coordination, crews should use words or phrases that are understood by all participants. They must use clear, concise terms that can be easily understood and complied with in an environment full of distractions. Multiple terms with the same meaning should be avoided. The Department of Defense (DOD) flight information publication (FLIP) contains standard terminology for radio communication. Operator’s manuals contain standard terminology for items of equipment. Table 6-1 is a list of other standard words and phrases that crewmembers may use.

Table 6-1. Examples of standard words and phrases	
<i>Standard word or phrase</i>	<i>Meaning of standard word or phrase</i>
Abort	terminate a preplanned aircraft maneuver.
Affirmative	yes.
Bandit	an identified enemy aircraft.
Blocking	announcement made by the crewmember who intends to block the pedals.
Bogey	an unidentified aircraft assumed to be enemy.
Braking	announcement made by the rated crewmember (RCM) who intends to apply brake pressure.

Table 6-1. Examples of standard words and phrases

Standard word or phrase	Meaning of standard word or phrase
Break	immediate action command to perform an emergency maneuver to deviate from the present ground track; will be followed by the word "right" or "left."
Call out	command by the pilot on the controls (P*) for a specified procedure to be read from the checklist by the another crewmember.
Cease fire	command to stop firing but continue to track.
Clear	no obstacle present to impede aircraft movement along the intended ground track. Will be preceded by the word "nose," "tail," or "aircraft" and followed by the direction (for example, "left," "right," "slide left," or "slide right"). Also indicates that ground personnel are authorized to approach the aircraft.
Come up/down	command to change altitude up or down; normally used to control masking and unmasking operations.
Contact	establish communication with... (followed by the name of the element).
Controls	refers to aircraft flight controls.
Correct	confirms a statement as being accurate or right. Do not use the word "right" to indicate correct.
Drifting	an alert of the unintentional or undirected movement of the aircraft; will be followed by the word "right," "left," "backward," or "forward."
Egress	command to make an emergency exit from the aircraft; will be repeated three times in a row.
Execute	initiate an action.
Expect	anticipate further instructions or guidance.
Fire light	announcement of illumination of the master fire warning light.
Firing	announcement that a specific weapon is to be fired.
Go ahead	proceed with your message.
Go plain/red	directive to discontinue secure operations.
Go secure/green	directive to activate secure communications.
I have the controls	used as a command or announcement by the RCM assuming control of the flight controls.
Inside	primary focus of attention is inside the cockpit.
In sight	preceded by the word "traffic," "target," "obstacle," or descriptive term. Used to confirm traffic, target, or obstacle is positively seen or identified.
Jettison	command for the emergency or unexpected release of an external load or stores; when followed by the word "door," will indicate the requirement to perform emergency door removal.
Maintain	command to continue or keep the same.
Mask	command to conceal aircraft.
Mickey	a Have Quick time-synchronized signal.
Move forward/ backward	command to hover the aircraft forward or backward; followed by distance in feet. Also used to announce intended forward or backward movement.
Negative	incorrect or permission not granted.
Negative contact	unable to establish communication with. . . (followed by name of element).

Table 6-1. Examples of standard words and phrases

<i>Standard word or phrase</i>	<i>Meaning of standard word or phrase</i>
No joy	target, traffic, or obstruction not positively seen or identified.
Now	indicates that an immediate action is required.
Outside	primary focus of attention is outside the aircraft.
Put me up	command to place a frequency in a specific radio.
Release	command for the planned or expected release of a sling load.
Report	command to notify.
Right	used to indicate a direction only, not to be used in place of "correct."
Roger	message received and understood.
Say again	repeat your transmission.
Slide left/right	command to hover the aircraft left or right; will be followed by distance. Also used to announce intended "left" or "right" movement.
Slow down	command to reduce ground speed.
Speed up	command to increase ground speed.
Stand by	wait; duties of a higher priority are being performed and request cannot be complied with at this time.
Stop	command to go no further; halt present action.
Strobe	indicates that the aircraft AN/APR-39 has detected a radar threat; will be followed by a clock direction.
Tally	target, traffic, or obstruction positively seen or identified; will be followed by a repeat of the word "target," "traffic," or "observation" and the clock position.
Target	an alert that a ground threat has been spotted.
Traffic	refers to friendly aircraft that present a potential hazard to the current route of flight; will be followed by an approximate clock position and the distance from your aircraft with a reference to altitude (high or low).
Transfer of controls	positive three-way transfer of the flight controls between the RCMs (for example, "I have the controls," "You have the controls," and "I have the controls").
Troops on/off	command for troops to enter/exit the aircraft.
Turn	command to deviate from present ground track; will be followed by words "right" or "left," specific heading in degrees, a bearing ("Turn right 30 degrees"), or instructions to follow a well-defined contour ("Follow the draw at 2 o'clock").
Unable	indicates the inability to comply with a specific instruction or request.
Unmask	command to position the aircraft above terrain features.
Up on	indicates primary radio selected; will be followed by radio position numbers on the intercommunication system (ICS) panel; (for example, "Up on 1, up on 3").
Weapons hot/cold/off	weapon switches are in the ARMED, SAFE, or OFF position.
Wilco	I have received your message, I understand, and I will comply.
You have the controls	used as a command or announcement by the RCM relinquishing the flight controls.

Appendix A

Nonrated Crewmember Training

SECTION I – CREW CHIEF (CE) TRAINING

This section describes training requirements for crew chief (CE) crewmembers.

A-1. CREW CHIEF AIRCRAFT QUALIFICATION TRAINING.

Crew chiefs must complete the aircraft qualification training listed below. At the crewmembers' next closeout, aircraft qualification will be documented in Part V, Remarks section, of the crewmember's DA Form 759 (*Individual Flight Record and Flight Certificate—Army*).

a. **Academic qualification training.** The crew chief must receive sufficient instruction to be knowledgeable in all applicable topics of chapter 3 and figure A-1. The subjects may be completed in any order. Commanders will develop a 50-question written examination covering all applicable topics listed in chapter 3, paragraph 3-4b and figure A-1 in addition to the operator's manual examination. Crewmembers must pass each examination with a grade of at least 70 percent. Training will be documented in accordance with TC 1-210, chapter 3.

ACADEMIC SUBJECTS

- | | |
|---|---|
| 1. Maintenance forms and records. | 2. CE qualification written examination. |
| 3. Aircrew training program introduction. | 4. Operator's manual written examination. |
| 5. Aircrew coordination training*. | |

*This academic training will be conducted in accordance with the current USAAVNC TSP.

Figure A-1. Crew chief academic training subjects

b. **Flight training.** The CE will be required to demonstrate proficiency in all base tasks listed in the DAY and NIGHT column with an "X" in chapter 2, figure 2-5, and demonstrate crew coordination and airspace surveillance proficiency in all other tasks listed in the DAY and NIGHT column of chapter 2, figure 2-4. Flight training consists of 10 flight hours. This must consist of at least 1 hour of night unaided flight time. The evaluation may be a continual evaluation. The commander may reduce the total flight time to no less than 6.0 hours based on a recommendation from the standardization instructor pilot (SP), instructor pilot (IP), standardization flight engineer instructor (SI), or flight engineer instructor (FI), concerning the crewmember's proficiency. This recommendation will be annotated in the remarks section of the crewmember's DA Form 7122-R (*Crew Member Training Record*). If the commander has selected chemical, biological, radiological, nuclear (CBRN) requirements as part of the unit's mission essential task list (METL), all tasks with an "X" marked under the NBC column will also be trained/evaluated as required.

SECTION II – FLIGHT MEDIC (MO) TRAINING

This section describes training requirements for 68W-flight medic (MO) crewmembers.

A-2. FLIGHT MEDIC (MO) AIRCRAFT QUALIFICATION TRAINING.

Flight medics must complete the aircraft qualification training listed below. At the crewmembers' next closeout, aircraft qualification will be documented in Part V, Remarks section, of the crewmember's DA Form 759.

a. **Academic qualification training.** The MO must receive sufficient instruction to be knowledgeable in all applicable topics of chapter 3 and figure A-2. The subjects may be completed in any order. Commanders will develop a 50-question written examination covering all applicable topics listed in chapter 3, paragraph 3-4b and figure A-2 in addition to the operator's manual examination. Crewmembers must pass each examination with a grade of at least 70 percent. Training will be documented in accordance with TC 1-210, chapter 3.

ACADEMIC SUBJECTS

- | | |
|---|--|
| 6. Maintenance forms and records. | 7. MO qualification written examination. |
| 8. Aircrew training program introduction. | 9. Patient care reporting procedures. |
| 10. Aircrew coordination training*. | 11. Operator's manual written examination. |
| 12. Medical protocols. | |

*This academic training will be conducted in accordance with the current USAAVNC TSP.

Figure A-2. Flight medic academic training subjects

c. **Flight training.** The MO will be required to demonstrate proficiency in all base tasks listed in the DAY and NIGHT column with an "X" in chapter 2, figure 2-6 and demonstrate crew coordination and airspace surveillance proficiency in all other tasks listed in the DAY and NIGHT column of chapter 2, figure 2-4. Flight training consists of 10 flight hours. This must consist of at least 1 hour of night unaided flight time. The evaluation may be a continual evaluation. The commander may reduce the total flight time to no less than 6.0 hours based on a recommendation from the SP, IP, SI, or FI, concerning the crewmember's proficiency. This recommendation will be annotated in the remarks section of the crewmember's DA Form 7122-R. If the commander has selected NBC requirements as part of the unit's METL, all tasks with an "X" marked under the NBC column will also be trained/evaluated as required.

SECTION III – NONRATED CREWMEMBER FLIGHT INSTRUCTOR (FI) AND STANDARDIZATION INSTRUCTOR (SI) TRAINING

This section describes qualification-training requirements for nonrated crewmember instructor (FI and standardization instructor SI training.

A-3. QUALIFICATION TRAINING.

The unit commander is responsible for conducting FI and SI qualification training in accordance with AR 95-1, TC 1-210, and this ATM. The crewmembers must complete academic and flight training and pass a written and flight evaluation administered by an IP, SP, or SI. At the crewmembers' next closeout, instructor qualification will be documented in Part V, Remarks section, of each crewmember's DA Form 759.

a. FI qualification.

(1) Academic training. The crewmember must receive sufficient instruction to conduct training and evaluations in the applicable subjects listed in figure A-3 and all applicable topics in chapter 3, paragraph 3-4b. The subjects may be completed in any order. Commanders will develop a 50-question written examination covering the subject areas in figure A-3. The crewmember must pass the examination with a grade of at least 70 percent. The crewmember must also conduct a minimum of one oral presentation to include a lesson plan of a topic selected by the evaluator from the academic subjects listed below. The commander is responsible for developing lesson plans that sufficiently cover the training topics below. The hour requirement shown is a recommendation on class length of subject areas listed.

System Subjects		Hours	Night and Night Vision Goggle Subjects		Hours
1.	UH-1H/V introduction	1.0	2.	Night operations	2.5
3.	Flight control system	0.5	4.	AN/AVS-6 operations	0.5
5.	Hydraulic system	1.0	6.	Night vision techniques	0.5
7.	Rotor system	0.5	8.	NVG ETP review	2.0
9.	Fuel system	0.5	Total Hours		5.5
13.	Power plants	1.0	Academic Subjects		
14.	Power train system	0.5	16.	NCM aircrew training program	8.0
15.	Electrical system	0.5	18.	In-flight duties	1.0
17.	Emergency procedures	1.0	20.	Aeromedical factors	4.0
19.	Internal load operations	0.5	22.	Regulation and publications	1.0
21.	External load operations	0.5	23.	Aviation life support equipment (ALSE)	1.0
Total Hours		7.5	24.	Aircrew coordination instructor training*	7.0
			25.	Operating limitations and restrictions	0.5
			26.	Refueling operations	0.5
			Total Hours		22.0
Fundamentals of Instruction Subjects			MO Subjects		
27.	Instructor fundamentals	2.0	Medical Protocols		
28.	Planning Instructional Activity	1.0	Medical Equipment Deployment		
29.	Flight Instructor Characteristics and Responsibilities	1.0	Patient Care Documentation		
Total Hours		4.0	Total Hours		5.0
Total Academic Hours		46.0	FI qualification written examination		2.0

* This training will be conducted in accordance with current USAAVNC TSP.

Figure A-3. Nonrated FI academic subjects

(2) Flight training. The crewmember will be required to demonstrate methods of instruction (MOI) proficiency in all tasks listed in chapter 2, figure 2-5 or 2-6, as appropriate, and any commander selected mission/additional tasks. The crewmember acting as an FI must conduct one nonrated crewmember (NCM) aircrew flight evaluation as a minimum during his training and complete aircrew coordination instructor qualification in accordance with the current USAAVNC TSP. Flight training consists of 14 hours in the aircraft. Training and evaluation will be conducted in all modes designated on the crewmembers DA Form 7120-R (*Commander's Task List*).

b. SI qualification.

(1) Academic training. The SI must receive sufficient instruction to be able to conduct training and evaluate FIs and other SIs. They must be able to assist the unit SP with the supervision and maintenance of the standardization program.

(2) Flight training. Flight training will emphasize the SI's ability to conduct the training and evaluations of other FIs and SIs. The ability to use role reversal is a key element in the training

and evaluation process. There is no designated flight training hour requirement; however, all modes of flight will be trained and evaluated.

c. Flight Medic (68W) FI qualification.

(1) Academic training. The crewmember must receive sufficient instruction to conduct training and evaluations in the applicable subjects listed in figure A-3 and all applicable topics in chapter 3, paragraph 3-4b. The subjects may be completed in any order. Commanders will develop a 50-question written examination covering the subject areas in figure A-3. The crewmember must pass the examination with a grade of at least 70 percent. The crewmember must also conduct a minimum of one oral presentation to include a lesson plan of a topic selected by the evaluator from the academic subjects listed in figure A-3. The commander is responsible for developing lesson plans that sufficiently cover the training topics below. The hour requirement shown is a recommendation on class length of subject areas listed.

(2) Flight training. The crewmember will be required to demonstrate method of instruction (MOI) proficiency in all tasks listed in chapter 2, figure 2-6, and any commander selected mission/additional tasks. The crewmember acting as an FI must conduct one NCM aircrew flight evaluation as a minimum during his training and complete aircrew coordination instructor qualification in accordance with the current USAAVNC TSP. Flight training consists of 14 hours in the aircraft. Training and evaluation will be conducted in all modes designated on the crewmembers DA Form 7120-R.

d. Flight Medic SI qualification.

(1) Academic training. The SI must receive sufficient instruction to be able to conduct training and evaluate FIs and other SIs. The SI must be able to assist the unit SP with the supervision and maintenance of the standardization program.

(2) Flight training. Flight training will emphasize the SI's ability to conduct the training and evaluations of other FIs and SIs. The ability to use role reversal is a key element in the training and evaluation process. There is no designated flight-training hour requirement, however all modes of flight will be trained and evaluated.

This page intentionally left blank.

Appendix B

Power Management

This appendix is to be used in conjunction with Tasks 2090, 2095, and 2093 of this ATM. The data contained here is crucial to the successful performance and understanding of the power management tasks. For more detailed explanation, see the high-altitude Army training site (HAATS) programs of instruction.

B-1. GENERAL.

a. Power management training, as embodied in the HAATS, is designed to raise situational awareness of aircrew members by establishing the highest measurable standards for the flight tasks involved. This is accomplished by using particular torque values to simulate maximum GWT during these flight maneuvers. While not actual limits, these values serve as references whereby pilots can observe requirements and results, draw inferences from performance, and develop correlations between their aircraft, the environment, and their own knowledge, understanding, and application of that knowledge. Referencing torque as a measurement of performance allows the particular task standards to be raised and made objective, allowing for more precise control, much like current instrument meteorological conditions (IMC) task standards. In attempting to achieve these raised standards, higher learning occurs, thus increasing the individual and crew's situational awareness in their environment.

b. Power management training uses three tasks to achieve elevated environmental awareness levels, precise aircraft control, and insights to pilot understanding, decision-making, and judgment—the essence of good pilotage. These three tasks are simulated maximum GWT reconnaissance, simulated maximum GWT takeoff, and simulated maximum GWT landing (Task 2090, Task 2095, and Task 2093). The awareness, insights, knowledge, and techniques gained from these three tasks readily transfer to a multitude of tasks and situations. The habits formed when learning these tasks, when applied continuously in all relevant tasks, will provide the skill sets required for the most demanding environments and missions, particularly those of high, heavy, and hot.

c. Possession and familiarity with tabular data is required to accomplish this training (see tabular data description and usage below). All tabular data format and usage is identical for each aircraft type, however awareness of the rule of thumb for the particular aircraft flown is required. For the UH-1H, the rule of thumb is one pound of torque is equal to 200 pounds of aircraft GWT. The rule of thumb allows interpretation from tabular data of actual torque requirements for a given GWT in one of the maneuvers intended to be performed. To interpret power requirements from tabular data the pilot also needs to know the actual aircraft GWT at any given moment. This is accomplished by establishing a zero fuel weight (typically the operating weight from the DD Form 365-4. By adding the current fuel weight to the known zero fuel weight the pilot can quickly and accurately establish current aircraft GWT.

B-2. TABULAR DATA DESCRIPTION USAGE.

a. Tabular data, located in appendix C of the operator's manual, is a matrix providing capability awareness through the presentation of GWT and torque references for various density altitudes up to and including 15,000 feet. The matrix format is pressure altitude in 500-foot increments on the left sides of the pages (C-2 through C-5) and temperature in 5-degree increments reading left to right across the pages (C-2 through C-4, page C-5, maximum torque available [MTA], is in 10-degree increments). Page C-1 defines the three numbers found in each matrix intersection. It is worth noting, however, that when the GWT depicted in a particular box is less than the aircraft structural limit of 9,500 pounds, then the upper torque figure is not only the power required to lift the given weight to an OGE altitude but also the maximum power available (page C-5, MTA, is presented to the nearest tenth decimal but is rounded up or down on pages C-2 through C-4 using .5 as the cut-off point). In addition, the lower torque value in a given box serves as an OGE GO/NO-GO value. The lower torque value in a given box serves as the primary reference in adding or subtracting in power management training.

b. Power management uses the rule of thumb (in this case, one pound of torque equals 200 pounds of aircraft GWT) to determine the power available and the actual power required for a maneuver. As an example, referencing 4,000 feet and 20 degrees, 8,530 pounds can be lifted to an OGE altitude requiring 43 pounds of torque while 35 pounds of torque serves as the OGE go-no-go value. It is determined that the zero weight of a particular aircraft is 6,600 pounds and the current fuel weight is 730 pounds, totaling 7,330 pounds. Subtracting actual GWT from the weight depicted in tabular data ($8,530 - 7,330 = 1,200$ pounds) and dividing the remainder by the rule of thumb ($1,200 \div 200$ pounds = 6 pounds of torque), 6 pounds of torque must be subtracted from the 35 pounds presented in tabular data to determine the actual torque required to hover for the actual aircraft weight (Full revolutions per minute [RPM], smooth surface, no wind). If the actual weight of an aircraft was determined to be higher than the weight depicted in tab data the process is similar: subtract the weight of tab data from the actual weight of the aircraft, divide by 200 and add the resultant to the 35 pounds of torque. The resultant torque value is defined as hover torque in power management training (see Paragraph B-3 below).

B-3. THE FOUR TORQUES OF POWER MAGEMENT.

a. Hover torque – Derived from tabular data (a/c zero weight, plus fuel, compared to weight depicted in tab data). If heavier than the weight depicted, determine difference and: divide by 200 and add to the IGE hover torque depicted. If lighter than the weight depicted, subtract the torque determined from the IGE torque depicted. The subsequent torque value is the maximum torque allowable (simulated) for the first maneuver (the reconnaissance). It also serves as a reference for determining predicted torque.

b. Predicted torque – The maximum torque believed required for each maneuver. For the vast majority of approaches, this should be actual torque (see paragraph d). There are some approaches where expended torque (see paragraph c) must be more than actual torque, (for example very steep approaches, tailwind approaches, approaches to very small pinnacles, and approaches to small pinnacles and ridgelines where turbulence and strong downdrafts are penetrated on short final). When it is believed that expended torque will be greater than actual torque, both must be predicted. For the takeoff, it is the minimum power believed required for the type of takeoff to be attempted: vertical, constant angle, or level acceleration.

c. Expended torque – The highest torque value used to accomplish each maneuver, the landing, and the takeoff. The amount of torque used, as well as when it is used, is noted by the nonflying pilot.

d. Actual torque – The actual torque required to hover in a landing zone (LZ) at the height, location, and direction previously established.

B-4. COCKPIT INDICATORS (CI).

a. Cockpit indicators are tools to determine and/or monitor wind conditions in a particular locale. Preferably they are used to prove the pilot's prediction of wind conditions rather than to discover those conditions.

b. Airspeed (A/S) compared to ground speed – indicates headwind/tailwind or no wind. TFS and A/S indicator movement to zero will both occur earlier for a tailwind, or later for a headwind, than on an approach with no wind. The airspeed indicator, TFS, and ground speed are also used to control the horizontal portion of approach closure speed.

c. Heading compared to ground track (crab) – indicates crosswind direct if any.

d. Torque compared to pedal position (heading aligned with ground track – slip), below 50 feet AGL, slightly above effective translational lift (ETL), and referencing a known torque/pedal relationship – indicates crosswind direct if any.

e. Vertical speed indicator (VSI) compared to A/S and torque. The instantaneous vertical speed indicator (IVSI)/VSI indicates rate of vertical closure. When compared to A/S indicator and torque, indicates the presence and strength of updrafts and downdrafts or pilot induced rate of climb or descent.

B-5. POST-TASK ANALYSIS.

a. This is the critique following each landing and takeoff. It is important to be methodical. Determine accuracy of wind predictions and determine expended and actual torque before proceeding. The pilot on the controls will determine the value of each of the four torques and compare them for discrepancies, if any. For the landing, when predicted torque is compared to actual torque, the pilot is evaluating his/her reconnaissance, specifically the ability to analyze and predict wind and surface influences and their degree of influence. Comparing actual torque to hover torque gives torque values to wind and surface influences that remain valid evermore. When expended torque is compared to actual torque, the pilot is evaluating the execution of the landing. Errors of execution are errors of perception: what was seen/felt, not seen/felt, seen/felt but misinterpreted. The pilot will explain what occurred, why it occurred, and determine how to correct the discrepancies. If the errors are related to the reconnaissance (wind), the pilot must revisit step 4 (wind and terrain analysis [WTA]) of the landing zone sequence (LZS) to determine cause of error. If the error is in execution, the pilot determines what caused it (perception or failed perception) and attempts to prove it by executing the maneuver again until the torques either match or are shown to be one of the exceptions noted in paragraph B-3b.

b. Common reasons for discrepancies between actual and predicted torques include poor WTA caused by a poor understanding of prevailing or convective winds, the rules of airflow, or both. If winds are understood, then discrepancies indicate a failure of understanding of cockpit indicators or the inability to apply them correctly. If winds are not the cause of discrepancies, surface conditions, dense vegetation, or sloping terrain are the causes.

c. A common reason for discrepancies between expended and actual torque is poor understanding of control inputs and the visual cues that should prompt those inputs. Control inputs are made or not made based on the presence or lack of visual and/or proprioceptive cues. Army aviation routinely operates in environments where visual information is degraded: night, desert, snow, over water, and mountains. A visual meteorological conditions (VMC) crosscheck that rivals a good

TC 1-211

instrument meteorological condition (IMC) crosscheck of instruments is required, particularly the airspeed indicator, torque gauge, and vertical speed indicator. These instruments are correlated with external cues but should prove more reliable. The correlation of these three instruments are noted and compared against the distance remaining to touchdown to determine the correct values and relationships. Precise control inputs are paramount in achieving matching torque values. If an aircraft is too slow horizontally it will fall through and require more power; if too fast, momentum must be overcome with additional power. If the aircraft is too fast vertically, again additional power is required.

B-6. LANDING ZONE SEQUENCE.

a. The LZS is used as an organizational tool for reconnaissance (see table B-1). It trains the mind to view information in an order of priority and to recognize important details in the areas of the environment: aircraft control inputs and timing, aircraft requirements and capability, as well as pilot understanding and correlation of the same. The low reconnaissance is separated from the final approach for training only. Separation allows the pilots the time and opportunity to train their mind to recognize and appreciate details that affect power, controllability, and possibilities prior to combining the maneuvers for the expedited demands of combat.

Table B-1. Landing zone sequence checklist

<p>1. Identify the landing area. Determine suitability.</p> <p>2. Identify power requirements. A/C can weigh _____, A/C weighs _____ (0 fuel wt. + fuel at landing), OGE capability yes/no and by how much _____ lbs., max power is _____, Hover Torque (2 feet) is _____.</p> <p>3. Determine wind drift circle.</p> <ul style="list-style-type: none">• ID specific start point, angle of bank, A/S, and altitude for circle.• Note heading and begin turn over start point.• Maintain constant angle, A/S, and altitude until returning to original heading.• Determine wind direction and velocity based on displacement from start point. <p>4. Conduct wind and terrain analysis (WTA). Visualize three-dimensional wind flow in area centered on LZ. Describe in detail from macro to micro scale and make specific predictions to be verified using CI during low reconnaissance.</p> <p>5. Determine routes in/out.</p> <ul style="list-style-type: none">• Power and wind typically dictate routing. In general, the best approach and departure routes for high weight situations are those requiring the least amount of power without compromising a viable escape route.• Determine best escape routes ("best" is determined by actions required to regain aircraft control after it is lost to a specific hazard) in and out of the LZ as well as in the LZ for the hazards identified. (Invisible hazards – rotor droop, LTE, settling w/power, strong downdrafts close to surface.)• In uncertain winds let the best escape route dictate all routing.
--

Table B-1. Landing zone sequence checklist**6. Conduct low reconnaissance.**

- Prove wind predictions using CI.
- ID exact touchdown point and verify suitability.
- Verify viability of escape plans and routing.

7. Predict torque in/out.

Considering all obtained information, predict the amount of torque required to hover in the LZ (actual torque), and if greater, the maximum torque required for the landing and departure (expended torques).

8. Analyze approach and departure.

- Upon completion of landing, conduct post-task analysis.
- Upon completion of takeoff, conduct post-task analysis.

This page intentionally left blank.

Glossary

A

A/C	aircraft
ACP	
ACT-E	Aircrew coordination enhanced
ADF	automatic direction finder
AED	automated external defibrillator
AGL	above ground level
AHO	above highest obstacle
AIM	aeronautical information manual
ALSE	aviation life support equipment
AMC	air mission commander
AMCOM	U.S. Army Aviation and Missile Command
AMPS	air mission planning station
ANVIS	aviator's night vision imaging system
APART	annual proficiency and readiness test
ARNG	Army National Guard
ASE	aircraft survivability equipment
ASET	aircraft survivability equipment trainer
A/S	airspeed
ASR	airport surveillance radar
ATC	air traffic control
ATIS	automatic terminal information service
ATM	aircrew training manual
ATP	aircrew training program
AUTO	automatic
AVA	aviation vibration analyzer
avail	available
AWR	airworthiness release

B

C

CADU	control and display unit
cal	calibration

CBI	computer-based instruction
CBRN	chemical, biological, radiological, nuclear
CDI	course deviation indicator
CE	course examiner
CG	center of gravity
CHUM	chart update manual
CI	cockpit indicators
CL	checklist
COMSEC	communication security
CTL	commander's task list

D

DAC	Department of the Army Civilian
DCM	directional control margin
DH	decision height
DME	distance measuring equipment
DOD	Department of Defense
DOT	Department of Transportation

E

ELA	en route low altitude
E3	electromagnetic environmental effects
EAATS	Eastern Army National Guard Aviation Training Site
EAT	external air transportability
ECCM	electronic counter-countermeasures
ECM	electronic countermeasures
EGT	exhaust gas temperature
EMER	emergency
equip	equipment
ETA	estimated time of arrival
ETE	estimated time en route
ETL	effective translational lift
EPT	Emergency Procedure Training
ETP	exportable training package

F

FAA	Federal Aviation Administration
FAC	flying activity category
FAF	final approach fix
FAT	free air temperature
FAR	federal aviation regulation
FIH	flight information handbook
FI	flight engineer instructor
FLIP	flight information publication
flt	flight
FM	frequency modulation
FPM	feet per minute
FRIES	fast-rope insertion and extraction

G

GPS	global positioning system
GWT	gross weight

H

HAATS	high-altitude army aviation training site
HAL	height above landing
HEED	helicopter emergency egress device
HIRTA	high-intensity radio transmission area
HIT	health indicator test

I

IAF	initial approach fix
IAS	indicated airspeed
IATF	individual aircrew training folder
IATF	individual aircrew training folder
ICS	intercommunication system
IE	instrument examiner
IF	intermediate approach fix
IFF	identification, friend or foe
IFR	instrument flight rules
IFRF	individual flight record folder
IGE	in-ground effect

ILS	instrument landing system
IIMC	inadvertent instrument meteorological conditions
IMC	instrument meteorological conditions
Ind	indicated
IP	instructor pilot
IR	infrared
ITO	instrument takeoff
IV fluids	intravenous fluids
IVSI	instantaneous vertical speed indicator
<u>J</u>	
JOG	joint operations graphic
JSIR	Joint spectrum interference resolution
<u>K</u>	
KIAS	knots indicated airspeed
<u>L</u>	
LOC	localizer
LSE	landing signal enlisted
LTE	loss of tail rotor effectiveness
LZS	landing zone sequence
LZ	landing zone
<u>M</u>	
MAP	missed approach point
MAHF	missed approach holding fix
Mayday	The international radiotelephony distress signal. When repeated three times, it indicates imminent and grave danger and that immediate assistance is requested.
max	maximum
MDA	minimum descent altitude
ME	maintenance evaluator
MEDEVAC	medical evacuation
MEF	maximum elevation figures
METL	mission-essential task list
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, civil considerations

MIJI	meaconing, interference, jamming, and intrusion
MOC	maintenance operational check
MO	medical officer
MOI	method of instruction
MOPP	mission-oriented protective posture
MOS	military occupational specialty
MP	maintenance test pilot
MSA	minimum safe altitude
MSL	
MTA	maximum torque available
MTF	maintenance test flight
<u>N</u>	
N₁	gas producer (speed)
N₂	power turbine (speed)
NAV	navigation
NAVAID	navigation aid
NBC	nuclear, biological, chemical
NCM	nonrated crewmember
NDB	Nondirectional beacon
nm	nautical mile
NOE	nap of the earth
MOC	maintenance operational check
NOTAM	Notice to Airmen
NVD	night vision device
NVG	night vision goggles
NVS	night vision system
<u>Q</u>	
OGE	out-of-ground effect
OR	observer
OROCA	off route obstruction clearance altitude–CONUS
ORTCA	off route terrain clearance altitude–OCONUS
<u>P</u>	
P	pilot not on the controls
PA	pressure altitude

Pan Pan	International radiotelephony urgency signal. When repeated three times, indicates uncertainty or alert followed by the nature of the urgency.
pax	passenger
P*	pilot on the controls
PC	pilot in command
PFE	primary flight examiner
PI	pilot
PMS	preventative maintenance system
POI	program of instruction
PPC	performance planning card
PPH	pounds per hour
PPS	precise positioning service (mode for GPS)
psi	pounds per square inch
PTA	post-task analysis
PZ	pickup zone
<u>R</u>	
R/C	rate of climb
RCM	rated crewmember
RL	readiness level
RMI	radio magnetic indicator
ROC	required obstacle clearance
ROE	rules of engagement
RPM	revolutions per minute
<u>S</u>	
SALUTE	size, activity, location, unit, time, and equipment
SAR	search and rescue
SAT	systems approach to training
SFTS	Synthetic Flight Training Systems
SI	standardization flight engineer instructor
SKED	
SM	statute mile
SOI	signal operating instructions
SOP	standing operating procedure
SP	standardization instructor pilot

SPIES	special patrol infiltration / exfiltration
<u>STOKES</u>	
<u>T</u>	
TACAN	tactical air navigation system (UHF)
TERPS	Terminal Instrument Procedures
TFS	transverse flow shudder
TM	technical manual
TRADOC	United States Army Training and Doctrine Command
TSP	training support package
<u>U</u>	
UHF	ultra high frequency
USAAVNC	United States Army Aviation Center
USAAWC	U.S. Army Aviation Warfighting Center
USAR	United States Army Reserve
U.S.	United States
UT	unit trainer
<u>V</u>	
VFR	visual flight rules
VMC	visual meteorological conditions
Vne	velocity never to exceed
VOR	very high frequency omnidirectional range
VSI	vertical speed indicator
<u>W</u>	
WTA	wind and terrain analysis
WPT/TGT	

This page intentionally left blank.

References

SOURCES USED

These are the sources quoted or paraphrased in this publication. Documents marked with an * were also used to develop this publication.

Army Regulations

- AR 40-8. *Temporary Flying Restrictions Due to Exogenous Factors*. 17 August 1976.
- AR 70-62. *Airworthiness Qualification of US Army Aircraft Systems*. 7 July 2000.
- AR 95-1. *Flight Regulations*. 3 February 2006.
- AR 95-10. *Department of Defense (DOD) Notice to Airmen (NOTAM) System*. 1 August 2004.
- AR 95-20 (also known as Defense Logistics Agency Manual [DLAM] 8210). *Contractor's Flight and Ground Operations*. 13 November 2002.
- AR 95-27. *Operational Procedures for Aircraft Carrying Hazardous Materials*. 11 November 1994.
- AR 385-95. *Army Aviation Accident Prevention*. 10 December 1999.
- AR 600-105. *Aviation Service of Rated Army Officers*. 15 December 1994.
- AR 600-106. *Flying Status for Nonrated Army Aviation Personnel*. 8 December 1998.
- DA Pamphlet 351-4. *U.S. Army Formal Schools Catalog*. 31 October 1995.
- DA Pamphlet 738-751. *Functional Users Manual for the Army Maintenance Management System—Aviation (TAMMS-A)*. 15 March 1999.

Department of Defense Airman's Information Manual

- DOD 7000.14-R. *DOD Financial Management Regulation*. 15 November 1992.
- DOD AIM 86-100. *Operation and Maintenance Overview General Triservice Mode 4 Handbook*. May 1987. This publication is available from Commanding Officer, ATTN: Code 2111, Naval Electronic Systems Engineering Activity, St. Inigoes, MD 20684-0010, or WR-ALC/ MMAM-AIMS, ATTN: DOD AIMSP0, Robins AFB, GA 31098-5609.

Department of Defense Flight Information Publications

- Army Aviation Flight Information Bulletin.
<http://www.usaasa.belvoir.army.mil/fib/fibmain.htm>
- Flight Information Handbook. DOD flight information publications (FLIP) are available from: US Army Aeronautical Services Agency, ATAS-AI, 9325 Gunston Rd, Ste N319, Ft. Belvoir, VA 22060-5582. <http://www.usaasa.belvoir.army.mil/default.htm>
- National Geospatial-Intelligence Agency (NGA) Aeronautical Flight Information File:
<http://164.214.2.62/products/usfif/index.html>

Federal Aviation Administration Publications

- FAA Handbook 8260.3B. *United States Standard for Terminal Instrument Procedures (TERPS)*, 1 July 1976.
- FAA Order 7130.3. *Holding Pattern Criteria*. 18 March 1998.

TC 1-211

FAA Order 8460.42A. *Helicopter GPS Nonprecision Approach Criteria*. 11 June 1997.
Federal Aviation Regulation (FAR), Part 105. *Parachute Operations*. 9 May 2001.

Field Manuals

FM 1-112. *Attack Helicopter Operations*. 2 April 1997 (will be revised as FM 3-04.112).
FM 1-113. *Utility and Cargo Helicopter Operations*. 12 September 1997 (will be revised as FM 3-04.113).
FM 1-120. *Army Air Traffic Services Contingency and Combat Zone Operations*. 22 May 1995 (will be revised as FM 3-04.120).
FM 1-202. *Environmental Flight*. 23 February 1983 (will be revised as FM 3-04.202).
FM 1-203. *Fundamentals of Flight*. 3 October 1988 (will be revised as FM 3-04.203).
FM 1-230. *Meteorology for Army Aviators*. 30 September 1982 (will be revised as FM 3-04.230).
FM 1-240. *Instrument Flying and Navigation for Army Aviators*. 15 December 1984 (will be revised as FM 3-04.240).
FM 2-0. *Intelligence*. 17 May 2004.
FM 3-04.111. *Aviation Brigades*. 21 August 2003.
FM 3-04.140. *Helicopter Gunnery*. 14 July 2003.
FM 3-04.300. *Flight Operations Procedures*. 26 April 2004.
FM 3-04.301. *Aeromedical Training for Flight Personnel*. 29 September 2000.
FM 3-05.211. *Special Forces Military Free-Fall Operations*. 6 April 2005.
FM 3-05.212. *Special Forces Waterborne Operations*. 31 August 2004.
FM 3-21.220. *Static Line Parachuting Techniques and Tactics*. 23 September 2003.
FM 3-25.26. *Map Reading and Land Navigation*. 18 January 2005.
FM 3-52. *Army Airspace Command and Control in a Combat Zone*. 1 August 2002.
FM 4-20.197. *Multi-service Helicopter Sling Load: Basic Operations and Equipment*. 20 July 2006.
FM 7-1. *Battle Focused Training*. 15 September 2003.
FM 4-02.2

FM 10-67-1. *Concepts and Equipment of Petroleum Operations*. 2 April 1998 (will be revised as FM 4-20.12).
FM 10-450-4. *Multi-service Helicopter Sling Load: Single Point Load Rigging Procedures*. 30 May 1998.
FM 17-95. *Calvary Operations*. 24 December 1996 (will be revised as FM 3-20.95).
FM 21-60. *Visual Signals*. 30 September 1987 (will be revised as FM 3-21.60).
FM 24-35. *Signal Operation Instructions "The SOI."* 26 October 1990.
FM 90-4. *Air Assault Operations*. 16 March 1987 (will be revised as FM 3-18.12).

International Standardization Agreement

STANAG 3114 (Edition Seven). *Aeromedical Training of Flight Personnel*. 22 May 2003.

National Guard Regulation

*NGR 95-210. *Army National Guard: General Provisions and Regulations for Aviation Training*. 1 July 1991.

National Guard Bureau publications are available from Chief, National Guard Bureau, ATTN: NSB-DAY, Washington, DC 20310-2500.

<http://www.ngbpc.ngb.army.mil/pubs/ARNG%20Series/armgseries.htm>

Other

Requests for contractor flight releases, airworthiness releases, and/or interim or complete airworthiness qualification for Army aircraft for which USAAMCOM has engineering cognizance will be forwarded to the Commander, USAAMCOM, ATTN: AMSAM-RD-AE-I, Redstone Arsenal, Alabama 35898-5000. Requests normally will come through the materiel developer (such as the program executive office or the system's program/project/product manager) or from the field through a MACOM. Requests for airworthiness approval for major modifications installed on aircraft not under USAAMCOM engineering cognizance will be forwarded to the appropriate engineering cognizant agency (such as the Federal Aviation Administration, National Aeronautics and Space Administration, U.S. Air Force, or U.S. Navy). (See AR 70-62, paragraph 2-3.)

JP 4-02.2

Airworthiness Releases

STP 8-91W15-SM-TG

GEN 04-ASAM-01.

Manufacturer's operating manuals

Special Operations Command (SOCOM) Regulation 350-6.

Technical Circulars

TC 1-201. *Tactical Flight Procedures*. 20 January 1984.

TC 1-204. *Night Flight Techniques and Procedures*. 27 December 1988.

TC 1-210. *Aircrew Training Program Commander's Guide to Individual, Crew and Collective Training*. 20 June 2006.

TC 8-800. *Semi-Annual Combat Medic Skills Validation Test (SACMS-VT)*. 14 June 2002.

TC 21-24. *Rappelling*. 10 September 1997.

Technical Manuals

TM 1-1500-250-23. *Aviation Unit and Aviation Intermediate Maintenance for General Tie-down and Mooring on All Series Army Models, AH-64, UH-60, CH-47, UH-1, AH-1, OH-58 Helicopters*. 24 August 1990.

TM 1-1500-328-23. *Aeronautical Equipment Maintenance Management Policies and Procedures*. 30 July 1999.

TC 1-211

- TM 1-6625-724-13&P. *Operator's, Aviation Unit, and Intermediate Maintenance Manual Including Repair Parts and Special Tools List For Test Set, Aviation Vibration Analyzer (AVA) with Version 7.01* PN 29313107 (NSN 6625-01-282-3746). 7 March 2002.
- TM 5-4220-202-14. *Maintenance Instructions with Parts Breakdown: USAF Flotation Equipment*. 1 April 1986.
- TM 11-5841-283-12. *Aviation Unit Maintenance Manual for Radar Signal Detecting Set, AN/APR-39(V)* (NSN 5841-01-023-7112) {NAVAIR 16-30APR39-1}. 9 August 1983.
- TM 11-5855-263-10. *Operator's Manual for Aviator's Night Vision Imaging System (ANVIS) AN/AVS-6(V)1* (NSN 5855-01-138-4749) (EIC: IPR), *AN/AVS-6(V)2* (5855-01-138-4748) (EIC: IPQ), *AN/AVS-6(V)1A* (5855-01-439-1745) (EIC: IPW) {TO 12S10-2AVS6-1}. 1 February 2004.
- TM 11-5855-313-10. *Operator's Manual Aviator's Night Vision Imaging System (ANVIS) AN/AVS-6(V)3* (NSN 5855-01-475-7061) (EIC: N/A). 1 February 2004.
- TM 11-5895-1199-12. *Operator's and Organizational Maintenance Manual for the Mark XII IFF System*. 1 July 1984.
- TM 55-1500-342-23. *Army Aviation Maintenance Engineering Manual for Weight and Balance*. 29 August 1986
- TM 55-1520-210-10. *Operator's Manual for Army Model UH-1H/V Helicopters*. 15 February 1988.
- TM 55-1520-210-CL. *Operator's and Crewmember's Checklist: Army Model UH-1H/V Helicopters*. 13 February 1997.
- TM 55-1520-242-MTF. *Maintenance Test Flight Manual for Army Model UH-1 and EH-1 Helicopters*. 20 December 1985.
- TM 55-1680-317-23&P. *Aviation Unit and Aviation Intermediate Maintenance Manual with Repair Parts and Special Tools List for Army Survival Kits*. 26 March 1987.
- TM 55-2840-229-23-1. *Aviation Unit and Intermediate Maintenance Manual for Engine Assembly, Model T53-L-13B* (NSN 2840-00-134-4803) Part No. 1-000-060-22; *Model T53-L-13BA* (2840-01-093-7451), Part No. 1-000-060-10A; *Model T53-L-703* (2840-00-621-1860), Part No. 1-000-060-23 {TO 2J-T53-16-1}. 9 March 1981.

DOCUMENTS NEEDED

These documents must be available to the intended users of this publication.

Department of the Army Publications

- DA Form 759. *Individual Flight Record and Flight Certificate—Army*.
- DA Form 1971-R. *Radiological Data Sheet—Monitoring or Point Technique*.
- DA Form 1971-1-R. *Radiological Data Sheet—Route Technique and Course Leg Technique*.
- DA Form 2028. *Recommended Changes to Publications and Blank Forms*.
- DA Form 2408-12. *Army Aviator's Flight Record*.
- DA Form 2408-13. *Aircraft Status Information Record*.
- DA Form 2408-13-1. *Aircraft Maintenance and Inspection Record*.
- DA Form 4186. *Medical Recommendation for Flying Duty*.
- DA Form 5484. *Mission Schedule/Brief*.

DA Form 7120-R. *Commander's Task List.*

DA Form 7122-R. *Crew Member Training Record.*

DA Form 7243-R. *UH-1 Performance Planning Card.*

DA Form 7382-R. *Sling Load Inspection Record.*

DA Form 7440-R. Blank Scenarios and Nuclear, Biological, and Chemical (NBC)
Development Tool.

DA Form 7441-R. Coordinators Checklist – (Table VIII)

DA Form 7442-R. *Table VIII – Tracking Sheet.*

DD Form 365-4. *Weight and Balance Clearance Form F-Transport/Tactical.*

Federal Aviation Administration Publications

FAA 7110.65R. *Air Traffic Control*, 16 February 2006.

This page intentionally left blank.

Index

- academic evaluation topics, 3-20
- after-action reviews, 6-6
- base tasks, 2-6
- checklist
 - after action review, 4-97
 - crew briefing, 4-8
 - landing zone sequence, B-4
- continuation training, 2-5
- crew coordination, 6-1
- crew terminology, 6-6
- crewmember evaluation
 - academic criteria, 3-19
 - performance criteria, 3-18
- cross-monitoring, 6-5
- currency requirements, 2-14
- decisionmaking techniques, 6-3
- evaluation
 - principles, 3-17
 - sequence, 3-20
- evaluators
 - selection of, 3-17
- flight evaluation, 3-23
- grading considerations, 3-18
- leadership, 6-2
- mission training, 2-4
- note
 - meaning of, 1-1
- nuclear, biological, and chemical training, 2-15
- performance tasks, 2-6
- pre-mission, 6-2
- qualification training, 2-1
- refresher training, 2-3
- situational awareness, 6-4
- statements and directives, 6-4
- symbol usage, 1-1
- task conditions, 4-1
- task description, 4-3
- task list, 2-6
- task standards, 4-3
- technical tasks, 2-6
- unexpected events, 6-3
- word distinctions, 1-1
- workload distribution, 6-3

This page intentionally left blank.

UH-1 PERFORMANCE PLANNING CARD

For use of this form, see TC 1-211; the proponent agency is TRADOC.

CURRENT CONDITIONS

PA	FAT	
TAKEOFF GWT	LOAD	
CAL FACTOR	FUEL	
	CHART VALUE	IND TRQ
MAX TORQUE AVAIL		
MAX ALLOWABLE GWT (IGE)		
MAX ALLOWABLE GWT (OGE)		
PREDICTED HOVER TORQUE		
PREDICTED HOVER TORQUE (OGE)		
GO/NO-GO TORQUE (IGE)		
GO/NO-GO TORQUE (OGE)		
DCM		

MAXIMUM CONDITIONS

PA	FAT	
LOAD	FUEL	
	CHART VALUE	IND TRQ
MAX TORQUE AVAIL		
MAX ALLOWABLE GWT (IGE)		
MAX ALLOWABLE GWT (OGE)		
GO/NO-GO TORQUE (IGE)		
GO/NO-GO TORQUE (OGE)		
DCM		

CRUISE DATA				
PA	FAT		GWT	
CRUISE MAX END OR R/C MAX RANGE VNE		IAS	IND TRQ	FUEL FLOW
FUEL MANAGEMENT				
START	STOP	PPH	RESERVE	BURNOUT
WEIGHT COMPUTATION				
BASIC WEIGHT				
CREW AND FLT EQUIP WEIGHT				
MISSION EQUIP WEIGHT				
OPERATING WEIGHT				
FUEL WEIGHT				
PAX, BAGGAGE, CARGO, AND AMMO WEIGHT				
TAKEOFF GWT				
REMARKS				

TC 1-211
16 May 2007

By order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:



JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0711512

DISTRIBUTION:

Active Army, Army National Guard, and U.S. Army Reserve: To be distributed in accordance with the initial distribution number (IDN) 113888, requirements for TC 1-211.

