TC 1-237

AIRCREW TRAINING MANUAL
UTILITY HELICOPTER
H-60 SERIES

September 2005

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Training Circular
No. TC 1-237

Headquarters
Department of the Army
Washington, DC, 27 September 2005

Aircrew Training Manual
Utility Helicopter
H-60 Series

Contents

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*This publication supersedes TC 1-212, 8 March 1996.

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Preface

This aircrew training manual (ATM) standardizes aircrew training programs and flight evaluation procedures. This manual provides specific guidelines for executing H-60 aircrew training. It is based on the battle-focused training principles outlined in FM 7-1. It establishes crewmember qualification, refresher, mission, and continuation training and evaluation requirements. This manual applies to all H-60 series crewmembers and their commanders.

This is not a stand-alone document. All of the requirements of the Army regulations (ARs) and training circular (TC) 1-210 must be met. Implementing this manual conforms to AR 95-1 and TC 1-210.

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 units' 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 that crewmembers know the level of performance expected. Each task has a description that describes how it should be done 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 his aircrew training program.

The proponent of this publication is 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-60 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).

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

This publication applies to the Active Army, the Army National Guard/Army National Guard of the United States, and the U.S. Army Reserve.

This publication has been reviewed for operations security considerations.

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Chapter 1
Introduction

This ATM describes training requirements for H-60 crewmembers. It will be used with AR 95-1, AR 600-105, AR 600-106, National Guard Regulation (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 designates a crew station(s) for each crewmember. The individual's DA Form 7120-R (*Commander's Task List*) must clearly indicate all crew station designations. Training and proficiency sustainment for rated crewmembers (RCMs) is required in each designated crew station with access to the flight controls. Instructor pilots (IPs), standardization instructor pilots (SPs), instrument examiners (IEs), and maintenance test pilot evaluators (MEs) must maintain proficiency in both seats. NCM training and proficiency sustainment is required in each designated crew station. Except for flight 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 during some portion of the above evaluations, the requirements for "both seat evaluation" have been met. (Maintenance test pilot [MP]/ME RL progression and APART evaluations will be conducted according to chapter 5 of this ATM.)

1-2. SYMBOL USAGE AND WORD DISTINCTIONS.

a. **Symbol usage**. The diagonal (/) means one or the other or both. For example, IP/SP may mean IP or SP, or it may mean IP and SP.

b. **Word distinctions**.

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

(a) A warning indicates an operating procedure or a practice that, if not correctly followed, could result in personal injury or loss of life.

(b) A caution indicates an operating procedure or a practice that, if not strictly observed, could result in damage to, or destruction of, equipment.

(c) A note highlights essential information that is not of a threatening nature.

(2) Will, must, should, and may.

(a) Will or must is used to indicate a mandatory action.

(b) Should is used to indicate a nonmandatory but preferred method of accomplishment.

(c) May is used to indicate an acceptable method of accomplishment.

c. **Night vision devices (NVDs)**.

(1) Night vision system (NVS) refers to the NVS that is attached to the aircraft.

(2) Night vision goggles (NVGs) refer to any NVG image intensifier system; for example, the AN/AVS-6 (aviator's night vision imaging system [ANVIS]).

Note. NVD refers to either NVS or NVG.

Chapter 2
Training

This chapter describes requirements for qualification, refresher, mission, and continuation training. Crewmember qualification requirements will be according to 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 H-60 is conducted at the United States Army Aviation Center (USAAVNC) or at Department of the Army (DA) approved training sites according to a USAAVNC-approved POI.

(2) Nonrated crewmember. Military occupational specialty (MOS) qualification is conducted at DA-approved training sites. Initial aircraft qualification training for NCMs (15T and 91W) is conducted at the unit according to this ATM, (appendix A, sections I and II), applicable regulations, and the commander's aircrew training program (ATP). NCMs must complete academic and flight training and pass the required written examinations within 90 consecutive days from the start of training (United States Army Reserve (USAR)—1 year, Army National Guard (ARNG)—refer to appropriate regulations). Qualification training requirements for nonrated crewmember standardization instructors (SIs) and nonrated crewmember instructors (FIs) are also outlined in appendix A, section III.

b. **NVG qualification**. Initial NVG qualification and aircraft NVG qualification will be according to TC 1-210, the USAAVNC NVG training support package (TSP), and this ATM. The NVG TSP can be obtained by writing to the Commander, US Army Aviation Center ATTN: ATZQ-ATB-N, Fort Rucker, AL 36362-5000 or atzqatbns@rucker.army.mil. Additionally, the NVG TSP may be obtained by downloading from the USAAVNC Digital Training Access Center (DTAC) at https://rucker-dtac.army.mil. Once logged on to the DTAC, click on the ftp link, select 155.147.190.23 under the heading, and then select the NVG folder. An additional download site is http://www.rucker.army.mil. Once accessed, click on the Night Vision Devices link, then click on the Training Support Packages link. The criteria specified in TC 1-210, paragraph 2-5, apply also to NVG RL progression.

(1) Initial NVG qualification. Initial NVG qualification training will be conducted according this ATM.

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

(b) Flight training.

- Rated crewmembers. RCMs will complete, as a minimum, 10 flight hours of training on the tasks outlined in table 2-1. The evaluation may be applied to the 10-hour training requirement.
- Nonrated crewmembers. NCMs will demonstrate proficiency in all tasks outlined for NCMs in table 2-1. 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 IP, SP, FI, or SI, as appropriate.

(2) H-60 additional aircraft NVG qualification. Each crewmember must complete the requirements outlined in paragraph 2-1b(1) above with the following exceptions.

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

(b) Flight training. RCMs will demonstrate proficiency in the tasks outlined in table 2-1.

(c) NVG progression. For progression to NVG RL 2, a crewmember must complete an NVG evaluation given at night by an NVG IP, SP, FI, or SI, as appropriate.

c. **Aircraft series qualification**. Additional aircraft series qualifications will be done according to the appropriate TSP or this ATM (appendix B), as applicable.

d. **ANVIS heads-up display (HUD) qualification training**. These qualification procedures are outlined in appendix C.

e. **Additional system qualifications**. These will be conducted according to appendix D—to include but not limited to external stores support system/extended range fuel system (ESSS/ERFS) and Volcano qualifications.

Table 2-1. Flight tasks for initial night vision goggles qualification

Task	Title
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*
1034	Perform ground taxi*
1038	Perform hovering flight
1040	Perform visual meteorological conditions takeoff
1046	Perform electronically aided navigation*
1048	Perform fuel management procedures
1052	Perform visual meteorological conditions flight maneuvers
1058	Perform visual meteorological conditions approach
1062	Perform slope operations
1064	Perform a roll-on landing*
1068	Perform go-around*
1070	Respond to emergencies
1114	Perform a rolling takeoff*
1155	Negotiate wire obstacles
1162	Perform emergency egress
1184	Respond to inadvertent instrument meteorological conditions *
2012	Perform tactical flight mission planning*
2024	Perform terrain flight navigation
2026	Perform terrain flight
2034	Perform masking and unmasking
2036	Perform terrain flight deceleration

Table 2-1. Flight tasks for initial night vision goggles qualification	
Task	**Title**
2081	Operate night vision goggles
2092	Respond to night vision goggles failure
* Applies to RCMs only.	

2-2. REFRESHER TRAINING. The refresher training program is designed for crewmembers that are initially integrated into the ATP as RL 3. It enables them to regain proficiency in all base tasks. This chapter lists refresher training requirements and provides guidelines for developing refresher training programs (tables 2-2 and 2-3). 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 (chapter 2) are met.

(a) Academic training. The RCM will receive training and demonstrate a working knowledge of the applicable topics listed in paragraph 3-4b (items 1-7) and complete an operator's manual written examination.

(b) Flight training. The RCM will receive training and demonstrate proficiency from the designated crew station(s). Proficiency must be demonstrated in each performance and technical base task listed in table 2-4 (page 2-7). An X under the mode of flight for performance tasks specifies the mode in which the task will be performed. 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). A task that may be performed from either crew station need not be evaluated from both. All tasks must be trained to proficiency. Table 2-2 is a guide for developing refresher flight training for RCMs. Actual hours will be based on individual proficiency.

Table 2-2. Refresher flight training guide for rated crewmembers	
Flight Instruction	**Hours**
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**

(2) Nonrated crewmember. The NCM completes RL 3 requirements when the criteria in TC 1-210 (chapter 2) 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). Proficiency must be demonstrated in each performance and technical base task listed in table 2-5 and table 2-6 (page 2-10 and 2-11). An X under the mode of flight for performance tasks specifies the mode in which the task will be performed. 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). NCMs must demonstrate crew coordination and airspace surveillance proficiency in all other flight tasks listed in table 2-4 (page 2-7). All standards of each flight task must be trained to proficiency. Table 2-3 is a guide for developing refresher flight training for NCMs. Actual hours will be based on individual proficiency.

Table 2-3. Refresher flight training guide for nonrated crewmembers

Flight Instruction	Hours
Day and night base task training	6.0
Flight evaluation	2.0
Total hours	**8.0**

b. **NVG refresher training**. The crewmember must complete 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.

(2) Flight training. Crewmembers will demonstrate proficiency in all tasks outlined for the appropriate crewmember in table 2-1. There is no minimum flying hour requirement.

(3) NVG progression. For progression to NVG RL 2, a crewmember must complete an NVG evaluation given at night by an NVG IP, SP, FI, or SI, as appropriate.

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 METL. Mission training may be done during mission support or collective training.

a. **Training requirements**.

(1) Academic training. Academic training should focus on training a crewmember to operate as a proficient member of an aircrew and 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 presently does not conduct door gunnery, section (9) may be deleted.

(2) Flight training. The crewmember will receive flight training and demonstrate proficiency in the mission and additional tasks designated by the commander. Performance tasks will be conducted in each mode as specified on the individual's DA Form 7120-1-R (*Crewmember Task Performance and Evaluation Requirements*) and DA Form 7120-2-R (*Crewmember Task Performance and Evaluation Requirements Continuation Sheet*) for the crewmember's position. Mission training hour requirements are based on demonstrated proficiency. 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).

b. **NVG mission training**. NVG mission training will be according to 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. Additionally for RCMs, if not previously ANVIS HUD qualified, ANVIS HUD qualification should be done during NVG mission training as outlined below. See appendix C for ANVIS HUD qualification requirements.

(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). If conducting

ANVIS HUD qualification, all RCMs will complete the academic portion of the ANVIS HUD qualification prior to beginning flight training with ANVIS HUD installed according to appendix C.

(2) Flight training. The crewmember will receive flight training and demonstrate proficiency in the mission/additional NVG tasks as specified by the commander on the individual's DA Form 7120-1-R/DA Form 7120-2-R for the crewmember's position. There is no minimum flight hour requirement.

(3) NVG progression. For progression to NVG RL 1, a crewmember must complete an NVG evaluation given at night by an NVG IP, SP, FI, or SI, as appropriate. For a RCM not previously ANVIS HUD qualified, he should complete ANVIS HUD qualification according to appendix C before progressing to NVG RL 1. A RCM who has been previously ANVIS HUD qualified does not need to complete ANVIS HUD qualification again. That RCM only needs to demonstrate proficiency in task 2086 before progressing to NVG RL 1 if that task is specified on the RCMs individual DA Form 7120-1-R/DA Form 7120-2-R.

c. **MP and ME mission training**. Due to the complexity of the H-60, 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 (MP) 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 table 2-8 (page 2-14 and 2-15).

2-4. CONTINUATION TRAINING REQUIREMENTS. The RCM aircraft and simulation device flying-hour requirements apply only to RCMs whose primary aircraft is a H-60 series helicopter. Hours/task iterations flown in similar series aircraft may be credited toward semiannual flying-hour requirements unless directed otherwise by the commander. For RCMs whose additional/alternate aircraft is a H-60 series helicopter, commanders will establish continuation training requirements according to 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. IPs, SPs, IEs, MEs, and unit trainers (UTs) may credit those hours they fly while performing assigned duties at any crew station designated on DA Form 7120-R, during the day and night unaided, 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 of NVG flight, of which a minimum of 6 hours must be flown at night in the aircraft from a crew station with access to the flight controls while using NVGs. The other 3 hours may be flown in the UH-60FS.

(2) Nonrated crewmember. Has 24 hours (12 hours USAR and ARNG) in the aircraft while performing crew duties and complying with AR 600-106 and DOD 7000.15 or NVG RL 1 NCMs, 5 hours at night while performing crew duties and wearing NVG.

Note. FIs and SIs 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**. All RCMs will complete simulator requirements listed below.

(1) All active and reserve RCMs within 200 statute miles (SMs) of a compatible synthetic flight training system (SFTS) device will complete the following number of hours in the SFTS:

(a) FAC 1– 18 hours annually.

(b) FAC 2 – 12 hours annually.

(2) RCMs outside of 200 SM: Commanders should set up SFTS programs when it is cost effective and feasible.

(3) ARNG RCMs refer to NGR 95-1.

(4) FAC 3 – 10 hours semiannually regardless of distance from a SFTS device. This is authorized to be prorated per TC 1-210.

(5) RCMs may apply 12 hours of UH-60FS time toward their semiannual aircraft flying-hour minimums.

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

(1) DA Form 7120-1-R/DA Form 7120-2-R in the crewmember's indivivual aircrew training folder (IATF) specify the tasks and modes the crewmember must perform. Task iteration requirements will be according to 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 tables 2-4 through 2-6 and those tasks from table 2-7 designated by the commander on the crewmember's DA Form 7120-1-R/DA Form 7120-2-R. Additional iterations should be added based on individual crewmember proficiency.

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

(4) MPs/MEs will perform a minimum of four iterations of maintenance test pilot tasks (4000 series) annually. MEs will perform two iterations from each crew station with access to the flight controls annually.

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

a. **Base tasks**. Tables 2-4 through 2-6 list the required performance and technical base tasks for RCMs and NCMs for RL progression. An X under the mode of flight for performance tasks specifies the mode for progression and annual task iteration requirements. Technical tasks may be performed in any mode of flight.

b. **Mission tasks**. Table 2-7 (page 2-12) lists the performance and technical mission tasks for RCMs and NCMs. The commander will select mission and any additional tasks that support the units METL. Once a task is selected by the commander, an "X" under the mode of flight column denotes a task as a mandatory task for RL progression in that mode of flight.

c. **Maintenance test pilot tasks**. Table 2-8 (page 2-14) lists the maintenance test pilot tasks. All tasks listed in this table will be evaluated during APART with the following exceptions: Tasks 4228, 4274, and 4288. Those tasks will be evaluated during RL progression only or at the discretion of the evaluator.

d. **Task groups.**

(1) Performance tasks. These tasks measure the crewmember's ability to perform, manipulate the controls, and respond to tasks that are affected by the conditions and/or mode of flight. These tasks are significantly affected by the conditions and/or mode of flight; therefore, the condition and/or mode of flight under which the task must be performed must be specified. The base tasks listed as performance tasks in tables 2-4 through 2-6 already have the applicable conditions and/or modes of flight specified. The mission tasks listed as performance tasks in table 2-7 must have the conditions and/or modes or flight specified by the commander based on the unit METL. These specified conditions and/or modes of flight will be outlined in writing. Those tasks designated as performance tasks are listed in uppercase and bold type in tables 2-4 through 2-7.

(2) Technical tasks. These tasks measure the crewmembers ability to plan, preflight, brief, run-up, or operate specific onboard systems, sensors, or avionics in flight or on the ground. These tasks are not significantly affected by the condition and/or mode of flight, therefore, may be performed or evaluated in any condition and/or mode. The commander may mandate specific modes or conditions of flight based on unit mission. Tasks designated as technical tasks are listed in lowercase and plain type in tables 2-4 through 2-7.

e. **Evaluation guidelines**.

(1) Evaluations. APART evaluation tasks are those that are identified with an "S" or "I" in the evaluation column of tables 2-4 through 2-6. Annual NVG evaluation tasks are those tasks identified with an "NG" in the evaluation column of tables 2-4 through 2-6. Tasks evaluated at night or while using NVD will suffice for tasks required in day conditions.

(2) Night evaluation tasks must be evaluated in that mode if designated on DA Form 7120-1-R/DA Form 7120-2-R by the commander.

(3) A nuclear, biological, and chemical (NBC) task iteration (wearing mission-oriented protective posture [MOPP IV]) performed at night or while wearing NVG may be substituted for a day NBC task iteration. An iteration completed in any mode (Day, Night or NVG) while wearing MOPP IV may also suffice for one of the iterations(s) required in that mode of flight when not wearing MOPP IV.

Table 2-4. Rated crewmember base task list

Legend:

Day	Day mode of flight	Inst	Instrument mode of flight
Night	Night unaided mode of flight	NVG	NVG mode of flight
Eval	Maneuver listed is required to be evaluated on the listed evaluation	I	Instrument flight evaluation
S	Standardization flight evaluation	NG	NVG annual/NVG PFE evaluation

Task	Task Title	Day	Inst	Night	NVG	Eval
1000	Participate in a crew mission briefing	X				S, I
1004	Plan a visual flight rules flight	X				S
1006	Plan an instrument flight rules flight	X				I
1010	Prepare a performance planning card	X				S, I
1012	Verify aircraft weight and balance	X				S

Table 2-4. Rated crewmember base task list

Legend:

Day	Day mode of flight	Inst	Instrument mode of flight
Night	Night unaided mode of flight	NVG	NVG mode of flight
Eval	Maneuver listed is required to be evaluated on the listed evaluation	I	Instrument flight evaluation
S	Standardization flight evaluation	NG	NVG annual/NVG PFE evaluation

<table>
<tr><th>Task</th><th>Task Title</th><th>Day</th><th>Inst</th><th>Night</th><th>NVG</th><th>Eval</th></tr>
<tr><td>1013</td><td>Operate mission planning system</td><td colspan="4">X</td><td>S</td></tr>
<tr><td>1014</td><td>Operate aviation life support equipment</td><td colspan="4">X</td><td>S</td></tr>
<tr><td>1016</td><td>Perform internal load operations</td><td colspan="4">X</td><td>S</td></tr>
<tr><td>1020</td><td>Prepare aircraft for mission</td><td colspan="4">X</td><td>S</td></tr>
<tr><td>1022</td><td>Perform preflight inspection</td><td colspan="4">X</td><td>S</td></tr>
<tr><td>1024</td><td>Perform before-starting engine through before-leaving helicopter checks</td><td colspan="4">X</td><td>S, I, NG</td></tr>
<tr><td>1026</td><td>MAINTAIN AIRSPACE SURVEILLANCE</td><td>X</td><td>X</td><td>X</td><td>X</td><td>S, NG</td></tr>
<tr><td>1028</td><td>Perform hover power check</td><td colspan="4">X</td><td>S, I, NG</td></tr>
<tr><td>1032</td><td>Perform radio communications procedures</td><td colspan="4">X</td><td>S, I</td></tr>
<tr><td>1034</td><td>PERFORM GROUND TAXI</td><td>X</td><td></td><td>X</td><td>X</td><td>S</td></tr>
<tr><td>1038</td><td>PERFORM HOVERING FLIGHT</td><td>X</td><td></td><td>X</td><td>X</td><td>S, NG</td></tr>
<tr><td>1040</td><td>PERFORM VISUAL METEOROLOGICAL CONDITIONS TAKEOFF</td><td>X</td><td></td><td>X</td><td>X</td><td>S, NG</td></tr>
<tr><td>1044</td><td>NAVIGATE BY PILOTAGE AND DEAD RECKONING</td><td>X</td><td></td><td>X</td><td>X</td><td>S</td></tr>
<tr><td>1046</td><td>Perform electronically aided navigation</td><td colspan="4">X</td><td>S, NG</td></tr>
<tr><td>1048</td><td>Perform fuel management procedures</td><td colspan="4">X</td><td>S, I, NG</td></tr>
<tr><td>1052</td><td>PERFORM VISUAL METEOROLOGICAL CONDITIONS FLIGHT MANEUVERS</td><td>X</td><td></td><td>X</td><td>X</td><td>NG</td></tr>
<tr><td>1054</td><td>Select landing zone/pickup zone/holding area</td><td colspan="4">X</td><td></td></tr>
<tr><td>1058</td><td>PERFORM VISUAL METEOROLOGICAL CONDITIONS APPROACH</td><td>X</td><td></td><td>X</td><td>X</td><td>S, NG</td></tr>
<tr><td>1062</td><td>PERFORM SLOPE OPERATIONS</td><td>X</td><td></td><td>X</td><td>X</td><td>S, NG</td></tr>
<tr><td>1064</td><td>PERFORM A ROLL-ON LANDING</td><td>X</td><td></td><td>X</td><td>X</td><td>S, NG</td></tr>
<tr><td>1068</td><td>PERFORM GO-AROUND</td><td>X</td><td></td><td>X</td><td>X</td><td>S</td></tr>
<tr><td>1070</td><td>RESPOND TO EMERGENCIES</td><td>X</td><td>X</td><td>X</td><td>X</td><td>S, NG</td></tr>
<tr><td>1082</td><td>PERFORM AUTOROTATION</td><td>X</td><td></td><td>X</td><td>X</td><td>S</td></tr>
<tr><td>1114</td><td>PERFORM A ROLLING TAKEOFF</td><td>X</td><td></td><td>X</td><td>X</td><td>S</td></tr>
<tr><td>1155</td><td>Negotiate wire obstacles</td><td colspan="4">X</td><td></td></tr>
<tr><td>1162</td><td>Perform emergency egress</td><td colspan="4">X</td><td>S</td></tr>
<tr><td>1166</td><td>Perform instrument maneuvers</td><td colspan="4">X</td><td>I</td></tr>
<tr><td>1168</td><td>Perform command instrument system procedures</td><td colspan="4">X</td><td>S or I</td></tr>
<tr><td>1170</td><td>Perform instrument takeoff</td><td colspan="4">X</td><td>I</td></tr>
<tr><td>1174</td><td>Perform holding procedures</td><td colspan="4">X</td><td>I</td></tr>
<tr><td>1176</td><td>Perform nonprecision approach</td><td colspan="4">X</td><td>I</td></tr>
</table>

Table 2-4. Rated crewmember base task list

Legend:

Day	Day mode of flight	Inst	Instrument mode of flight
Night	Night unaided mode of flight	NVG	NVG mode of flight
Eval	Maneuver listed is required to be evaluated on the listed evaluation	I	Instrument flight evaluation
S	Standardization flight evaluation	NG	NVG annual/NVG PFE evaluation

Task	Task Title	Day	Inst	Night	NVG	Eval
1178	Perform precision approach	X				I
1180	Perform emergency global positioning system recovery procedure	X				
1182	**PERFORM UNUSUAL ATTITUDE RECOVERY**	X	X	X	X	S or I
1184	**RESPOND TO INADVERTENT INSTRUMENT METEOROLOGICAL CONDITIONS**	X		X	X	S, NG
1188	Operate aircraft survivability equipment	X				S
1190	Perform hand and arm signals	X				S
1194	Perform refueling operations	X				
1253*	Operate central display unit	X				S
1254*	Operate multifunction display	X				S
1262	Participate in a crew-level after action review	X				S

*Base tasks requiring specialized equipment do not apply to aircraft that do not have the equipment.

Note. Performance tasks are in uppercase and bold type. Technical tasks are in lowercase and plain type.

Table 2-5. Nonrated crewmember (15T) base task list					
Legend:					
Day	Day mode of flight	Inst	Instrument mode of flight		
Night	Night unaided mode of flight	NVG	NVG mode of flight		
Eval	Maneuver listed is required to be evaluated on the listed evaluation	I	Instrument flight evaluation		
S	Standardization flight evaluation	NG	NVG annual/NVG PFE evaluation		

Task	Task Title	Day	Night	NVG	Eval
1000	Participate in a crew mission briefing		X		S, NG
1014	Operate aviation life support equipment		X		S
1016	Perform internal load operations		X		S, NG
1020	Prepare aircraft for mission		X		S, NG
1022	Perform preflight inspection		X		S
1024	Perform before-starting engine through before-leaving helicopter checks		X		S, NG
1026	**MAINTAIN AIRSPACE SURVEILLANCE**	X	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 TAKEOFF**	X	X	X	S, NG
1048	Perform fuel management procedures		X		S, NG
1052	**PERFORM VISUAL METEOROLOGICAL CONDITIONS FLIGHT MANEUVERS**	X	X	X	S, NG
1058	**PERFORM VISUAL METEOROLOGICAL CONDITIONS APPROACH**	X	X	X	S, NG
1062	**PERFORM SLOPE OPERATIONS**	X	X	X	S, NG
1070	**RESPOND TO EMERGENCIES**	X	X	X	S, NG
1114	**PERFORM A ROLLING TAKEOFF**	X	X	X	S
1155	Negotiate wire obstacles		X		
1162	Perform emergency egress		X		S, NG
1188	Operate aircraft survivability equipment		X		S
1190	Perform hand and arm signals		X		S
1194	Perform refueling operations		X		
1230*	Perform litter and ambulatory patients load/secure/and unload procedures		X		S
1258*	Operate mission medical interior cabin systems		X		S
1262	Participate in a crew-level after action review		X		S

*Base tasks requiring specialized equipment do not apply to aircraft that do not have the equipment.

Note. Performance tasks are in uppercase and bold type. Technical tasks are in lowercase and plain type.

Table 2-6. Nonrated crewmember (91W) base task list

Legend:

Day	Day mode of flight	Inst	Instrument mode of flight
Night	Night unaided mode of flight	NVG	NVG mode of flight
Eval	Maneuver listed is required to be evaluated on the listed evaluation	I	Instrument flight evaluation
S	Standardization flight evaluation	NG	NVG annual/NVG PFE evaluation

Task	Task Title	Day	Night	NVG	Eval
1000	Participate in a crew mission briefing		X		S, NG
1014	Operate aviation life support equipment		X		S
1016	Perform internal load operations		X		S, NG
1020	Prepare aircraft for mission		X		S, NG
1022	Perform preflight inspection		X		S
1024	Perform before-starting-engine through before-leaving-helicopter checks		X		S, NG
1026	**MAINTAIN AIRSPACE SURVEILLANCE**	X	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 TAKEOFF**	X	X	X	S, NG
1048	Perform fuel management procedures		X		S, NG
1052	**PERFORM VISUAL METEOROLOGICAL CONDITIONS FLIGHT MANEUVERS**	X	X	X	S, NG
1058	**PERFORM VISUAL METEOROLOGICAL CONDITIONS APPROACH**	X	X	X	S, NG
1062	**PERFORM SLOPE OPERATIONS**	X	X	X	S, NG
1070	**RESPOND TO EMERGENCIES**	X	X	X	S, NG
1114	**PERFORM A ROLLING TAKEOFF**	X	X	X	S
1155	Negotiate wire obstacles		X		
1162	Perform emergency egress	X	X	X	S, NG
1188	Operate aircraft survivability equipment		X		S
1190	Perform hand and arm signals		X		S
1194	Perform refueling operations		X		
1228	Relay patient information to medical control		X		S
1230	Perform litter and ambulatory patients load/secure/and unload procedures		X		S
1234	Operate medical equipment		X		S
1238	Provide treatment for a patient		X		S
1239	Perform basic trauma life support		X		S
1258	Operate mission medical interior cabin system		X		S
1262	Participate in a crew-level after action review		X		S

*Base tasks requiring specialized equipment do not apply to aircraft that do not have the equipment.

Note. Performance tasks are in uppercase and bold type. Technical tasks are in lowercase and plain type.

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

Legend:

Day	Day mode of flight	Inst	Instrument mode of flight
Night	Night unaided mode of flight	NVG	NVG mode of flight
Eval	Maneuver listed is required to be evaluated on the listed evaluation	I	Instrument flight evaluation
S	Standardization flight evaluation	NG	NVG annual/NVG PFE evaluation

Task	Task Title	Day	Inst	Night	NVG	Eval
2010	**PERFORM MULTIAIRCRAFT OPERATIONS**					
2012	**PERFORM TACTICAL FLIGHT MISSION PLANNING (RCM ONLY)**					NG
2014	Perform electronic countermeasures/electronic counter-countermeasures procedures					
2022	Transmit tactical reports					
2024	**PERFORM TERRAIN FLIGHT NAVIGATION**					NG
2026	**PERFORM TERRAIN FLIGHT**					NG
2034	**PERFORM MASKING AND UNMASKING**					
2036	**PERFORM TERRAIN FLIGHT DECELERATION**					NG
2042	Perform actions on contact					
2048	**PERFORM SLING LOAD OPERATIONS**					
2050	Develop an emergency global positioning system recovery procedure					
2052	**PERFORM WATER BUCKET OPERATIONS**					
2054	**PERFORM FAST-ROPE INSERTION AND EXTRACTION OPERATIONS**					
2056	**PERFORM RAPPELLING OPERATIONS**					
2058	**PERFORM SPECIAL PATROL INFILTRATION/EXFILTRATION OPERATIONS**					
2060	**PERFORM RESCUE-HOIST OPERATIONS**					
2061	Operate forward looking infrared system					
2063	Operate storm scope weather mapping system					
2062*	**PREPARE A PATIENT FOR HOIST OPERATIONS**					
2064	**PERFORM PARADROP OPERATIONS**					
2065	Operate personnel locater system					
2066	Perform extended range fuel system operation					
2068	**PERFORM SHIPBOARD OPERATIONS**					
2070	**PERFORM M-139 VOLCANO OPERATIONS**					
2075	Perform fat hawk operations					
2076	**PERFORM CAVING LADDER OPERATIONS**					
2078	**PERFORM HELOCAST OPERATIONS**					
2081	**OPERATE NIGHT VISION GOGGLES**					NG
2086	**OPERATE AVIATOR’S NIGHT VISION IMAGING SYSTEM HEADS-UP DISPLAY**					

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

Legend:

Day	Day mode of flight	Inst	Instrument mode of flight
Night	Night unaided mode of flight	NVG	NVG mode of flight
Eval	Maneuver listed is required to be evaluated on the listed evaluation	I	Instrument flight evaluation
S	Standardization flight evaluation	NG	NVG annual/NVG PFE evaluation

Task	Task Title	Day	Inst	Night	NVG	Eval
2090	**PERFORM LANDING AREA RECONNAISSANCE FOR SIMULATED MAXIMUM GWT**					
2092	**RESPOND TO NIGHT VISION GOGGLES FAILURE**					**NG**
2093	**PERFORM SIMULATED MAXIMUM GROSS WEIGHT APPROACH AND LANDING**					
2095	**PERFORM SIMULATED MAXIMUM GROSS WEIGHT TAKEOFF**					
2098	Perform aerial radio relay					
2108*	Perform auxiliary power unit operations (NCM only)					
2112*	**OPERATE ARMAMENT SUBSYSTEM**					
2116	Perform an aerial radiological survey					
2120**	Provide patient treatment at emergency medical technician-basic, intermediate, or paramedic level					
2122**	Perform advanced cardiac life support					
2126**	Perform pediatric advanced life support					
2127	Perform combat maneuvering flight					
2169	Perform aerial observation					

* Applies to NCMs only.

**Applies to flight medics only.

Note. Performance tasks are in uppercase and bold type. Technical tasks are in lowercase and plain type.

Table 2-8. Maintenance test pilot base tasks

Legend:

Day	Day mode of flight	Inst	Instrument mode of flight
Night	Night unaided mode of flight	NVG	NVG mode of flight
Eval	Maneuver listed is required to be evaluated on the listed evaluation	I	Instrument flight evaluation
S	Standardization flight evaluation	M	MP/ME flight evaluation
NG	NVG annual/NVG PFE evaluation		

Task	Task Title	Eval
4000	Perform prior to maintenance test flight checks	M
4004	Perform interior checks	M
4010	Perform starting auxiliary power unit checks	M
4014	Perform caution advisory/master warning checks	M
4038	Perform instrument display system checks	M
4040	Perform stabilator audio warning priority check	M
4042	Perform heater and vent system/windshield wiper check	M
4044	Perform flight control hydraulic system checks	M
4046	Perform collective friction check	M
4048	Perform tail rotor servo check	M
4050	Perform computer and stability augmentation system checks	M
4052	Perform flight control breakout forces checks	M
4060	Perform trim system checks	M
4062	Perform damping forces check	M
4064	Perform trim beep checks	M
4066	Perform collective to yaw electronic coupling/ flight path stabilization heading hold checks	M
4068	Perform stabilator checks	M
4070	Perform fuel quantity indicator checks	M
4072	Perform altimeter check	M
4074	Perform fire detection system checks	M
4076	Perform windshield anti-ice and backup pump interlock checks	M
4078	Perform pitot heat system check	M
4082	Perform fuel boost pump checks	M
4086	Perform engine starter system checks	M
4088	Perform starting engine checks	M
4090	Perform engine run-up and systems checks	M
4092	Perform hydraulic leak system check	M
4102	Perform electrical system checks	M
4112	Perform taxi checks	M
4122	Perform health indicator test/baseline-bleed air and anti-ice checks	M

Table 2-8. Maintenance test pilot base tasks		
Legend: Day — Day mode of flight; Inst — Instrument mode of flight Night — Night unaided mode of flight; NVG — NVG mode of flight Eval — Maneuver listed is required to be evaluated on the listed evaluation; I — Instrument flight evaluation S — Standardization flight evaluation; M — MP/ME flight evaluation NG — NVG annual/NVG PFE evaluation		
Task	**Task Title**	**Eval**
4142	Perform hover power/hover controllability checks	M
4158	Perform automatic flight control system hover checks	M
4200	Perform backup tail rotor servo check	M
4202	Perform generator underfrequency disable/low rotor RPM checks	M
4204	Perform compasses, turn rate, and vertical gyros checks	M
4210	Perform takeoff and climb checks	M
4218	Perform in-flight controllability checks	M
4220	Perform maximum power check	M
4225	Perform cruise stabilator checks	M
4226	Perform AFCS in-flight checks	M
4228	Perform vibration absorber check and tuning	
4236	Perform autorotation revolutions per minute check	M
4254	Perform Vh check	M
4274	Perform in-flight communication/navigation/flight instruments checks	
4276	Perform special/detailed procedures	M
4284	Perform engine shutdown checks	M
4288	Perform gust lock operations	

Note. Those base tasks listed in table 2-8 not performed satisfactorily during evaluations may be trained and re-evaluated by the ME according to AR 95-1, paragraph 4-30.

2-6. CURRENCY REQUIREMENTS.

a. Aircraft currency will be according to AR 95-1. Those crewmembers whose currency has lapsed must complete an evaluation given in the aircraft by an IP, SP, FI, or SI, as appropriate. Commanders should consider selecting tasks from each mode of flight (day, night and instrument) and evaluating tasks from each selected mode during the currency evaluation. These requirements will be outlined in the unit standing operating procedure (SOP).

b. To be considered NVG current, a crewmember must take part every 60 days in at least a 1-hour flight in the aircraft at night while wearing NVG. A RCM must be at a crew station with access to the flight controls. Using the UH-60FS to maintain currency is not authorized. A NCM must perform designated duties in a crew station authorized on the DA Form 7120-R (*Commander's Task List*). Those RCMs and NCMs whose currency has lapsed must complete as a minimum a 1-hour proficiency flight evaluation given at night in the aircraft by an NVG IP, SP, FI, or SI, as appropriate.

The minimum tasks to be evaluated are listed in tables 2-4 through 2-7 and identified by an “NG” in the evaluation column.

c. If the crewmember fails to demonstrate proficiency, he will be regressed to the appropriate RL status.

2-7. ANNUAL NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) REQUIREMENTS.

a. Crewmembers will receive NBC training in the tasks listed below. The commander may select other tasks based on the unit's mission. Crewmembers will perform at least one iteration of the tasks listed below annually while wearing MOPP IV NBC gear. Task 1028 applies to RCMs only.

(1) Task 1022 – Perform preflight inspection.

(2) Task 1024 – Perform before-starting-engine through before-leaving-helicopter checks.

(3) Task 1026 – Maintain airspace surveillance.

(4) Task 1028 – Perform hover power check.

(5) Task 1038 – Perform hovering flight.

(6) Task 1040 – Perform visual meteorological conditions takeoff.

(7) Task 1058 – Perform visual meteorological conditions approach.

b. While conducting NBC training, the commander will ensure that aircrews exercise caution when performing flight duties when the wet bulb globe temperature is above 75 degrees Fahrenheit.

c. Commander’s may allow both pilots to fly while wearing MOPP IV.

Note. Emergency procedures may be conducted while the aircrew is wearing MOPP IV.

Chapter 3
Evaluation

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

3-1. EVALUATION PRINCIPLES.

a. The value of any evaluation depends on adherence to fundamental evaluation principles. These principles are described below.

(1) 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.

(2) The evaluation method 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 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.

(3) All participants must completely understand the purpose of the evaluation.

(4) Cooperation by all participants is necessary to accomplish the evaluation objectives. The emphasis is on all participants—not just on the examinee.

(5) 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.

b. The evaluation will determine the examinee's ability to perform essential tasks to prescribed standards. Flight evaluations will also determine the examinee's ability to exercise crew coordination in completing these tasks.

c. The guidelines for evaluating crew coordination are based on an 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.

d. In all phases of the 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 that he is being supported by a fully functioning crewmember.

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. Some tasks are identified in TRAINING AND EVALUATION REQUIREMENTS as tasks which 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 (to include the aircraft or simulator) to determine the examinee's knowledge of the task.

(2) In the aircraft or in the simulator. Tasks which require evaluation under these conditions must be performed in the aircraft or the UH-60FS. 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.

3-3. CREWMEMBER EVALUATION. Evaluations determine the crewmember's ability to perform the tasks on his DA Form 7120-1-R (*Crewmember Task Performance and Evaluation Requirements*) and DA Form 7120-2-R (*Crewmember Task Performance and Evaluation Requirements Continuation Sheet)* 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—UH-60 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. **Performance criteria**.

(1) PI. The PI must demonstrate a working knowledge of the appropriate subjects in paragraph 3-4b. In addition, he must be familiar with his individual aircrew training folder (IATF), and understand the requirements listed on his commander's task list.

(2) PC/MP. The pilot in command/maintenance test pilot (PC/MP) must meet the requirements in paragraph 3-3a (1). In addition, he must demonstrate sound judgment and maturity in managing the mission, crew, and assets.

(3) UT. The UT must meet the requirements in paragraph 3-3a (2). In addition, he 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 paragraph 3-3a (2). In addition, he must be able to objectively instruct, evaluate, and document performance of the crew chief (CE), medical officer (MO), observer (OR), SI, FI, PI, PC, UT, and IE using role reversal for IP, IE, UT, PC, SI, and FI, as appropriate. He must be able to develop and implement an individual training plan and have 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) CE/MO/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, he must be familiar with and understand the requirements listed in his individual aircrew training folder (IATF).

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

(9) SI. The SI must meet the requirements in paragraph 3-3a (7) and (8). In addition, he must be able to train and evaluate the SI, FI, CE, MO, and OR using role reversal, as appropriate. The SI also must 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).

b. **Academic evaluation criteria**.

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

(2) APART standardization/NG annual evaluations. The SP/IP/SI/FI will evaluate a minimum of two topics from each subject area in paragraph 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 instrument meteorological condition (IMC) flight and flight planning. If the evaluated crewmember is an IP/SP/IE, the IE will evaluate the ability of the IP/SP/IE to instruct instrument-related tasks.

(4) 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, evaluate topics in paragraph 3-4b (12) if the examinee is an ME.

(5) Other ATP evaluations. The SP/IP/SI/FI will evaluate a minimum of two topics from each subject area in paragraph 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) Will review the examinee's individual flight records folder (IFRF) and individual aircrew training folder (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) Will confirm the purpose of the evaluation, explain the evaluation procedure, and discuss the evaluation standards and criteria to be used.

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

(1) Regulations and publications (AR 95-1, DA Pam 738-751, Department of Defense flight information publication (DOD FLIP), TC 1-210, FM 1-240, (appropriate aircraft operator's manual, appropriate –23 series manuals, chapters 2, 4, and 6 of this ATM, and local and unit SOPs). Topics in this subject area are—

- ATP requirements
- Crew coordination
- Airspace regulations and usage*
- Flight plan preparation and filing*
- Inadvertent IMC procedures*
- Forms, records, and publications required in the aircraft
- Unit SOP and local requirements
- Aviation life support equipment (ALSE)
- Visual flight rules/instrument flight rules (VFR/IFR) minimums and procedures*
- Weight and balance requirements
- Range operations and safety
- DOD flight information publications and maps*

(2) Aircraft systems, avionics, and mission equipment description and operation. (Appropriate aircraft operator's manuals and chapter 4 of this ATM). Topics in this subject area are—

- Engines and related systems
- Flight control and automatic flight control system (AFCS) system
- Powertrain system
- Utility system
- Flight instruments*
- Heating, ventilation, cooling, and environmental control unit
- Lighting
- Servicing, parking, and mooring
- Mission equipment
- Avionics
- Emergency equipment
- Fuel system
- MARK XII IFF
- Hydraulic and pneumatic system
- Main and tail rotor groups
- Auxiliary power unit
- Electrical power supply and distribution systems
- Aircraft survivability equipment (ASE)
- Cargo handling systems
- Armament

(3) Operating limitations and restrictions (appropriate aircraft operator's manual). Topics in this subject area are—

- Wind limitations*
- Power limitations*
- Aircraft system limitations*
- Temperature limitations*
- Rotor limitations*
- Engine limitations*
- Airspeed limitations
- Loading limitations

- Performance planning*
- Weather/environmental limitations/restrictions*
- Flight envelope limitations (that is, ERFS , rescue hoist, sling loads, and Volcano)
- Maneuvering limits*
- Weapon system limitations

(4) Aircraft emergency procedures and malfunction analysis (appropriate aircraft operator's manual). Topics in this subject area are—

- Emergency terms and their definitions
- Engine malfunctions*
- Fires
- Hydraulic system malfunctions*
- Landing and ditching procedures
- Stabilator malfunctions*
- Rotor, transmission, and drive system malfunctions*
- Emergency exits and equipment
- Chip detectors*
- Fuel system malfunctions*
- Electrical system malfunctions*
- Flight control malfunctions*
- AFCS malfunctions*
- Mission equipment

(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 appropriate aircraft operator's manual). Topics in this subject area are—

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

(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 10-450-3, FM 10-450-4, FM 10-450-5, FM 55-450-2, FM 34-1, FM 3-52, FM 3-100.2, and FM 90-4; TC 1-201, TC 1-204, and TC 1-210; appropriate aircraft operator's manual; chapter 4 of this ATM, and unit SOP). Topics in this subject area are—

- ASE employment
- Downed aircraft procedures
- Communication security (COMSEC)
- Mission equipment
- Volcano operations
- High intensity radio transmission area (HIRTA)
- Tactical formation
- Fratricide prevention
- Terrain flight planning and safety
- Actions on contact
- Internal load operations
- NBC operations
- Fire support

(9) Weapon system operation and employment (FM 1-112 and FM 3-04.140, M60D/M240H operator's manual, appropriate aircraft operator's manual, and unit SOP). Topics in this subject area are—

- Weapons initialization, arming, and safety
- Range estimation
- Operation and function of the M60D/M240H
- Duties of the door gunner
- Visual search and target detection
- Fire control/fire commands
- Weapons employment during night and NVD operations
- Techniques of fire and employment

(10) Night vision goggle operations (FM 3-04.301, TC 1-204, appropriate aircraft operator's manual, NVG operator's manual, and unit SOP). Topics in this subject area are—

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

(11) ME and MP topics (DA Pam 738-751, applicable –23 series manuals, applicable maintenance test flight manuals, chapter 5 of this ATM, and applicable aircraft operator's manual). Topics in this subject area are for MEs and MPs only.

- Engine start
- Instrument indications
- Electrical system
- Auxiliary power unit (APU) system
- Power plant
- Engine performance check
- Power train
- Hydraulic system and leak detection isolation
- Flight controls
- Vibrations
- Fuel system
- AFCS system

- Communication and navigation equipment
- Maintenance operational check/maintenance test flight (MOC/MTF) requirements
- Warning systems indications
- MTF weather requirements

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

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

c. **Phase 3–Flight evaluation**. If this phase is required, the following procedures apply.

(1) Briefing. The evaluator will explain the flight evaluation procedure and brief the examinee on which tasks he will be evaluated. When evaluating an evaluator/trainer, the evaluator **must** advise the examinee that, during role reversal, he 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 according to task 1000.

(2) Preflight inspection, engine start, and run-up procedures. The evaluator will evaluate the examinee's use of the appropriate TMs/CLs/MTFs 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 commander's task list as mandatory for the designated crew station(s) for the type of evaluation he is conducting and those mission or additional tasks selected by the commander. The evaluator, in addition to the commander-selected tasks, may randomly select for evaluation any tasks listed on the mission or additional task list. An IP, SP, ME, IE, UT, FI and SI must demonstrate an ability to instruct and/or evaluate appropriate flight tasks.

Note. During 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**. Upon completing the evaluation, the evaluator will—

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

(2) Offer recommendations for improvement.

(3) Tell the examinee whether he 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.

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

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Chapter 4

Crewmember Tasks

This chapter implements portions of STANAG 3114/Air Standard 60/16.

This chapter describes the tasks that are essential for maintaining 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. It does not contain all the maneuvers that can be performed in the aircraft.

4-1. TASK CONTENTS.

a. **Task number**. Each ATM task is identified by a 10-digit system 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 237 (UH-60). For convenience, only the last four digits are listed in this training circular (TC). The last four digits are as follows:

- Individual tasks are assigned 1000-series numbers.
- Crew tasks are assigned 2000-series numbers.
- Maintenance tasks are assigned 4000-series numbers.

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. These tasks will be assigned 3000-series numbers.

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-60FS in the conditions do not apply to NCM. 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 VMC or IMC.

(c) Day, Night, and NVD employment.

(d) In any terrain or climate.

(e) NBC including MOPP equipment employment.

(f) Electromagnetic environmental effects.

(2) Common training/evaluation conditions are—

(a) When a 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. Evaluators/trainers who are evaluating/training NCMs must be at a crew 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—to perform these tasks in the aircraft:

- Task 1070 – Respond to emergencies.
- Task 1082 – Perform autorotation.
- Task 1182 – Perform unusual attitude recovery.

(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, HUD, and so forth) or mission equipment (water bucket, ERFS, and so forth) is required to perform 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) Base tasks requiring specialized equipment do not apply to aircraft that do not have the equipment.

(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 and the hover power check indicates that out of ground effect (OGE) power is not available.

- Task 2048 – Perform sling load operations.
- Task 2052 – Perform water bucket operations.
- Task 2054 – Perform fast rope insertion and extraction operations.
- Task 2056 – Perform rappelling operations.
- Task 2058 – Perform special patrol infiltration/exfiltration operations.
- Task 2060 – Perform rescue hoist operations.
- Task 2076 – Perform caving ladder operations.

d. **Standards**. The standards describe the minimum degree of proficiency to which the task must be done. The terms, "without error," "properly," and "correctly" apply to all standards. The standards are based on ideal conditions. Crew actions (specified in the description) include satisfactorily performing 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 chapter 6 of this ATM.

(2) Hover.

(a) Maintain heading ±10 degrees.

(b) Maintain altitude, ±3 feet (±5 feet for OGE). *

(c) Do not allow drift to exceed 3 feet (10 feet for OGE hover). *

(d) Maintain ground track within 3 feet.

(e) Maintain a constant rate of movement appropriate for existing conditions.

*These standards require that the other crewmembers announce drift and altitude changes 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 ground track with minimum drift.
(e) Maintain rate of climb or descent ±200 feet per minute (FPM).
(f) Maintain the aircraft in trim ±½ ball width.

(4) All tasks with the APU/engines operating (RCMs and NCMs).
(a) Maintain airspace surveillance (task 1026).
(b) Apply appropriate environmental considerations.

e. **Description**. The description explains the preferred method for doing 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. 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 PC duties. When required, PC responsibilities are specified. For all tasks, the following responsibilities apply.

(a) All crewmembers. Perform crew coordination actions, and announce malfunctions or emergency conditions. Monitor engine and systems operations, and avionics (navigation and communication) as necessary. During VMC, focus attention primarily outside the aircraft, maintain airspace surveillance, and clear the aircraft. 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 conducting the mission and for operating, securing, and servicing the aircraft he commands. The PC will ensure that a crew briefing is done and that the mission is performed according to the mission briefing, ATC instructions, regulations, and SOP requirements.

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

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

(e) P. The P is responsible for navigation, in-flight computations, assisting the P* (as requested), and properly executing emergency procedures. When duties permit, he assists the P* with obstacle clearance.

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

(g) Trainer/evaluator. When acting as PI during training and evaluations, he will act as a functioning crewmember and perform as required, unless he is training or evaluating crewmember response to an ineffective crewmember. In the aircraft, he 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 accomplishing the task under various flight modes—for example, night, NVG, environmental conditions, snow/sand/dust and mountain/pinnacle/ridgeline operations. Crewmembers must consider additional aspects to a task when performing it in different environmental conditions. Including 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 (HH-60L, ERFS, Volcano, and so forth) may also be addressed as a consideration. Training considerations establish specific actions and standards used in the training environment.

(1) Night and NVD. Wires and other hazards are much more difficult to detect and must be accurately marked and plotted on maps. Crewmembers 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 a determination cannot be made if they contain barriers or obstacles) will be treated as physical obstacles. Altitude and ground speed are difficult to detect and using artificial illumination may sometimes be necessary. Crewmembers determine the need for artificial lighting prior to descending below barriers and 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. Crewmembers take special precautions to identify and confirm the correct switches and levers.

(2) Night unaided. Using the white light or weapons flash will impair night vision. The P* should not view white lights, weapons flash, or impact directly. He allows time for dark adaptation or, if necessary, adjusts altitude and airspeed until adapted. He exercises added caution if performing flight tasks before reaching full dark adaptation. Dimly visible objects may be easier to detect using peripheral vision but may tend to disappear when viewed directly. Off-center viewing techniques are used to locate and orient on objects.

(3) NVD. Using 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 NVGs.

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 (tables 2-4 through 2-7) lists 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. In addition to the references listed with each task, the following common references apply as indicated.

(1) All flight tasks (tasks with APU/engines operating).
- (a) AR 95-1.
- (b) FM 1-203.
- (c) FM 1-230.
- (d) Appropriate aircraft operator's manual/CL/MTFs.
- (e) DOD FLIP.
- (f) FAR/host-nation regulations.
- (g) Unit/local SOPs.
- (h) Aircraft logbook (DA Form 2408 series).
- (i) FM 3-04.301.

(2) All instrument tasks.
- (a) AR 95-1.

(b) FM 1-240.
(c) FAA Instrument Flying Handbook (FAA-H-8003-15).
(d) FAA Instrument Procedures Handbook (FAA-H-8261-1).
(e) DOD FLIP.
(f) Aeronautical Information Manual.

(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.
(f) FM 90-4.

(5) All medical tasks.
(a) FM 8-10-6.
(b) TC 8-800.
(c) Appropriate aircraft operator's manual.
(d) Unit SOP and treatment protocol.

4-2. TASK LIST. The following numbered tasks are H-60 tasks.

TASK 1000

Participate in a crew mission briefing

CONDITIONS: Before flight in a H-60 helicopter, DA Form 5484-R (*Mission Schedule/Brief)* information, and a unit-approved crew briefing checklist.

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

1. The pilot in command (PC) will acknowledge an understanding of DA Form 5484-R and will actively participate in a crew mission briefing.
2. A rated crewmember (RCM) will conduct the aircrew mission briefing using table 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 then brief essential areas of the mission to the PC according to AR 95-1. The PC will acknowledge a complete understanding of the mission briefing and will initial DA Form 5484-R.

   b. The PC has overall responsibility for the crew mission briefing. He 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. See the following suggested format (table 4-1) 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.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus the following:

- FM 3.04.300
- DA Form 5484-R

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

Crew Mission Briefing Checklist

1. Mission overview.
2. Currency verification.
3. Flight route.
4. Weather—departure, en route, destination, and void time.
5. Required items, mission equipment, and personnel.
6. Airspace surveillance procedures (task 1026), assign scan sectors.
7. Analysis of the aircraft.
   a. Logbook and preflight deficiencies.
   b. Performance planning.
      (1) Comparison of computed ETF/ATF with logbook.
      (2) Recomputation of PPC, if necessary.
      (3) Max torque available and GO/NO GO data.
      (4) Single engine capability - MIN/MAX – IAS.
      (5) Emergency SE IAS – Airspeed to maintain between SE MIN/MAX IAS based on the mission and briefed for purposes of crew coordination.
   c. Mission deviations required based on aircraft analysis.
8. Crew actions, duties, and responsibilities.
   a. Aircrew coordination – two challenge rule, terminology.
   b. Transfer of flight controls (P*).
   c. Brief emergency actions.
      (1) Mission considerations.
      (2) Inadvertent IMC.
      (3) Egress procedures and rendezvous point.
      (4) Actions to be performed by P*, P, and NCM.
      (5) NVG failure.
9. General crew duties: Announce when focused inside (time limit to be appropriate for conditions, when VMC).
   a. Pilot on the controls (P*).
      (1) Fly the aircraft - primary focus outside when VMC, inside when IMC.
      (2) Cross-check systems and instruments.
      (3) Monitor/transmit on radios as directed by the PC.
   b. Pilot not on the controls (P).
      (1) Tune radios and set transponder.
      (2) Navigate.
      (3) Copy clearances, ATIS, and other information.
      (4) Cross-check systems and instruments.
      (5) Monitor/transmit on radios as directed by the PC.
      (6) Read and complete checklist items as required.
      (7) Set/adjust switches and systems as required.
   c. Crew chief, medic, and other assigned crewmembers.
      (1) Secure passengers and cargo.
      (2) Perform other duties assigned by the PC.
10. Risk assessment considerations.
11. Time and place for crew-level after action review.
12. Crewmembers' questions, comments, and acknowledgment of mission briefing.

TASK 1004

Plan a visual flight rules flight

CONDITIONS: In a H-60 helicopter and given access to weather information; notices to airmen (NOTAMs); flight planning aids; necessary charts, forms, and publications.

STANDARDS: Appropriate common standards plus the following 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 visual flight rules (VFR) per AR 95-1, applicable Federal Aviation Regulations (FARs)/host-nation regulations, local regulations, and standing operating procedures (SOPs).
3. Determine the correct departure, en route, and destination procedures.
4. Select route(s) and altitudes that avoid hazardous weather conditions; do not exceed aircraft or equipment limitations and conform to visual flight rules (VFR) cruising altitudes per Department of Defense flight information publication (DOD FLIP).
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 per AR 95-1, ±100 pounds.
7. Complete and file the flight plan per AR 95-1 and DOD FLIP.
8. Perform mission risk assessment per unit SOP.

DESCRIPTION:

1. Crew actions.
   a. The pilot in command (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-nation weather facilities, obtain information about the weather. After ensuring that the flight can be completed under VFR per AR 95-1, check NOTAMs, chart updating 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 accomplish the mission. Determine the magnetic heading, ground speed, and ETE for each leg. Compute total distance and flight time. Calculate the required fuel using a CPU-26A/P computer/Weems plotter (or equivalent) or approved mission planning software. Complete the appropriate flight plan and file it with the appropriate agency.

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

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1006

Plan an instrument flight rules flight

CONDITIONS: In a H-60 helicopter and given access to weather information; notices to airmen (NOTAMs); flight planning aids; necessary charts, forms, and publications.

STANDARDS: Appropriate common standards plus the following 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 instrument flight rules (IFR) per AR 95-1 and applicable Federal Aviation Regulations (FARs)/host-nation regulations, local regulations, and standing operating procedures (SOPs).
3. Determine the proper departure, en route, and destination procedures.
4. Select route(s) and altitudes that avoid hazardous weather conditions, do not exceed aircraft or equipment limitations, and conform to IFR cruising altitudes per Department of Defense flight information publication (DOD FLIP).
5. If off airway, determine the course(s) ±5 degrees.
6. Select an approach that is compatible with the weather, approach facilities, and aircraft equipment; determine if an alternate airfield is required.
7. Determine distance ±1 nautical mile, true airspeed ±5 knots, ground speed ±5 knots, and estimated time en route (ETE) ±1 minutes for each leg of the flight.
8. Determine the fuel required per AR 95-1 and FM 1-240, ±100 pounds.
9. Complete and file the flight plan per AR 95-1 and the DOD FLIP.
10. Perform mission risk assessment per unit SOP.

DESCRIPTION:

1. Crew actions.
   a. The pilot in command (PC) may direct the other rated crewmember (RCM) to complete some elements of the IFR flight planning.
   b. The other RCM will complete the assigned elements and report the results to the PC.
2. Procedures. Using appropriate military, Federal Aviation Administration (FAA), or host-nation 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 accomplish the mission. When possible, select preferred routing. Determine the magnetic heading, ground speed, and ETE for each leg, to include flight to the alternate airfield if required. Compute the total distance and flight time. Calculate the required fuel using a CPU-26A/P computer/Weems plotter (or equivalent) or approved mission planning software. Complete the appropriate flight plan and file it with the appropriate agency.

   Note. Crews should consider and plan to use global positioning system (GPS) as an emergency backup system only. FAA-approved IFR GPS possess specific noncorruptible terminal instrument procedure data that cannot be altered by the aircrew.

Note. Crewmembers must be proficient in using all IFR navigation equipment installed in the aircraft they are operating (such as distance measuring equipment [DME], tactical 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. Training will be conducted academically.
2. Evaluation. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

TASK 1010

Prepare a performance planning card

CONDITIONS: Given a blank DA Form 5701-60-R (*H-60 Performance Planning Card*), mission conditions, engine torque factors, and aircraft basic weight.

Note. The charts in the aviation and missile command (AMCOM)-approved aircraft operator's manual/checklist (CL) or the AMCOM-approved performance planning software must be used for performance planning.

Note. Performance planning items shaded in grey box (figures 4-1 and 4-2, page 4-14) are not required to be completed each time a performance planning card (PPC) is computed. These values should be completed when, based on the proposed mission, the information may be required for the flight. Additionally, these items will be annotated in the procedures as OPTIONAL after the item name.

Note. Tabular performance data usage and values are explained at the end of the task description (figures 4-3 and 4-4, page 4-30).

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

1. Calculate PPC values using accurate conditions for the time of takeoff within the following parameters:
   a. Free air temperature (FAT) ± 5 degrees Celsius.
   b. Pressure altitude (PA) ± 1,000 feet.
   c. Gross weight ± 500 pounds.
   d. Engine torque factor (ETF) 0.03.
2. Compute values within following parameters:
   a. Torque values ±2 percent.
   b. Weight values ±500 pounds.
   c. Fuel flow ±100 pounds per hour.
   d. Airspeeds ±5 knots.
3. Determine performance planning data necessary to complete the mission.
4. Correctly determine aircraft weight, maximum torque available, maximum allowable gross weight (OGE), and GO/NO GO (OGE) using tabular data found in the CL when an update is required.

DESCRIPTION:

1. Crew actions. The pilot in command (PC) will compute or direct other rated crewmembers (RCMs) to compute the aircraft performance data required to complete the mission. He will ensure aircraft performance meets mission requirements, and aircraft limitations are not exceeded.

2. Procedures.

a. Determine and have available aircraft performance data required to complete the mission. Using the DA Form 5701-60-R is mandatory to organize performance planning data required for the mission.

Note. The data presented in the performance charts in the -10 are primarily derived for either a "clean" or "high drag" aircraft. When the external equipment or configuration differs significantly from the clean or high drag configuration, drag compensations will be made. This configuration is referred to as the alternative or sling load configuration and the appropriate drag compensation is described.

Note. The procedures for determining performance planning data are the same for the UH-60A/L and UH-60Q/HH-60L aircraft unless specifically noted in the appropriate items.

(1) Departure data. (Refer to figures 4-1 and 4-2 for each item number for completing DA Form 5701-60-R.)

H-60 PERFORMANCE PLANNING CARD

For use of this form, see TC 1-237; the proponent agency is TRADOC.

DEPARTURE

AIRCRAFT GWT: (3) lb	PA: (1) / (1)		FAT: (2) °C/ (2) °C	
STORES WEIGHT: (4) lb	DUAL ENGINE		SINGLE ENGINE #1	#2
FUEL WEIGHT: (5) lb				
ZERO FUEL WEIGHT: (14) lb				
	ATF: (6)		ETF: (6)	ETF: (6)
TORQUE RATIO	(7)		(7)	(7)
MAX TORQUE AVAILABLE	(8) %		(8) %	(8) %
MAX ALLOWABLE GWT OGE/ IGE	(9) lb	(9) lb		
GO/NO GO TORQUE OGE/ IGE	(10) %	(10)		
MAX HOVER HEIGHT IGE	(11) ft			
PREDICTED HOVER TORQUE	(12) %		(12) %	(12) %
MIN SE AIRSPEED - IAS- W/O / W/ STORES			(13) kts	(13) kts

REMARKS:
(15)

CRUISE

PA: (1) ft	FAT: (2) °C	MAX ANGLE: (17) °		Vne-IAS: (18) kts	
		DUAL ENGINE		SINGLE ENGINE #1	#2
MAX TORQUE AVAILABLE	CT (4) %	(3) %		(3)	(3)
MIN / MAX - IAS		(5) kts	(5) kts	(5) kts	(5) kts
CRUISE SPEED - IAS / TAS		(6) kts	(6) kts	(13) kts	(13) kts
CRUISE TORQUE		(7) %		(14) %	
CRUISE FUEL FLOW		(8) pph		(15) pph	
CONTINUOUS TORQUE AVAILABLE		(9) %		(9) %	
MAX RANGE - IAS / TORQUE		(10) kts	(10) %		
MAX ENDURANCE / MAX R/C - IAS		(11) kts	(11) kts		
MAX ALTITUDE - MSL		(12) ft		(12) ft	
MAX ALLOWABLE GWT - SE				(16) lb	
OPTIMUM SE IAS AT MAX GWT				(16) kts	

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Figure 4-1. Sample H-60 performance planning card (front)

ARRIVAL					
LANDING GWT: (3) lb		PA: (1) ft		FAT: (2) °C	
		DUAL ENGINE		SINGLE ENGINE #1	SINGLE ENGINE #2
TORQUE RATIO		TR: (4)		TR: (4)	TR: (4)
MAX TORQUE AVAILABLE		(5)		(5)	(5)
PREDICTED HOVER TORQUE		(6) %		(6) %	(6) %
MAX ALLOWABLE GWT	OGE/ IGE	(7) lb	(7) lb		
GO/NO GO TORQUE	OGE/ IGE	(8) %	(8) %		
MAX HOVER HEIGHT IGE		(9) ft			
MIN SE AIRSPEED - IAS- W/O / W/ STORES				(10) kts	(10) kts
REMARKS:					

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Figure 4-2. Sample H-60 performance planning card (back)

(1) Departure data.

Item 1—PA. Record forecast maximum PA for the departure location and PA for time of departure.

Item 2—FAT. Record forecast maximum FAT for the departure location and FAT for time of departure.

Note. Maximum PA and temperature will be used when computing all items in the departure section except for item 12. Item 12 will be computed using forecast FAT and PA at **time of departure**.

Item 3—AIRCRAFT GWT. Record the total planned aircraft gross weight (GWT) at takeoff. This includes the aircraft basic weight, crew, internal load, internal fuel, and when applicable, external stores support system (ESSS) stores and sling load. Several times throughout the PPC, this weight will be used for computations. Use the actual weight of the aircraft and all additions for these computations.

Item 4—STORES WEIGHT. Record the planned weight of any stores weight.

Note. External stores are defined as a sling load, ESSS wing stores, Volcano, or other jettisonable items.

Item 5—FUEL WEIGHT. Record total planned fuel weight (internal and/or external) at takeoff.

Item 6—ATF/ETF. Record the aircraft torque factor (ATF) and ETFs in the appropriate blocks.

Item 7—TR. Use the aircraft TORQUE FACTOR chart to compute torque ratios (TRs) as described below.

> Step 1: Enter the appropriate aircraft TORQUE FACTOR chart on the left at the appropriate temperature. Move right to the ATF or ETF.
>
> Step 2: Move straight down to the bottom of the chart, note the torque ratio (~ TR). Record the TR.

Item 8—MAX TORQUE AVAILABLE. Use the appropriate MAXIMUM TORQUE AVAILABLE chart to compute engine specification torque available as described in the three steps below. (T700 engines will use the 30 MIN LIMIT chart for computations. T701C will use 10 MIN for dual-engine computations and 2.5 MIN for single-engine computations. Mission requirements may dictate using other charts for performance planning.)

Note. The maximum torque available is also referred to as intermediate rated power (IRP)—10- or 30-minute limit. The maximum torque available—2.5 minute limit is also referred to as SINGLE ENGINE CONTINGENCY POWER—2.5 MINUTE LIMIT.

Note. Certain temperature and PA combinations will exceed the appropriate aircraft operator's manual, chapter 5 torque limitations. This item represents actual maximum torque available values. During aircraft operations, the appropriate aircraft operator's manual, chapter 5 torque limitations shall not be exceeded.

> Step 1: Enter the MAXIMUM TORQUE AVAILABLE chart at the appropriate temperature then move right to the appropriate PRESSURE ALTITUDE ~ 1,000 FT.
>
> Step 2: Move down and read the SPECIFICATION TORQUE AVAILABLE PER ENGINE ~ %.

Step 3: If the ATF or ETF is less than 1.0, multiply the specification torque by the torque ratio to obtain maximum torque available. An alternate method is to continue down to the TORQUE RATIO, item 8. Move left to read the maximum TORQUE AVAILABLE ~ % per engine. Record MAX TORQUE AVAILABLE.

Note. Adjust maximum torque available as required for planned use of engine anti-ice and/or cockpit heater according to the appropriate aircraft operator's manual.

Item 9—MAX ALLOWABLE GWT OGE / IGE. Use the appropriate HOVER chart to compute maximum allowable gross weight for out of ground effect/inground effect (OGE/IGE) as described below. Annotate the computed maximum allowable gross weight OGE/IGE or the maximum gross weight per the appropriate aircraft operator's manual, chapter 5—whichever is less.

Note. If OGE capability does not exist, the MAX HOVER HEIGHT IGE, item 11, must be computed.

Note. If the blade erosion kit is installed, adjust the maximum allowable GWT according to the appropriate aircraft operator's manual.

- MAX ALLOWABLE GWT OGE

  Step 1: Enter the HOVER chart at the TORQUE PER ENGINE ~ % (OGE) at the dual engine MAX TORQUE AVAILABLE, item 8, then move right to the GROSS WEIGHT ~ 1,000 LB chart. If the dual engine maximum torque available exceeds transmission torque limits, use the DUAL ENGINE TRANS LIMIT line to compute the maximum allowable gross weight OGE.

  Step 2: Reenter the HOVER chart at the appropriate FREE AIR TEMP ~ °C and move right to the appropriate PRESSURE ALTITUDE ~ 1,000 FT, then move down to the GROSS WEIGHT ~ 1,000 LB chart. Read the maximum allowable gross weight OGE at the intersection of this step and step 1 above. Record the MAX ALLOWABLE GWT OGE.

- MAX ALLOWABLE GWT IGE.

  Step 1: Enter the HOVER chart at the TORQUE PER ENGINE ~ % (IGE) at the dual engine MAX TORQUE AVAILABLE, item 8, then move up to the desired IGE WHEEL HEIGHT ~ FT (normally the 10-foot line), then move right to the GROSS WEIGHT ~ 1,000 LB chart. If the dual engine maximum torque available exceeds transmission torque limits, use the DUAL ENGINE TRANS LIMIT line to compute the maximum allowable gross weight IGE.

  Step 2: Reenter the HOVER chart at the appropriate FREE AIR TEMP ~ °C and move right to the appropriate PRESSURE ALTITUDE ~ 1,000 FT then move down to the GROSS WEIGHT ~ 1,000 LB chart. Read the maximum allowable gross weight IGE at the intersection of this step and step 1 above. Record the MAX ALLOWABLE GWT IGE.

Item 10—GO/NO GO TORQUE OGE / IGE. Use the appropriate HOVER chart as described below.

- OGE. Use maximum allowable gross weight OGE, item 9a.
- IGE. Use maximum allowable gross weight IGE, item 9b.

Note. GO/NO GO is computed using the maximum forecast pressure altitude and temperature for the mission. When the actual temperature is less than maximum, the torque required to hover at a given gross weight is less.

Step 1: Enter the chart at the appropriate FREE AIR TEMP ~ °C.

Step 2: Move right to the appropriate PRESSURE ALTITUDE ~ 1,000 FT.

Step 3: Move down to the weight(s) used in item 9a or 9b accordingly.

Step 4: Move left to the 10-foot hover line (or appropriate WHEEL HEIGHT ~ FT that will be used to check the GO/NO GO).

Step 5: Move down to read the GO/NO GO torque value(s). Record the GO/NO GO TORQUE OGE / IGE.

Item 11—MAX HOVER HEIGHT IGE. If OGE capability does not exist, use the appropriate HOVER chart to compute the MAX HOVER HEIGHT IGE, as described below.

Step 1: Enter the HOVER chart at the appropriate FREE AIR TEMP ~ °C and move right to the appropriate PRESSURE ALTITUDE ~ 1,000 FT, then move down to the AIRCRAFT GWT ~ 1,000 LB, item 3, then move left to the WHEEL HEIGHT ~ FT lines.

Step 2: Reenter the bottom of the HOVER chart at the TORQUE PER ENGINE ~ % (IGE) at the dual engine MAX TORQUE AVAILABLE, item 8, then up to the intersection from step 1 above. Interpolate hover height as required. Record the MAX HOVER HEIGHT IGE.

Note. If OGE capability does exist, place OGE in this block.

Item 12—PREDICTED HOVER TORQUE. Use the appropriate HOVER chart as described below for torque required to hover. Use AIRCRAFT GWT, item 3, and current PA, item 1, and FAT, item 2.

Note. If the blade erosion kit is installed, adjust the torque required according to the appropriate aircraft operator's manual.

- PREDICTED HOVER TORQUE (DUAL ENGINE). Compute the torque the same as for item 10 above using the AIRCRAFT GWT, item 3, instead of the MAX ALLOWABLE GWT. Record dual engine PREDICTED HOVER TORQUE.
- PREDICTED HOVER TORQUE (SINGLE ENGINE). Double the PREDICTED HOVER TORQUE value that was computed in the step above. If the value exceeds the appropriate MAX TORQUE AVAILABLE, item 8, single engine, record NA in the appropriate block(s). Record single engine PREDICTED HOVER TORQUE.

Note. At the time of departure, maximum torque available may be higher than what is listed in MAX TORQUE AVAILABLE, item 8, due to item 8 being computed using maximum FAT for the mission. At the time of departure, engine performance may be increased due to a lower FAT. If this is the case, the aircraft may be able to sustain hover capability, single engine even though MAX TORQUE AVAILABLE, item 8, may be less than PREDICTED HOVER TORQUE – SINGLE ENGINE.

Note. PREDICTED HOVER TORQUE (SINGLE ENGINE) is computed using a specific wheel height. If not applicable (NA) is recorded in the appropriate block(s), the aircraft may still be capable of sustaining single-engine hover at a lower wheel height.

Item 13—MIN SE AIRSPEED- IAS - W/O STORES / W/STORES. Use the appropriate CRUISE chart for departure conditions to compute the minimum single-engine airspeed with external stores and without external stores as described below.

Note. If the aircraft will be operating without external stores, record NA in the w/stores block.

- If aircraft will be operating without external stores, do the following:

  Step 1: Using the SE 30 MIN or 2.5 MIN line enter the bottom of the CRUISE chart at the lowest ETF.

  Step 2: Follow the slant of the line up to the first intersection of aircraft gross weight (without external stores, item 3 minus item 4). Read left or right for the IAS ~ KTS. Record MIN SE AIRSPEED– IAS – W/O STORES.

- If aircraft will be operating with external stores, proceed with step 3 below.

Step 3: Continue with the slant of the line to the first intersection of AIRCRAFT GWT, item 3. Read left or right for the IAS ~ KTS. Record MIN SE AIRSPEED– IAS – W/STORES.

Item 14—ZERO FUEL WEIGHT: Use the appropriate DD Form 365-4 from the aircraft logbook to record the ZERO FUEL WEIGHT.

Note. The zero fuel weight on the DD Form 365-4 is computed using standard, average, or estimated weight for personnel, equipment, and fuel. Actual weights may vary greatly from those on the DD Form 365-4. Special consideration must be given to the actual weights of any items placed on the helicopter. If the PC feels that an accurate weight cannot be estimated, compute an adjusted ZERO FUEL WEIGHT. The method to determine adjusted zero fuel weight is described below. There will be times due to winds, surface, or any other condition that cause the hover torque to be inaccurate so that you will be unable to use the method below.

Note. Use the HOVER chart from the appropriate aircraft -10/CL to compute the adjusted ZERO FUEL WEIGHT.

Step 1: Note FAT, PA, and total indicated fuel weight.

Step 2: While at a hover, note wheel height and hover torque.

Step 3: Enter the HOVER chart at the noted FREE AIR TEMP ~ °C. Move down to the noted PRESSURE ALTITUDE ~ 1,000 FT, then left to the GROSS WEIGHT ~ 1,000 LB chart.

Step 4: Reenter the HOVER chart at the TORQUE PER ENGINE ~ % (IGE) at the noted hover torque. Move right to the WHEEL HEIGHT ~ FT to the noted hover height then move down to the intersection of step 3 above. Note aircraft gross weight.

Step 5: Subtract the noted total indicated (internal and external) fuel weight from the gross weight computed in step 4 above. Record the ZERO FUEL WEIGHT.

Note. Although data needed to compute ZERO FUEL WEIGHT is noted at a hover, the calculation should be made when practical.

Item 15—REMARKS: Record appropriate mission information. Examples of these may include drag factors, fuel requirements for the mission, and GO/NO GO for sling loads.

Note. The GO/NO GO TORQUE for sling loads is determined by using the same process as item 10 above, using the MAX ALLOWABLE GWT OGE and a wheel height that suspends the load approximately 10 feet above ground level (AGL).

(2) Cruise data.

Item 1—PA. Record planned cruise PA.

Item 2—FAT. Record forecast FAT at the planned cruise PA.

Item 3—MAX TORQUE AVAILABLE. Maximum torque available (dual engine) can be derived from the CRUISE chart by referencing the TORQUE AVAILABLE ~ (30-MINUTE T700 or 10-MINUTE T701) ATF 1.0 line.

Note. Max torque is derived from the cruise charts and takes into account the effect of ram-air on engine performance at a selected airspeed. Torque values may vary when flying at airspeeds other than the planned cruise airspeed.

Step 1: Enter the chart at the bottom with the ATF and follow the slant of the line up to item 6 DUAL ENGINE CRUISE IAS.

Step 2: Read straight down to get your MAX TORQUE. If the ATF is between 1.0 and 0.9, interpolation is another method to obtain this value.

Note. Maximum torque available (single engine) can be derived from the CRUISE chart by referencing the TORQUE AVAILABLE SE ~ (30-minute T700 or 2.5-minute T701) ATF 1.0 line.

Step 1: Enter the chart at the ETF and follow the slant of the line until you intercept your planned SINGLE ENGINE CRUISE IAS (item 13). If item 13 is not selected to be filled out, record max torque available at the intersection of the ETF and 0 airspeed line.

Step 2: Read straight down to get your MAX TORQUE. If the ATF is between 1.0 and 0.85, interpolation is another method to obtain this value.

Step 3: Double the value before entry in the block.

Note. The maximum torque available—30-minute limit for the T700 engine and the 10-minute limit for the T701C can also be derived from the tabular data in the CL. If the ATF is between 1.0 and 0.9, interpolation is required.

Note. Adjust as required for planned use of engine anti-ice and/or cockpit heater according to the appropriate aircraft operator's manual.

Item 4—CT. Record the value of one half the MAX TORQUE AVAILABLE SE of the engine with the lowest ETF.

Note. Critical torque (CT) is the dual engine torque value, which when exceeded, may not allow the aircraft to maintain % RPM R within normal limits under single-engine operations in the same flight conditions.

WARNING

During dual engine flight, conditions that require torque settings greater than the critical torque indicates the pilot is operating outside the aircraft low ETF single-engine capability. If operating dual engine above the CT and an engine fails, malfunctions, or must be shut down, the pilot—in these circumstances—must immediately adjust torque, airspeed, and/or gross weight to achieve single-engine capability.

Item 5—MIN / MAX–IAS. Use the appropriate CRUISE chart to compute the minimum / maximum indicated airspeeds as described below.

DUAL ENGINE (OPTIONAL).

- Clean and high drag configuration.

  Step 1: Enter the bottom of the CRUISE chart at the MAX TORQUE AVAILABLE, item 3, CRUISE data.

  Step 2: Move up to the first intersection of AIRCRAFT GWT (item 3, DEPARTURE data). Read left or right for minimum IAS ~ KTS. Record the DUAL ENGINE MIN–IAS. If the maximum torque available line is right of the gross weight line, record 0 for the MIN–IAS.

  Step 3: Continue up to the second intersection of AIRCRAFT GWT (item 3 DEPARTURE data). Read left or right for maximum IAS ~ KTS. Record the DUAL ENGINE/ MAX–IAS.

Note. If the maximum torque available line is to the left of (does not intersect) the AIRCRAFT GWT (item 3 DEPARTURE data), the aircraft cannot maintain dual engine level flight for the conditions.

- Alternative or external load configuration.

Note. For alternative or external load configurations, refer to the -10, chapter 7, section VI, DRAG. Determine and add together the appropriate drag multiplying factors.

Note. The torque change to compensate for drag (alternative or external load configuration) at minimum indicated airspeed is often negligible and not computed. The dual-engine maximum indicated airspeed is adjusted for alternate or external load configuration as follows:

  Step 1: Enter the CRUISE chart at DUAL ENGINE MAX–IAS, (item 5, step 3 above), then move left or right to the curved dashed line, then move up to read-ΔTRQ ~ % FOR DRAG AREA OF 10 SQ FT of ΔF.

  Step 2: Multiply the ΔTRQ times the drag multiplying factor. Subtract the result from the maximum torque available used initially in item 5, step 1 above.

  Step 3: Reenter the bottom of the CRUISE chart at the adjusted torque value and move up to the second intersection of AIRCRAFT GWT (item 3, DEPARTURE data). Read left or right for DUAL ENGINE MAX–IAS. Record the adjusted DUAL ENGINE MAX–IAS.

Note If the adjusted maximum torque available line is to the left of (does not intersect) the AIRCRAFT GWT (item 3, DEPARTURE data), the aircraft cannot maintain dual engine level flight for the conditions.

SINGLE ENGINE.

- Clean and high drag configuration.

  Step 1: Enter the bottom of the CRUISE chart at one-half the maximum torque available for the low ETF engine, item 3 above, but no more than one-half of transmission torque limit single engine.

  Step 2: Move up to the first intersection of the AIRCRAFT GWT, item 3, DEPARTURE data then read left or right for minimum–IAS ~ KTS. Record the SINGLE-ENGINE MIN–IAS.

  Step 3: Continue up to the second intersection of the AIRCRAFT GWT, item 3, DEPARTURE data then read left or right for maximum–IAS. Record the SINGLE ENGINE MAX–IAS.

Note. If the maximum torque available line is to the left of (does not intersect) the AIRCRAFT GWT (item 3, DEPARTURE data), the aircraft cannot maintain single engine level flight for the conditions. As fuel is burned, single-engine capability during the flight may become possible.

- Alternative or external load configuration.

Note. The torque change to compensate for drag (alternative or external load configuration) at minimum indicated airspeed is often negligible and not computed.

Note. The maximum indicated airspeed, single engine, is adjusted for alternate or external load configuration as follows:

  Step 1: Enter the CRUISE chart at SINGLE ENGINE MAX–IAS, (item 5 step 3, above), then move left or right to the curved dashed line. Move up to read ΔTRQ ~ % FOR DRAG AREA OF 10 SQ FT of ΔF

  Step 2: Multiply the ΔTRQ times the drag multiplying factor. Subtract the result from the maximum torque available value used initially in item 5, step 1 above.

  Step 3: Reenter the bottom of the CRUISE chart at one-half the adjusted torque value and move up to the second intersection of the AIRCRAFT GWT (item 3, DEPARTURE data). Read left or right for SINGLE ENGINE MAX–IAS. Record the adjusted SINGLE ENGINE MAX–IAS.

Item 6—CRUISE SPEED - IAS / TAS (DUAL ENGINE). Record planned CRUISE – IAS (inner IAS ~ KTS scale). Enter the CRUISE chart at cruise IAS and move laterally to the outer TRUE AIRSPEED ~ KTS scale. Record dual-engine CRUISE TAS.

Item 7—CRUISE TORQUE (DUAL ENGINE). Use the appropriate Cruise chart to compute the torque required to cruise as described below.

- Clean and high drag configuration.

  Step 1: Enter the CRUISE chart at the selected cruise IAS in item 5 above. Move left or right as appropriate to the AIRCRAFT GWT ~ 1000 LB (item 3, DEPARTURE data).

  Step 2: Move down to the TORQUE PER ENGINE ~ % line to read the CRUISE torque. Record the dual engine CRUISE TORQUE.

Note. Compare this value to Item 9 to see if you will be time limited for this IAS.

Note. For alternative or external load configurations, refer to section VI, DRAG. Determine and add together the appropriate drag multiplying factors from the -10, chapter 7. For Max Range IAS alternative or external load configuration computations, add the appropriate Change in Flat Plate Drag Area - ΔF Sq. Ft.

- Alternative or external load configuration.

  Step 1: Enter the appropriate cruise chart at the IAS in item 5 above.

  Step 2: Move left or right as appropriate to the ΔTRQ ~ % FOR DRAG AREA OF 10 SQ FT OF ΔF (dashed) line, and then up to find the change in torque percent for each 10 square feet of drag.

  Step 3: Multiply the ΔTRQ ~ % times the drag multiplying factor.

  Step 4: Add the value from step 3 to the clean cruise torque value (do not exceed the dual engine transmission torque limit).

Note. If the new torque value when added to attempts to exceed the dual engine transmission torque limit, add up to the transmission limit. If the new torque value is limited by the dual engine transmission torque limit, the planned cruise airspeed must be reduced.

Note. This new cruise torque reflects the power required to overcome the added drag.

Item 8—CRUISE FUEL FLOW (DUAL ENGINE).

- Cruise chart method. Use the appropriate CRUISE chart.

  Step 1: Enter the bottom of the chart at the cruise torque value computed in item 6 above.

  Step 2: Move up to TOTAL FUEL FLOW ~ 100 LB/HR and read cruise fuel flow. Record the dual-engine CRUISE FUEL FLOW.

Note. Adjust as required for planned use of engine anti-ice and cockpit heater according to the appropriate aircraft operator's manual.

- Engine fuel flow chart method. Use the SINGLE/DUAL ENGINE FUEL FLOW chart.

  Step 1: Enter the chart at the INDICATED TORQUE PER ENGINE ~ % for the cruise torque value computed in item 6 above.

  Step 2: Move right to the cruise PRESSURE ALTITUDE ~ 1,000 FT.

  Step 3: Move up to the DUAL ENGINE FUEL FLOW ~ LB/HR line and read cruise fuel flow. Record the dual engine CRUISE FUEL FLOW.

Note. Adjust as required for FAT and/or planned use of engine anti-ice and cockpit heater according to the appropriate aircraft operator's manual.

Item 9—CONTINUOUS TORQUE AVAILABLE (OPTIONAL). Use the appropriate CRUISE chart to compute the continuous torque available as described below.

Note. The continuous torque available is also referred to as MAXIMUM CONTINUOUS POWER.

Note. Use the same procedure to find CONTINUOUS TORQUE (SINGLE ENGINE) but enter at item 13, single engine cruise speed, if computed.

Step 1: Enter the CRUISE chart at the selected cruise IAS in item 5 above. Move left or right as appropriate to the TORQUE AVAILABLE–CONTINOUS line, 0.9 or 1.0 using the ETF for the weakest engine. If the ETF of the weakest engine is between 0.9 and 1.0, then interpolation is required. The TORQUE AVAILABLE–CONTINUOUS is predicated on the weakest engine.

Step 2: Move straight down (do not follow the slant of the line) to the TORQUE PER ENGINE ~ % to read the CONTINUOUS TORQUE. Record the dual engine CONTINUOUS TORQUE.

Note. Adjust CONTINUOUS TORQUE for planned use of engine anti-ice and/or heater according to the appropriate aircraft operator's manual.

Item 10—MAX RANGE–IAS / TORQUE (OPTIONAL). Use the appropriate cruise chart to compute the maximum range indicated airspeed as described below.

- Clean and high drag configuration.

  Step 1: Find the intersection of the AIRCRAFT GROSS WEIGHT (item 3, departure data) and the MAX RANGE line.

  Step 2: Move left or right to find the MAXIMUM RANGE IAS.

  Step 3: At the intersection of the AIRCRAFT GROSS WEIGHT, item 3, departure data, and the MAX RANGE line move down to the TORQUE PER ENGINE ~ % line, then read torque for the maximum range indicated airspeed. Record MAX RANGE TORQUE.

- Alternative or external load configuration.

  Step 1: Insert the change in square feet of drag into the formula found in the -10, chapter 7 or 7A (6 kts/10 ft2 X ΔF2).

  Step 2: Subtract the airspeed change from the results of the formula in step 1 above from the clean or high drag configuration MAX RANGE IAS.

Example: You are flying with both cargo doors open. The change in flat plate drag area (ΔF2) from -10, chapter 7 or 7A (DRAG) is 6.0 square feet. The equation using the "-10" method would be as follows:

6 kts X 6-ft2 drag = 36 kts = 3.6 knots

10 ft2 10

Item 11—MAX ENDURANCE / MAX R/C–IAS (OPTIONAL). Use the appropriate CRUISE chart to compute maximum endurance indicated airspeed and maximum rate of climb indicated airspeed as described below.

- Clean and high drag configuration.

  Step 1: Enter the bottom of the appropriate cruise chart at AIRCRAFT GWT (item 3, departure data). Move up along the gross weight line to the intersection of the gross weight line and the MAX END AND R/C line. Move left or right as required to the IAS ~ KTS value then read maximum endurance indicated airspeed. Record MAX END–IAS.

  Step 2: At the intersection of the aircraft gross weight line and the MAX END AND R/C line, read straight down and find the torque value associated with MAX END–IAS. Note this torque as it will be used in the next step.

  Step 3: Subtract the torque value found in step 2 above from the MAX TORQUE AVAILABLE dual-engine, item 3, cruise data or transmission torque limit according to the appropriate aircraft operator's manual, chapter 5, whichever is less to find the TORQUE INCREASE – PER ENGINE - % TRQ and note the TORQUE INCREASE – PER ENGINE.

  Step 4: Use the CLIMB/DESCENT charts in the appropriate aircraft operator's manual, chapter 7, section VII. Enter the bottom of the CLIMB/DESCENT chart for clean or high drag, as appropriate, at the TORQUE INCREASE – PER ENGINE - % TRQ using the value from step 3 above.

Step 5: Move up to the GROSS WEIGHT ~ 1,000 LB line from item 3 departure data, then move left to read the RATE OF CLIMB ~ FT/MIN. Note the rate of climb.

Step 6: Use the AIRSPEED SYSTEM CORRECTIONS charts in the appropriate aircraft operator's manual, chapter 7, section IX. Enter the appropriate AIRSPEED SYSTEM CORRECTION chart for clean or high drag at the MAX END–IAS from item 10 above. Move up to the appropriate segmented line for the rate of climb value derived from step 5 above (R/C greater or less than 1,400 ft/min).

Step 7: Move left to read the CORRECTION TO ADD ~ KNOTS. Add or subtract this value to/from the MAX END–IAS item 10. Record the resultant MAX R/C–IAS.

- Alternative or sling load configuration.

Note. The torque change to compensate for drag (alternative or sling load configuration) at MAX END–IAS is often negligible and not computed.

Item 12—MAX ALTITUDE–MSL (OPTIONAL). Compute MAX ALTITUDE–MSL based on MAX END–IAS.

Note. Several different cruise charts may have to be referenced when computing the MAX ALTITUDE–MSL.

- Dual engine (optional).

Step 1: Enter the appropriate CRUISE chart at the MAX END AND R/C line. Move left or right along that line until you intercept the AIRCRAFT GWT (item 3, departure data).

Step 2: If the intersection of MAX END AND R/C line and AIRCRAFT GWT (item 3, departure data) is to the left of the TORQUE AVAILABLE ~ 30 MINUTES (10 MINUTES if applicable) line corresponding to your ATF, (flight is still possible at MAX END–IAS) move to the next higher CRUISE chart and repeat steps 1 and 2. If the intersection of MAX END AND R/C and AIRCRAFT GWT (item 3, departure data) is to the right of the TORQUE AVAILABLE ~ 30 MINUTES (10 MINUTES if applicable) line corresponding to your ATF, (flight is no longer possible at MAX END–IAS) move to the next lower CRUISE chart and repeat steps 1 and 2.

Step 3: Record the MAX ALTITUDE–MSL that will allow you to maintain flight at the AIRCRAFT GWT (item 3, departure data). Interpolation between the charts is authorized.

Note. To achieve your MAX ALTITUDE–MSL you must fly at MAX END–IAS.

Note. Ensure you account for changes in FAT as you change CRUISE charts.

Note. The torque change to compensate for drag (alternative or sling load configuration) at MAX END–IAS is often negligible and not computed.

- Single engine (optional). Use the appropriate CRUISE chart for the single engine MAX ALTITUDE–MSL calculation as described below. The lowest ETF for your aircraft will be used for this computation.

Note. When single engine capability does not exist at the planned cruise altitude, this block is required to be computed.

Note. When the capability to maintain level flight after an engine failure or malfunction is not possible, continued flight may be possible by adjusting to MAX END–IAS and adjusting collective to the MAXIMUM TORQUE AVAILABLE to attain minimum rate of descent while descending to a lower PA (where level flight may be possible) and/or jettisoning the external stores (if no allowable altitude/temperature combination cruise charts yield a GWT greater than or equal to the AIRCRAFT GWT, item 3, departure data).

Note. The torque change to compensate for drag (alternative or sling load configuration) at MAX END–IAS is often negligible and not computed.

Step 1: Enter the appropriate CRUISE chart at the MAX END AND R/C line. Move left or right along that line until you intercept the AIRCRAFT GWT (item 3, departure data).

Step 2: If the intersection of MAX END AND R/C line and AIRCRAFT GWT (item 3, departure data) is to the left of SE 30 MINUTES (SE 2.5 MINUTES if applicable) line corresponding to your lowest ETF, (flight is still possible at MAX END–IAS) move to the next higher CRUISE chart and repeat steps 1 and 2. If the intersection of MAX END AND R/C and AIRCRAFT GWT (item 3, departure data) is to the right of the value of SE 30 MINUTES (SE 2.5 MINUTES if applicable) line corresponding to your ETF, (flight is no longer possible at MAX END–IAS) move to the next lower CRUISE chart and repeat steps 1 and 2.

Step 3: Record the MAX ALTITUDE–MSL SE that will allow you to maintain flight at the AIRCRAFT GWT (item 3, departure data). Interpolation between the charts is authorized.

Note. If aircraft is equipped with stores and no CRUISE chart will yield a MAX ALLOWABLE GWT–(SINGLE ENGINE) that is greater than or equal to the AIRCRAFT GWT, level flight is not possible. Subtract the weight of the stores and adjust the AIRCRAFT GWT to reflect the new AIRCRAFT GWT (without stores) and attempt to recompute the MAX ALTITUDE–MSL.

Note. If level flight cannot be maintained either with or without stores, record NA in MAX ALTITUDE–MSL (SINGLE ENGINE) block.

Item 13—CRUISE SPEED–IAS / TAS (SINGLE ENGINE) (OPTIONAL). Select an IAS that falls within the range of MIN / MAX SE – IAS, item 11 above. Convert to TAS as described in item 6 CRUISE SPEED (DUAL ENGINE).

Note. Do not confuse single engine cruise speed with emergency single engine airspeed. The emergency single engine airspeed is the speed used immediately following an emergency that requires adjustment to single engine airspeed. Single engine cruise speed and associated data is used in the pre-mission planning process. In the event an engine fails, malfunctions or must be shut down, and single engine operations are possible but landing is not practical (such as over water, jungle, densely forested areas, mountainous terrain or other impractical landing areas), the single engine cruise speed may be used after establishing emergency single engine speed when required to reach the intended landing area. The single engine cruise IAS may, in some instances, equal the emergency single engine IAS.

Item 14—CRUISE TORQUE (SINGLE ENGINE) (OPTIONAL). Use the appropriate CRUISE chart to compute torque required for cruise (single engine) as described below.

- Clean and high drag configuration.

Step 1: Enter the CRUISE chart at the selected single engine cruise IAS, item 13 above. Move left or right as appropriate to the AIRCRAFT GWT (item 3, departure data).

Step 2: Move down to the TORQUE PER ENGINE ~ % line to read the CRUISE torque, and double the torque value. Record the single engine CRUISE/TORQUE.

Note. Compare this value to item9 to see if you will be time limited for this IAS.

- Alternative or sling load configuration.

  Step 1: Enter the appropriate cruise chart at the selected single engine cruise IAS in item 13 above—then move left or right to the curved dashed line. Move up to read the Δ TRQ ~ % FOR DRAG AREA OF 10 SQ FT OF ΔF.

  Step 2: Multiply the Δ TRQ ~ % by the drag multiplying factor and then double.

  Step 3: Add or subtract the value in step 2 to/from the uncorrected clean or high drag cruise torque values in item 14, step 2 (do not exceed the single engine transmission torque limit). Record the adjusted single engine CRUISE TORQUE.

Note. If the adjusted torque value exceeds the single engine transmission torque limit, use the single engine transmission torque limit and adjust cruise airspeed.

Item 15—CRUISE FUEL FLOW (SINGLE ENGINE) (OPTIONAL).

- Cruise chart method. Use the appropriate CRUISE chart.

  Step 1: Enter the bottom of the chart at the torque value computed in item 14 above CRUISE TORQUE (SINGLE-ENGINE).

  Step 2: Move up to TOTAL FUEL FLOW ~ 100 LB/HR and read the cruise fuel flow.

  Divide the cruise fuel flow value in half. Record the single engine CRUISE FUEL FLOW.

Note. Adjust as required for planned use of engine anti-ice and cockpit heater according to the appropriate aircraft operator's manual.

- Engine fuel flow chart method. Use the SINGLE/DUAL ENGINE FUEL FLOW chart.

  Step 1: Enter the chart at the INDICATED TORQUE PER ENGINE ~ % for the cruise torque value computed in item 14 above CRUISE TORQUE (SINGLE-ENGINE).

  Step 2: Move right to the cruise PRESSURE ALTITUDE ~ 1,000 FT.

  Step 3: Move down to the SINGLE ENGINE FUEL FLOW ~ LB/HR line and read fuel flow value. Record the single engine CRUISE FUEL FLOW.

Note. Adjust as required for FAT and/or planned use of engine anti-ice and cockpit heater according to the appropriate aircraft operator's manual.

Item 16—MAX ALLOWABLE GWT – SE and OPTIMUM SE IAS AT MAX GWT (SINGLE ENGINE) (OPTIONAL). Use the appropriate CRUISE chart to compute the MAX ALLOWABLE GWT, and OPTIMUM IAS AT MAX ALLOWABLE GWT, (SINGLE ENGINE), as described below.

- Clean and high drag configuration.

  Step 1: Using the SE 30 MIN or 2.5 MIN line, enter the bottom of the CRUISE chart at the lowest ETF.

  Step 2: Follow the slant of the line up to the intersection of MAX END AND R/C line then read the indicating maximum allowable gross weight. Record the MAX ALLOWABLE GWT. Read left or right for optimum IAS ~ KTS at maximum allowable gross weight. Record the OPTIMUM SE IAS AT MAX GWT. If the maximum torque available line is right of the gross weight lines, enter MAX ALLOWABLE GWT according to the appropriate aircraft operator's manual, Chapter 5, then read left or right from the respective value for OPTIMUM IAS AT MAX ALLOWABLE GWT.

Note. If the MAX ALLOWABLE GWT is less than the AIRCRAFT GWT, then the aircraft cannot maintain single engine level flight for the conditions. As fuel is burned, single engine capability during the flight may be possible.

- Alternative or sling load configuration.

Note. The single engine maximum allowable gross weight and optimum indicated airspeed at maximum allowable gross weight are adjusted for alternate or sling load configuration as follows:

Step 1: Enter the CRUISE chart at the optimum indicated airspeed at maximum allowable GWT, step 2 above. Read left or right to the curved dashed line then move up to read Δ TRQ ~ % FOR DRAG AREA OF 10 SQ FT of ΔF.

Step 2: Multiply the Δ TRQ by the drag multiplying factor. Subtract the result from the CT in item 4.

Step 3: Reenter the bottom of the CRUISE chart at the adjusted torque value from step 2, then move up to the intersection of MAX END AND R/C line. Read maximum allowable gross weight and optimum IAS at maximum allowable gross weight. Record the adjusted MAX ALLOWABLE GWT and OPTIMUM SE IAS AT MAX GWT.

Note. If the adjusted torque value does not intersect the AIRCRAFT GWT (item 3, departure data), the aircraft cannot maintain single-engine level flight for the conditions. Item 12b must be computed. As fuel is burned, single engine capability during the flight may be possible.

Item 17—MAX ANGLE. Use the AIRSPEED FOR ONSET OF BLADE STALL chart in the appropriate aircraft operator's manual, chapter 5, to compute the maximum bank angle for the planned cruise IAS as described below.

Step 1: Enter the chart at the cruise PRESSURE ALTITUDE ~ 1,000 FT. Move right to the cruise temperature FAT °C.

Step 2: Move down to the AIRCRAFT GWT (item 3, departure data), then move left to the ANGLE OF BANK ~ DEG chart.

Step 3: Reenter the chart at the INDICATED AIRSPEED ~ KTS at the planned cruise airspeed, item 5 above, then move up to the ANGLE OF BANK ~ DEG chart. Record derived MAX ANGLE or 60°, whichever is less.

Item 18—Vne - IAS. Use the appropriate AIRSPEED OPERATING LIMITATIONS chart of the appropriate aircraft operator's manual, chapter 5, to compute the Vne as described below.

Step 1: Enter the chart at the cruise FREE AIR TEMPERATURE ~ °C. Move right to the cruise PRESSURE ALTITUDE ~ FT.

Step 2: Move down to the AIRCRAFT GWT (item 3, departure data). If the COMPRESSIBILITY LIMITS ~ FAT or the MACH LIMIT dashed temperature line (- 10 to -50 °C) is reached prior to the aircraft GROSS WEIGHT ~ LBS, stop there.

Step 3: Move left to the MAXIMUM INDICATED AIRSPEED (VNE) ~ KNOTS line for the Vne value. Record Vne-IAS.

(3) Arrival data. Complete this section in its entirety if arrival conditions at destination have increased from DEPARTURE in any of the following by the minimum amount: 5 degrees Celsius, 1,000 feet PA, or 500 pounds.

Item 1—PA. Record forecast PA for time of arrival.

Item 2—FAT. Record forecast FAT for time of arrival. If unavailable, use maximum forecast FAT for the mission.

Item 3—LANDING GWT. Record the estimated gross weight for arrival.

Item 4—TR. Compute the torque ratios for dual and single engine the same as item 7, (DEPARTURE DATA), using arrival FAT and PA.

Item 5—MAX TORQUE AVAILABLE. Compute maximum torque available for dual and single engine the same as item 8, (departure data), using arrival forecast PA and FAT.

Note. Adjust as required for planned use of engine anti-ice and/or cockpit heater according to the appropriate aircraft operator's manual.

Note. This information can also be derived from the tabular performance data in the appropriate aircraft operator's CL.

Item 6—PREDICTED HOVER TORQUE. Compute the predicted hover torque the same as item 12 (departure data), using arrival forecast PA and FAT.

Item 7—MAX ALLOWABLE GWT OGE/IGE. Compute the maximum allowable gross weight the same as item 9 (departure data), using arrival forcast PA and FAT.

Item 8—GO/NO GO TORQUE OGE / IGE. Compute the GO / NO-GO TORQUE OGE / IGE the same as item 10 (departure data), using arrival forcast PA and FAT.

Item 9—MAX HOVER HEIGHT IGE. If OGE capability does not exist, compute the maximum hover height IGE the same as item 11 (DEPARTURE DATA, page 4-18), using arrival forecast PA and FAT.

Item 10—MIN SE–IAS - W/O STORES / W/STORES. Compute the minimum single engine airspeed with external stores and without external stores the same as item 13, (departure data), using arrival forecast PA and FAT.

ARRIVAL DATA UPDATES

Note. Updates—Care should be taken to monitor the accomplishment of the mission. The PPC should be updated in flight or on the ground as the mission progresses if the requirements below are met. Updates are required when there is intent to land and/or takeoff and when operating within 3,000 pounds of the MAX ALLOWABLE GWT (OGE) and there is an increase of 500 feet pressure altitude, and/or 5 degrees Celsius from the planned PPC.

Item 3—AIRCRAFT WEIGHT. Update the aircraft weight as described below. The tabular performance data in the back of the appropriate aircraft operator's CL will be used for the following computations.

Note. Update when internal and/or external load weights have changed. Adjust zero fuel weight in item 14 (departure data).

Item 5—MAX TORQUE AVAILABLE. Use the appropriate tabular performance data MAXIMUM TORQUE AVAILABLE table as described in figure 4-3.

> Step 1: Enter the table at the appropriate HP~FT (pressure altitude) and move right to the ATF 1.0 or 0.9 values as required.
>
> Step 2: Continue right to the appropriate FREE AIR TEMPERATURE ~ °C column. Read MAX TORQUE AVAILABLE.

Note. The ATFs shown on the chart are 1.0 and 0.9. If the aircraft has an ATF between these values, interpolation is required.

Item 7—MAX ALLOWABLE GWT OGE. Use the appropriate MAXIMUM OGE HOVER WEIGHT AND TORQUE REQUIRED table as described below. (See figure 4-4 for example table.)

> Step 1: Enter the table at the appropriate HP ~ FT (pressure altitude) and move right to the GW ~ 100 LB line.
>
> Step 2: Continue right to the appropriate FREE AIR TEMPERATURE ~ °C column.

Multiply the indicated value by 100 to determine the MAX ALLOWABLE GWT OGE.

Step 3: Move down to Q ~ OGE ~ % line. Read torque required to hover OGE, at the MAX ALLOWABLE GWT OGE.

<u>Item 8—GO/NO GO OGE</u>. Use the appropriate Maximum OGE HOVER WEIGHT AND TORQUE REQUIRED table as described below.

Step 1: Enter the table at the appropriate HP ~ FT (pressure altitude) and move right to the Q ~ IGE ~ % line.

Step 2: Continue right to the appropriate FREE AIR TEMPERATURE ~ °C column. Read the GO/NO GO OGE torque value. This is also the torque required to hover IGE, at the MAX ALLOWABLE GWT OGE.

4. Tabular performance data. Figures 4-3 and 4-4 explain the tabular performance data presented in the CL.

Maximum Torque Available* - 30 Minute Limit
Anti-ice Off T700-GE-700 Engine (continued)

HP ~FT	ATF	Free Air Temperature ~ °C						
		-15	-10	-5	0	5	10	15
8000	1.0	89	90	90	90	88	85	84
	0.9	89	88	86	85	83	81	78

Pressure Altitude (PA)

ATF – If the aircraft ATF is between 0.9 and 1.0, Interpolate the maximum torque available as described below.

Free Air Temperature (FAT)

EXAMPLE: UH-60A/Q
PA: +8000'
ATF: 0.96
FAT: +10°C

96 is 6/10 of the Difference Between ATF .90 (0.9) and 1.00 (1.0)

Maximum Torque Available

85 – 81 = 4% TRQ
4 X 6/10 = 2.4% TRQ
81 + 2.4 = 83.4 % Maximum Torque Available

Figure 4-3. Example maximum torque available chart

Maximum OGE Hover Weight and Torque Required
Anti-ice Off T700-GE-700 Engine (continued)

HP ~FT	ATF *	Free Air Temperature ~ °C							
		10		15		20		25	
		1.0	0.9	1.0	0.9	1.0	0.9	1.0	0.9
8000	GW ~ 100 LB	173	166	169	162	166	157	162	152
	Q ~ OGE ~ %	85	81	84	78	82	75	79	72
	Q ~ IGE ~ %	73	69	71	67	70	64	67	62

GW ~ 100 LB (aircraft gross weight) - multiply this value times 100.

Q ~ OGE ~ % (torque required to hover OGE at 100-feet wheel height) at maximum allowable gross weight OGE above (GW ~ 100 LB).

Q ~ IGE ~ % (torque required to hover IGE at 10-feet wheel height) at maximum allowable gross weight OGE above (GW ~ 100 LB).

EXAMPLE: UH-60A/Q

PA: +8000'
ATF: 0.96
FAT: +10°C

.96 is 6/10 of the Difference Between ATF .90 (0.9) and 1.00 (1.0)

GW~100 LB

Maximum allowable gross weight OGE, (0.9) 166 X 100 = 16,600, (1.0): 173 X 100 = 17,300 pounds.
17,300 - 16,600 = 700 Pounds
700 X 6/10 = 420 Pounds
16,600 + 420 = 17,020 Pounds Maximum Allowable Gross Weight OGE

Q~OGE~%

85 - 81 = 4% TRQ
4 x 6/10 = 2.4% TRQ
81 + 2.4 = 83.4% TRQ required to Hover 17,020 Pounds OGE

Q~IGE~%

73 - 69 = 4% TRQ
4 x 6/10 = 2.4% TRQ
69 + 2.4 = 71.4% TRQ required to Hover 17,020 Pounds IGE

71.4% TRQ is Also the GO/NO-GO OGE

Figure 4-4. Example maximum out-of-ground effect hover weight and torque required chart

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus the following:

- DA Form 365-4
- DA Form 5701-60-R

TASK 1012

Verify aircraft weight and balance

CONDITIONS: Given crew data, aircraft configuration, mission cargo, passenger data, the appropriate aircraft operator's manual, and completed DD Form(s) 365-4 (*Weight and Balance Clearance Form F-Tactical/Transport*) from the aircraft logbook.

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

1. Verify that center of gravity (CG) and gross weight (GWT) remain within aircraft limits for the duration of the flight per the appropriate aircraft operator's manual.
2. Identify all mission or flight limitations imposed by weight or CG.
3. Ensure DD Form(s) 365-4 has been completed within 90 days.

DESCRIPTION:

1. Crew actions.
   a. The pilot in command (PC) will brief crewmembers on any limitations.
   b. Crewmembers will continually monitor aircraft loading (such as fuel transfers, sling loads, cargo load) during the mission 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 mission requirements, the PC will ensure adjustments are made to existing DD Form 365-4 (to meet the criteria outlined in AR 95-1) and 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 transfer, sling loads, and cargo loading operations.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references and DD Form 365-4.

TASK 1013

Operate mission planning system

CONDITIONS: Given approved computer and mission planning software, a mission briefing, signal operating instructions (SOI) information, weather information, navigational maps, Department of Defense flight information publication (DOD FLIP), intelligence data, and other materials as required.

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

1. Configure and operate the approved mission planning software.
2. Evaluate and enter all pertinent weather data, as appropriate.
3. Select and enter appropriate primary and alternate routes.
4. Select and enter appropriate tactical/terrain flight mission planning control features.
5. Select and enter appropriate communication data.
6. Load mission data to data transfer cartridge, if applicable.
7. Print out time distance heading (TDH) cards, waypoint lists, crew cards, communication cards, and kneecards as required.

DESCRIPTION:

1. Crew actions. The pilot in command (PC) will assign tasks. The crew receives the mission briefing. Any crewmember may enter data into the approved mission planning software and brief the crew on the mission.
2. Procedures. Plan the flight according to task 1004, 1006, or 2012 as applicable, using all appropriate data.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus the following:

- Task 1004
- Task 1006
- Task 2012

TASK 1014

Operate aviation life support equipment

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

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

1. Inspect/perform operational checks on ALSE.
2. Use personal and mission ALSE.
3. Brief passengers in using ALSE.

DESCRIPTION:

1. Crew actions. The pilot in command (PC) will verify that all required ALSE equipment 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 per the appropriate aircraft operator's manual and the unit standing operating procedure (SOP). Brief passengers in using ALSE.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus the appropriate ALSE technical manuals.

TASK 1016

Perform internal load operations

CONDITIONS: In a H-60 helicopter loaded with passengers/cargo.

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

1. Rated.

   a. Perform or ensure that a thorough passenger briefing has been conducted and that a passenger manifest is on file according to AR 95-1. Conduct the passenger briefing per the appropriate aircraft operator's manual/checklist (CL) and unit standing operating procedure (SOP).

   b. Ensure that the passengers/cargo is 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 according to AR 95-1. Conduct the passenger briefing per the appropriate aircraft operator's manual/CL and unit SOP.

   b. Load the aircraft per the load plan, if applicable.

   c. Ensure that floor loading limits are not exceeded.

   d. Secure passengers/cargo according to the appropriate aircraft operator's manual.

DESCRIPTION:

1. Crew actions.

   a. The PC will formulate a load plan, ensure that a DD Form 365-4 (*Weight and Balance Clearance Form F-Tactical/Transport*) is verified, if required, and ensure that the aircraft will be within gross weight (GWT) and center of gravity (CG) limits. He will ensure that the crew loads the cargo, uses proper tie-down procedures, and completes a passenger briefing as required. The pilot in command (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 nonrated crewmember (NCM) will complete a passenger briefing as directed and will ensure passengers are seated and wearing seat belts according to AR 95-1. He will monitor passengers/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.)

   b. Brief passengers for the flight and seat them according to the load plan or DD Form 365-4, as appropriate. Conduct the passenger briefing per the appropriate aircraft operator's manual /CL or 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. Training may be conducted in the aircraft or academically.
2. Evaluation. Evaluation may be conducted in the aircraft or academically.

REFERENCES: Appropriate common references plus the following:

- AR 95-27
- DA Pam 738-751
- DD Form 365-4
- FM 55-450-2
- TM 55-1500-342-23

TASK 1020

Prepare aircraft for mission

CONDITIONS: In a H-60 helicopter and given a warning order or a mission briefing and required mission equipment.

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

1. Install, secure, inspect, and inventory all mission 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 according to 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. Training will be conducted in the aircraft.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the appropriate airworthiness releases.

TASK 1022

Perform preflight inspection

CONDITIONS: With a H-60 helicopter and given the appropriate aircraft operator's manual/checklist (CL).

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

1. Rated.

   a. Perform the preflight inspection per the appropriate aircraft operator's manual/checklist (CL).

   b. 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*), per DA Pam 738-751.

2. Nonrated. Assist in all before preflight and preflight duties per the appropriate aircraft operator's manual/CL, unit standing operating procedure (SOP), and 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 according to the appropriate aircraft operator's manual/CL. He 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. If circumstances permit, accomplish preflight inspection during daylight hours.

   c. The nonrated crewmember (NCM), if available, will ensure all cowlings and equipment are secured upon completing the preflight.

NIGHT OR NVG CONSIDERATIONS: If performing the preflight inspection during the hours of darkness, a flashlight with an unfiltered 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. TC 1-204 contains details on preflight inspection at night.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus DA Pam 738-751.

TASK 1024

Perform before-starting-engine through before-leaving-helicopter checks

CONDITIONS: In a H-60 helicopter and given the appropriate aircraft operator's manual/checklist (CL).

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

1. Perform procedures and checks per the appropriate aircraft operator's manual/CL and health indicator test (HIT) check procedures.
2. 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*), and the 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. Crewmembers will coordinate with each other before entering data into aircraft systems.

   b. The pilot not on the controls (P) will read the checklist and announce auxiliary power unit (APU) and engine starts.

   c. The appropriate crewmember(s) will clear the area around the aircraft before APU start and each engine start.

   d. The nonrated crewmembers (NCMs) will perform duties as required by his duty position and as directed by the pilot in command (PC), according to the unit standing operating procedure (SOP), while maintaining situational awareness.

   e. The PC will ensure the appropriate information is entered on DA Form 2408-12, DA Form 2408-13, DA Form 2408-13-1 and the HIT log according to the unit SOP and DA Pam 738-751.

   f. Secure the aircraft after completing the flight per the appropriate aircraft operator's manual, the appropriate -23 series manual, TM 1-1500-250-23, and the unit SOP.

2. Procedures. Perform the before-starting-engine through before-leaving-helicopter checks per TMs 1-1520-237-10/CL. The call and response method should be used, as appropriate. The crewmember reading the checklist will read the complete checklist item. The crewmember performing the check will answer with the appropriate response. For example, for the call "Anticollision/position lights – as required" the response might be "Anticollision lights, both, night; position lights, steady, bright." Responses that don't clearly communicate action of 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. A response of "All in the normal operating range" communicates more accurate information. Perform the HIT check and when complete, record data on the HIT log. After the flight, enter all information required on the appropriate Department of the Army (DA) forms.

NIGHT OR NVG CONSIDERATIONS: Before starting the engines, ensure that internal and external lights are operational and set. Internal lighting levels must be high enough to easily see the instruments and to start the engines without exceeding operating limitations.

SNOW/SAND/DUST CONSIDERATIONS: Ensure all rotating components and inlets/exhausts are clear of ice and/or snow before starting APU/engines.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training. Training may be conducted in the aircraft or the simulator.
2. Evaluation. Evaluation will be conducted in the aircraft unless flight activity category (FAC) 3 or instrument annual proficiency and readiness test (APART) is allowed in simulator.

REFERENCES: Appropriate common references plus the following:

- DA Pam 738-751
- HIT log
- TM 1-2840-248-23
- TM 1-1500-250-23
- TM 1-1520-237-10

TASK 1026

MAINTAIN AIRSPACE SURVEILLANCE

CONDITIONS: In a H-60 helicopter.

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

1. Brief airspace surveillance procedures prior to flight. This will include scan sectors.
2. Announce any unplanned 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 using a time limit that is appropriate for the conditions and announce when attention is focused back outside.
4. Maintain airspace surveillance in assigned scan sectors.

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 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. He 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. He will announce when his 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, 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 clearing “S” turns to the left or right. The clearing “S” turns will provide the aircrew with a greater visual scan area.

   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 NVG CONSIDERATIONS: Using 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. Training may be conducted in the aircraft or simulator.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1028

Perform hover power check

CONDITIONS: In a H-60 helicopter, at an appropriate hover height, and with performance planning information available.

STANDARDS: Appropriate common standards plus determine if sufficient power is available to perform the mission.

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (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 announce his intent to bring the aircraft to a stationary hover for a hover power check. During the ascent, check for proper center of gravity (CG) and control response. Remain focused outside the aircraft and announce when the aircraft is stabilized at the desired hover altitude. Use a 10-foot stationary hover into the wind when performing a hover power check unless the mission or terrain constraints dictate otherwise.

   c. The pilot not on the controls (P) will monitor the aircraft instruments and verify the power check. He will compare the actual hover performance data to the computed data on the performance planning card (PPC) and announce the results to the P*. If GO/NO GO inground effect (IGE) or out of ground effect (OGE) torque is indicated prior to reaching the planned hover height used during 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 nonrated crewmember (NCM) will remain focused primarily outside the aircraft to assist in clearing and to provide adequate warning of obstacles.

Note. If an adjusted zero fuel weight is required, the data should be recorded when time permits.

2. Procedures.

   a. Use the hover height computed during performance planning when performing this task unless the mission or terrain constraints dictate otherwise.

   b. At desired hover height, monitor the aircraft instruments and verify the power check. Compare the actual performance data to that computed.

Note. If the torque required to maintain a stationary hover does not exceed the GO/NO GO torque 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, all IGE maneuvers may be attempted. If the torque required to maintain a stationary hover exceeds the GO/NO GO IGE and structural limits have been exceeded, further flight is prohibited until appropriate maintenance action is performed.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training. Training may be conducted in the aircraft or simulator.
2. Evaluation. Evaluation will be conducted in the aircraft unless flight activity category (FAC) 3 or instrument annual proficiency and readiness test (APART) is allowed in the simulator.

REFERENCES: Appropriate common references.

TASK 1032

Perform radio communication procedures

CONDITIONS: In a H-60 helicopter.

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

1. Rated.
   a. Program, check, and operate aircraft avionics.
   b. Establish radio contact with the desired unit or air traffic control (ATC) facility. When communicating with ATC facilities, use correct radio communication procedures and phraseology per the Department of Defense flight information publication (DOD FLIP) and Department of Transportation/Federal Aviation Administration (DOT/FAA) 7110.65.
   c. Correctly operate intercommunication system.
   d. Perform two-way radio failure procedures per the DOD FLIP or host-nation regulations.
2. Nonrated.
   a. Correctly operate intercommunication system.
   b. 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. He 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, medical evacuation (MEDEVAC). He 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 visual meteorological conditions (VMC) or inside instrument meteorological condition (IMC) on the instruments, as appropriate, but should not participate in troubleshooting the malfunction.
      (4) The P will remain focused primarily inside the aircraft to identify and correct the avionics malfunction.

2. Procedures.

   a. 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.

   b. Procedure 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.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus the Department of Transportation/ Federal Aviation Administration (DOT/FAA) 7110.65.

TASK 1034
PERFORM GROUND TAXI

CONDITIONS: In a H-60 helicopter and the aircraft cleared.

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

1. Maintain speed appropriate for conditions.
2. Maintain the desired ground track within ±3 feet.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will ensure that the parking brake is released and the tail wheel is locked or unlocked as required before starting the ground taxi. He will announce his intent to begin ground taxi operations, the intended direction of any turns, and that the aircraft is clear of all traffic and obstacles. He will remain focused primarily outside the aircraft.

   b. The pilot not on the controls (P) and nonrated crewmember (NCM) will help clear the aircraft and provide adequate warning of traffic and obstacles. They also will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.

2. Procedures. Ensure the area is suitable for ground taxi operations. Initiate the taxi by centering the cyclic and increasing the collective slightly to start forward movement. If required, adjust lateral cyclic and/or pedals to release the tail wheel lockpin. Avoid droop stop pounding contact by using proper cyclic and collective control applications. Ensure that both sets of brakes operate properly, conditions permitting. Use left or right pedal input to turn the aircraft and lateral cyclic as necessary to maintain a level fuselage attitude in the turns. To regulate the taxi speed, use a combination of collective, slight forward cyclic and brakes. Be aware that high gross weights, soft, rough, or sloping terrain may require using more than normal power.

   Note. During taxi with the tail wheel unlocked, fuselage roll attitude is controlled with the cyclic. The attitude indicator, inclinometer, as well as outside visual cues, may be used to reference fuselage roll attitude. The normal method for ground taxi is with the tail wheel in the unlocked position.

   Note. While ground taxiing, minor heading changes may be made with the tail wheel locked. However, care should be taken not to break or bend the tail wheel-locking pin. A slight fuselage roll in the opposite direction may indicate excessive pedal input with the tail wheel locked. Excessive collective application may activate the drag beam switch.

   Note. Depending on ground velocity, emergency stops may be performed by lowering the collective and applying the wheel breaks or by bringing the aircraft to a hover.

   Note. Excessive cyclic input and insufficient collective application may result in droop stop pounding or main rotor contact with mission equipment.

DROOP STOP POUNDING (DSP): DSP is a phenomenon that can occur when there is excessive downward blade travel causing the blades to strike the droop stops when they are in the fly position. The conditions, which combine to induce this type DSP, include excessive aft cyclic, low collective, and all wheels on the ground. The maneuver that is most likely to produce DSP is the roll-on landing in conjunction with aerodynamic braking; however, DSP can also occur during taxi and down slope landings.

NIGHT OR NVG CONSIDERATIONS: The landing light should be used for unaided ground taxi and the searchlight with installed infrared (IR) bypass filter when wearing night vision goggles (NVGs). Using proper scanning techniques will help detect obstacles that must be avoided.

SNOW/SAND/DUST CONSIDERATIONS: If ground reference is lost because of blowing snow/sand/dust, lower the collective, neutralize the flight controls, and apply wheel brakes until visual reference is reestablished. When initiating ground taxi, apply pressure and counterpressure to the pedals to ensure the wheels/skis are not frozen to the ground, if appropriate. Use caution when taxiing near other maneuvering aircraft because of limited visual references and possible relative motion illusion.

> ***Note.*** Because of decreased visual references and relative motion illusions, limit ground speed to a safe rate.

> ***Note.*** At night, use of the landing, search, or anticollision lights may cause spatial disorientation in blowing snow/sand/dust.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1038

PERFORM HOVERING FLIGHT

CONDITIONS: In a H-60 helicopter with the aircraft cleared.

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

Rated.

a. Perform a smooth, controlled ascent to hover.

b. Perform a smooth, controlled descent with minimal drift at touchdown.

DESCRIPTION:

1. Crew actions.

a. The pilot on the controls (P*) will announce his intent to perform a specific hovering flight maneuver and will remain focused primarily outside the aircraft to monitor altitude and avoid obstacles. He will ensure and announce that the aircraft is cleared prior to turning or repositioning the aircraft. He will announce when he terminates 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).

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 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. Using air taxi enables the pilot to proceed at an optimum airspeed/altitude, minimize downwash 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 counterpressure 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 descent to 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 NVG 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 an instrument takeoff (ITO) (task 1170). If a go-around is not feasible, try to maneuver the aircraft forward and down to the ground to limit the possibility of touchdown with lateral or aft movement.
2. When performing operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Using 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. For 10-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 10-foot hover taxi unsafe, determine whether to abort the maneuver, ground taxi, air taxi, or perform an ITO (task 1170).

2. For 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 10-foot hover, but increase altitude to not more than 100 feet and accelerate to a safe airspeed 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 ITO (Task 1170) or unusual attitude recovery (task 1182) if ground reference is lost.

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

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

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1040

PERFORM VISUAL METEOROLOGICAL CONDITIONS TAKEOFF

CONDITIONS: In a H-60 helicopter.

STANDARDS: Appropriate common standards plus (rated only) maintain aircraft in trim above 50 feet (AGL) or as appropriate for transition to mission profile.

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, 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 focused primarily outside the aircraft throughout the maneuver to provide obstacle clearance. He will announce whether the takeoff is from the ground or from a hover and his intent to abort or alter the takeoff. He will select reference points to assist in maintaining the takeoff flight path.

   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.

   d. The P will monitor power requirements and advise the P* if power limits are being approached. The P and NCM will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.

2. Procedures.

   a. From the ground. Select reference points to maintain ground track. With the cyclic and pedals in the neutral position, increase power. Continue applying power as required to transition to mission profile. As the aircraft leaves the ground, maintain heading with pedals and apply forward cyclic as required to establish an accelerative attitude appropriate for the terrain and to avoid obstacles. Adjust the cyclic to continue the acceleration to the desired climb airspeed, and maintain the desired ground track. Make the required power adjustments 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 making the transition to terrain flight; then place the aircraft in trim. After obtaining the desired airspeed, adjust the cyclic as necessary to stop the acceleration and maintain desired climb airspeed. Maintain takeoff power until reaching minimum single engine airspeed and then adjust power as necessary to continue the desired rate of climb or transition to mission profile.

   b. From a hover. Select reference points to maintain ground track. Apply forward cyclic to accelerate the aircraft while simultaneously applying power. Perform the rest of the maneuver as for a takeoff from the ground.

Note. Avoid unnecessary nose low accelerate attitudes; 5 degrees nose low is recommended for acceleration. However, 10 degrees nose low should not be exceeded.

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.

c. From the ground with less than OGE power. Select reference points to maintain ground track. With the cyclic and pedals in the neutral position, increase power until the aircraft becomes “light on the wheels.” Continue applying power until the aircraft is airborne. As the aircraft leaves the ground, apply forward cyclic as required to avoid obstacles and to accelerate smoothly through effective translational lift (ETL) at an altitude appropriate for the terrain. Adjust the cyclic to continue the acceleration to the desired climb airspeed and maintain the desired ground track. Make the required power adjustments to clear obstacles in the flight path and to obtain the desired rate of climb. Maintain heading with the pedals when below 50 feet AGL or until making the transition to mission profile; then place the aircraft in trim. After obtaining the desired airspeed, adjust the cyclic as necessary to stop the acceleration. Adjust power as necessary to continue or to stop the rate of climb.

d. From a hover with less than OGE power. Apply forward cyclic to accelerate the aircraft while applying power to maintain the desired hover altitude. Perform the rest of the maneuver as for a takeoff from the ground with less than OGE power.

NIGHT OR NVG 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. If sufficient illumination does not exist, 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.

2. Maintain the takeoff power setting until reaching climb airspeed. Adjust power as required to establish the desired rate of climb and cyclic to maintain the desired airspeed. Alternate attention between cross-checking instruments and assisting in obstacle avoidance. The P* and NCM should maintain orientation outside the aircraft and concentrate on obstacle avoidance. The P should make all internal checks.

a. Maintain desired ground track. 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.

b. Use proper scanning techniques to avoid spatial disorientation.

c. When performing operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Using 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: 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 instrument takeoff (ITO) if ground reference is lost.

Note. At night, use of the landing, search, or anticollision 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. Re-position 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 focuse primarily outside for obstacle avoidance.

MOUNTAIN/PINNACLE/RIDGELINE CONSIDERATIONS: Analyze winds, obstacles, and density altitude. Perform a hover power check. Determine the best takeoff direction and path for conditions. After clearing any obstacle(s), 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 wheels/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 wheels/skis. When free, adjust the controls as necessary to perform a VMC takeoff.

Note. Before performing operations in a mud/muskeg/tundra environment, he must understand dynamic roll over characteristics.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1044

NAVIGATE BY PILOTAGE AND DEAD RECKONING

CONDITIONS: In a H-60 helicopter with the appropriate maps, plotter, flight computer, and flight log.

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

1. Maintain orientation within ½ mile or 800 meters.
2. Arrive at checkpoints/destination at estimated time of arrival (ETA) ±1 minute.

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

REFERENCES: Appropriate common references.

TASK 1046

Perform electronically aided navigation

CONDITIONS: In a H-60 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 technical manual (TM).
2. Determine the position of the aircraft along the route of flight within 300 meters.
3. Use the command instrument system (CIS) per the appropriate aircraft operator's manual if coupled with an electronically aided navigational system.

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 terrain features to assist in navigation.

   b. The P will be the primary operator of the electronically aided navigation system. He 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. He 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.

Note. Only the P will perform in-flight time/labor intensive navigational 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 CIS. 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

> **WARNING**
>
> **Failure to monitor fuel balancing operations could result in engine flameout because of fuel starvation.**

CONDITIONS: In a H-60 helicopter with a (CPU)-26A/P computer or calculator.

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

1. Rated.
   a. Verify that the required amount of fuel is onboard at the time of takeoff.
   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 of leveling off or within 10 minutes of entering into the mission profile.
   b. Within 15 to 30 minutes after taking the initial readings, compute the fuel consumption rate ±50 pounds per hour and complete the fuel consumption check.
   c. Monitor the remaining fuel quantity and the continuing rate of consumption.

DESCRIPTION:

1. Crew actions.
   a. The pilot not on the controls (P) or nonrated crewmember (NCM) will record the initial fuel figures, fuel flow computation, burnout, and reserve times. He will announce when he initiates the fuel check and when he completes 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/balancing operation is completed.
   e. The NCM will acknowledge and monitor the fuel transfer/balancing operation until the operation is completed.
2. Procedures.
   a. When performing the before takeoff check, determine the total fuel onboard, and compare it with fuel required for the mission. If the fuel onboard is inadequate, add sufficient fuel or abort or revise the mission.

b. Initial airborne fuel reading. Within 10 minutes after leveling off or within 10 minutes of entering into the mission profile, record the total fuel quantity and the time of reading. Complete the fuel consumption check 15 to 30 minutes after taking the initial airborne fuel reading. Determine if the remaining fuel is sufficient to complete the flight without the planned use of the required reserve.

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

Note. Do not perform fuel consumption checks while transferring fuel from external fuel 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.

Note. If an emergency or urgent situation requires placing an ENG FUEL SYS selector to cross-feed (for example, fuel filter bypass caution light), recalculate burnout time and reserve entry time based on the usable fuel remaining.

d. Main fuel balance operations. Place the ENG FUEL SYS selector of the lowest fuel indicator to XFD. After the fuel quantities equalize, return the selector to DIR.

e. Auxiliary fuel management. Follow procedures outlined in the appropriate aircraft operator’s manual when using the external extended range fuel system. When using nonstandard auxiliary fuel systems, use the appropriate manufacturer’s operator’s manuals.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus the manufacturer's operator’s manual.

TASK 1052

PERFORM VISUAL METEOROLOGICAL CONDITIONS FLIGHT MANEUVERS

CONDITIONS: In a H-60 helicopter given visual meteorological conditions (VMC) conditions.

STANDARDS: Appropriate common standards plus (rated only) 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. He 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 procedure (SOP), and FM 1-203.

NIGHT OR NVG CONSIDERATIONS:
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.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1054

Select landing zone/pickup zone/holding area

WARNING

Not all hazards will be shown 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 H-60 helicopter given a map or photo data.

STANDARDS: Appropriate common standards plus the following 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 the 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. He will announce his intent to deviate from the maneuver.
    c. The pilot not on the controls (P) and nonrated crewmember (NCM) will assist in LZ reconnaissance and clearing the aircraft. They will provide adequate warning of obstacles and will acknowledge the P*'s intent to deviate from the maneuver.
2. Procedures. 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 landing zone/pickup zone (LZ/PZ).

a. Tactical.

(1) Mission. Determine if the mission can be done from the selected LZ. Consider flight time, fuel, number of sorties, and access routes.

(2) Location. To reduce troop fatigue, consider distance of PZ or LZ from supported unit or objective. Also consider the supported unit's mission, equipment, and method of travel to/from PZ/LZ.

(3) 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, avenues of approach and departure. The area should be large enough to provide dispersion.

b. Technical.

(1) 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 linkup.

(2) Landing formation. Plan landing formation for shape and size of LZ.

(3) Sling loads. For missions requiring sling loads at or near maximum gross weight of the helicopter select larger LZs where barriers have minimum vertical development.

(4) 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.

(5) Obstacles. Hazards within the LZ that cannot be eliminated must be plotted. Plan approach and departure routes over lowest obstacles.

c. Meteorological.

(1) Ceiling and visibility. Ceiling and visibility are critical when operating near threat elements. Inadvertent instrument meteorological condition (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 onboard will not be available for the mission, and the entire mission may be at risk.

(2) Winds. Determine approach and departure paths.

(3) 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 NVG 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. Using 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 multiaircraft operations, determine the number of aircraft that the area can accommodate safely.

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

REFERENCES: Appropriate common references.

TASK 1058

PERFORM VISUAL METEOROLOGICAL CONDITIONS APPROACH

CONDITIONS: In a H-60 helicopter given visual meteorological conditions (VMC) conditions.

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

Rated.

1. Select a suitable landing area (analyze suitability, barriers, wind, approach path, touchdown point, 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 AGL or as appropriate for transition from terrain flight.
7. Perform a smooth and controlled termination to a hover or touchdown to the surface.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will focus primarily outside the aircraft to provide obstacle clearance throughout the maneuver. He will announce when he begins 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, 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 (on base or final), 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 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 or touchdown).

   a. To a hover. The approach to a hover may terminate with a full stop over the planned termination point, or continue 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. Proceed as for an approach to a hover, except determine an approach angle that allows obstacle clearance while descending to the desired point of touchdown. (The decision to terminate to the surface with zero speed or with forward movement will depend on the aircraft's loading or environmental conditions.)

c. Touch down 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. Apply brakes if required.

Note. If wind conditions may be a factor, a wind evaluation should be performed. Techniques for evaluating wind conditions are found in FM 1-202.

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

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.

NIGHT OR NVG 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 proper scanning techniques to avoid spatial disorientation.
4. When performing operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Using 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:

1. Termination to a point OGE. This approach requires OGE power and may be used for most snow landings and some 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, slowly 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. Apply slight aft cyclic just prior to touchdown to prevent burying the wheels or toes of the skis. When the wheels or heels of the skis contact the snow/ground, slowly lower the collective and allow the aircraft to settle. Lower the collective as necessary, neutralize the flight controls, and apply brakes as necessary to stop forward movement.
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

whiteout/brownout conditions will occur. The termination is made directly to a reference point on the ground with no forward speed. The angle should be slightly steeper than a normal approach and the approach speed faster than a normal approach. After ground contact, slowly lower the collective to the full down position, neutralize the flight controls, and apply brakes as necessary to ensure no forward movement.

Note. When landing in deep snow, the aircraft wheels/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 vent blowers turned off.

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, using the landing, search, or anticollision light may cause spatial disorientation while in blowing snow/sand/dust.

CONFINED AREA CONSIDERATIONS: An approach to the forward one third of the useable landing area will reduce the approach angle and minimize power requirements. Before beginning the approach, the crew will determine and brief an escape route in case a go-around is necessary. 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 touchdown, 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 beginning the approach, the crew will determine and brief an escape route in case a go-around is necessary. 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, the P* may have 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 the 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 10-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. Training may be conducted in the aircraft or simulator.
2. Evaluation. The evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus task 1010.

TASK 1062

PERFORM SLOPE OPERATIONS

CONDITIONS: In a H-60 helicopter with aircraft cleared and given a slope area.

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

1. Rated.
   a. Select a suitable landing area.
   b. Set the parking brake before landing.
   c. Perform a smooth and controlled descent and touchdown.
   d. Maintain heading ±5 degrees.
   e. Do not allow aircraft to drift ±1 foot until touchdown. Then no drift allowed.
   f. Perform a smooth and controlled ascent from the surface.
2. Nonrated.
   a. Confirm suitable landing area.
   b. Confirm parking brake set before landing.
   c. Announce drift and altitude.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P)* will announce his intent to perform a slope operation and establish the helicopter over the slope. He will ensure the brakes are set. He will announce his intended landing area and any deviation from the intended maneuver. 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 assist in setting the parking brakes and verify when they are set. He will note the aircraft attitude on the vertical situation indicator (VSI), 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. Set the parking brakes. Announce the initiation of the slope landing. Smoothly lower the collective until the tail or main landing gear contacts 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 wheel 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 gear to the slope. With the down slope gear on the ground, simultaneously lower the collective full down and neutralize the cyclic. If cyclic or aircraft slope limits are reached before the aircraft is firmly on the ground, return the aircraft to a hover. Select a new area where the slope is less steep and attempt another slope landing.

b. Takeoff. Before takeoff, announce initiation of an ascent. Smoothly increase the collective and apply the cyclic into the slope to maintain the position of the up slope wheel. Continue to increase the collective to raise the down slope wheel(s), 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, the crew must understand dynamic roll over and droop stop pounding characteristics.

Note. When the tail wheel is locked and on the ground, overcontrolling the pedals may result in roll oscillations caused by the thrust of the tail rotor.

Note. Crewmembers must be aware of the helicopter's normal hovering attitude before putting a wheel on the ground.

NIGHT OR NVG CONSIDERATIONS:

1. When conducting slope operations, determine the need for artificial illumination before starting the maneuver. Select reference points to determine slope angles. (References probably will be limited and difficult to ascertain.) If, at any time, successful completion of the landing is doubtful, abort the maneuver.
2. When performing operations during unaided night flight, ensure that the searchlight or landing light (white light) is in the desired position. Using the white light will impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching fully dark adaptation.

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.

TASK 1064

PERFORM A ROLL-ON LANDING

CONDITIONS: In a H-60 helicopter given a suitable landing area.

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

1. Select a suitable landing area.
2. Maintain a constant approach angle clear of obstacles to desired point of touchdown.
3. Maintain ground track alignment with the landing direction, as appropriate.
4. Perform a smooth, controlled touchdown and termination, appropriate for the conditions, below 60 knots ground speed aligned with the landing direction ±5 degrees.
5. Ensure speed at touchdown is no slower than that appropriate for the conditions.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will announce his intent to perform a roll-on landing, when beginning the approach, the intended point of landing, and any deviation from the approach.

   b. The P will verify that the brakes are released before starting the approach. The P and NCM will confirm the suitability of the landing area and will provide adequate warning of hazards or obstacles. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.

2. Procedures: When the desired approach angle is intercepted, adjust the collective as necessary to maintain a constant angle of approach and adjust the cyclic for an attitude that will result in an optimum airspeed for the conditions. Before touchdown, align the aircraft with the landing direction. Before tail wheel touchdown, increase the collective as necessary to make a smooth touchdown below 60 knots ground speed. After tail wheel contact, use collective to smoothly lower the landing gear to the surface. If desired, use aerodynamic braking while maintaining the main landing gear off the ground to assist in stopping the roll out. Allow the aircraft to descend to the surface by adjusting the collective as necessary and centering the cyclic to allow a smooth touchdown. After the main landing gear is on the surface, center the cyclic to avoid droop stop pounding, then lower the collective, and apply the brakes as necessary.

   Note. When it is necessary to perform a roll-on landing because of a single engine failure, the P* should not decelerate the aircraft below minimum single engine indicated airspeed (IAS) until the aircraft is at a point from which obstacles in the flight path will be cleared and a safe landing can be assured.

DROOP STOP POUNDING (DSP)/AERODYNAMIC BRAKING:

1. DSP is a phenomenon that can occur when there is excessive downward blade travel causing the blades to strike the droop stops when they are in the fly position. The conditions, which combine to induce this type DSP, include excessive aft cyclic, low collective, and all wheels on the ground. The maneuver that is most likely to produce DSP is the roll-on landing in conjunction with aerodynamic braking; however, DSP can also occur during taxi and down slope landings. Aerodynamic braking is a procedure that uses the aerodynamic forces of the rotor system to slow or stop the aircraft. Once the tail wheel is on the ground, using the aft cyclic in conjunction with an increase in collective will slow or stop the aircraft.
2. Aerodynamic braking is permissible while the tail wheel is on the ground before main gear contact. Once the main wheels contact the ground, the cyclic must be centered, collective lowered (center cyclic before lowering the collective), and brakes applied (only when collective is full down as required). If a pilot attempts to slow the aircraft after main wheel contact by using aft cyclic as he lowers the collective, he will hear an audible 4/Rev knocking. This is the first indication of DSP. With more rear cyclic applied, DSP will become heavy (you may also feel the pounding in the airframe) and main rotor blade contact with the ALQ-144 and tail rotor drive shaft may result.

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

NIGHT OR NVG CONSIDERATIONS: Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. The rate of descent at night during the final 100 feet should be slightly slower than during the day to avoid abrupt attitude changes at low altitudes.

ROUGH/UNPREPARED SURFACE CONSIDERATIONS: Closely monitor touchdown speed when landing to a rough or unprepared surface. Consistent with the situation and aircraft capabilities, a more pronounced deceleration before touchdown coupled with more effective aerodynamic braking after tail wheel touchdown may be appropriate. Note that the wheel brakes may be less effective. 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. Training may be conducted in the aircraft or simulator.
2. Evaluation. The evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1068

PERFORM GO-AROUND

CONDITIONS: In a H-60 helicopter.

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

1. Determine when a go-around is required.
2. Immediately apply appropriate power to initiate go-around.
3. Immediately adjust to appropriate climb airspeed for conditions.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will announce his intent to perform a go-around and will remain primarily focused outside to avoid obstacles.

   b. The pilot not on the controls (P) and nonrated crewmember (NCM) will assist in clearing the aircraft and provide adequate warning of obstacles. The P will also monitor systems instruments to ensure aircraft limits are not exceeded.

2. Procedures. When it becomes doubtful that a safe landing can be done, announce "go-around." Immediately apply power (if available) and simultaneously adjust pitch attitude to stop the descent and clear any obstacles. Maintain aircraft in trim and adjust to the appropriate climb speed for conditions. Maintain the appropriate ground track.

   Note. The decision to go-around may be made at any time but in limited power situations should be determined before descending below the barriers or decelerating below effective transitional lift (ETL).

NIGHT OR NVG CONSIDERATIONS: A go-around should also be initiated if visual contact with the landing area is lost.

SNOW/SAND/DUST CONSIDERATIONS: If during the approach, visual reference with the landing area or obstacles is lost, initiate a go-around or instrument takeoff (ITO) as required, immediately. Be prepared to transition to instruments. Once visual meteorological conditions (VMC) are regained, continue with the go-around.

MOUNTAINOUS AREA CONSIDERATIONS: If at any time during an approach, the aircraft does not have sufficient power and turbulent conditions or wind shift create an unsafe condition, perform a go-round immediately. Perform one of the following:

1. Where escape routes exist, turn the aircraft away from the terrain, apply forward cyclic and lower the collective, if possible. Accelerate the aircraft to an appropriate airspeed for conditions and complete the go-around.
2. Where escape routes do not exist, adjust aircraft for maximum rate of climb to ensure obstacle clearance. Upon clearing obstacles, accelerate aircraft to an appropriate airspeed for conditions and complete the go-around.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1070

RESPOND TO EMERGENCIES

CONDITIONS: In a H-60 helicopter, given a specific emergency condition or the indications of a specific malfunction, and given a suitable landing area.

Note. For standardization annual proficiency and readiness test (APART) and annual evaluations, the following emergency procedures will be evaluated: Single engine failure (at altitude and at a hover), decreasing RPM R to include performing electronic control unit/digital electronic control unit (ECU/DECU) lockout (in flight), and any emergency procedure that results in a degraded automatic flight control system (AFCS) condition. Other emergency procedures may be evaluated at the discretion of the evaluator.

Note. For evaluations, the following AFCS systems will be deactivated: SAS 1, SAS 2, TRIM, FPS, and BOOST.

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

1. Rated.

   a. Identify the malfunction, determine the appropriate emergency procedure, and perform or describe the appropriate immediate action procedures outlined in the appropriate aircraft operator's manual/checklist (CL).

   b. Select a suitable landing area.

   c. For AFCS OFF, when a hover is required, maintain altitude ±5 feet and heading ±20 degrees.

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 according to the crew briefing.

DESCRIPTION:

1. Crew actions. Any crewmember detecting an emergency will immediately announce the emergency to the other crewmembers. If time permits, lock shoulder harnesses, make a mayday call, and tune transponder to emergency, as appropriate.

   a. The pilot on the controls (P*) will perform the underlined and nonunderlined steps as appropriate depending on the environmental or aircraft conditions for the pilot on the controls (that is, noncircled items) as per the appropriate aircraft operator's manual/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 condition (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 nonunderlined steps for the pilot not on the controls (that is, circled items) as per the appropriate aircraft operator's manual/CL. If time permits, he will verify all emergency checks with the appropriate aircraft operator's manual/CL. He will request appropriate emergency assistance as described in the Flight Information Handbook.

c. The nonrated crewmember (NCM) will prepare the passengers for an emergency landing. During the descent he 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, he will use the nearest emergency exit to expedite the evacuation. He 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/advisory lights, and central display unit/pilot display unit [CDU/PDU] indications). Determine the malfunction and select the appropriate emergency procedure. Perform the emergency procedure per the appropriate aircraft operator's manual/CL.

NIGHT OR NVG CONSIDERATIONS: Take special precautions to identify the correct switches/levers when performing emergency procedures at night or while wearing night vision goggles (NVGs).

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted in the aircraft unless flight activity category (FAC) 3 or instrument annual proficiency and readiness test (APART) is allowed in the simulator.

REFERENCES: Appropriate common references.

TASK 1082
PERFORM AUTOROTATION

CONDITIONS: In a H-60 helicopter and given an emergency procedure requiring autorotation.

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

1. Identify the malfunction, determine the appropriate emergency procedure, and perform or describe the appropriate procedures outlined in the appropriate aircraft operator's manual/checklist (CL).
2. Select a suitable landing area.
3. Adjust airspeed appropriate for the emergency.
4. Perform a deceleration and termination as directed by the instructor pilot (IP) or as appropriate for the type of emergency per the appropriate aircraft operator's manual.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will enter the autorotation and remain focused primarily outside the aircraft throughout the maneuver and will announce "autorotation." The P* will monitor RPM R, trim, airspeed, and announce the intended point of termination. The P* will perform the appropriate steps for the pilot on the controls per the appropriate aircraft operator's manual/CL. The P* will acknowledge any announced warnings, recommendations, or control input made by the pilot not on the controls (P).

   b. The P will monitor RPM R, aircraft trim, and airspeed and provide adequate warning for corrective actions. If time permits, lock shoulder harnesses, place transponder to emergency; and make a mayday call. If the P must make a control input to prevent exceeding any limitations, he will announce his actions to the P*. The P will perform the underlined steps and nonunderlined steps for the pilot not on the controls (that is, circled items) per the appropriate aircraft operator's manual/CL. He will perform actions as directed by the P*. He will monitor and back up the performance of the emergency procedures, and confirm actions per the checklist, time permitting.

   c. The P and nonrated crewmember (NCM) will confirm the suitability of the landing area, assist in clearing the aircraft, and provide adequate warning of obstacles.

   d. The NCM will prepare the passengers for an emergency landing. After landing, the NCM will assist in evacuating the passengers to the designated assembly area according to the crew briefing. If normal exits cannot be used, he will use the nearest emergency exit to expedite the evacuation. He 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.

   a. Recognize the emergency and enter autorotation or during training select the correct entry point. An autorotation may be done either "straight in" or "with turn." When executing an autorotation with turn, aircrews must be aware of the tendency for RPM R to increase. Smoothly lower the collective (at a moderate rate) to the full down position. Apply pedal as required to maintain the aircraft in trim. Adjust the cyclic to assume airspeed appropriate for the conditions, and initiate a turn, if necessary.

Note. When turning to the right, an increase in RPM R will develop rapidly in relation to the rate of cyclic application. The RPM R increase can be quite rapid with a corresponding rapid right turn. The increase in RPM R will even be further aggravated with heavy gross weight aircraft, and high density altitude. Adjust the collective as necessary to prevent rotor overspeed.

Note. When executing an autorotation with turn to the left, a slight to moderate increase in RPM R will normally occur. However, when right lateral cyclic is rapidly applied from a left turn condition into a right turn condition, an even greater increase in RPM R will be evident. The increase in RPM R will even be further aggravated with heavy gross weight aircraft and high density altitude. Adjust the collective as necessary to prevent rotor overspeed. An autorotation may be done “straight in” or “with turn.” When executing an autorotation with turn, aircrews must be aware of the tendency for RPM R to increase.

b. During the descent, the P* and P will monitor RPM R to prevent an overspeed or underspeed condition and the P* will adjust the collective as necessary to establish and maintain a steady state autorotation. The P will call out RPM R, airspeed, and aircraft in trim. (Steady state autorotation is defined as RPM R within limits; airspeed is not below 80 knots indicated airspeed [KIAS]; torque, trim, and aircraft in position to land at the desired touchdown point.) If conditions are not met, execute a go-around.

c. Between 50 and 75 feet above ground level (AGL), adjust the cyclic for a smooth, progressive deceleration. Maintain ground track and apply pedal to align the aircraft with the direction of touchdown.

d. Terminate the autorotation by one of the three following methods. (During training the instructor pilot [IP] will announce which is to be used.)

(1) Power recovery. Upon receiving the command "power recovery," the P* will apply the collective as necessary to arrest the rate of descent while simultaneously maintaining trim with the pedals. He continues to apply sufficient collective to arrest the rate of descent and establish a normal climb.

Note. While applying the collective for a go-around, be aware of the tendency for initial RPM R decay.

(2) Terminate with power. Upon receiving the command "terminate with power," the P* will adjust the collective to arrest the descent at an altitude that will ensure that the tail wheel will not contact the ground. (Conditions permitting; ground speed at the termination of the maneuver should be the same as for touchdown.)

(3) Touchdown autorotations may only be conducted in an emergency or in the simulator. During touchdown autorotations, the P* will adjust the cyclic and collective to smoothly cushion the main gear onto the landing surface. After the main wheels are on the ground, he smoothly lowers the collective to full down, neutralizes the cyclic, and maintains heading and ground track with the pedals. He will use the brakes as necessary to stop roll out.

Note. When conducting autorotation training/evaluation in the aircraft (power levers at fly), the P* should limit the torque to below 10 percent to ensure that an autorotational descent (not a steep approach) is occurring. Torque spikes as a result of collective application to arrest RPM R are acceptable as long as the collective is reduced below 10 percent dual engine torque. The intent of the torque limit is to ensure the rotor is decoupled from the engines and autorotational descent is established.

NIGHT OR NVG CONSIDERATIONS: Suitable landing areas will be much more difficult to locate at night. Hazards will be difficult to detect in the landing area. Use the landing light/searchlight as appropriate.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1114

PERFORM A ROLLING TAKEOFF

WARNING

If the takeoff is aborted, it may be impossible to stop the aircraft before clearing the barriers (depending on aircraft weight, speed, surface composition, and size of the takeoff area). Situations requiring this maneuver will usually result in very marginal single-engine characteristics. This increased risk factor will be addressed during the mission risk assessment process.

CAUTION

Do not exceed power or aircraft component limitations when actual inground effect (IGE) hover power is not available.

CONDITIONS: In a H-60 helicopter with the aircraft cleared and from a suitable takeoff area.

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

1. Before takeoff—
   a. Establish and maintain power, as necessary.
   b. Maintain alignment with takeoff direction ±5 degrees.
   c. Accelerate to desired takeoff speed not to exceed 60 knots ground speed.
2. After takeoff—
   a. Adjust power, as required, not to exceed aircraft limits.
   b. Maintain ground track alignment with the takeoff direction with minimum drift.
   c. Maintain maximum rate of climb airspeed ±5 knots indicated airspeed (KIAS).
   d. Maintain aircraft in trim immediately after takeoff.

DESCRIPTION:

1. Crew actions.
   a. The pilot in command (PC) will confirm the area is suitable for the maneuver.
   b. The pilot on the controls (P*) will remain focused primarily outside the aircraft during the maneuver. The P* will announce when he initiates the maneuver and his intent to abort or alter the takeoff.
   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. The P and NCM will announce when their attention is focused inside the aircraft and again when attention is reestablished outside. The

P will monitor power requirements, ground speed, and advise the P* when power limits are being approached.

Note. When conducting operations with jettisonable external stores, the P will be prepared to jettison the stores when operating below minimum single-engine airspeed or as briefed during the crew briefing.

2. Procedures.

   Note. A rolling takeoff is used when hover power for takeoff is marginal or insufficient and a takeoff must be made. Use the rotor system thrust to accelerate the aircraft to a more efficient speed for flight.

   a. Verify that the takeoff surface is suitable for the maneuver, and select ground reference points.

   b. Neutralize the cyclic, and raise the collective to establish the aircraft light on the wheels.

   c. Use the pedals to maintain heading.

   d. Coordinate forward cyclic, maintain heading with pedals, and increase the collective as necessary to accelerate the aircraft. Accelerate to MAX R/C–IAS (not to exceed 60 knots ground speed).

   Note. It may be necessary to lower the collective to keep the main landing gear in contact with the takeoff surface until takeoff speed is attained. Do not force the aircraft to remain on the ground after takeoff speed is attained. Note that the aircraft nose will drop as a result of the stabilator programming as forward speed increases causing the tail wheel to lift off the surface.

   e. Upon reaching takeoff speed, adjust power to maximum and cyclic as necessary to allow the aircraft to become airborne.

   f. After takeoff, trim the aircraft as soon as possible. Establish and maintain maximum rate of climb airspeed until the aircraft is clear of obstacles.

Note. For training, to simulate situations requiring a rolling takeoff, use 10 percent below hover torque as maximum torque available.

Note. Pilot technique, winds, and type of runway surface will affect the distance needed to perform this maneuver.

NIGHT OR NVG CONSIDERATIONS:

1. If sufficient illumination or night vision device (NVD) resolution exists to view obstacles, accomplish the takeoff in the same way as a rolling takeoff during the day. Visual obstacles such as shadows should be treated as physical obstacles. If sufficient illumination or NVD resolution does not exist, a rolling takeoff should not be performed.

2. 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 establishing the crab angle required to maintain the desired ground track.

3. Using the landing light or searchlight is recommended at night to view obstacles and maintain awareness of the rotor tip path plane. Ensure ground clearance with the searchlight or landing light as the helicopter lifts off the ground.

SNOW/SAND/DUST CONSIDERATIONS: This task may be used in environments where these conditions are present. It may allow the aircraft to get ahead of the blowing conditions into clear air before takeoff. This maneuver should be aborted if visual cues become lost when power is applied. Extreme care should be taken to confirm that the snow, sand, or dust conditions do not cover rough areas in the takeoff path that could damage the aircraft.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1155

Negotiate wire obstacles

CONDITIONS: In a H-60 helicopter.

STANDARDS: Appropriate common standards plus the following 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. Locate guy wires and supporting poles. Estimate the amount of available clearance between the wires and the ground to determine the method of crossing.

   c. 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.

   d. Underflight/ground taxi. When flying under wires, ensure a minimum ground-to-wire clearance of hover height plus 30 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, consider ground taxiing under the wires.

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

NIGHT OR NVG CONSIDERATIONS: Wires are difficult to detect at night and with night vision goggles (NVGs). Flying under 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. Training may be conducted in the aircraft or simulator.
2. Evaluation. 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 or passenger in the aircraft until assistance arrives.**

CONDITIONS: In a H-60 helicopter.

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

1. Perform or describe using emergency exits on the aircraft per the appropriate aircraft operator’s manual.
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 per the appropriate aircraft operator’s manual.
4. Assist in marshaling passengers to designated assembly area.
5. Perform or describe duties as briefed in the crew mission briefing.

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (PC) will direct an emergency egress. He will determine if the egress will be done before the rotor blades have stopped. (If the PC is incapacitated, the next ranking rated crewmember/nonrated crewmember [RCM/NCM] will perform this function.) He 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 perform duties as briefed during the crew briefing and 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, break out the Plexiglas windows with the crash axe, boot, or 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.

   c. Perform emergency engine shutdown procedures per the appropriate aircraft operator’s manual.

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 the cockpit to maintain orientation, employ underwater breathing device (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, break out the windows with the crash axe, boot, or other suitable object, and swim clear of the aircraft. Do not activate life preserver until clear of aircraft and on surface.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1166

Perform instrument maneuvers

CONDITIONS: In a H-60 helicopter in instrument meteorological condition (IMC) or simulated IMC and given appropriate navigational publications.

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

1. Tune and identify appropriate navigational aids (NAVAIDs).
2. Determine, intercept, and maintain the desired course ± 5 degrees.
3. Maintain the desired heading ± 5 degrees.
4. Maintain the desired distance measuring equipment (DME) arc ± 1 nautical mile.
5. 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 acknowledge all directives given by ATC or the pilot not on the controls (P). He will announce airspeed, heading, and altitude changes and any deviation not directed by ATC or the P.

   b. The P will select and announce radio frequencies. He also will monitor radios and ATC information not monitored by the P*. The P will confirm airspeed, heading, and altitude changes.

   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. Adjust cyclic as required to maintain the desired airspeed and heading. Adjust collective as required to maintain the desired climb/descent rate or altitude and maintain aircraft in trim with the pedals. Perform instrument procedures per AR 95-1, FM 1-240, aeronautical information manual (AIM), FAA Instrument Flying Handbook, FAA Instrument Procedures Handbook and Department of Defense flight information publication (DOD FLIP).

   a. When expecting to use the automatic direction finder (ADF), ensure that the ADF will receive on the desired band and the Number 2 bearing pointer points at the selected station.

   b. When expecting to use the VHF omnidirectional range radio beacon/instrument landing system (VOR/ILS) receiver, ensure that the VOR is operational and the vertical situation indicator (VSI) and horizontal situation indicator (HSI) give 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 reintercept. If navigational instruments do not indicate movement toward the course within a reasonable time, increase the intercept angle. When reintercepting 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, FAA Instrument Flying Handbook, FAA Instrument Procedures Handbook or AIM.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1168

Perform command instrument system procedures

CONDITIONS: In a H-60 helicopter.

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

1. Configure the horizontal situation indicator/vertical situation indicator (HSI/VSI) mode select panels and command instrument system (CIS) to obtain the desired navigational data and commands.
2. Follow the cyclic roll, cyclic pitch, and collective position indicator commands, as appropriate.

DESCRIPTION: Configure the CIS MODE SEL panel and, if required, the HSI/VSI MODE SEL panel, as required per the appropriate aircraft operator's manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1170

Perform instrument takeoff

CONDITIONS: In a H-60 helicopter in instrument meteorological condition (IMC) or simulated IMC and aircraft cleared.

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

1. Adjust vertical situation indicator (VSI).
2. Maintain power as required (+5 percent, -0 percent torque) to maintain desired climb airspeed and rate of climb without exceeding aircraft limits per the appropriate aircraft operator's manual.
3. Maintain accelerative climb attitude ± 2 degrees until climb airspeed is attained.
4. Maintain the aircraft in trim after effective translational lift (ETL).

DESCRIPTION:

1. 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. He will announce when he initiates the maneuver and his intent to abort or alter the takeoff. Before the aircraft enters simulated or actual IMC, he 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. He will announce when his 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.
2. 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 3 to 5 degrees 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.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1174

Perform holding procedures

CONDITIONS: In a H-60 helicopter in instrument meteorological condition (IMC) or simulated IMC and given holding instructions and appropriate Department of Defense flight information publication (DOD FLIP).

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

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

DESCRIPTION:

1. Crew actions.

    a. Before arrival at the holding fix, the pilot in command (PC) will analyze the holding instructions and determine the holding pattern and proper entry procedures. He 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. He will announce ATC information not monitored by the pilot on the controls (P*). He also 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. He 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 as published 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 the outbound leg when abeam the station. This is indicated by the # 2 bearing pointer or the TO/FROM indicator indicating a FROM indication. When holding at an intersection, begin timing the outbound leg upon establishing the outbound heading.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1176

Perform nonprecision approach

CONDITIONS: In a H-60 helicopter in instrument meteorological condition (IMC) or simulated IMC, given approach information and appropriate Department of Defense flight information publication (DOD FLIP).

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

1. Correctly perform the approach.
2. Correctly intercept and maintain nondirectional beacon (NDB) courses within 5 degrees of course centerline.
3. Correctly intercept and maintain VHF omnidirectional range radio beacon (VOR) courses within 5 degrees of course centerline (one dot on the horizontal situation indicator/vertical situation indicator [HSI/VSI]).
4. Correctly intercept and maintain localizer courses within 2.5 degrees of course centerline (two dots on the HSI/VSI).
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 as published or per ATC instructions upon reaching the missed approach point (MAP) if landing cannot be done per AR 95-1.

DESCRIPTION:

Crew actions.

1. The pilot in command (PC) will review the approach with the other crewmembers before initiating the procedure. He will confirm with the crew the specific approach to be flown, that the correct navigational aid (NAVAID)/communication frequencies are set, and the HSI /VSI mode select panel and command instrument system (CIS) are selected as required. The PC may assign other crewmembers to perform these duties.
2. The pilot on the controls (P*) will focus primarily inside the aircraft on the instruments and perform the approach. He will follow the heading/course, altitude, and missed approach directives issued by the pilot not on the controls (P). He will announce any deviation not directed by ATC or the P and will acknowledge all navigation directives given by the P.
3. The P will call out the approach procedure to the P* and will advise the P* of any unannounced deviations. He will monitor outside for visual contact with the landing environment. If he makes visual contact suitable to complete the landing per AR 95-1, he will announce such and may, if directed by the PC, take the controls and complete the landing. If visual contact is not made at the missed approach point, he will announce such and call out the missed approach procedures.
4. 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.

Note. A Doppler/global positioning system (GPS) that is not certified for instrument flight rules (IFR) flight will not be used as the primary source of navigation information for IFR operations in controlled airspace; however, its use should be considered and planned for as an emergency backup system.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1178

Perform precision approach

CONDITIONS: In a H-60 helicopter in instrument meteorological condition (IMC) or simulated IMC, given approach information and appropriate Department of Defense flight information publication (DOD FLIP).

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

1. Correctly perform the approach.
2. For an instrument landing system (ILS) approach, intercept and maintain the localizer course within 2.5 degrees of course centerline (two dots on the horizontal situation indicator (HSI), and glide slope within 0.5 degree of glide slope center (two dots on the VSI).
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 published decision altitude (DA) or decision height (DH) prescribed for the approach.
5. Perform the correct missed approach procedure as published or per ATC instructions upon reaching the DA/DH if landing cannot be done per AR 95-1.

DESCRIPTION:
Crew actions.

1. The pilot in command (PC) will review the approach with the other crewmembers before initiating the procedure. He will confirm with the crew the specific approach to be flown, that the correct navigational aid (NAVAID)/communication frequencies are set, and the HIS/VSI mode select panel and command instrument system (CIS) are selected as required. The PC may assign other crewmembers to perform these duties.
2. The pilot on the controls (P*) will focus primarily inside the aircraft on the instruments and perform the approach. He will follow the heading/course, altitude, and missed approach directives issued by the P. He will announce any deviation not directed by ATC or the pilot not on the controls (P) and will acknowledge all navigation directives given by the P.
3. The P will call out the approach procedure to the P* and will advise the P* of any unannounced deviations. He will monitor outside for visual contact with the landing environment. If he makes visual contact suitable to complete the landing per AR 95-1, he will announce such and may, if directed by the PC, take the controls and complete the landing. If visual contact is not made by DA/DH, the P will announce such and call out the missed approach procedures.
4. 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.

Note. A Doppler/global positioning system (GPS) that is not certified for instrument flight rules (IFR) flight will not be used as the primary source of navigation information for IFR operations in controlled airspace; however, its use should be considered and planned for as an emergency backup system.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1180

Perform emergency global positioning system recovery procedure

CONDITIONS: In a H-60 helicopter in visual meteorological conditions (VMC) or simulated instrument meteorological condition (IMC), given an approved emergency global positioning system (GPS) recovery procedure.

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

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

DESCRIPTION:

1. Before the flight, the crew should review the recovery procedure in conjunction with the map to familiarize themselves with the procedure and with 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. Before 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. He will adjust the aircraft ground track to cross the IAF, IF, and then the FAF on the prescribed course. When over the FAF, he begins the final descent as appropriate.
3. 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 his attention is focused inside the cockpit. The P and nonrated crewmember (NCM) will monitor the aircraft instruments during the procedure and the P will 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.
4. The NCM will position himself on the P* side of the aircraft for obstruction clearance and airspace surveillance. He alerts the crew immediately if VMC is encountered.

NIGHT OR NVG CONSIDERATIONS. The P should be in a position to assume control of the aircraft 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 coordinating with air traffic control (ATC) or with other aircraft using the approach procedure.
>
> ***Note.*** The AN/ARN-128B Doppler/GPS will not be used as the primary source of navigation information for IFR operations in controlled airspace; however, its use should be considered and planned for as an emergency backup system.
>
> ***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. Training may be conducted in the aircraft or simulator.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the unit SOP.

TASK 1182

PERFORM UNUSUAL ATTITUDE RECOVERY

CONDITIONS: In a H-60 helicopter in visual meteorological conditions (VMC) or simulated instrument meteorological condition (IMC).

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

1. Analyze aircraft attitude.
2. Without delay, use correct recovery procedures.
   a. Attitude—level the wings on the attitude indicator.
   b. Heading—maintain heading; turn only to avoid known obstacles.
   c. Torque—adjust torque as necessary.
   d. Trim—trim aircraft as necessary.
   e. Airspeed—adjust airspeed as necessary.

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 pilot on the controls (P*).

   b. The P* will remain focused inside the aircraft during this maneuver and will acknowledge the unusual attitude recovery and transfer of aircraft controls.

   c. The P will assist in monitoring the aircraft instruments; he will call out attitude, torque, and trim as necessary.

   d. During 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. 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. 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 (NVG) operations, video noise may contribute to loss of visual cues.

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

REFERENCES: Appropriate common references.

TASK 1184

RESPOND TO INADVERTENT INSTRUMENT METEOROLOGICAL CONDITIONS

CONDITIONS: In a H-60 helicopter, in visual meteorological conditions (VMC).

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

1. Announce "IMC," maintain proper aircraft control, immediately make the transition to instrument flight, and initiate immediate climb.
2. Initiate correct inadvertent IMC recovery procedures.
   a. Attitude—level the wings on the attitude indicator.
   b. Heading—maintain heading; turn only to avoid known obstacles or as briefed for multiship operations.
   c. Torque—adjust torque as necessary.
   d. Trim—trim aircraft as necessary.
   e. Airspeed—adjust airspeed as necessary.
3. Contact air traffic control (ATC), as required. Comply with ATC instructions, local regulations, and standing operating procedure (SOP).

DESCRIPTION:

1. Crew actions.
   a. The pilot on the controls/pilot not on the controls (P*/P) will announce inadvertent IMC as appropriate.
   b. The pilot in command (PC) will announce the minimum altitude to which the crew will climb (and heading if turn required for single and multiship operations) as the procedure is initiated.
   c. The P* will announce when he initiates inadvertent IMC procedures. He will announce if he is disoriented and unable to recover.
   d. The P will monitor the cockpit instruments to assist in recovery, set the transponder to emergency, make the appropriate radio calls, and perform any other crew tasks as directed by the P*. It may be necessary for the P to take the controls and implement recovery procedures.
   e. The nonrated crewmember (NCM) will focus primarily outside the aircraft to provide adequate warning for avoiding terrain or obstacles. The P and NCM will perform any other crew tasks as directed by the PC.
2. Procedures. If inadvertent IMC are encountered—
   a. Immediately adjust the pitch and roll attitude, adjust power, trim, and airspeed as required to ensure obstacle clearance/avoidance. All components are changed simultaneously with little or no lead time over the other.
   b. Complete the inadvertent IMC recovery per local regulations and policies.

NIGHT OR NVG CONSIDERATIONS: When using night vision goggles (NVGs), he may see through a thin obscuration, such as fog and drizzle, with little or no degradation. 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 thin obscuration that would otherwise prevent him from seeing the landing environment.

Note. If IMC conditions are entered with the searchlight or landing light on, spatial disorientation may occur.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1188

Operate aircraft survivability equipment

CONDITIONS: In a H-60 helicopter equipped with aircraft survivability equipment (ASE).

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

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

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
   b. The PC will also ensure that all ASE payloads and settings are per the mission briefing.
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. Training may be conducted in the aircraft, simulator, or academically.
2. Evaluation. Evaluation may be conducted in the aircraft, simulator, or academically.

REFERENCES: Appropriate common references plus the following:

- AFTTP 3-1
- Computer based ASE trainer (CBAT) programs
- Equipment operator’s manuals
- Unit S-2 / TACOPS officer

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 the following additions/modifications:

1. Rated. Identify at a minimum the hand and arm signals required for moving an aircraft left, right, forward, or backward and for takeoff and landing per FM 21-60.
2. Nonrated. Identify and perform at a minimum the hand and arm signals required for moving an aircraft left, right, forward, or backward and for takeoff and landing per FM 21-60.

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

REFERENCES: Appropriate common references plus FM 21-60.

TASK 1194

Perform refueling operations

CONDITIONS: With a H-60 helicopter and refueling equipment.

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

1. Ensure that safety procedures are complied with per FM 10-67-1 and the appropriate aircraft operator's manual, FM 3-04.111, and FM 1-113.
2. Ensure that all doors and windows are closed on the refueling side (for hot refueling operations).
3. Ensure that the aircraft is refueled per FM 10-67-1, the appropriate aircraft operator's manual, FM 3-04.111, FM 1-113, and the unit standing operating procedure (SOP).
4. 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 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.

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

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:

- DA Pam 738-751
- FM 10-67-1
- FM 21-60

TASK 1228

Relay patient information to medical control

CONDITIONS: Given symptoms of a patient, a communication radio, and an estimated time of arrival (ETA).

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

1. Relay essential patient information.
2. Relay ETA and proposed landing site.
3. Respond to medical control's directives.

DESCRIPTION: The crewmember will perform radio communication procedures according to task 1032. Inform the pilot in command (PC) before transmitting on the radio to avoid radio transmission conflicts. Rotate the intercommunication system (ICS) selector switch to the correct position and listen to ensure the net is clear. Using correct radio procedures, relay patient information, and give ETA. Carry out instructions from medical control and advise them of any pertinent changes in information.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1230

Perform litter and ambulatory patient load/secure/and unload procedures

WARNING

Be alert for untrained personnel approaching the aircraft. Ensure ground personnel are clear of the aircraft before takeoff.

CAUTION

Check for loose items of medical or personal gear as patients approach the aircraft and are exposed to the rotor wash.

CONDITIONS: In a medical evacuation (MEDEVAC) configured H-60 helicopter with a crew, patients, and the appropriate number of litters.

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

1. Configure the aircraft for loading patients.
2. Determine the patient's loading category.
3. Brief litter teams and passengers on procedures for approaching, loading, and leaving the aircraft.
4. Secure patients to litters.
5. Load and secure litter and ambulatory patients.
6. Secure medical equipment and patients' baggage.
7. Unload patients at destination.

DESCRIPTION:

1. Crew actions.
   a. The medical officer (MO) will coordinate loading and unloading procedures.
   b. The crew chief (CE) will assist with loading and unloading as directed by the MO.
2. Procedures. Direct/escort ambulatory patients to their seats. Ensure they are secured and have been briefed. Load and secure litter patients as required. Secure any medical equipment and baggage. Advise the pilot in command (PC) when all patients are prepared for departure. Upon landing, direct/escort ambulatory patients away from the aircraft, and unload litter patients as required.

   Note. If the aircraft is equipped with external stores support system (ESSS), loading and unloading of patients must be performed from both sides of the aircraft because the litter support unit has to be placed at a 45-degree angle from load position.

3. 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.

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.

TASK 1234

Operate medical equipment

CONDITIONS: In a medical evacuation (MEDEVAC) configured H-60 helicopter, given a medical equipment set (air ambulance), manufacturer's instructions, an actual or simulated patient, and a medical equipment preflight checklist.

> ***Note.*** The commander will establish written inspection criteria covering security, amounts of equipment required (intravenous (IV) fluids, oxygen, and so forth), and serviceability requirements of equipment. The commander must also specify the recording and reporting requirements for the preflight inspection.

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

1. Perform a preflight inspection of all assigned medical equipment.
2. Operate all assigned medical equipment.
3. Identify and correct deficiencies; annotate inspection results on a medical equipment checklist.

DESCRIPTION:

1. 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.
2. Identify deficiencies and turn in procedures for unserviceable equipment.
3. Record the results of the preflight inspection on the medical equipment checklist.
4. Operate all assigned equipment to the manufacture’s specifications.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus the following:

- Manufacturer's instructions
- Medical equipment checklist
- Unit standing operating procedure (SOP)

TASK 1238

Provide treatment for a patient

> **WARNING**
>
> **Keep all patients clear of the cockpit area. The normal reaction of a confused patient is to resist restriction of movement.**

CONDITIONS: In a medical evacuation (MEDEVAC) configured H-60 helicopter, given a medical equipment set (air ambulance), with an actual or simulated patient, and additional equipment according to local medical treatment protocols, TC 8-800 skill evaluation conditions, and standing operating procedure (SOP).

Note. The commander, with guidance from the appropriate medical authority, will establish written medical 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.

STANDARDS: Appropriate common standards plus provide treatment according to local medical treatment protocols and semiannual combat medic skills-validation test (SACMS-VT).

Note. This task encompasses many individual subtasks as delineated in the SACMS-VT. Each subtask must be evaluated using the skill set sheets listed below (found in TC 8-800). A record of these evaluations will be tracked on DA Form 7442-R (*Table VIII – Tracking Sheet)*, and this form will be kept in the miscellaneous section of the nonrated crewmember's (NCM's) individual aircrew training folder (IATF).

- DA Form 7443-R (*Trauma Casualty Assessment/Management Skill Sheet).*
- DA Form 7443-1-R (*Perform Needle Chest Decompression Skill Sheet)*.
- DA Form 7443-2-R (*Bleeding Control and Shock Management Skill Sheet)*.
- DA Form 7443-3-R (*Intravenous (IV) Skill Sheet)*.
- DA Form 7443-4-R (*Immobilization (Traction) Skill Sheet)*.
- DA Form 7443-5-R (*Spinal Immobilization (Seated) Skill Sheet)*.
- DA Form 7443-6-R (*Spinal Immobilization (Supine) Skill Sheet)*.
- DA Form 7443-7-R (*Extract a Casualty Skill Sheet)*.
- DA Form 7443-8-R (*Medical Assessment/Management Skill Sheet)*.
- DA Form 7443-9-R (*Airway Management Upper Airway Adjuncts and Suction Skill Sheet)*.
- DA Form 7443-10-R (*Bag Valve Mask Skill Sheet)*.
- DA Form 7443-11-R (*Oxygen Administration Skill Sheet)*.
- DA Form 7443-12-R (*Mouth-to-Mask with Supplemental Oxygen Skill Sheet)*.
- DA Form 7443-13-R (*Insert a Combitube® Skill Sheet)*.
- DA Form 7443-14-R (*Cardiac Arrest Management Automated External Defibrillator (AED) Skill Sheet**).

- DA Form 7443-15-R (*Cardiopulmonary Resuscitation (1 Rescuer) Skill Sheet)*.
- DA Form 7443-16-R (*Cardiopulmonary Resuscitation (2 Rescuers) Skill Sheet)*.
- DA Form 7443-17-R (*Nuclear, Biological, and Chemical (NBC) Skill Sheet)*.
- DA Form 7443-18-R (*Evaluate a Casualty Skill Sheet)*.

* DA Form 7443-14-R is only required when automated external defibrillators (AEDs) are used by medical treatment personnel.

Note. These medical evaluations will comply with TC 8-800 and local medical treatment protocols. Scenarios should be developed to reflect the unit's wartime mission, peacetime operations, local EMS, and flight surgeon's directives.

DESCRIPTION: The flight medic must treat injuries and illnesses per local medical protocols and semiannual combat medic skills-validation skills (SACMS-VT) (TC 8-800). Commanders will find that aligning SACMS-VT with the crewmember's annual proficiency and readiness test (APART) period will facilitate the emergency medical technician-basic/-paramedic (EMT-B/EMT-P) civilian biennial certification process and will tie in additional critical battlefield treatment modalities.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. SACMS-VT conducted outside the APART period can be conducted without using the aircraft provided all other conditions are met.

REFERENCES: Appropriate common references plus the following:

- DA Form 7442-R
- DA Form 7443-1-R through -18-R
- FM 8-10-26 (appendix J)
- Local medical treatment protocols

TASK 1239

Perform basic trauma life support

CONDITIONS: In a medical evacuation (MEDEVAC) configured H-60 helicopter, given a medical equipment set (air ambulance), with an actual or simulated patient, and additional equipment according to local protocols and standing operating procedure (SOP).

> ***Note.*** The commander will establish (in writing) 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.

STANDARDS: Appropriate common standards plus perform basic trauma life support (BTLS) treatment according to current Brady's BTLS guidelines.

TRAINING AND EVALUATION REQUIREMENTS

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

REFERENCE: BTLS and Advanced Prehospital Trauma Life Support Manual.

> ***Note.*** Crewmembers must be BTLS certified or advanced prehospital trauma life support certified to perform this task.

> ***Note.*** The commander or designated representative will arrange for certification and recertification consisting of written and hands on performance tests.

TASK 1253

Operate central display unit

CONDITIONS: In a UH-60Q/HH-60L.

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

1. Initialize the central display unit (CDU) for use in flight.
2. Operate the communication (COM), navigation (NAV), and standard transfer specification (STS) pages of the CDU.

DESCRIPTION:

Crew actions.

1. 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. The P* maintains focus outside the aircraft at all times (unless instrument meteorological condition [IMC]). The P monitors all mission equipment and uses the CDU for communication, navigation, and mission information.
2. The P will place the CDU into operation during run-up and will operate in flight through shutdown by using any or all of the following functions:
   a. Initializing the CDU using the initialization (INI) page according to the checklist.
   b. Entering and storing data on the DATA page as necessary to effectively complete assigned mission. Transferring data from the data transfer device (DTD) to the CDU and saving data from the CDU to the DTD as necessary.
   c. Entering and engaging flight plan (to include search patterns) of flight plan (FPN) page of the CDU. P should also be able to modify existing flight plans in flight to accomplish mission changes en route.
   d. Using the STS page of the CDU to determine system status and determine mission accomplishment relative to operational condition of displayed equipment.
   e. Selecting and setting up the avionics using the COM page of CDU.
   f. Using the NAV page to select and tune the proper navigation aid.
   g. Using the features of the calculator (CLC) page.
   h. Fixing positions and recording positions as waypoints using the FIX page of the CDU.
   i. Addressing emergency procedure associated with CDU failures.

NIGHT OR NVG CONSIDERATIONS: Ensure CDU lighting adjustment is set at an acceptable level for night or night vision goggle (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 appropriate manufacturer’s references.

TASK 1254

Operate multifunction display

CONDITIONS: In a UH-60Q/HH-60L.

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

1. Operate the installed multifunction display (MFD) per the appropriate technical manual.
2. Use the MFD to include soft keys.
3. Select correct header display for the required information (communication [COM] or navigation [NAV]).
4. Select and use the appropriate screen (flight plan, hover and attitude display, or forward looking infrared [FLIR]).
5. Select the caution advisory screen or pop-up window for run-up or current mission profile.
6. Interpret data between the MFD and central display unit (CDU).

DESCRIPTION:

1. Crew actions. 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. The P* maintains focus outside the aircraft at all times (unless IMC). The P monitors all mission equipment and uses the MFD. The P will back up all navigation information with either a map or using navigational aids.

   Note. The aircraft attitude information displayed on the MFD is advisory only and should not be used as the primary flight display.

2. Procedures. Perform the turn on, press the ILLUM ALL soft key for caution advisory, and select operation modes per the appropriate technical manual. Know and understand factors and or emergencies adversely affecting the MFDs, which could result in degraded mission performance or the mission being aborted. The proper shutdown procedures will be performed per the technical manual.

NIGHT OR NVG CONSIDERATIONS: Ensure MFD lighting adjustment is set at an acceptable level for night or night vision goggle (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 appropriate manufacturer's references.

TASK 1258

Operate mission medical interior cabin systems

> **WARNING**
>
> **Serious personal or patient injury can occur if improperly operating or positioning the litter lift.**

CONDITIONS: In a UH-60Q/HH-60L.

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

1. Use litter lift system and prepare ambulatory seats for use (if required).
2. Operate all medical control panels and emergency stops.
3. Generate oxygen using the onboard oxygen generation system (OBOGS).
4. Administer oxygen using the oxygen delivery system (ODS).
5. Configure and use the medical suction system.
6. Control interior cabin climate using the environmental control unit (ECU).

DESCRIPTION:

1. Crew Actions.

   a. The medical officer (MO) determines the condition of the patient—ambulatory or litter. The MO or crew chief (CE) (after and during loading) operates the litter lift system to facilitate the loading and unloading of patients. The CE installs required seating for ambulatory patients.

   b. The MO or CE will operate the medical control panels to raise or lower the liner pans to the height necessary for loading. Crewmembers will know positions of all emergency stops in the aircraft.

   c. The CE or MO will initiate oxygen generation by turning OBOGS on. Determine if system has a charge. Acknowledge built-in test (BIT) fault light (if required) and perform appropriate emergency procedure.

   d. MO determines the appropriate amount of oxygen (O2) to be delivered. MO opens desired station sets and verifies flow rate. Place mask on patient and administer O2.

   e. MO installs "T" fitting to keep material out of suction pump if pump becomes contaminated. (See the appropriate aircraft operator's manual.)

   f. The CE or MO will select appropriate mode of operation for the environmental control system (ECS).

2. Procedures. Complete the loading of litter and or ambulatory patients. Adjust litter lifts as required to facilitate patients onboard. Ensure proper en route care is provided. Provide O2 to patients as required. Use the suction pump as needed. Select appropriated mode (heat, air condition, or vent) on the ECS to maintain a comfortable cabin temperature.

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:

- Appropriate manufacturer's references
- FM 8-10-26

TASK 1262

Participate in a crew-level after action review

CONDITIONS: After flight in a H-60 and given a unit-approved, crew-level after action review checklist.

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

1. The pilot in command (PC) will conduct a detailed crew-level after action review using the example shown below 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. He will use a unit-approved checklist similar to the one shown in table 4-2 below. The PC will actively seek input from all crewmembers. He will 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. Training will be conducted academically.
2. Evaluation. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

Table 4-2. Suggested format for a crew-level after action review checklist
Crew-Level After Action Review Checklist
1. Restate mission objectives with METT-TC considerations. 2. Conduct review for each mission segment: a. Restate planned actions/interactions for the segment. b. What actually happened? (1) Each crewmember states in own words. (2) Discuss impacts of crew coordination requirements, aircraft/equipment operation, tactics, commander's intent, and so forth. c. What was right or wrong about what happened? (1) Each crewmember states in own words. (2) Explore causative factors for both favorable and unfavorable events. (3) Discuss crew coordination strengths and weakness in dealing with each event. d. What must be done differently the next time? (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? (1) Each crewmember states in own words. (2) Are changes necessary to— (a) Crew coordination techniques? (b) Flying techniques? (c) SOP? (d) Doctrine, ATM, TMs? 3. Determine effect of segment actions and interactions on the overall mission. a. Each crewmember states in own words. b. Lessons learned. (1) Individual level. (2) Crew level. (3) Unit level. 4. Advise unit operations of significant lessons learned.

TASK 2010

PERFORM MULTIAIRCRAFT OPERATIONS

CONDITIONS: In a H-60 helicopter.

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

1. Rated.
   a. Maneuver into the flight formation.
   b. Change position in the flight formation when required.
   c. Maintain proper horizontal and vertical separation for the type of formation flight being conducted.
   d. Perform techniques of movement, if required.
2. Nonrated.
   a. Assume a position in the helicopter (as briefed) to observe other aircraft in the formation.
   b. Announce if visual contact is lost with other aircraft.

DESCRIPTION:

1. Crew actions.
   a. The pilot on the controls (P*) will focus primarily outside the aircraft for clearing and keeping track of other aircraft. He will announce any maneuver or movement before execution and inform the pilot not on the controls (P) and nonrated crewmember (NCM) if visual contact is lost with other aircraft. He will ensure the appropriate radio calls are made during inadvertent instrument meteorological condition (IMC) breakup.
   b. The P and NCM will provide adequate warning of traffic or obstacles detected in the flight path and identified on the map. They will inform the P* if visual contact is lost with other aircraft, if an enemy is sighted, and when their attention is focused inside the aircraft again when attention is reestablished outside. The PC will call out direction and altitude in case of IMC breakup.
   c. The NCM will position himself in the aircraft (as briefed) to observe other aircraft in the formation and assist in maintaining aircraft separation and obstacle clearance.
2. Procedures.
   a. Perform formation flight per appropriate publications and the unit standing operating procedure (SOP).
   b. If the tactical situation requires, perform techniques of movement per TC 1-201.

NIGHT OR NVG CONSIDERATIONS: Closure rates are more difficult to determine. 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.
2. Night vision goggle (NVG). When conducting NVG formation flight, the crew should use the infrared (IR) formation lights to maintain the aircraft's position in the formation.

Note. Additional crewmember requirements are in TC 1-210, chapter 4.

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.

TASK 2012

PERFORM TACTICAL FLIGHT MISSION PLANNING

CONDITIONS: Before flight in a H-60 helicopter and given a mission briefing, navigational maps, a navigational computer, approved mission planning software (if available), and other flight planning materials as required.

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

1. Analyze the mission using the mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC) factors available.
2. Perform a map/photo reconnaissance using the available map media or photos. Ensure that all known hazards to terrain flight are plotted or entered into the approved mission planning software (if applicable).
3. Select the appropriate terrain flight modes.
4. Select appropriate primary and alternate routes and enter all of them on a map, route sketch, or into the approved mission planning software.
5. Determine the distance ±1 kilometer, ground speed ±5 knots, and ETE ±1 minute for each leg of the flight.
6. Determine the fuel required and reserve per AR 95-1 ±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/air mission commander (PC/AMC) will delegate mission tasks to crewmembers, have the overall responsibility for mission planning, and will conduct a thorough crew mission briefing. He 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 METT-TC factors. 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 or approved mission planning software. Annotate the map, overlay, or approved mission planning software with sufficient information to complete the mission according to unit standing operating procedure (SOP). This includes waypoint coordinates that define the routes for entry into the Doppler/global positioning system (GPS) and/or approved mission planning software. Consider such items as hazards, checkpoints, observation posts, and friendly and enemy positions. Review contingency procedures.

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

NIGHT OR NVG CONSIDERATIONS: More detailed flight planning is required when the flight is conducted in reduced visibility, at night, or in the night vision goggle (NVG) environment. TC 1-204 contains details about night navigation. 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. Training will be conducted academically.
2. Evaluation. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

TASK 2014

Perform electronic countermeasures/electronic counter-countermeasures procedures

CONDITIONS: In a H-60 helicopter and given a signal operating instructions (SOI).

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

1. Test and operate aircraft avionics and voice security equipment according to the appropriate aircraft operator's manual.
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. He 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. He 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 frequency hopping (FH)/have-quick 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 pass mission critical information on unsecured nets. Do not identify a unit or an individual by name during nonsecure 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, when challenged or when requesting authentication.

   b. Meaconing, interference, jamming, and intrusion/joint spectrum interference resolution (MIJI/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. Training may be conducted in the aircraft or simulator.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

- FM 1-103
- FM 24-35
- TM 11-5895-1199-12

TASK 2022

Transmit tactical reports

CONDITIONS: In a H-60 helicopter and given sufficient information to compile a tactical report.

STANDARDS: Appropriate common standards plus transmit the appropriate report using the current signal operating instructions (SOI).

DESCRIPTION:

Crew actions.

1. 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.
2. The P will assemble and transmit the report. He 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 pilot not on the controls (P) is unable to do so.
3. 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 nonsecure means.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus the following:

- FM 34-1
- SOI

TASK 2024

PERFORM TERRAIN FLIGHT NAVIGATION

CONDITIONS: In a H-60 helicopter and given a mission briefing and required maps and materials.

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

1. Rated.

   a. During nap of the earth (NOE) flight (surface to 25 feet above highest obstacle [AHO]), know the en route location within 200 meters.

   b. During contour flight (25 to 80 feet AHO) or low-level flight (80 to 200 AHO), know the en route location within 500 meters.

   c. Locate each objective within 100 meters.

   d. Arrive at each objective at the planned time ±1 minute (if an objective arrival time was given in the mission briefing).

2. Nonrated. Anounce significant terrain features to aid in navigation.

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). He will acknowledge commands issued by the P for heading and airspeed changes necessary to navigate the desired course. The P* and NCM 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. He 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 horizontal situation indicator (HSI) during low-level flight, the P may include headings. The P should use electronically aided navigation to help arrive at a specific checkpoint or turning point.

   c. The P*, P and nonrated crewmember (NCM) should use standardized terms to prevent misinterpretation of 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 using terrain features and rally terms when giving directions. This will allow the P* to focus his attention outside the aircraft.

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

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, task 1046, and task 1172.

NIGHT OR NVG CONSIDERATIONS:

1. Conducting the flight in reduced visibility or at night requires more detailed and extensive flight planning and map preparation. TC 1-204 contains details on night navigation. Night vision goggle (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. Training may be conducted in the aircraft or simulator.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus FM 21-26.

TASK 2026

PERFORM TERRAIN FLIGHT

CONDITIONS: In a H-60 helicopter with tactical flight mission planning completed.

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

1. Rated.

   a. 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).

   b. Maintain aircraft in trim during contour and low-level flight and when appropriate for nap of the earth (NOE) flight.

2. Nonrated. Maintain constant scan of assigned sector.

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). He 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 reestablished 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. He 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. 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 techniques while maneuvering over the desired route. The crew must look far enough ahead of the aircraft at all times to assist in avoiding traffic and obstacles.

   a. 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.

   b. Contour flight. Perform contour flight by varying altitude and while maintaining a relatively constant airspeed—depending on the vegetation, obstacles, and ambient light. Generally, follow the contours of the earth.

c. 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.

Note. Hover out of ground effect (OGE) power may be required for this task.

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

NIGHT OR NVG CONSIDERATIONS:

1. Wires are difficult to detect with the night vision goggle (NVG).
2. Use proper scanning techniques to ensure obstacle avoidance.
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. Training may be conducted in the aircraft or simulator.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

- FM 21-26
- TC 1-210

TASK 2034

PERFORM MASKING AND UNMASKING

CONDITIONS: In a H-60 helicopter.

STANDARDS: Appropriate common standards plus the following 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. He 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. Masking is a technique using 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:

   a. 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.

   b. Unmasking at a hover (vertically). Announce 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.

c. Unmasking at a hover (laterally). Sometimes, the aircraft may be unmasked by moving laterally from the mask. Announce 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 may be required for this task.

NIGHT OR NVG CONSIDERATIONS: When hovering above 25 feet, the P* may have difficulty in maintaining altitude and position. Use the radar altimeter to assist in maintaining altitude. Use references, such as lights, tops of trees, or manmade objects above and to the sides of the aircraft. By establishing a reference angle to these objects, the P* can detect altitude changes when his perspective to these objects changes. Ground objects—fences, trails, roads—provide excellent references for detecting lateral drift. Proper scanning techniques must be used. The P* may become spatially disoriented when alternating his viewing perspective between high and low references.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 2036

PERFORM TERRAIN FLIGHT DECELERATION

CONDITIONS: In a H-60 helicopter.

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

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

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will focus primarily outside the aircraft to clear the aircraft throughout the maneuver. He will announce his 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. Coordinate applying 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 tail clear of obstacles. Maintain heading and make all control movements smoothly. If the aircraft attitude is changed excessively or abruptly, it may be difficult to return the aircraft to a level attitude and over controlling may result.

Note. Hover out of ground effect (OGE) power may be required for this task.

NIGHT OR NVG CONSIDERATIONS: Because of the limited field of view of the night vision goggle (NVG), avoid making abrupt changes in aircraft attitude. An extreme nose-high attitude limits the forward field of view and may cause disorientation. Maintain proper scanning techniques to ensure obstacle avoidance and tail rotor clearance.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 2042

Perform actions on contact

CONDITIONS: In a H-60 helicopter.

STANDARDS: Appropriate common standards plus use the correct actions on contact consistent with the tactical situation.

1. If appropriate, immediately deploy to a covered and concealed position using suppressive fires.
2. Continue observation as appropriate for the mission.
3. Transmit tactical report per signal operating instructions (SOI), unit standing operating procedure (SOP), or mission briefing.

DESCRIPTION:

1. Crew actions. When engaged by or upon detecting the enemy, the crewmember identifying the threat will announce the nature (visual observation, radar detection, or hostile fire) and the direction of the threat.

   a. The pilot on the controls (P*) will deploy to cover or concealment. He will announce the direction of flight to evade detection.

   b. The pilot not on the controls (P) will remain oriented on threat location. He will announce warnings to avoid obstacles. He will announce when his attention is focused inside the aircraft and again when his attention is reestablished outside.

   c. When the crew encounters a directed threat, the P* will remain primarily focused outside to avoid obstacles, perform the required evasive maneuver, reposition the aircraft as necessary to break radar or visual lock, and then avoid the threat.

   d. The P will begin dispensing chaff or flares as required. The P and nonrated crewmember (NCM) will assist in clearing the aircraft and provide adequate warning of obstacles.

Note. Remaining in the same position while activating chaff negates the effectiveness of this countermeasure.

   e. The NCM will remove and install safety pin(s) according to the appropriate aircraft operator's manual/checklist (CL) and will dispense flares as required.

   f. The NCM will remain focused primarily outside the aircraft and announce adequate warning to avoid obstacles. He will also provide suppressive fire as required.

   g. The crew will transmit a tactical report per the SOI/TACSOP.

Note. The P should note location of threat. The best method is doing a target store on the Doppler/global positioning system (GPS). If unable, note the location of a threat (distance and bearing) relative to a point on the route. Both the rated crewmembers (RCMs) and NCMs must be able to transmit a tactical report per the SOI, unit SOP, or mission briefing.

2. Procedures. Fly the helicopter to a concealed area using the evasive techniques below and suppressive fire, as required. Choose a course of action that supports the mission and the intent of the unit commander's directives. For additional information, see task 2022.

a. The specific maneuver required will depend on the type of hostile fire encountered.

(1) Tanks, rocket-propelled grenades (RPGs), 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 at unequal intervals and small changes in altitude to provide the best protection until you are beyond the effective range of hostile weapons. If the situation permits, employ immediate suppressive fire.

(2) Large caliber, antiaircraft fire (radar controlled). Dispense chaff and execute an immediate 90-degree turn, as appropriate for the threat location, and mask the helicopter. After turning, do not maintain a straight line of flight or the same altitude for more than 10 seconds before initiating a second chaff dispense and 90-degree turn. To reduce the danger, descend immediately to nap of the earth (NOE) altitude.

Note. Dispensing chaff while maneuvering may cause tracking radars to break lock.

(3) Fighters. Upon sighting a fighter, try to mask the helicopter. If the fighter is alone and executes a dive, turn the helicopter toward the attacker and descend. This maneuver will cause the fighter pilot to increase his attack angle. Depending on the fighter's dive angle, it may be advantageous to turn sharply and maneuver away once the attacker is committed. The fighter pilot will then have to break off his attack to recover from the maneuver. Once he breaks off his attack, maneuver the helicopter to take advantage of terrain, vegetation, and shadow for concealment.

(4) IR Missiles. With an IR jammer installed, reduce the collective to decrease the IR signature and maneuver the aircraft to allow the jammer to be effective against the missile. If the Common Missile Warning System (CMWS) is installed and dispenses flares, ensure the distance between the IR signature created by the flares and the aircraft is maintained to allow the missile to track the IR flare(s). After manual/auto flare dispense, attempt to break line of sight with the threat location/direction and deploy to cover to preclude additional engagements.

Note. Proper operation and full protection of the flare system may require level flight.

(5) 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 flight path or altitude to evade it.

(6) Radar-guided missiles. Maneuver the helicopter to break the line of sight to the radar source. Begin a descending, decelerating turn away from the threat source and attempt to maneuver the aircraft to keep the threat system to the right or left rear of aircraft and simultaneously dispense chaff. Attempt to keep the chaff cloud between the aircraft and the threat source. Once chaff is dispensed, turn the aircraft to maneuver away from the chaff cloud and continue to chaff and turn until the aircraft is masked.

(7) Artillery. Depart the impact area and determine NBC requirements.

b. If hit by hostile fire, rapidly assess the situation and determine an appropriate course of action. The first step is to assess aircraft controllability. Then check all instruments and warning and caution lights. If a malfunction is indicated, initiate the appropriate emergency procedure. If continued flight is possible, take evasive action. Make a radio call 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 and land (determine if flight should be extended for medical attention). After landing, inspect the aircraft to determine the extent of damage and if further flight can be continued.

Note. Proper employment of terrain flight techniques will reduce exposure to enemy threat weapon systems.

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.

NIGHT OR NVD CONSIDERATIONS: Threat elements will be harder to detect. Rapid evasive maneuvers will be more hazardous due to division of attention and limited visibility. Maintain situational awareness with regard to threat and hazard location. Flare deployment will degrade vision and night vision goggles.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus the following:

- Computer Based ASE Trainer (CBAT)
- FM 34-25-7

TASK 2048
PERFORM SLING LOAD OPERATIONS

WARNING

When performing this task with cabin doors open, ensure that personnel in the cabin area are wearing safety harnesses secured to tie-down rings or are seated in seats with seat belts on.

CAUTION

A static electricity discharge wand will be used according to FM 10-450-3.

CONDITIONS: In a H-60 or a UH-60 FS helicopter with an operational cargo hook, sling load, completed DA Form 7382-R (*Sling Load Inspection Record)* or training load according to FM 10-450-3.

Note. Prior to sling load operations, a qualified sling load inspector will inspect all sling loads. Certification must be recorded on a DA Form 7382-R and a copy provided to the aircrews.

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

1. Rated.
   a. Before hookup. Verify copy of DA Form 7382-R is complete and on file and that the aircraft will remain within gross weight and center of gravity (CG) limitations.
   b. Hook up 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 10 feet ±5 feet.
      (3) Determine power sufficient to complete the maneuver without exceeding aircraft limitations.
   c. Take off. 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 10 feet ±5 feet.
      (2) Perform a vertical descent with the load to the desired touchdown point ±5 feet.
2. Nonrated.
   a. The nonrated crewmember (NCM) will ensure that the aircraft is prepared for sling load operations. He will also ensure that all slings have been inspected according to FM 10-450-3 and all sling equipment is secured in the aircraft before takeoff.
   b. Provide aircraft guidance for hookup and release.

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. He will ensure that DD Form 7382-R has been completed. He 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 he 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. He 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. He 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. He 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 10 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 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 10 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. Loads will meet external air transportability (EAT) requirements according to FM 10-450-4 and FM 10-450-5. Procedures for air transportation of hazardous material will be according to 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 according to the unit standing operating procedure (SOP).

Note. Sling extenders or "reach pendants" will be used to ensure load clearance when transporting the following: M119/105 (forward firing position), any "built up" high mobility multipurpose wheeled vehicle (HMMWV) (Avenger, ambulance, shelter, and so forth), or any other equipment that requires additional clearance.

Note. Self-hookup operations are authorized provided planning, briefing, and training has been done according to the unit SOP. Self-hookup is used to support gun raids, forward arming and refueling point (FARPs), and so forth when support personnel are not available. The type of load, as well as the size and height, must be considered before attempting a self-hookup. Some loads are more prone to entangle the sling straps than others. A "shepherd's hook," "Q-Tip," or similar device may be used by the NCM to grab the clevis. Hands and arms will not be used to grab the clevis.

Note. The following standard words and phrases are some examples of terminology used for sling load operations:

- "Hook is armed."
- "Load under the nose."
- "Load in sight."
- "Forward."
- "Back."
- "Left."
- "Right."
- "Down."
- "Up."
- "Hold."
- "Load is hooked."
- "Hookup crew clear."
- "Slings coming tight."
- "Load is centered."
- "Load is off the ground."
- "Load on ground."
- "Slack in the slings."
- "Release the load."
- "Load is released."
- "Clear to reposition."

NIGHT OR NVG CONSIDERATIONS:

1. For unaided night flight, the landing light and searchlight should be operational. If a night vision goggle (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 chemstick lighting.

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:

- AR 95-27
- DA Form 7382-R
- FM 55-450-2
- FM 10-450-3
- FM 10-450-4
- FM 10-450-5
- FM 21-60

TASK 2050

Develop an emergency global positioning system recovery procedure

> **WARNING**
>
> **This procedure is designed strictly for recovery under visual meteorological conditions (VMC) in a training environment. If the operational environment requires the possible actual use of the procedure for inadvertent instrument meteorological conditions (IIMC) recovery, the procedure will be submitted for terminal instrument procedures (TERPS) review and approval through HQ, USAASA or USAASD-E.**

Note. THIS TASK SHOULD BE SELECTED FOR INSTRUMENT EXAMINERS (IEs).

CONDITIONS: With a 1/50,000 scale or larger tactical map or visual flight rules (VFR) sectional or joint operations graphic (JOG) map and obstruction information.

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

1. Select a suitable recovery/landing area.
2. Determine the highest obstruction in the area of operations and establish the minimum safe altitude (MSA) for the area operations.
3. Select a missed approach point (MAP), approach course (degrees magnetic), missed approach course, missed approach holding fix (MAHF), final approach fix (FAF), intermediate approach fix (IF), and initial approach fix (IAF).
4. Determine the highest obstacle within the final approach segment that extends from the FAF to the MAP.
5. Determine minimum descent altitude (MDA) for obstacle clearance in the final approach segment.
6. Determine the appropriate obstacles in the missed approach segment and determine 20:1 slope penetration.
7. Determine the highest obstacle in the intermediate approach segment from the IF to the FAF.
8. Determine altitude for obstacle clearance in the intermediate approach segment.
9. Determine the highest obstacles within the initial approach segment from the IAF to the IF.
10. Determine altitude for obstacle clearance in the initial approach segment.
11. Establish a 1-minute inbound holding pattern at the MAHF.
12. Prepare an emergency recovery procedure diagram per the example.
13. Complete a suitability/flyability check to include loading waypoints under VMC to validate the procedure.

Note. If unable to complete a suitability/flyability check due to the operational environment, the command should consider an elevated risk when using this recovery procedure.

DESCRIPTION:

Note. All altitudes are in feet, all waypoints are LAT/LONG, all distances are in nautical miles (NMs), and visibility is in statute miles (SMs). (The FIH has the necessary conversion tables.)

1. Select the most suitable recover/landing area. Determine the MSA for the landing area. Use the off route obstruction clearance altitude (OROCA) or off route terrain clearance altitude (ORTCA) elevation from the en route low altitude (ELA) chart for the area of operations. Select the highest altitude within 30 NM of the MAP. If an ELA is not available, the minimum sector altitude will be determined by adding 1,000 feet to the maximum elevation figures (MEF). When a MEF is not available, apply the 1,000-foot rule to the highest elevation within 30 NM of the MAP. Minimum sector altitudes can be established with sectors not less than 90 degrees and with sector obstacle clearance having a 4 NM overlap. Rounding is allowed to the next higher 100-foot increment.

2. All waypoints (IAF, IF, FAF, MAP, and MAHF) will be verified by two separate GPS NAV systems (for example, Doppler global positioning system navigation system [DGNS], embedded global positioning system/inertial navigation system [EGI], precision lightweight global positioning system receiver [PLGR]).

3. Approach segment construction.

a. Final approach segment. The final approach segment begins at the FAF and ends at the MAP.

(1) Determine the MAP (normally associated with the landing area or threshold).

(2) Determine the FAF. The minimum distance is 2 NM from the MAP. The optimum length is 3 NM. The maximum length is 10 NM.

(3) Determine area of consideration for obstacle clearance.

- Starting .3 NM prior to the FAF, draw a line that is 1.2 NM long on both sides of centerline (total 2.4 NM) perpendicular to the final approach course.
- At .3 NM past the MAP, draw a line that is 1 NM long on both sides of the centerline (total 2 NM) perpendicular to the final approach course.
- Complete the trapezoid by connecting the outer ends of the lines. This trapezoid is the area of consideration for obstacle clearance.

(4) Determine MDA obstacle clearance. Locate the highest obstacle in the final segment trapezoid. Add 250 feet of required obstacle clearance (ROC) and round up to the next higher 20-foot increment.

Note. For visibility requirements, use table 4-3, located under the recovery procedure diagram, page 4-143.

b. Missed approach segment. The missed approach segment starts at the .3 NM prior to the MAP and ends at a holding point designated by a MAHF clearance limit. Optimum routing is straight ahead (within 15 degrees of the final approach course) to a direct entry. However, a turning missed approach may be designated if needed for an operational advantage.

(1) Determine the MAHF. The maximum distance is 7.5 NM from the MAP to MAHF.

- Starting .3 NM prior the MAP draw a line perpendicular to the missed approach course that is 1 NM long on both sides of the centerline (total 2 NM).
- At the MAHF draw a line perpendicular to the missed approach course that is 2 NM long on both sides of the centerline (total 4 NM).

- Complete the trapezoid by connecting the outer ends of the lines.

Note. This trapezoid is the area of consideration for missed approach surface and the 20 to 1 obstacle clearance evaluation.

(2) Determine a turning missed approach. If a turning missed approach is developed, use a flight path turning radius of 1.3 NM until a straight line from apex of radius can be made to the MAHP (usually made back to the FAF). The outer edge of the area should have a 2.6 NM radius. Once the turn is completed, expand the missed approach area to 2 NM on both sides of centerline at the MAHF. The outer edge will be a straight line from the left outer edge of primary area of final segment to the point 2 NM perpendicular to the MAHP.

(3) Determine missed approach obstacle clearance. This surface begins over the MAP at a height of MDA minus required obstacle clearance (ROC). The missed approach surface area ascends uniformly at the rate of 1 foot Vertically, for each 20 feet Horizontally (20H:1V). Evaluate the 20:1 surface from .3 NM past the MAP to the MAHF. The height of the missed approach surface over an obstacle is determined by measuring the straight line distance from .3 NM line past the MAP to the obstacle defining the 20:1 surface. If obstacles penetrate the surface area, establish a higher climb gradient, a higher MDA, move the MAP, or turn the missed approach.

Note. Where the 20:1 surface reaches a height of 1,000 feet below the MSA, further application of the surface is not required.

Note. To determine the maximum allowable height of an obstacle at a given point: Measure the distance from the obstacle to the .3 NM point as described above in paragraph 3b(3). Multiply the distance by 304 (20:1 ratio) and add to the beginning 20:1 surface height. If there is no penetration, the area is clear. At the MAHF, if the surface has not reached the MSA, specify a climb to the MSA.

Note. The area for the missed approach holding falls within the MSA area so the MSA altitude normally will be use as the MAHF altitude if it meets the surface evaluation requirements.

c. Intermediate approach segment. The intermediate segment begins at the IF and ends at the FAF.

(1) Determine the IF. The minimum distance is 3 NM from the FAF. The maximum length is 5 NM.

(2) Determine the area of consideration for obstacle clearance.

- Starting 1 NM prior to the IF, draw a line that is 2 NM long on both sides of centerline (total 4 NM) perpendicular to the intermediate approach course.
- At the FAF, draw a line that is 1.2 NM long on both sides of the centerline (total 2.4 NM) perpendicular to the intermediate approach course.
- Complete the trapezoid by connecting the outer ends of the lines. This trapezoid is the area of consideration for obstacle clearance.

Note. The angle(s) of offset from the final approach course may not exceed 60 degrees.

(3) Determine intermediate segment altitude. Locate the highest obstacle in the intermediate segment trapezoid. Add 500 feet of ROC and round to the nearest 100 feet. Use this altitude en route to the FAF.

d. Initial approach segment. The initial approach segment begins at the IAF and ends at the IF.

(1) Determine the IAF. Up to three IAFs are allowed. The minimum distance is 3 NM from the IF. The maximum length is 10 NM.

(2) Determine the area of consideration for obstacle clearance.

- Starting 1 NM prior to the IAF and at the IF, draw a line 2 NM long on both sides of centerline (total 4 NM) perpendicular to the initial approach course.
- Complete the rectangular box by connecting the outer ends of the lines. This box is the area of consideration for obstacle clearance.

Note. The angle(s) of offset from the intermediate course may not exceed 60 degrees.

Note. For other than straight configurations, connect the outside of the boxes by drawing a 2 NM arc (from the IF) between the initial and intermediate segments.

(3) Determine the initial approach segment altitude – Locate the highest obstacle in the initial segment box. Add 1,000 feet of ROC and round to the nearest 100 feet. Use this altitude en route to the IF.

(4) Determine IAF obstacle clearance – Use the MSA altitude en route to the IAF within 30 NM.

4. Recovery procedure diagram. When preparing the recovery procedure diagram, show "FOR VFR TRAINING AND EMERGENCY USE ONLY" twice conspicuously in the plan view. Prior to publication, the diagram will include as a minimum all those items included in the example procedure diagram (figure 4-5).

5. Flyability check. Complete a flight check under VMC in an aircraft to finalize the procedure and validate the diagram. The flight should validate the following:

a. Locations – IAF, IF, FAF, MAP, and MAHF.

b. Obstacles.

c. Approach course.

d. Obstacle clearance.

e. Altitudes – MDA, FAF, IF, IAF, MSA/holding pattern altitude.

6. Flyability validation. Once a successful flyability/suitability check has been completed, the developer will validate the diagram in the lower marginal data area. Once validated by the developer, the procedure must be approved by at least the high-risk approval authority of the unit in the lower marginal data area prior to publication..

Note: Digital maps may be used to complete the initial planning for these procedures. Templates made to the appropriate scale may be used also.

RECOVERY PROCEDURE DIAGRAM

1. The recovery procedure diagram is a pictorial representation of the procedure to recover the aircraft under VMC using the aircraft navigation system. The procedure is based on crewmember entered coordinates into the aircraft navigation system.

2. The procedure 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 necessary to execute the procedure.

a. Margin identification:

(1) Top margin includes—approach course, landing area length and touchdown zone elevation, procedure name, landing area name, city and state, landing area lighting, missed approach procedure, and frequencies.

(2) Bottom margin includes—developers printed name, date of development, and signature, check pilots printed name, date of flyability check, and signature, approval authorities printed name and date of approval and signature.

b. Plan view includes—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."
- "LIMIT FINAL & MISSED APPROACH TO MAX 90 KIAS."
- "SPECIAL AIRCREW TRAINING REQUIRED" once.

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

c. Profile view includes—the minimum altitude for prescribed fixes, distance between fixes and the missed approach procedure.

d. Minimums section includes—the minimum descent altitude, visibility, and the height above landing (HAL). Use table 4-3 to compute minimum visibility requirement based on HAL.

Table 4-3. Effect of height above landing surface elevation on visibility minimums

HAL	250 – 475 feet	476 – 712 feet	713 – 950 feet
Visibility Minimum (SM)	1/2	3/4	1.0

e. Landing area sketch includes—a drawing/diagram of the landing area and the elevation of the highest obstacle within the landing area. It shows the MAP in relation to the available landing area.

3. The space for notes directly below the minimum section will include waypoint names and coordinates.

Note. The unit SOP will address the following topics: training requirements, procedure usage, flyability check, and periodic obstacle/diagram updates.

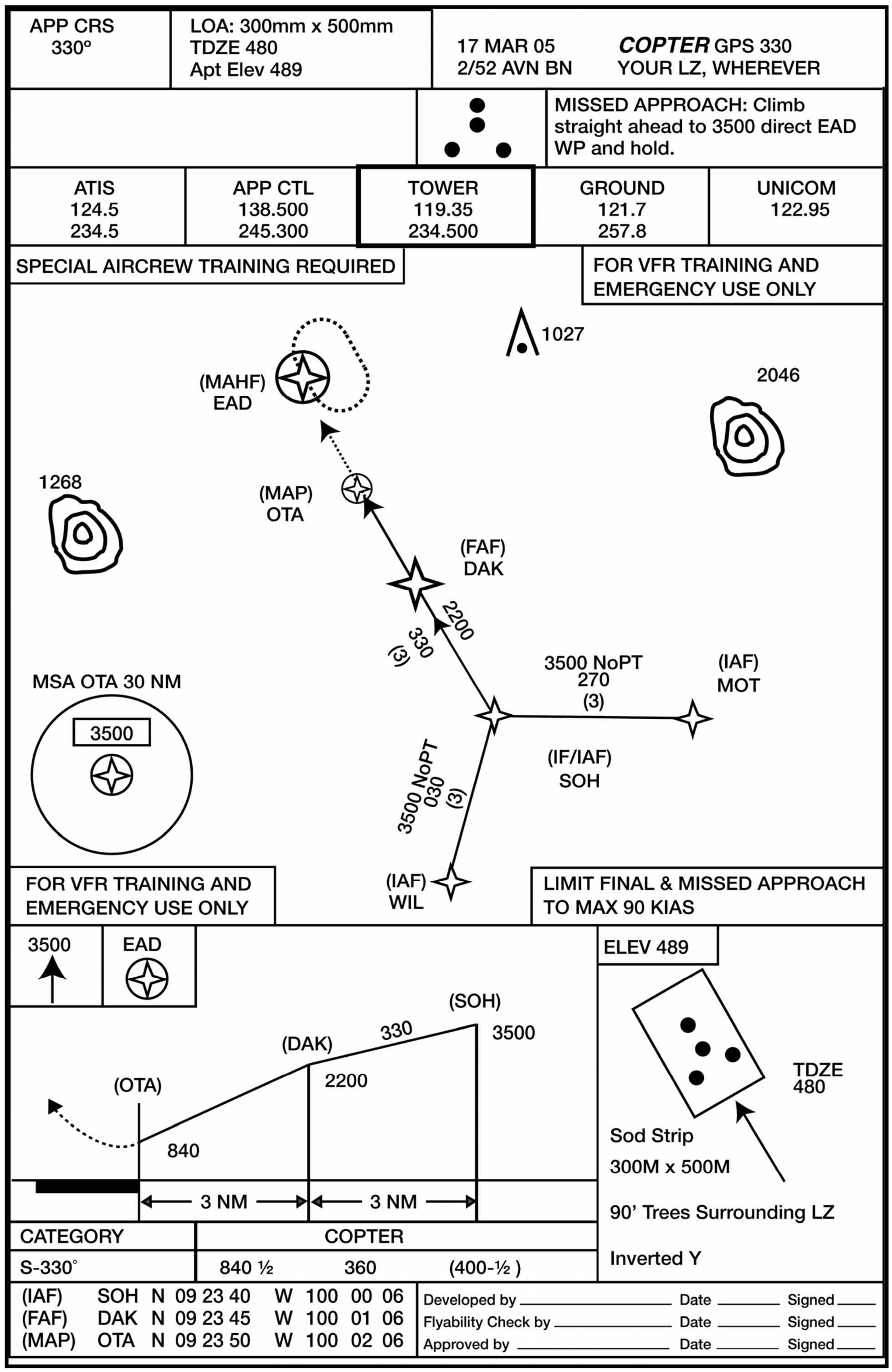

Figure 4-5. Sample of an emergency GPS recovery procedure diagram

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus the following:

- Unit SOP
- FM 1-240
- FAA Handbook 8260.3 (TERPS Manual)
- FAA Order 8260.42A (Helicopter GPS Nonprecision Approach Criteria)
- FAA Order 7130.3 (Holding)

TASK 2052

PERFORM WATER BUCKET OPERATIONS

WARNING

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

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

When performing this task with cabin doors open, ensure that any personnel in the cabin area are wearing safety harnesses secured to tie-down rings or are seated in seats with seat belts on.

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

CONDITIONS: In a H-60 helicopter with an operational cargo hook and water bucket.

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

1. Rated.

   a. Conduct premission planning to determine fuel and bucket cinching requirements. Verify the aircraft will remain within gross weight 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 manufacture 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 AGL, ±1 foot.

      (3) Complete hover power and GO/NO GO checks.

   h. En route: Maintain safe load obstacle clearance (minimum 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 RCM(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.

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 He 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. He 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. He 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 according to 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 and again when attention is reestablished outside.

e. The NCM will remain primarily focused on the bucket. He will guide the P* during the bucket pickup, advise of the bucket condition in flight, provide directions and assistance 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. Sling load procedures according to task 2048 will be used for normal sling 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. He 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, all installation checks are completed according to unit standing operating procedure (SOP) and the water bucket operator's manual.

(3) The crew will conduct the ground checks according to manufacture procedures to confirm the proper operation of the water bucket before 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 pick up. 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.

d. Take off. 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 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 according to the 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 seconds 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 sill 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 also 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 the obstacle.

g. Post mission.

(1) Ensure water bucket is serviceable.

(2) Derig aircraft and water bucket. Ensure all documentation is complete on water bucket usage and inspection.

SAND/DUST/SMOKE CONSIDERATIONS: If during the approach, visual reference with the water release area or obstacles is lost, initiate a go-around or instrument takeoff (ITO) as required, immediately. Be prepared to transition to instruments. Once visual meteorological conditions (VMC) are regained, continue with the go-around. (If required, releasing the water reduces the gross weight (GWT) by 5,000 to 6,000 pounds and minimizes power demand.)

MOUNTAINOUS AREA CONSIDERATIONS: If at any time during an approach, the aircraft does not have sufficient power, and turbulent conditions or wind shift creates an unsafe condition, perform a go-around immediately. (If required, releasing the water reduces the GWT by 5,000 to 6,000 pounds and minimizes power demand.)

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. Operations become increasing more hazardous as references are reduced (open 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 NVG 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 pickup.

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:

- AR 70-62
- FM 10-450-3
- FM 20-32
- Water bucket airworthiness release

TASK 2054

PERFORM FAST-ROPE INSERTION AND EXTRACTION OPERATIONS

> **WARNING**
>
> **Ensure that crewmembers in the cabin area are wearing safety harnesses secured to tie-down rings anytime the cabin doors are open. Also ensure that all ropers are on the ground before any ropes are released.**

CONDITIONS: In a H-60 helicopter with fast-rope insertion and extraction system (FRIES) equipment installed.

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

1. Rated.
   a. Conduct a thorough crew and passenger briefing.
   b. Maintain entry altitude as directed ±10 feet.
   c. Maintain maximum 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 operations per TC 21-24 and the appropriate air worthiness release (AWR).

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. He 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 he begins 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.

   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. Task 1038 and task 2036 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 NVD 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. Training will be conducted in the aircraft.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the FRIES airworthiness release.

TASK 2056

PERFORM RAPPELLING OPERATIONS

> **WARNING**
>
> **Ensure that the rappel master and crew chief are wearing safety harnesses secured to tie-down rings anytime the cabin doors are open. Also ensure that all rappellers are on the ground before any rappel ropes are released.**

CONDITIONS: In a H-60 helicopter with rappelling equipment installed.

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

1. Rated.

   a. Conduct a thorough crew and passenger safety briefing.

   b. Maintain appropriate hover altitude ±5 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 per TC 21-24.

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (PC) will conduct a crew and passenger briefing and ensure personnel understand their responsibilities during rappelling operations, including aircraft safety and actions in the event of an emergency. He will ensure the aircraft is rigged. He will 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. He 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. He will also ensure that all rappelling ropes are dropped or retrieved and secured in the aircraft before takeoff.

2. Procedures. 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. During the rappelling operation, use the collective to maintain altitude and be prepared to correct for center of gravity (CG) changes as the rappellers depart the aircraft.

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 inhibiting the ability of the rappellers to control their descent.
3. The rope is exposed to the elements for a sufficient length of 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 NVG 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. Night vision goggle (NVG) lighting will be according to unit standing operating procedure (SOP) or the tactical environment.

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 rappelling airworthiness release.

TASK 2058

PERFORM SPECIAL PATROL INFILTRATION/EXFILTRATION SYSTEM OPERATIONS

WARNING

Ensure that the SPIES master and crew chief wear safety harnesses secured to tie-down rings anytime cabin doors are open.

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 roll-on landing to avoid entanglement in the rotor system.

CONDITIONS: In a H-60 helicopter with special patrol infiltration/exfiltration system (SPIES) equipment installed.

STANDARDS: Appropriate common standards plus the following 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 speed (KIAS) in moderate climates and 50 KIAS in cold climates.)
   d. Do not let the bank angle exceed 30 degrees.
2. Nonrated. Ensure that the aircraft is prepared for SPIES operations per TC 21-24 and the unit standing operating procedure (SOP).

DESCRIPTION:

1. Crew actions.
   a. The pilot in command (PC) will conduct a thorough crew briefing and ensure all crewmembers are familiar with SPIES operations, emergency procedures, and communication procedures. He 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. He 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.

2. 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. It 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, a transition is made into hovering flight at an altitude of 250 feet AGL. A vertical descent is started with the rate not to exceed 100 feet per minute at touchdown. Maintain a stable hover until SPIES team members clear the rope.

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 onboard, the team members take their orders from personnel in charge of the deck.

NIGHT OR NVG CONSIDERATIONS:

1. For unaided night flight, the landing light and searchlight should be operational. If a night vision goggle (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 treetops, 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 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. Training will be conducted in the aircraft.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the SPIES airworthiness release.

TASK 2060

PERFORM RESCUE HOIST OPERATIONS

> **WARNING**
>
> **Ensure that crewmembers in the cabin area are wearing safety harnesses secured to tie-down rings anytime the cabin doors are open. The crewmember riding the hoist will be secured either to the aircraft or to the jungle penetrator.**

CONDITIONS: In a H-60 helicopter equipped with a rescue hoist system.

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

1. Rated.

   a. Perform a preflight inspection of the rescue hoist per the appropriate aircraft operator's manual/checklist (CL).

   b. Perform rescue hoist procedures per the appropriate aircraft operator's manual/CL, FM 8-10-6, TC 1-201, and the unit standing operating procedure (SOP).

   c. Maintain appropriate hover altitude ±5 feet.

   d. Do not allow drift to exceed ±5 feet.

   e. Perform postflight procedures per the appropriate aircraft operator's manual/CL.

2. Nonrated.

   a. Perform a preflight inspection of the rescue hoist per the appropriate aircraft operator's manual/CL and the unit SOP.

   b. Operate the rescue hoist pendant.

   c. Prepare the appropriate hoisting equipment for the required mission.

   d. Perform postflight procedures per the appropriate aircraft operator's manual/CL.

   e. Operate rescue hoist searchlight (if installed).

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (PC) will conduct a thorough crew briefing and ensure all crewmembers are familiar with rescue hoist operations, emergency procedures, communication procedures, lowering the flight medic, and lifting the patient off the ground using the hoist or aircraft. He will also ensure that all crewmembers understand "CUT CABLE" procedures.

   b. The pilot on the controls (P*) will remain focused primarily outside the aircraft throughout the maneuver for aircraft control and obstacle avoidance. He will announce the intended point of hover and remain centered over the target with corrections from the nonrated crewmember (NCM).

   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 the drift of the aircraft. The P will also monitor cockpit indications. The P will be able to operate the control panel for the rescue hoist (if necessary).

d. The NCM will ensure that the hoist is configured and will also ensure that all lifting devices (such as jungle penetrator, sked/stokes litter, and survivor's slings) are secured in the aircraft before takeoff.

e. The NCM will conduct the hoist operation per FM 8-10-6, TC 1-201, the appropriate aircraft operator's manual/CL, and the unit SOP. The P* will perform the appropriate steps for the pilot on the controls per the appropriate aircraft operator's manual/CL and initiate the appropriate type of landing.

Note. The P* should be in the right seat which allows the P in the left seat to visually monitor the entire operation.

2. Procedures.

a. General recovery procedures over land. Crewmembers should be alerted approximately 5 minutes before arriving at pickup site. Crewmembers complete all required checks (such as 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 according to FM 8-10-6, TC 1-201, the appropriate aircraft operator's manual /CL, and the unit SOP.

b. Inert patient recovery. General format is the same as over land except—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—a smoke device may be used to determine wind direction and velocity. Terminate the approach at a 100-foot hover—20 feet before reaching the patient. Deploy the recovery device and allow it 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 ship versus 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. The NCM will advise the P* when the person/equipment is in position on the jungle penetrator. The NCM will perform hoist operations according to the standard words and phrases according to the unit SOP. The NCM will secure jungle penetrator or stokes litter upon completion of the hoisting operation. Should difficulty in maintaining a stable hover occur, the NCM will extend additional cable as "slack" to preclude inadvertent jerking the cable.

NIGHT OR NVG CONSIDERATIONS: Use proper scanning techniques to avoid spatial disorientation.

1. For unaided night flight, the landing light and searchlight should be operational. If a night vision goggle (NVG) filter is installed, it should be removed.

2. Hovering with minimum drift is difficult and requires proper scanning techniques and crewmember coordination when NVGs are used. 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.

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 FM 8-10-6.

TASK 2061

Operate forward looking infrared system

> **CAUTION**
>
> During takeoff, do not rotate forward while on the main landing gear (to preclude contacting the FLIR turret on the ground). During landings, do not make a hard landing (compressing the struts) or heavy braking (to preclude contacting the FLIR turret on the ground).

CONDITIONS: In a H-60.

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

1. Operate the installed forward looking infrared (FLIR) per the appropriate aircraft operator's manual.
2. Use the multifunction display (MFD) to view FLIR picture.
3. Select menu for operating FLIR.
4. Select and use the appropriate field of view (FOV) polarity gain and pointing control on the FLIR system.
5. Select the caution advisory screen or pop-up window for run-up or current mission profile.
6. Interpret data between the MFD and central display unit (CDU).

DESCRIPTION:

1. Crew actions.
   a. During run-up, the pilot on the controls (P*) and pilot not on the controls (P) will ensure all procedures per the appropriate aircraft operator's manual are followed to ensure no damage occurs to the FLIR turret.
   b. The P* will focus primarily outside the aircraft and respond to navigation cues given by the P. The P* flies the mission profiles at the appropriate airspeeds, altitudes, and headings as directed by the P.
   c. The P selects desired FLIR menu items to view outside the aircraft.
   d. The P monitors all mission equipment and uses the FLIR and MFD.
   e. The FLIR is stowed and shut down per the appropriate aircraft operator's manual.
2. Procedures. Perform the turn on, test the procedures, and select operational modes per the appropriate technical manual. Select the polarity, FOV and gain to best fit the current mission profile. Know and understand factors and or emergencies adversely affecting the MFDs, which could result in degraded mission performance or the mission being aborted. Know and understand takeoff and landing procedures that could cause damage to the FLIR system turret. The proper shutdown procedures will be performed per the technical manual.

NIGHT OR NVG CONSIDERATIONS: Ensure MFD lighting adjustment is set at an acceptable level for night or night vision goggle (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 appropriate manufacturer's references.

TASK 2062

PREPARE PATIENT FOR HOIST OPERATIONS

CONDITIONS: In a H-60 helicopter with hoist, given appropriate hoisting equipment, and with actual or simulated patient.

STANDARDS: Appropriate common standards plus the following 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 8-10-6 and local directives. The sked/stokes litter, and poleless semirigid litter must be used with a tagline and weak link.

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:

- FM 8-10-6
- FM 8-15

TASK 2063

Operate storm scope weather mapping system

CONDITIONS: In a H-60 helicopter.

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

1. Operate the installed storm scope weather mapping system as per the appropriate aircraft operator's manual.
2. Select 360 degree or 120 degree forward sector and nautical mile distance for best weather representation.
3. Select and use 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.

   a. 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.

   b. The P monitors all mission equipment and uses the Storm Scope Weather Mapping System.

   c. 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 per the appropriate technical manual. Consider the flight planning factors using the Storm Scope 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 per the technical manual.

NIGHT OR NVG CONSIDERATIONS: Ensure Storm Scope Weather Mapping System lighting adjustment is set at an acceptable level for night or night vision goggle (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 appropriate manufacturer's references.

TASK 2064

PERFORM PARADROP OPERATIONS

WARNING

Ensure that any personnel in the cabin area not wearing parachutes are wearing safety harnesses secured to tie-down rings or are seated in seats with seat belts on.

If parachutes use automatic rip cord 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 rip cord releases can be disconnected.

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 roll-on landing to avoid entangling deployment bags in the rotor system.

CONDITIONS: In a H-60 helicopter with a jumpmaster.

STANDARDS: Appropriate common standards plus the following 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 per the appropriate aircraft operator's manual, FM 3-05.211, FM 3-21.220, and the unit standing operating procedure (SOP).

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (PC) will conduct a thorough crew briefing and ensure all crewmembers are familiar with paradrop operations, emergency procedures, and communication procedures. He 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. He 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.

2. Procedures. Maintain altitude, airspeed, and ground track as determined during pre-mission planning and jumpmaster's instructions. Perform in-flight procedures per FM 3-05.211, FM 57-220, and FM 3-21.220. The crew will conduct the paradrop per the procedures covered in the briefing and the references listed below. The PC will check that the jumpmaster or crew chief (CE) 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, he will communicate with the CE via hand-and-arm signals. The CE will relay necessary information to the P*/P via the intercom.

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:

- Federal Aviation Regulation (FAR), Part 105
- FM 3-21.220
- FM 3-05.211
- FM 57-220

TASK 2065

Operate personnel locater system

CONDITIONS: In a H-60 helicopter with personnel locator system (PLS) installed.

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

1. Program proper frequencies into the PLS.
2. Insert the proper search code into the PLS.
3. Use the PLS control head.
4. Interpret the course to target information displayed on the instrument panel.

DESCRIPTION:

1. Crew actions.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.
2. Procedures. Load the proper frequencies and the proper search code during the before-starting-engine checks. Correctly use the burst, continuous home switch positions during the tracking procedure, and correctly follow the course indicator on the instrument panel to the downed crewmember location.

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 appropriate manufacturer's references.

TASK 2066

Perform extended range fuel system operations

CONDITIONS: In a H-60 helicopter with an extended range fuel system (ERFS) consisting of the appropriate fuel tanks.

> ***Note.*** ERFS encompasses any authorized extended range fuel system such as auxiliary fuel management system (AFMS), crashworthy external fuel system (CEFS), and internal auxiliary fuel system (Robertson.)

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

1. Rated.
   - a. Verify that the required amount of fuel is onboard at the time of each takeoff.
   - b. Initiate an alternate course of action if the actual fuel consumption varies from the planned value and the flight cannot be completed with the required reserve.
   - c. Balance/manage fuel tank levels (if appropriate) to maintain aircraft within center of gravity (CG) limits.
   - d. Verify that the aircraft will remain within weight and CG limitations for the duration of the flight.
   - e. Operate the auxiliary fuel management panel per the appropriate aircraft operator's manual/checklist (CL).
   - f. Recognize and respond to ERFS malfunctions.
   - g. Perform or describe appropriate emergency procedures per the appropriate aircraft operator's manual /CL.
2. Nonrated.
   - a. Complete all preflight duties per the appropriate aircraft operator's manual /CL and unit standing operating procedure (SOP).
   - b. Recognize and alert the pilot not on the controls (P) to ERFS malfunctions.

DESCRIPTION: Monitor the main fuel quantity indicators and the auxiliary fuel management panel to ensure that the system is operating normally. Operate the fuel management system panel in the AUTO or MANUAL mode, as required.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training. Training may be conducted in the aircraft or simulator.
2. Evaluation. 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 H-60 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. Set the parking brakes before landing.

   c. Ensure a green deck before landing.

   d. Perform a visual meteorological conditions (VMC) approach.

   e. Perform a VMC takeoff.

2. Nonrated.

   a. Ensure tail wheel is cleared on deck.

   b. 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. He will announce when he begins 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. He will announce his intentions to takeoff.

   b. The pilot not on the controls (P) will call out "crossing the wake" and will complete the before-landing check. He will ensure that the parking brakes are set and the tail wheel is locked. The P will verbally relay the signalman's signals if the P* loses visual contact with the LSE.

   c. The P and 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 and will acknowledge all P* directions. They will assist the P* in ensuring that the main wheels 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 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 and cross perpendicular to the ships 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 main wheels 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 wheels are 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 10 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 he has 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.

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.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training. Training may be conducted in the aircraft or simulator.
2. Evaluation. 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 2070

PERFORM M-139 VOLCANO OPERATIONS

CONDITIONS: In a H-60 helicopter with M-139 Volcano System installed.

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

1. Rated

   a. Conduct permission planning to include required load configuration for size of minefield to be emplaced. Verify the aircraft will remain within center of gravity (CG) limitations for the duration of the flight.

   b. In conjunction with the nonrated crewmember(s) (NCMs), complete the required M-139 checks to ensure proper system operation prior to mission departure.

   c. Operate the M-139 Volcano System per the appropriate aircraft operator's manual/checklist (CL) and airworthiness release.

   d. Recognize and respond to a Volcano System malfunction.

   e. Perform or describe appropriate emergency procedures per the appropriate aircraft operator's manual/CL.

   f. Deploy a minefield in the designated location, orientation, and length maintaining ground speed ±5 kilometers per hour (KPH).

   g. Submit scatterable minefield warning (SCATMINWARN) report. (See table 4-4.)

2. Nonrated.

   a. In conjunction with the rated crewmember (s) (RCMs), complete required M-139 checks to ensure proper system operation prior to mission departure.

   b. Load and inventory M87/M87A1/M88 mine canisters.

   c. Set dispenser control unit (DCU) to mission parameters.

   d. Operate the M-139 Volcano System per the appropriate operator's manual/CL.

   e. Recognize and respond to a Volcano System malfunction.

   f. Perform or describe appropriate emergency procedures per the appropriate operator's manual/CL.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will focus primarily outside the aircraft to provide obstacle clearance throughout the maneuver and maintain ground speed ±5 KPH and altitude ±10 feet during the mine-dispensing pass.

   b. The pilot not on the controls (P) will provide adequate warning to avoid obstacles detected in the flight path and will announce when his attention is focused inside the cockpit and again when attention is reestablished outside. P will back up the P* with altitude and ground speed calls using the AN/ASN-128 Doppler or AN/ASN 128B Doppler/global positioning system (GPS) ground speed display to match the DCU ground speed setting and the AN/APN-209 radar altimeter for height above the ground. The P will complete and send the SCATMINWARN message.

c. The NCM will operate the DCU and advise the P* and P of DCU settings prior to mine dispensing. In addition, the NCM will advise the P* of any DCU faults or failures.

2. Procedures.

a. Preflight.

(1) The pilot in command (PC) will analyze the mission using mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC) and determine the number of canisters required to conduct the mission and the initial profile to be used during the mine emplacement. The PC will select or have designated one or more of the following control measures during mine emplacement:

- Visual identification—start/stop markers on the ground.
- Time-lapse tables to determine the minefield length.
- Canister countdown.
- Doppler/GPS navigation system—start/stop coordinates.

(2) The NCMs will ensure the Volcano System is installed, all installation checks are completed, and the mine canister pallets are loaded per direction of the PC or standing operating procedure (SOP).

(3) The crew will conduct the ground checks according to the appropriate operator's manual/CL to confirm the proper operation of the Volcano prior to takeoff.

b. Prior to arrival at target area.

(1) T–5 minutes: Turn the DCU power switch "ON" and verify no malfunctions indicated during initial built-in test (BIT).

(2) T–2 minutes: Place the DCU fire circuit switch to ENABLE.

(3) T–1 minute: Place the interface control panel (ICP) arm switch to ARM. Verify the ARMED advisory light is illuminated and no fault codes are displayed on the DCU.

(4) T–30 seconds: Verify no DCU fault codes.

c. At target area.

(1) Initiate the mine-dispensing sequence prior to the start point based on ground speed and altitude to ensure mines impact at the start point and not 10 meters after. P* maintains ground speed ±5 KPH and altitude ±10 feet during the mine-dispensing pass.

(2) Terminate mine dispensing prior to the end point based on ground speed and altitude to ensure mines stop at the designated end point (±10 meters).

d. Postmission.

(1) Place the ICP arm switch to SAFE and verify ARMED advisory light extinguished.

(2) Place DCU fire circuit switch "OFF."

(3) Set DCU power switch (as required).

(4) Prepare and submit SCATMINWARN message.

Table 4-4. Scatterable minefield warning format	
Alpha	Emplacement system.
Bravo	Antitank (yes/no).
Charlie	Antipersonnel (yes/no).
Delta	Number of aim/corner points.
Echo	Grid coordinates of aim/corner points and size of safety zone.
Foxtrot	Date-time group of life cycle.

NIGHT OR NVG CONSIDERATIONS: During the mine deployment phase, the P*'s attention will be divided between the aircraft instruments (altitude and ground speed) and the outside. It is critical during night vision goggle (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 mine delivery phase.

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:

- FM 20-32
- Volcano airworthiness release

TASK 2075

Perform fat hawk operations

CONDITIONS: In a H-60 helicopter with extended range fuel system installed, personnel as outlined in FM 1-113, and enough fuel/armament to conduct the operation.

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

1. Rated.

   a. Conduct permission planning to include required load configuration as briefed. Verify the aircraft will remain within gross weight and CG limitations for the duration of the flight.

   b. Conduct a thorough crew and support personnel safety briefing.

   c. Ensure the aircraft is configured and fueled for the mission.

   d. Ensure that the passengers and cargo are restrained.

   e. Set up the micro forward area refueling equipment (FARE) system.

2. Nonrated.

   a. Load the aircraft per the load plan, if applicable.

   b. Ensure that floor loading limits are not exceeded.

   c. Secure passengers and cargo.

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (PC) will conduct a thorough crew briefing and ensure all crewmembers and support personnel are familiar with fat hawk operations, emergency procedures, and communication procedures. He 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 not on the controls (P) and nonrated crewmember (NCM) will assist refuel/rearm teams in loading and unloading the aircraft. They act as fire safety guards during refuel operations as directed or briefed.

2. Procedures.

   a. Preflight. After receiving a mission briefing, ensure that required fuel and ammunition is on hand. Ensure that it is installed, secured, inventoried, and operational before flight according to the unit standing operating procedure (SOP). Conduct a thorough crew and support team briefing covering as a minimum the following: landing direction, frequencies and call signs, emergency procedures, execution (security, setup, refuel, rearm, recovery), dispersal plan alternate setup location, site layout and loads.

   b. Arrival. The designated primary rearming/refueling aircraft will set up first. The secondary rearming/refueling aircraft will carry a duplicate two-point FARE for backup. The secondary aircraft will loiter outside the weapon’s surface danger area and no closer than 150 feet from the rearm/refuel site. The security team will immediately establish perimeter defense as briefed. The site layout and FARE system setup will be according to FM 3-04.111, FM 1-113, and unit SOP.

Note. Task 1016 contains procedures that may be used in performing this task.

NIGHT OR NIGHT VISION GOGGLE (NVG) CONSIDERATIONS: Certain lighting configurations can look like an "inverted Y." Lighting configuration of the H-60s should be briefed to all aircrews prior to conducting 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.

TASK 2076

PERFORM CAVING LADDER OPERATIONS

CONDITIONS: In a H-60 helicopter with caving ladder equipment installed.

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

1. Rated.

   a. Conduct a thorough crew briefing.

   b. Ensure 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 pilot on the controls (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. He will ensure the aircraft is rigged per the SOP.

   b. The P* will remain focused primarily outside the aircraft throughout the maneuver for aircraft control and obstacle avoidance. He will announce the intended point of extraction and remain centered over the target with corrections from the P and NCM 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 ladder is on the ground or in the water. If forward flight is required, the NCM must constantly monitor the survivors and keep the P* informed of their stability.

2. Procedures.

   a. 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 10 feet from the bottom for operations conducted at night. Proper flotation will be attached to the ladder as necessary.

   b. The PC will inform the NCM when to deploy the ladder and establish what maximum radar altimeter reading may be achieved with the ladder safely on the ground or in the water.

   c. 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 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 provide assistance to the P* in order to maintain a constant position over the personnel in the water.

d. 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 with the entry into the aircraft as much as possible. In the event 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.

NIGHT OR NIGHT VISION GOGGLE (NVG) 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. Training will be conducted in the aircraft.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

- Caving ladder airworthiness release
- FM 3-05.212

TASK 2078

PERFORM HELOCAST OPERATIONS

WARNING

Ensure that crewmembers and the helocast master in the cabin area are wearing safety harnesses secured to tie-down rings anytime the cabin doors are open.

CONDITIONS: In a H-60 helicopter with helocast equipment installed, a helocast team, and a helocast master.

STANDARDS: Appropriate common standards plus the following 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.
   a. Ensure aircraft is configured for helocast operations.
   b. Perform crew coordination actions.

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 according to the unit standing operating procedure (SOP).

   b. The pilot on the controls (P*) should make the approach into the wind if possible. He will slow to the desired airspeed and altitude. The maximum airspeed and altitude is 10 knots at 10 feet.

Note. Going faster or higher could result in injury to personnel. The pilot cannot rely on the airspeed indicator below 40 indicated airspeed (IAS); 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 their 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 “1 minute out” alert calls. The PC at “1 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 knots indicated airspeed (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 that 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 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 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 (NVG) 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. Training will be conducted in the aircraft.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

- FM 3-05.211
- FM 3-21.220
- FM 10-542
- FM 20-11-1
- FM 31-20-4
- USSOCOM REG 350-6

TASK 2081

OPERATE NIGHT VISION GOGGLES

CONDITIONS: In a H-60 helicopter, given a set of night vision goggles (NVGs).

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

1. Preflight the NVGs.
2. Mount and adjust NVGs.
3. Store unit after use.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) is responsible for clearing the aircraft and obstacle avoidance.

   b. The pilot not on the controls (P) will announce when his attention is focused inside the cockpit. Upon completing the aviator's night vision imaging system (ANVIS) checks and adjustments, he will announce the status of his goggles.

2. Procedures. Ensure the NVGs are within inspection dates and check for serviceability. Adjust for proper fit, focus, and diopter setting. After use, ensure batteries are removed. Store the unit.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus TM 11-5855-263-10.

TASK 2086

OPERATE AVIATOR'S NIGHT VISION IMAGING SYSTEM HEADS-UP DISPLAY

CONDITIONS: In a H-60 helicopter with aviator's night vision imaging system heads-up display (ANVIS HUD) installed.

STANDARDS: Appropriate common standards plus describe and demonstrate correct terminology and usage of the AN/AVS-7 according to TM 11-5855-300-10.

DESCRIPTION: Perform operational procedures for the AN/AVS-7. These include assembly, preparation for use, operating procedures, and equipment shutdown.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus TM 11-5855-300-10.

TASK 2090

PERFORM LANDING AREA RECONNAISSANCE FOR SIMULATED MAXIMUM GROSS WEIGHT

CONDITIONS: In a H-60 helicopter, simulating maximum gross weight for conditions, while using tabular data.

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

1. Establish altitude, airspeed, and flight path for conducting a high reconnaissance commensurate with terrain and environmental conditions.
2. Accurately determine wind direction and approximate velocity at touchdown point and identify other pertinent wind characteristics in proximity to landing zone (LZ).
3. Accurately assess the LZ size, axis, surface conditions, and obstacles.
4. Precisely plan routes in and out for maneuver to include any and all escape routes required above and below effective translational lift (ETL).
5. Confirm the winds and tentative plan formulated in the high reconnaissance by performing a thorough low reconnaissance.

DESCRIPTION:

Crew actions.

1. On approaching the operational area, the crew will identify the LZ and determine its suitability for landing and takeoff. The pilot on the controls (P*) will establish a high reconnaissance pattern appropriate for the terrain and wind. Using tabular data, the pilot not on the controls (P) will determine if out of ground effect (OGE) capability exists and the maximum power available. The P*/P will assess the wind in and around the LZ using as necessary wind/terrain analysis, visible indications, and cockpit indications. 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 available for an aircraft at maximum gross weight. When the wind direction and conditions are in doubt, the best escape routes should dictate the approach and departure routes.

   Note. The best possible route is that route requiring the least amount of power for the landing intended—to the ground or a particular hover height—without compromising a viable escape.

   Note. The difference between a go-around and an escape is that a go-around is a proactive maneuver with full control available while an escape is a reactive maneuver without full control. Usually the collective must either be maintained or reduced during an escape maneuver.

2. The tentative plan for the landing and takeoff was established in the high reconnaissance. The low reconnaissance is performed to confirm or refute information determined in the high reconnaissance. It is performed as low and as slow as good judgment dictates but not below ETL. The P*/P must use cockpit or visual cues to confirm wind predictions, verify the suitability of the precise landing point, confirm that the escape routes identified are viable, confirm the precise altitude of the landing point, and verify environmental conditions are the same as those selected in the tabular data. The P* will thoroughly brief the maneuver and crew duties including those duties required if an escape plan is executed.

Note. This is a training maneuver unto itself and should not be rushed or performed haphazardly. Even the smallest errors or omissions will result in incorrect power calculations. The pilots must appreciate and anticipate the aircraft's limits and their own limits as well as the aircraft's and their own reactions to those limits. At no time in power management training will pilots knowingly attempt to execute landing or takeoffs at less than actual torque values.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 2092

RESPOND TO NIGHT VISION GOGGLES FAILURE

CONDITIONS: In a H-60 helicopter given an academic or a visual cue that the night vision goggles (NVGs) have failed.

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

1. Identify or describe indications of impending NVG failure.
2. Perform or describe emergency procedures for NVG failure.

DESCRIPTION: Impending NVG failure may be indicated by one or both tubes flickering or blinking.

1. Crew actions.

   a. The pilot on the controls (P*) will remain focused outside the aircraft. He is responsible for clearing the aircraft and obstacle avoidance. If the P*'s NVGs fail or indicate impending failure, he will announce "goggle failure." He will transfer the controls to the pilot not on the controls (P) if necessary.

   b. If the P's NVGs fail or indicate impending failure, he will announce "goggle failure" and switch batteries or troubleshoot the goggles. If the NVGs are not restored to operation, make the appropriate report and modify the mission as briefed.

2. Procedures.

   a. During nap of the earth (NOE) or contour flight, the P* will immediately announce "goggle failure" and begin a climb at a rate that will ensure obstacle avoidance. Transfer the flight controls if necessary, 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, the P* will use the procedure described above. A climb is not required.

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.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus TM 11-5855-263-10.

TASK 2093

PERFORM SIMULATED MAXIMUM GROSS WEIGHT APPROACH AND LANDING

CONDITIONS: In a H-60 helicopter with landing area reconnaissance for simulated maximum gross weight complete.

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

1. Maintain approach angle sufficient to clear obstacles.
2. Maintain the predetermined rate of horizontal and vertical closure appropriate for conditions.
3. Monitor wind conditions using cockpit indicators (CI).
4. Execute a smooth, controlled termination to the ground or the hover altitude determined in the reconnaissance.
5. Correctly determine wind direction and velocity at the landing point.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will maintain his primary focus outside the aircraft while conducting a cross-reference of CI to execute the approach. During the approach, the P* will announce any deviation to the briefed approach, particularly any deviation in escape routing. The pilot not on the controls (P) will cross monitor CIs and alert the P* when briefed parameters (CI) are being approached or exceeded. The P and crew chief (CE) will assist in clearing the aircraft during the entire maneuver.

   b. Upon completing the approach, the P* will conduct a hover power check in the intended landing direction, over the intended landing point, and at the altitude selected in the reconnaissance. The crew will then verify whether conditions (surface, wind, and temperature/pressure altitude) are the same as they predicted during the reconnaissance.

2. Procedures.

   a. Airspeed compared to ground speed indicates headwind/tailwind or no wind. This is also used to control horizontal closure speed.

   b. Heading compared to ground track indicates crosswind direction.

   c. Torque compared to pedal position (aircraft must be aligned with ground track (below 50 feet), airspeed slightly above effective translational lift, and referencing a known torque/pedal reference setting) indicates crosswind direction.

   d. The vertical speed indicator (VSI) indicates rate of vertical closure and the possibility of inadequate torque applied.

   e. The early or abrupt movement of the airspeed indicator needle to zero indicates a tailwind. Airspeed indicator behavior is referenced against previous no-wind condition.

   f. The duration of the transverse flow shudder and the distance remaining to termination when it ceases also indicates the presence of a headwind or tailwind. The “normal” distance is referenced during no-wind conditions. This is also used to control horizontal closure speed.

   g. The correlation of airspeed, torque and VSI indicates and/or measures the presence and strength of updrafts and downdrafts.

NIGHT OR NIGHT VISION GOGGLE (NVG) CONSIDERATIONS: Using CIs will provide the crewmembers with improved control during periods of reduced visual cues and acuity. There are no other special considerations.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 2095

PERFORM SIMULATED MAXIMUM GROSS WEIGHT TAKEOFF

CONDITIONS: In a H-60 helicopter, with the maximum torque available known, and aircraft clear.

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

1. Correctly determine the type of takeoff that requires the minimum amount of power to safely complete the maneuver and accurately predict the amount required.
2. Correctly determine the point where the aircraft will enter effective translational lift (ETL) and, if necessary, establish an abort line.
3. Use the minimum power necessary for the type of takeoff being performed.
4. Accurately determine the amount of power used in the maneuver.

DESCRIPTION:

1. Crew actions.

   a. After assessing the landing zone (LZ), wind, and obstacles, the pilot on the controls (P*) will select the type of takeoff—level acceleration (coordinated climb, best angle, best rate), constant angle, or vertical. The P* will then determine the ETL point for the takeoff selected and establish an abort plan.

Note. In having to correctly determine the ETL point, the P* is forced to accurately consider the effects of his control inputs, wind, and surface considerations. Any under or over estimation of the point must be explained in the post-task analysis following the takeoff maneuver. In considering a nap of the earth (NOE) deceleration as part of the abort plan, the P* must consider the amount of power and tail rotor authority available for the abort and the amount of airspeed at the time of the abort. As in the simulated maximum gross weight (SMGW) approach, the amount of power determined necessary for the maneuver would also be the hypothetical limit for establishing the takeoff escape plan. Power used beyond that determined necessary would have to be explained in the takeoff post-task analysis.

   b. The pilot not on the controls (P) and crew chief (CE) will announce when ready for takeoff and will focus their attention primarily outside the aircraft to assist in clearing the obstacles. The P will also cross-monitor torque to note the amount of power used as well as when it was used. The crew will select reference points to assist in maintaining ground track.

Note. 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 as necessary and noted by the P.

2. Procedures.

   a. Level acceleration. This is a simulated situation where the power required to hover is the maximum power available. The P* will coordinate cyclic and pedals as necessary to accelerate the aircraft. 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 if necessary, and analyze for cause. As the transverse flow shudder develops, increase forward cyclic. As the aircraft enters ETL, make a significant forward cyclic input to prevent blowback. Maintain altitude and allow the aircraft to accelerate until the climb point is reached. Adjust the cyclic as necessary and climb to the necessary height. If using the best angle, ensure ETL is not lost.

Note. Recommendation—Practice this maneuver paralleling barriers rather than into them until proficiency is attained.

b. Constant angle.

(1) In this maneuver, the angle can range from vertical to flat. It demands that more power is available than the power required to hover. 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 amount of power required to clear the obstacle given a particular angle. The P* initiates the takeoff by coordinating all the flight controls to begin a constant angle climb over a predetermined path. Power is used as required and the P notes the amount as well as when it was used.

(2) Vertical takeoffs are also constant angle takeoffs. As in very steep to vertical approaches, there is a point where there is no discernible difference in power required between vertical takeoffs and those of a lesser angle. In some wind conditions, less power is required to depart vertically than at a lesser angle.

NIGHT OR NIGHT VISION GOGGLE (NVG) CONSIDERATIONS: If sufficient illumination exists to adequately view obstacles, the P* may accomplish the maneuver in the same manner as in daylight; however, additional altitude should be used in the hover height to avoid settling to the surface due to poor visual cues. If insufficient illumination exists, then an altitude over airspeed takeoff should be used. The crew must use proper scanning techniques to avoid spatial disorientation. Visual obstacles such as shadows should be treated the same as physical obstacles.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 2098

Perform aerial radio relay

CONDITIONS: In a H-60 helicopter equipped with a retransmission control panel.

STANDARDS: Appropriate common standards plus the following 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 (mode selector-RETRANS) 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 intercommunication system (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. Training may be conducted in the aircraft or simulator.
2. Evaluation. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references plus the following:

- FM 24-35
- Signal operating instructions (SOI)

TASK 2108

Perform auxiliary power unit operations (NCM only)

> **WARNING**
>
> **Aircraft survivability equipment (ASE) systems, when energized, may cause thermal burns or blindness when personnel are too close to an active system. Observe all operators' manual restrictions.**
>
> **Flight controls and stabilator systems may cause damage when aircraft alternating current (AC) power is applied. Ensure flight controls and stabilator systems are clear before applying AC power to the aircraft.**
>
> **Prior to auxiliary power unit (APU) operations, remove the pitot covers, rotor blade tie-downs, and mooring chains and engage the gust lock.**

CONDITIONS: In a H-60 helicopter with a qualified and current APU operator stationed in a pilot seat during APU operations.

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

1. Preflight all systems to be operated during APU operations.
2. Operate APU, systems, and equipment according to the appropriate aircraft operator's manual/checklist (CL).
3. Shut down systems, equipment, and APU according to the appropriate aircraft operator's manual /CL.
4. Enter appropriate information (if required) 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)*.

DESCRIPTION:

1. Crew actions.

   a. The nonrated crewmember (NCM) will coordinate with and brief any additional ground support personnel prior to APU start. Perform preflight inspection of the APU. Ensure that the rotor blade tie-downs and mooring chains are removed, and that the gust lock is engaged. He 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 keeping the APU exhaust and stabilator areas clear during the APU start sequence and any subsequent ground checks.

   b. Additional ground support personnel should assist the NCM as directed.

2. Procedures. Brief the additional ground support personnel as necessary. Perform preflight inspection of the APU ensuring exhaust plug, rotor blade tie-downs, mooring chains, fluid levels,

APU accumulator pressure is a minimum of 2,800 pounds, and backup hydraulic pump has been checked or removed as applicable. If an additional cockpit crewmember is available, direct his assistance with monitoring the master warning fire light during the APU start sequence. Confirm that the SAS 1 switch and the APU ACCUM LOW advisory lights are OFF. Place the FUEL PUMP switch to the APU BOOST position and note the PRIME BOOST PUMP ON advisory light illuminates. Confirm the APU exhaust area is clear. Place the APU CONTR switch to ON. Maintain positive control of the APU switch throughout the start sequence. After the APU ON advisory light illuminates, release the APU CONTR switch. Verify the stabilator area is clear and brief the additional cockpit crewmember that the engine out audio should sound when the APU generator is engaged. Place the APU generator switch to ON. Verify the APU GEN ON advisory light illuminates. The BACKUP PUMP advisory light should come on in about four seconds. Reset the engine out audio using either MASTER CAUTION PRESS TO RESET switch or if external power was used to perform the start, select the EXT PWR switch to OFF. Direct the external power cable to be disconnected and the power generating equipment to be secured at a safe distance outside the rotor disk unless further use is anticipated. The APU ACCUM LOW light should extinguish after either 90 or 180 seconds.

SINGLE CREWMEMBER CONSIDERATIONS:

1. Clearing the APU and stabilator. When performing this task without additional crewmember support, the NCM will just prior to APU start confirm the APU exhaust area and stabilator is clear. During the APU run, the NCM will remain at either pilot station. The NCM will ensure the stabilator area remains clear throughout any stabilator operations.
2. Disabling stabilator auto mode. Because the stabilator area cannot be observed from the cockpit, the NCM may elect to disable the stabilator auto mode for safety. After applying AC power, momentarily engage the cyclic mounted stabilator slew-up switch or the stabilator automatic flight control system (AFCS) panel MAN SLEW switch to the UP position. During aircraft systems troubleshooting, it is important to remember that the stabilator may slew down if AC power is interrupted and then restored.

NIGHT OR NIGHT VISION GOGGLE (NVG) CONSIDERATIONS: During night operations, ensure adequate lighting (anticollision, position lights) are on, and fire guard has a flashlight. This task is prohibited while wearing night vision devices (NVDs).

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.

TASK 2112

OPERATE ARMAMENT SUBSYSTEM

WARNING

Observe all safety precautions for uploading ammunition according to TM 9-1095-206-12&P.

To prevent accidental firing, do not retract bolt and allow it to go forward if belted ammunition is in feed tray or if a live round is in the chamber. Move cocking handling forward by hand.

CONDITIONS: In a H-60 helicopter with one or two machine guns installed.

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

1. Install and preflight the appropriate weapon according to the appropriate aircraft operator's manual and the appropriate weapon technical manual.
2. Load and safe the weapon.
3. Acquire and identify target.
4. Estimate range to target.
5. Engage target(s) according to weapon control measures, mission briefing, and rules of engagement (ROE).
6. Apply appropriate firing techniques.
7. Suppress, neutralize, or destroy as applicable.
8. Describe or perform emergency procedures for misfire, hangfire, cook off, 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 before installating and loading the weapon system. Perform installation and preflight inspection of the weapon. He 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 installating and loading the weapon. He will ensure that the proper amount of ammunition is loaded onboard the aircraft according to the mission briefing.
2. Procedures. 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. After loading the ammunition, ensure the safety button is in (S) position. 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 machine gun allows firing of single rounds or short bursts. The trigger must be completely released for each shot. Conduct weapons engagement according to the

mission briefing, ROE, and crew briefing. After acquiring and identifying the target, estimate range and ensure that the target is within the weapons field of range and the kill zone is within the weapons effective range. Use correct firing techniques and ballistic corrections to successfully suppress, neutralize, or destroy as applicable the threat. Consideration must be given to the intervisibility of friendly and enemy positions and trying to preclude any undesirable collateral damage or fratricide incidents. Perform any firing malfunctions emergency procedures as required for misfire, hangfire, cook off, runaway gun, ruptured cartridge or double feeding of cartridges. Firing malfunctions and corrective actions must be committed to memory. After target engagement, clear and safe the weapon. Ensure the safety button is in the (S) position. After completing the mission, record any information as required on 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)*. Refer to FM 3-04.140 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) covering the employment of door gunners during formation flights.

NIGHT OR NIGHT VISION GOGGLE (NVG) CONSIDERATIONS: During night or NVG operations, range estimations will be more difficult which 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, target loss may accrue momentarily due to muzzle blast and the brightness of the tracers.

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:

- DA Form 2408-13-1
- FM 3-04.140
- FM 3-06
- TM 9-1095-206-12&P

TASK 2116

Perform an aerial radiological survey

CONDITION: In a H-60 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 or Course Leg Technique (Ground and Aerial Survey)]*.

STANDARDS: Appropriate common standards plus the following 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 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. Training may be conducted in the aircraft or academically.
2. Evaluation. Evaluation will be conducted in the aircraft or academically.

REFERENCES: Common standard references plus the following:

- DA Form 1971-R
- DA Form 1971-1-R

TASK 2120

Provide patient treatment at emergency medical technician-basic, intermediate, or paramedic—level

CONDITIONS: In a medical evacuation (MEDEVAC) configured H-60 helicopter, given a medical equipment set (air ambulance), with an actual or simulated patient, and additional equipment according to local medical treatment protocols 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.

STANDARDS: Provide treatment according to current National Registry of Emergency Medical Technician-Basic (NREMT-B), National Registry of Emergency Medical Technician-Intermediate (NREMT-I), or National Registry of Emergency Medical Technician-Paramedic (NREMT-P) treatment protocols of the current Department of Transportation (DOT) guidelines.

> ***Note.*** The DOT emergency medical technician-B/I/P (EMT-B/I/P) guidelines and protocols change frequently, and it is not possible to update the aircrew training manual (ATM) as rapidly as the DOT guidelines. Therefore, commanders must review the DOT guidelines often and ensure their medics are held to the appropriate standard.

DESCRIPTION: The flight medic must treat injuries and illnesses to the EMT-B/I/P level of care.

TRAINING AND EVALUATION REQUIREMENTS

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

REFERENCE: The DOT National standards for EMT-B/I/P.

> ***Note.*** The commander or designated representative will arrange for certification or recertification consisting of written and hands-on performance tests according to NREMT guidelines and certification standards.

TASK 2122

Perform advanced cardiac life support

CONDITIONS: In a medical evacuation (MEDEVAC) configured H-60 helicopter, given a medical equipment set (air ambulance), with an actual or simulated patient, and additional equipment according to local protocols and standing operating procedures (SOPs).

> ***Note.*** The commander, with guidance from the appropriate medical authority, will establish written medical 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.

STANDARDS: Appropriate common standards plus perform current advanced cardiac life support (ACLS) treatment according to American Heart Association guidelines.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCE: Current American Heart Association advance cardiac life support manual.

> ***Note.*** Crewmembers must be ACLS certified to perform this task.

> ***Note.*** The commander or designated representative will arrange for certification and recertification consisting of written and hands-on performance tests.

TASK 2126

Perform pediatric advanced life support

CONDITIONS: In a medical evacuation (MEDEVAC) configured H-60 helicopter, given a medical equipment set (air ambulance), with an actual or simulated patient, and additional equipment according to local protocols and standing operating procedures (SOPs).

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. This task only applies to nonrated crewmembers (NCMs).

STANDARDS: Appropriate common standards plus perform pediatric advance life support (PALS) according to current American Heart Association guidelines.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCE: American Heart Association pediatric advance life support treatment manual.

Note. Crewmembers must be PALS certified before performing this task.

Note. The commander or designated representative will arrange for certification and recertification which consists of written and hands-on performance tests.

TASK 2127

Perform combat maneuvering flight

CONDITIONS: In a H60 helicopter in a simulated or actual tactical environment.

STANDARDS:

1. Establish entry altitude ± 100 feet.
2. Establish entry airspeed ± 10 knots indicated airspeed (KIAS).
3. Maintain aircraft within operating limits and flight envelope.
4. Correctly perform crew coordination actions.

WARNING

Initial training should be conducted at sufficient altitudes to allow for longer recovery times due to uncoordinated flight control inputs and pilot experience. Helicopter flight performance based on the environmental and aircraft conditions must be the determining factor in selecting altitudes that ensure adequate room to recover after maneuvering.

DESCRIPTION:

1. Crew actions.

a. The pilot in command (PC) will brief the crew on the combat flight maneuvers to be performed. He must ensure the crew is aware of the effects of the environmental conditions on flight performance and consider the effects of an engine failure during combat maneuvering flight.

Note. If an engine failure occurs above or below single engine airspeeds at low altitudes, power available may not be enough to recover.

b. The pilot on the controls (P*) will announce the type of maneuver to be performed and any deviation from the maneuver. The P* will remain primarily focused outside the aircraft when performing the maneuver. The primary reference during these maneuvers will be the visible horizon. The P* will make smooth and controlled flight control inputs. Pitch and roll angles should be determined by referencing aircraft attitude with the outside horizon and/or heads-up display (HUD) symbology. The P* will only momentarily scan the instruments to ensure torque, trim, airspeed, and RPM R are maintained. He will also announce recovery from the maneuver.

c. The pilot not on the controls (P) will maintain airspace surveillance and monitor instruments to ensure torque, trim, airspeed, RPM R, maneuver parameters, and aircraft limitations are not exceeded. He will announce when his attention is focused inside the cockpit. The P will provide adequate warning to avoid enemy, obstacles, or traffic detected in the flight path and if any deviation is necessary to complete the maneuver.

d. The nonrated crewmember (NCM) will maintain airspace surveillance, offer threat advisories, and engage threat targets as necessary.

2. Procedures.

a. Combat flight maneuvers. Combat flight maneuvers should be employed in concert with task 2042 in order to mask the helicopter or evade enemy threat systems. The maneuvers described are typically initiated at cruise airspeeds greater than 100 KIAS. During training, the maneuvers should be initiated between the minimum and maximum single engine airspeed not to exceed 100 KIAS. Aircrews must be familiar with aerodynamic factors such as mushing, transient torque, and blade stall before performing these maneuvers. Consider using maximum rate of climb airspeed as much as possible during these maneuvers due to the amount of excess power available and the performance characteristics while maneuvering. The P* will focus his attention outside using the horizon as the primary reference for these maneuvers.

b. Decelerating turn. The decelerating turn is used to rapidly change the direction of the aircraft at low level altitudes while trading airspeed energy to maintain safe operational altitude. The angle of bank, forward airspeed, gross weight, and environmental conditions at the initiation of the maneuver will determine the type/amount of deceleration necessary to slow the aircraft to maintain altitude.

(1) At cruise altitudes, apply aft and directional cyclic to initiate the turn

(2) At terrain flight altitudes, consider the desired direction and magnitude of the turn before initiating the maneuver. Angles of bank should be lower than those used during cruise flight since sufficient recovery altitude may not be available.

(3) Adjust the flight controls as necessary to maintain the pitch attitude and altitude and to maintain the aircraft in trim.

Note. Recovery is affected by applying opposite cyclic (roll) and forward cyclic when reaching the desired heading and adjusting the collective to obtain the desired airspeed and altitude.

c. Break turn. The break turn is used at terrain and cruise flight altitudes to rapidly change the direction of the helicopter while maintaining or gaining airspeed. As altitude allows, this turn also enables a simultaneous three-axis change of position and direction. This maneuver is effective when performing evasive maneuvers to quickly mask the helicopter against enemy threats.

(1) At cruise altitudes, apply directional cyclic to initiate the turn. As the roll rate and bank angle increase, allow the nose to drop while maintaining the aircraft in trim to take advantage of the descent rate while deploying to cover.

(2) At terrain flight altitudes, consider the desired direction of turn before initiating the maneuver. Angles of bank should be lower than those used during cruise flight since sufficient recovery altitude may not be available.

(3) Adjust cyclic as necessary to maintain the pitch attitude to prevent excessive nose-low attitude and to maintain aircraft in trim.

Note. Recovery is affected by applying opposite cyclic (roll) when reaching the desired heading and adjusting the collective to obtain the desired airspeed and altitude.

d. Cyclic climb to a pushover break. This maneuver is used to rapidly climb over an obstacle and increase altitude to evade an enemy threat followed by a descent to mask the aircraft.

(1) Initiate the maneuver by smoothly applying aft cyclic and collective as necessary to begin an ascent. As airspeed decreases (trading airspeed for altitude), maintain attitude within limits and aircraft in trim. As aircraft reaches the appropriate altitude, apply collective as necessary to maintain RPM R and torque within limits.

(2) Initiate the descent by applying forward cyclic while maintaining torque as necessary, and maintain aircraft in trim.

WARNING

Excessive bank angles may not be sustainable with only the application of power. Airspeed (kinetic energy) or altitude (potential energy) may also not be available to trade for lift. These factors must be evaluated before and during the maneuver. Do not allow high sink rates to develop, as recovery altitude or power may not be available to recover. These conditions are aggravated as helicopter gross weight and density altitude increase.

e. Dive/dive recovery. This maneuver is used at altitudes above terrain flight to rapidly mask from a threat by placing the aircraft in a dive. This maneuver can be employed when necessary to break contact with enemy fire while using suppressive fire. A straight ahead dive is rarely tactically feasible and the maneuver usually incorporates a turn. The pilots must be aware of the tendency for RPM R to build in turns with high rates of descent.

(1) To dive the aircraft as a result of potential enemy contact, apply forward cyclic to obtain the desired dive angle. Adjust the collective to as necessary to facilitate a rapid descent and maintain the aircraft in trim.

(2) If the aircraft has been observed by enemy threat, it may be necessary to turn an angle of approximately 30 to 45 degrees to evade while minimizing the profile of the aircraft and orienting crew served weapons for suppressive fire.

(3) Recover at an altitude that will allow sufficient time to arrest the sink rate after collective and cyclic have been applied to recover from the dive.

Note. During this maneuver, airspeed will increase rapidly. Ensure airspeed does not exceed Vne by initiating a recovery prior to the limit.

Note. If mushing occurs, apply forward cyclic to increase lift on the rotor system.

NIGHT OR NIGHT VISION GOGGLES CONSIDERATIONS:

1. Rapid evasive maneuvers will be more hazardous due to division of attention, limited visibility, and aircraft limitations. Be particularly aware of aircraft altitude and three-dimensional position in relation to threat, obstacles, and terrain. Proper sequence and timing is critical in that the P* must announce intentions prior to initiating maneuvers that might cause spatial disorientation. Select a reference point to maintain orientation on threat or friendly troops to aid in maintaining situational awareness (SA). Reference points may be acquired by selecting a global positioning system (GPS) reference point or prominent terrain feature.

2. As airspeed increases, altitude above the obstacles should also increase. Aircrews will comply with the night vision goggle (NVG) altitude and airspeed limitations of TC 1-210. Bank angles should be commensurate with ambient light and altitude above the terrain. High bank angles will result in an inaccurate readout from the radar altimeter and therefore will be unreliable. Using NVGs without HUD symbology display will require greater crew workload to monitor torque, airspeed, trim, RPM R, and rates of descent.

Note. While performing combat maneuvering flight, visual contact with other aircraft in the formation may be lost due to maneuvering or reduced visibility. If this occurs, the crewmember should announce loss of visual contact and comply with standing operating procedure (SOP) requirements.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus the following:

- The Army Aviator’s Handbook for Maneuvering Flight and Power Management
- TM 1-1520-237-10
- Unit SOP

TASK 2169

Perform aerial observation

CONDITIONS: In a H-60 helicopter.

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

1. Use correct visual search techniques.
2. Accurately identify the target.
3. Accurately locate the position of the target.
4. Without error, transmit tactical report.

DESCRIPTION:

1. Crew actions. The pilot in command (PC) will complete a thorough crew and mission briefing. The pilot on the controls (P*) will focus his attention primarily outside the aircraft and respond to navigation instructions or cues given by the other crewmembers. Crewmembers 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. 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.

b. During missions involving direct observation, the aircrew is concerned with detection, identification, location, and reporting.

(1) Detection. Detection requires determinating 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 while conducting 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.

c. 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 nap 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) Shapes and 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 and dust. Smoke should be observed for color, smell, and volume. Dust from moving vehicles can be observed at great distances.

(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.

d. Systematic methods for conducting visual aerial observation include the motive and stationary techniques. The technique used depends on the altitude flown and the terrain encountered.

(1) 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. In using the motive technique, the observer looks forward of the aircraft and through the center of the acquisition sector for obvious sightings. He then scans through the acquisition sector, gradually working back toward the aircraft. 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 90-degree area of the observation work sector. This is the primary search area and is at the approximate 10 to 2 clock position and has no overlap in the center of the aircraft.
- The recognition sector is the remainder of the observation work sector.

(2) 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 his 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 pilot not on the controls (P) will duplicate the same technique on his side of the aircraft. The crew chief (CE) and other crewmembers, if assigned, will perform as directed by the PC.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus FM 17-95.

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 H-60 maintenance test pilots according to AR 95-1. This chapter contains tasks and procedures to be used by contractor maintenance test pilots according to AR 95-20 volume 1 (DLAM 8210.1) section 3.4 (publications). Commanders will program six annual flight hours into the flying hour program to support training and evaluations of all maintenance test pilot/maintenance test flight evaluators (MP/MEs) in their aircrew training program (ATP). If discrepancies are found between this chapter and the appropriate aircraft –23 maintenance manuals or maintenance test flight (MTF) manual, the task as written in the MTF manual takes precedence.

5-1. TASK CONTENTS.

a. **Task number**. Each aircrew training manual (ATM) task is identified by a 10-digit SAT number that corresponds to the maintenance test pilot tasks listed in chapter 2, table 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 maintenance test pilot (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 common standards listed in chapter 4 apply to all tasks listed in this section unless specifically stated otherwise. The following common standards apply to all MP tasks.

(1) Perform procedures and checks in sequence per the appropriate aircraft MTF manual, 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 call out and confirmation method and announce the initiation and completion of each check.

(6) The MP should perform maintenance tasks from the left seat. The MP must occupy the left seat for the following tasks: 4200, 4202, 4220, 4228, 4236, and 4254. The restriction does not

apply to initial ME training/evaluations. MEs, when performing these tasks, may sit in the right seat when conducting training/evaluations.

(7) The MP/ME will guard the collective anytime the engine power control levers are manipulated.

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 pilot in command (PC) or 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 PC in all situations, except when undergoing training or evaluation by an ME. For all tasks, MP actions and responsibilities apply 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 to 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 manual. This section defines the checks in each task that, as a minimum, must be evaluated on an evaluation flight. Table 2-8 defines readiness level (RL) progression and annual proficiency and readiness test (APART) evaluation tasks. The evaluator may select additional checks for evaluation. Tasks that involve dual systems (such as stability augmentation system [SAS] or engines) require that only one system be evaluated while in flight or on the ground. At his discretion, the evaluator may require that both systems (such as SAS 1 and SAS 2) be checked. 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. If one or more checks are performed unsatisfactorily, the task will be graded unsatisfactory. However, when the task is reevaluated, only those unsatisfactory checks must be reevaluated.

h. **References**. The references are sources of information relating to that particular task. In addition to the common references listed in chapter 4 of this ATM, the following references apply to all MP tasks:

(1) Aircraft historical records.

(2) TM 1-1500-328-23.

(3) DA Pam 738-751.

(4) Appropriate –23 series manuals.

(5) TM 1-6625-724-13&P.

(6) Applicable airworthiness directives or messages from aviation and missile command (AMCOM).

5-2. TASK LIST. The following numbered tasks are H-60 maintenance test pilot tasks.

TASK 4000

Perform prior to maintenance test flight checks

CONDITION: In a H-60 helicopter.

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

1. Perform the preflight inspection according to the appropriate aircraft operator's manual/checklist (CL).
2. Determine the suitability of the aircraft for flight and the mission to be performed.
3. Determine required maintenance operational checks (MOCs) and maintenance test flight (MTF) maneuvers to be completed.
4. Ensure logbook entries are made according to DA Pam 738-751.
5. Brief the rated crewmember (RCM) and nonrated crewmember (NCM) on the mission and their duties.

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 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. He may direct the RCM (if available) to complete such elements of the aircraft preflight inspection as are appropriate, but he 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 are made 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. He will brief the RCM or NCM and any additional support personnel concerning operation on or around the helicopter during ground operations. He will ensure that ground communication capability is adequate. He 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.

   a. Review the aircraft forms and records to determine the necessary checks and tasks to be performed. Use additional publications and references as necessary.

   b. Conduct a risk assessment of the mission.

   c. Preflight the aircraft with special emphasis on areas or systems where maintenance was performed.

   d. Verify all test equipment is correctly installed and secured as applicable.

   e. 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 that the additional crewmembers or required support personnel may not be familiar with.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4004

Perform interior checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) should direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as necessary. During checks of equipment or switches that are located at both the pilot and copilot positions, brief the RCM on the procedures required to perform the check at his cockpit station and demonstrate performance of the check if necessary.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures.

   a. For checks involving duplicate equipment or switches, brief the RCM/NCM on the proper method of performing the check and demonstrate as required. Brief the RCM/NCM (prior to placing helmets on) that—

   (1) When the BATT switch is moved to the ON position, the stabilator audio will sound and will be reset using the pilot's MASTER CAUTION switch, following verification of the audio from both cockpit stations.

   (2) The MP will reset all subsequent MASTER CAUTION and/or audio warnings unless otherwise directed.

   b. Confirm the stabilator area is clear before applying alternating current (AC) power to the aircraft.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4010

Perform starting auxiliary power unit checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will coordinate with and brief the rated crewmember (RCM), nonrated crewmember (NCM), and any additional ground support personnel prior to APU start. He will brief all concerned personnel on procedures to be followed in the event of an emergency. The MP will direct assistance from the RCM and NCM to aid in maintaining the auxiliary power unit (APU) exhaust and stabilator areas clear during the APU start sequence and any subsequent ground checks.

   b. The RCM and/or NCM should assist the MP as directed.

2. Procedures.

   a. Perform the check according to the MTF manual with the following additional information:

      (1) Brief the RCM and/or NCM as necessary.

      (2) If an additional cockpit crewmember is available, direct his assistance with monitoring the master warning fire light during the APU start sequence.

Note. If any work has been done to the stabilator system, the MP should take manual control to check upper and lower limit switches prior to AUTO MODE.

   b. The APU ACCUM LOW light should extinguish after either 90 or 180 seconds depending on aircraft configuration.

   c. If external power was used to perform the start, select the EXT PWR switch to OFF. Direct the external power cable to be disconnected and the power generating equipment to be secured at a safe distance outside the rotor disk.

   d. Check and set (as required) any installed digital chronometers (clocks).

SOLO MP CONSIDERATIONS:

1. Clearing the APU and stabilator. When performing this task without additional crewmember support, the MP will visually confirm the APU exhaust area is clear prior to the APU start, and then again visually confirm the stabilator is clear prior to APU GEN or EXT PWR engagement unless stabilator auto mode is disabled. During the APU run, the MP will remain within easy reach of the APU controls with an unobstructed view of the caution/advisory panel. The MP will ensure the stabilator area remains clear throughout any manual or automatic mode stabilator operations.

2. Disabling stabilator auto mode. Because of the difficulty of directly observing the stabilator area from the cockpit, the MP may elect to temporarily disable the stabilator auto mode engagement in the interest of safety. Immediately after applying alternating current (AC) power, momentarily engage the cyclic slew up or the stabilator automatic flight control system (AFCS) panel MAN SLEW switch. During aircraft systems troubleshooting, it is important to remember

that the stabilator may slew down if AC power is interrupted and then restored. The MP will ensure the stabilator area remains clear throughout any manual or automatic mode stabilator operations.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4014

Perform caution advisory/master warning check

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as required.
   b. The RCM and/or NCM should assist the MP as directed.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual.
   b. Brief the RCM and/or NCM as necessary.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4038

Perform instrument display system checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) may direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) if available.

   b. The RCM and/or NCM should assist the MP as directed.

2. Procedures. Perform these checks according to the maintenance test flight (MTF) manual with the following additional information:

   a. Brief the RCM and/or NCM as necessary.

   b. Verify that the static indications and range markings on the CDU and PDUs are normal for current conditions and aircraft type.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. During all evaluations, the following checks will be evaluated:

- CDU-PDU test.
- Photocell sensitivity check.

REFERENCES: Appropriate common references.

TASK 4040

Perform stabilator audio warning priority check

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) will direct the rated crewmember (RCM) and/or nonrated crewmember (NCM) to assist with circuit breaker and weight on wheels (WOW) switch functions.
   b. The RCM and/or NCM should assist the MP as directed.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual.
   b. Brief the RCM and/or NCM to acknowledge all audios.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4042

Perform heater and vent system/windshield wiper checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM) and/or nonrated crewmember (NCM), as required.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures.

   a. Heater and ventilating system check.

      (1) Perform the check according to the maintenance test flight (MTF) manual.

      (2) Brief the RCM and NCM to shield their eyes from debris that may be blown from the aircraft vents.

   b. Windshield wiper operating system check.

      (1) Perform the check according to the MTF manual

      (2) If unable to keep the windshield wet during check, pin up the wiper blade arms so the blades do not touch the windshield.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. The following checks will be evaluated on an evaluation flight:

- Heater and ventilating system check.
- Windshield wiper operating system check.

REFERENCES: Appropriate common references.

TASK 4044

Perform flight control hydraulic system checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
    a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as required.
    b. The RCM and/or NCM should assist the MP as directed.
2. Procedures. Confirm automatic flight control system (AFCS) switches are set as required according to the MTF manual. Perform the following procedures:
    a. Cyclic forward stop check. Perform the check according to the maintenance test flight (MTF) manual.

Note. Collective "mid position" depends on aircraft rigging and as a result is not precisely the same on every aircraft. To determine mid position, center the pedals, and hold slight forward pressure against the cyclic (full forward and centered laterally). Adjust the collective until the cyclic position appears closest to the instrument panel. That point is the collective "mid position" for that aircraft. If during the attempt to determine the mid position point of the collective, the cyclic appears to remain relatively stationary, troubleshoot for improper aircraft rigging.

    b. Primary servo check. Perform the check according to the MTF manual.
    c. Boost servo check. Perform the check according to the MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. The following checks will be evaluated on an evaluation flight:

- Cyclic forward stop check.
- Primary servo check.
- Boost servo check.

REFERENCES: Appropriate common references.

TASK 4046

Perform collective friction check

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The maintenance test pilot (MP) may direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) if available.

    b. The RCM and NCM should assist the MP as directed.

2. Procedures.

    a. Perform the check according to the maintenance test flight (MTF) manual.

    b. Using an appropriate spring scale, check the force required to start movement from the full down and full up positions.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4048

Perform tail rotor servo check

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) will direct assistance from an additional crewmember or ground support individual to confirm full tail rotor paddle movement.
   b. The rated crewmember (RCM) and nonrated crewmember (NCM) should assist the MP as directed.
2. Procedures.
   a. Perform the check according to the MTF manual.
   b. Brief the additional crewmember or ground support individual to visually monitor the tail rotor system and to verbally confirm pitch beam travel as appropriate.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4050

Perform stability augmentation system engagement/disengagement error check

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as required.

   b. The RCM will assist the MP as directed.

2. Procedures.

   a. Perform the check according to the maintenance test flight (MTF) manual.

   b. Position a main rotor blade directly over the nose of the aircraft.

   c. Brief the additional cockpit crewmember to monitor the main rotor blade tip cap trailing edge of the 3 o'clock blade (or 9 o'clock blade depending on the cockpit crew station he occupies).

   d. If available, direct an additional crewmember or ground support individual to monitor the tail rotor paddles and 6 o’clock blade and report any movement during the checks.

Note. Main rotor blade tip cap jump of the blade positioned at 12 o'clock will normally indicate a roll stability augmentation system (SAS) problem. Jump noted at either the 3 or 9 o'clock positions would normally indicate a pitch SAS problem. Due to control mixing, SAS movement in one axis could show up in a different control surface (such as jump at the 3 or 9 o'clock position may be caused by a yaw SAS problem). To completely isolate an axis, station a crewmember to observe the SAS actuator for movement during further troubleshooting. When performing direct observation troubleshooting of the SAS actuators, brief the individual to exercise caution around flight controls and hydraulic systems, and maintain positive communications with the cockpit during checks. Both SAS systems will be checked during this task.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4052

Perform flight control breakout forces checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as necessary.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures. Perform the check according to the maintenance test flight (MTF) manual with the following additional information:

   a. Using an appropriate spring scale graduated in ounces, measure the amount of force required to induce cyclic breakout (begin movement) in the fore and aft, left and right directions. Apply the spring scale as close to the cyclic grip mid hand hold position as possible. Re-center the cyclic before each measurement. Note and record the spring scale reading at the point the cyclic starts to move. Cyclic breakout measurements in all axes should not exceed amount stated in the MTF manual.

   b. Using an appropriate spring scale graduated in pounds, measure the amount of pressure required to induce breakout of the pedal(s) in both directions. The pressure required to start the pedal(s) moving in each direction should not exceed amount listed in MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4060

Perform trim system checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as required.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures. Advise the additional cockpit crewmember to remain clear of the controls. The collective should remain at mid position for the duration of these checks.

   a. Trim system check. Perform the check according to the maintenance test flight (MTF) manual.

   b. Cyclic force gradient check. Center the cyclic. Perform the check according to the MTF manual with the following additional information:

      (1) Without releasing trim, sequentially displace and then release the cyclic forward, aft, left, and right (approximately 2 inches) to verify that a force gradient exists. The trim should remain engaged and no caution or failure advisory lights should illuminate.

      (2) Depress the cyclic TRIM REL switch, re-reference the cyclic to the forward left quadrant, and release the switch. Repeat the force gradient check as performed with cyclic centered. Repeat for the remaining three quadrants and then re-center the cyclic.

      (3) Direct the additional cockpit crewmember to re-reference his cyclic to different positions to confirm that his cyclic trim release button functions correctly.

   c. Cyclic trim check. Perform the check according to the MTF manual.

   d. Cyclic force check. Perform the check according to the MTF manual using an appropriate spring scale graduated in pounds

   e. Yaw pedal force gradient check. Center the pedals. Direct the additional cockpit crewmember to observe your demonstration of the checks.

      (1) Without disengaging trim, attempt to displace each pedal and confirm that a force gradient exists.

      (2) Depress the left pedal trim switch only and displace the pedal. Release the trim switch. Confirm that trim maintains the new reference position by attempting to displace the pedal without releasing trim. Continue checking by re-referencing pedals through full range of travel. Repeat for the right pedal.

      (3) Direct the additional cockpit crewmember to re-reference his pedals to different positions to confirm that his pedal trim release switches functions correctly.

   f. Yaw pedal trim check. Perform the check according to the MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. The following checks will be evaluated on evaluation flights:

- Trim system check.
- Cyclic force gradient check.
- Cyclic trim check.
- Cyclic force check.
- Yaw pedal force gradient check.
- Yaw pedal trim check.

REFERENCES: Appropriate common references.

TASK 4062

Perform damping forces check

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as required.
   b. The RCM and NCM will assist the MP as directed.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual
   b. Brief the additional cockpit crewmember to remain clear of the controls

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4064

Perform trim beep checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as required.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures. The collective should be adjusted to and remain at mid position for the duration of these checks.

   a. Beep trim check. Perform the check according to the maintenance test flight (MTF) manual with the following additional information: Direct the additional cockpit crewmember to remain clear of the controls.

      (1) Select the cyclic STICK TRIM switch to left for about 3 seconds and release. Repeat check to the right.

      (2) Select the cyclic STICK TRIM to FWD for about 3 seconds and release. Repeat the check to aft.

      (3) Direct the additional cockpit crewmember to perform the same checks at his crew station.

   b. Beep timing check. Perform the check according to the MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. The following checks will be evaluated on evaluation flights:

- Beep trim check.
- Beep timing check.

REFERENCES: Appropriate common references.

TASK 4066

Perform collective to yaw electronic coupling/flight path stabilization heading hold checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as required.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures.

   a. Collective to yaw electronic coupling check. Perform the check according to the maintenance test flight (MTF) manual.

Note. When reducing the collective from the full up position, the left pedal may initially start to drive further forward (and right pedal may initially drive further to the rear) from the point where it stopped with the collective at full up. This is normal. With the collective at full up, the mixer limits the yaw flight control input to less than the yaw trim actuator is capable of providing (roller hits the mixer stop). As the collective is initially lowered, the mixer allows more left pedal input up to the point the collective position sensor input, causing the trim actuator to compensate for the reduced collective setting and to drive the trim actuator in the opposite direction.

   b. FPS heading hold check. Perform the check according to the MTF manual with the following additional information. Direct additional cockpit crewmember to remain clear of flight controls. After completing left crew station checks, direct and monitor additional cockpit crewmember to perform checks at their crew station.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. The following checks will be evaluated on evaluation flights:

- Collective to yaw electronic coupling check.
- FPS heading hold check.

REFERENCES: Appropriate common references.

TASK 4068

Perform stabilator checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
    a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM), nonrated crewmember (NCM), and any ground support personnel as required.
    b. The RCM, NCM, and/or ground support personnel should assist the MP as directed.
2. Procedures.
    a. Perform the check according to the maintenance test flight (MTF) manual
    b. Brief the NCM or ground support individual to—
        (1) Keep the stabilator area clear throughout the checks
        (2) Verify and verbally confirm the stabilator positions of full up, full down, and 0 degrees.
    c. Brief the additional cockpit crewmember that—
        (1) The pilot's stabilator indicator will be used as the master reference of stabilator position.
        (2) He should verbally confirm his stabilator position indications following each procedural step.
        (3) He acknowledges each reception of a stabilator audio tone. Directs the assistant to close and secure the nose compartment door.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4070

Perform fuel quantity indicator checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions. The rated crewmember (RCM) and nonrated crewmember (NCM) should assist the maintenance test pilot (MP) as directed.
2. Procedures. Perform the check according to the maintenance test flight (MTF) manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4072

Perform altimeter checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the checks and will direct assistance from the rated crewmember (RCM) and nonrated crewmember (NCM) as required.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures.

   a. Barometric altimeters check. Perform the check according to the maintenance test flight (MTF) manual and direct the additional cockpit crewmember to do the same.

   b. Radar altimeter checks. Perform the check according to the MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. The following checks will be evaluated on evaluation flights:

- Barometric altimeters check.
- Radar altimeters check.

REFERENCES: Appropriate common references.

TASK 4074

Perform fire detection system checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM) and nonrated crewmember (NCM) as required.
   b. The RCM and NCM should assist the MP as directed.
2. Procedures. Perform the check according to the maintenance test flight (MTF) manual with the following additional information: This procedure checks only the system circuitry amplifiers and T-handle light bulbs.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4076

Perform windshield anti-ice and backup pump interlock checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the checks in sequence. He should direct assistance from the rated crewmember (RCM) and nonrated crewmember (NCM) and/or ground support personnel as necessary.

   b. The RCM, NCM, and/or ground support personnel should assist the MP as directed.

2. Procedures. Perform the check according to the maintenance test flight (MTF) manual with the following additional information: An increase in windshield temperature may be apparent to personnel checking the outside of the windshield surface before cockpit personnel feel any increase. The MP may direct an additional crewmember or ground support individual to check each windshield heater element zone for an increase in temperature from outside the aircraft.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4078

Perform pitot heat system check

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the checks in sequence. The MP will brief the individual checking the pitot tubes to feel for radiant heat and not to touch the pitot tubes. He should direct assistance from the rated crewmember (RCM) and nonrated crewmember (NCM) and/or ground support personnel as necessary.

   b. The RCM, NCM, and/or ground support personnel should assist the MP as directed.

2. Procedures. Perform the check according to the maintenance test flight (MTF) manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4080

Perform mission equipment checks

CONDITION: In a H-60 helicopter with equipment installed.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the checks in sequence and should direct assistance from the rated crewmember (RCM) and nonrated crewmember (NCM) and/or ground support personnel as necessary.

   b. The RCM, NCM, and/or ground support personnel should assist the MP as directed.

2. Procedures.

   a. Preflight the mission equipment according to the appropriate operator's manual, maintenance test flight (MTF) manual, airworthiness releases, military or manufacturer's technical references.

   b. When performing the checks, observe all notes, cautions, and warnings contained in the procedure.

   c. Direct assistance from additional crewmembers and ground support personnel as necessary.

   d. Make all required entries to the MTF check sheet as appropriate.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4082

Perform fuel boost pump checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the checks in sequence. He may direct assistance from an additional cockpit crewmember as necessary.

   b. The rated crewmember (RCM) and nonrated crewmember (NCM) or additional ground support personnel will assist the MP as directed.

2. Procedures.

   a. Perform the check according to the maintenance test flight (MTF) manual.

   b. Confirm both ENG FUEL SYS selectors are in DIR.

   c. Verify the #1 and #2 FUEL PRESS caution capsules are illuminated. If one or both of the fuel pressure caution lights are not illuminated; place the appropriate power control lever to the LOCKOUT position until the appropriate FUEL PRESS light(s) illuminate prior to check.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4086

Perform engine starter system checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards plus brief the rated crewmember (RCM), nonrated crewmember (NCM) as explained in the procedure description.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will direct assistance from additional crewmembers and/or ground support personnel if available.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures.

   a. Perform the check according to the maintenance test flight (MTF) manual.

   b. Brief the RCM, NCM, and any additional ground support personnel as necessary. The briefing may vary in content but at a minimum will include confirming that—

      (1) Ignition switch is OFF

      (2) The tail wheel is locked.

      (3) The parking brake is set.

      (4) The rotor disk area is clear.

      (5) Fireguard is posted.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4088

Perform starting engine checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards plus brief the pilot on the controls (P*) of his duties as explained in the procedure description.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) should coordinate with, and direct assistance from, the rated crewmember (RCM), nonrated crewmember (NCM), and any ground support personnel as necessary. The MP will perform pilot not on the controls (P) duties during this check.
   b. The RCM, NCM, and any ground support personnel should assist the MP as directed.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual.
   b. Brief and coordinate with the RCM, NCM, and any additional ground support personnel as necessary. The briefing may vary in content but at a minimum will include—
      (1) Briefing the additional cockpit crewmember on the MTF manual 45-second emergency engine shutdown criteria and procedures to follow in the event of an emergency.
      (2) Directing him to assist during the engine start sequence by—
      - Monitoring the flight controls.
      - Starting his clock when "idle" is announced.
      - Monitoring indications for the MTF manual 45-second emergency engine shutdown criteria.
      - Monitoring the master warning FIRE light.
      - Noting the Ng SPEED at the time the ENG OUT light extinguishes.
   c. Confirm the flight controls are neutral and the collective is up 1 inch and frictioned.
   d. Transfer the flight controls to the additional cockpit crewmember.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4090

Perform engine run-up and systems checks

CONDITION: In a H-60 helicopter at 100 percent Nr.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the checks in sequence. He should coordinate with, and direct assistance from, the rated crewmember (RCM), nonrated crewmember (NCM), and any ground support personnel as necessary. The MP will guard the collective during each procedure. The MP should request the RCM to assist with monitoring the turbine gas temperature (TGT) during environmental control unit/digital electronic control unit (ECU/DECU) lockout operations.

   b. The RCM, NCM, and any ground support personnel should assist the MP as directed.

2. Procedures. Perform the check according to the maintenance test flight (MTF) manual with the following additional information: Brief the RCM, NCM, and any ground support personnel as necessary. Confirm the flight controls are neutral and the collective is full down. Transfer the flight controls to the RCM. Direct assistance from the RCM to monitor the flight controls, and maintain the rotor tip path level with respect to the airframe. Prior to initiating each procedure, confirm the tail wheel is locked, the parking brake is set, and the rotor disk area is clear. Guard the collective during each procedure.

   a. Engine overspeed check. Perform the check according to the MTF manual.

   b. ECU/DECU lockout/Np overspeed check. Perform the check according to the MTF manual. Request the RCM assist with monitoring the TGT during ECU/DECU lockout operations. Identify the power control lever on the engine to be checked. Maintain continuous positive control of the power control lever during the check.

   c. Engine RPM trim check. Perform the check according to the MTF manual.

   d. Acceleration/deceleration check. Perform the check according to the MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. The following checks will be evaluated on evaluation flights:

- Engine overspeed check.
- ECU/DECU lockout/Np overspeed check.
- Engine RPM trim check.
- Acceleration/deceleration check.

REFERENCES: Appropriate common references.

TASK 4092

Perform hydraulic leak system check

CONDITION: In a H-60 helicopter with collective full down and ground idle.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will direct the rated crewmember (RCM) to monitor the flight controls and maintain the collective full down or as low as possible when boost is off. The MP will guard the collective during the procedure.

   b. The RCM, nonrated crewmember (NCM), and any ground support personnel should assist the MP as directed.

2. Procedures.

   a. Perform the check according to the maintenance test flight (MTF) manual.

   b. Brief the RCM, NCM, and any additional support personnel as necessary.

   c. Confirm the flight controls are neutral and the collective is full down.

   d. Transfer the flight controls to the RCM; direct his assistance with monitoring the flight controls and maintaining the tip path level with respect to the airframe.

   e. Confirm (1) the tail wheel is locked, (2) the parking brake is set, (3) the rotor disk area is clear, (4) and any personnel stationed outside the aircraft are clear of the main landing gear.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4102

Perform electrical system checks

CONDITION: In a H-60 helicopter at 100 percent Nr and APU on and operating.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the required checks in sequence. He will direct the pilot not on the controls (P) to monitor the flight controls, maintain the collective full down. The MP should direct the rated crewmember (RCM) to assist with circuit breaker and switch functions as necessary.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures.

   a. Perform the check according to the maintenance test flight (MTF) manual.

   b. Brief the RCM, NCM, and any ground support personnel as necessary.

   c. Confirm that the flight controls are neutral and the collective is full down. Transfer the flight controls to the RCM.

   d. Request assistance from the RCM to monitor the flight controls and to maintain the rotor tip path level with respect to the airframe.

   e. The briefing may vary in content but at a minimum will include confirming that (1) the tail wheel is locked, (2) the parking brake is set, (3) the rotor disk area is clear, and (4) the RCM is monitoring the flight controls.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. The following checks will be evaluated on evaluation flights:

- Underfrequency protection check.
- Alternating current (AC) system essential bus tie connector check.
- AC system primary bus tie connector check.
- Direct current (DC) system bus tie connector check.

REFERENCES: Appropriate common references.

TASK 4112

Perform taxi checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the checks in sequence. He may direct assistance from the rated crewmember (RCM) and nonrated crewmember (NCM) as necessary.

   b. The RCM and NCM will assist the MP as directed.

2. Procedures.

   a. Systems instruments check. In checklist sequence, confirm all systems instruments are in the normal ranges and record all required data on the maintenance test flight (MTF) check sheet.

   b. Brakes and tail wheel lock checks. Confirm the chocks are removed, the crew is secure, the parking brakes are released, and the rotor disk area and intended taxi or hover path is clear. Establish taxi speed with minimum collective and forward cyclic.

   (1) Apply moderate, even pressure to both brake pedals. Confirm the brake response is balanced, pedal feel is firm, and the pedal master cylinder(s) do not bottom out.

   (2) Direct the RCM to check the brakes at his cockpit crew station in the same manner.

   (3) Direct the RCM to press the TAIL WHEEL switch once, and verbally confirm the UNLOCK indication. Alternately apply slight pressure to each pedal while taxiing and verify the tail wheel swivels.

   (4) Before proceeding to the test flight hover area, check the parking area for indications of fluid leakage from the aircraft.

   (5) When no further taxiing turns are anticipated, position the aircraft into the wind or as required, and direct the RCM to press the TAIL WHEEL switch once, and verbally confirm the LOCK indication. Alternately apply slight pressure to each pedal to confirm the tail wheel is locked.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4122

Perform health indicator test/baseline bleed air and anti-ice checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) should direct the rated crewmember (RCM) to assist with monitoring the flight controls, maintaining the airframe level when the collective is not full down, and adjusting the collective as necessary to complete the checks. The MP will record and calculate health indicator test (HIT) data during the checks and assist in maintaining obstacle avoidance.

   b. The RCM and nonrated crewmember (NCM) will assist the MP as directed.

   c. Procedures.

      (1) Perform the check according to the maintenance test flight (MTF) manual.

      (2) Position the aircraft into the prevailing wind. Set the brakes if required; direct assistance as necessary.

      (3) Confirm the flight controls are neutral and the collective is full down. Transfer the flight controls to the RCM.

      (4) Direct assistance from the RCM to monitor the flight controls, maintain the airframe level when the collective is not full down, and adjust the collective as required to complete the checks.

      (5) Direct the NCM, if available, to record HIT data, assist with maintaining obstacle avoidance, and advise the cockpit concerning movements of other aircraft operating in the immediate area.

      (6) Guard the collective when manipulating the engine power control lever or at anytime the collective is not full down.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4142

Perform hover power/hover controllability checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the initial ascent to a hover. He should direct the rated crewmember (RCM) to assist with monitoring aircraft instruments and with maintaining obstacle avoidance. The nonrated crewmember (NCM), if available, should be directed to assist with maintaining obstacle avoidance and monitoring aircraft drift.

   b. The RCM and NCM will assist the MP as directed.

2. Procedures.

   a. Perform the check according to the maintenance test flight (MTF) manual.

   b. Perform the before-takeoff checks.

   c. Brief the RCM to monitor the aircraft systems instruments and alert you of any abnormal conditions.

   d. Brief the NCM to assist with maintaining obstacle avoidance and monitoring aircraft drift.

   e. Announce your intention to bring the aircraft to a hover. Verify the area around the aircraft is clear. Gradually adjust the collective until the aircraft is light on the gear. Lightly apply pedal inputs and confirm the aircraft responds appropriately. Continue to adjust the collective to a stable hover.

   f. As the aircraft becomes airborne, note (1) that no excessive control displacement is required (2) and that the apparent center of gravity (CG) is as expected for the load conditions.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. The following checks will be evaluated on evaluation flights:

- Hover power check.
- Hover controllability check.

REFERENCES: Appropriate common references.

TASK 4158

Perform automatic flight control system hover checks

CONDITION: In a H-60 helicopter heading into the wind.

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

1. Maintain hover height according to the maintenance test flight (MTF) manual.
2. Heading/yaw check(s) torque variance: +10 percent, -0 percent.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will determine the automatic flight control system (AFCS) to be checked. He will direct the rated crewmember (RCM) to assist with the AFCS control panel switch functions and monitoring aircraft systems indications. He will direct assistance from the nonrated crewmember (NCM), if available, to clear the aircraft and maintain obstacle avoidance.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures.

   a. Perform the check according to the MTF manual.

   b. Brief the RCM and NCM as necessary.

   c. Stabilize the aircraft and confirm the aircraft maneuver area is clear before performing each maneuver.

   d. Direct the RCM to assist with AFCS switch panel functions as necessary.

Note. The hover height may be adjusted due to terrain or obstacles.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. The following checks will be evaluated on evaluation flights:

- Stability augmentation system (SAS) checks.
- Flight path stabilization (FPS) checks.

REFERENCES: Appropriate common references.

TASK 4200

Perform backup tail rotor servo check

CONDITION: In a H-60 helicopter over a level surface whenever practical, heading into the wind.

STANDARDS: Appropriate common standards plus brief the pilot not on the controls (P) of his duties as explained in the description procedures.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform pilot on the controls (P*) duties during this check and remain focused outside the aircraft during the maneuver. The MP will brief the rated crewmember (RCM) and nonrated crewmember (NCM) on conducting the maneuver and any specific crew actions or duties to be performed.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures.

   a. Perform the check according to the maintenance test flight (MTF) manual.

   b. Position the helicopter into the wind and land to conduct the briefing. Set the brakes if required; direct assistance as necessary.

   c. Brief the RCM and NCM on conducting the maneuver. Direct the RCM to brace himself against the airframe or cockpit door with his right hand and to identify and hold the TAIL SERVO switch on the MISC switches panel. Brief the RCM on using the terms "backup," "normal," and "power control levers" and the resultant actions he is to perform. He does not remove his hand from the TAIL SERVO switch unless "power control levers" or "check complete" is announced. Direct the NCM to remain secured and to assist in clearing the aircraft and maintaining obstacle avoidance.

Note. If the aircraft begins an uncommanded turn or the pedals bind during the backup servo (#2 T/R) check, direct the RCM to place the tail rotor control switch to “normal.” If tail servo control is not regained, announce “power control levers," perform a hovering autorotation, and do not attempt to fly the aircraft until the deficiency is corrected.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4202

Perform generator underfrequency protection disable/low rotor revolutions per minute checks

CONDITIONS: In a H-60 helicopter over a level surface, heading into the wind.

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

1. Do not allow revolutions per minute rotor (RPM R) to decrease below 85 percent.
2. Maintain engine torque (TRQ) indications within 10 percent during RPM R reduction and recovery.
3. Brief the pilot on the controls (P*) of his duties as explained in the description procedures.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) will perform pilot not on the controls (P) duties during this check and will guard the collective throughout the maneuver. The MP will brief the rated crewmember (RCM) and nonrated crewmember (NCM) on conducting the maneuver and any specific crew actions or duties to be performed.
   b. The RCM and NCM should assist the MP as directed.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual.
   b. Establish a stabilized 10-foot hover into the wind.
   c. Transfer the flight controls to the RCM. Brief the RCM on (1) conduct of the maneuver, (2) control response during low rotor operation, (3) the requirement to maintain a 10-foot hover height and to monitor drift, (4) the low rotor RPM audio, (5) and recovery procedures in the event that underfrequency protection is not disabled.
   d. Direct the NCM to remain secured and assist in clearing the aircraft and maintaining obstacle avoidance.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4204

Perform compasses, turn rate, and vertical gyros checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will brief the rated crewmember (RCM) and nonrated crewmember (NCM) on conducting the maneuver and duties to be performed. The MP will guard the collective throughout the maneuvers.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures. Perform the check according to the maintenance test flight (MTF) manual with the following additional information: Brief the RCM on conducting the maneuver. Direct the RCM to assist with gyro mode selection switch functions and to confirm instrument indications as necessary. Direct the NCM to remain secured, assist with clearing the aircraft, and maintain obstacle avoidance.

   a. Note and compare the standby magnetic compass heading with horizontal situation indicator (HSI) heading indications at both the pilot and copilot stations.

   b. Direct the RCM to set MODE SEL TURN RATE and VERT GYRO switches at the pilot's station to ALTR and note that the legend lights indicate appropriately. Perform pedal turn to the left of the initial heading until both turn rate indicators indicate full deflection. Stop turn and stabilize hover at the new heading. Note and compare headings again. Repeat to the right. Check the HSI compass cards and the standby magnetic compass for smooth operation and heading comparison. Confirm both turn rate indicators indicate full deflection during turns in either direction. Smoothly displace the cyclic to induce 5 degree up and down pitch, and 10 degree left and right roll indications. Confirm both vertical situation indicators (VSIs) indicate appropriately. Direct RCM to switch to NORM for turn and to vertical gyros on the pilot's MODE SEL panel.

   c. Have the RCM guard the collective control. The MP will set copilot station MODE SEL TURN RATE and VERT GYRO switches to ALTR and note that the legend lights indicate appropriately.

   d. Perform brief pedal turns to the left and right of the initial heading and confirm both turn rate indicators indicate full deflection during turns in either direction. Smoothly displace the cyclic to induce 5 degree up and down pitch and 10 degree left and right roll indications. Confirm both VSIs indicate appropriately. Direct the RCM to select the TURN RATE and VERT GYRO switches on the pilot's MODE SEL panel to NORM, and note the legend lights indicate appropriately. Have pilot not on the controls (P) guard the collective control. Reset copilot's station switches to NORM.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4210

Perform takeoff and climb checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards plus brief the pilot not on the controls (P) of his duties as explained in the procedure description.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) will perform the checks in sequence. He should direct assistance from the RCM or nonrated crewmember (NCM) as necessary. MP should be on the controls during climb out.
   b. The RCM and NCM should assist the MP as directed.
2. Procedures. Perform the check according to the maintenance test flight (MTF) manual. Perform the before-takeoff checks according to the MTF manual. Brief the RCM to verbally confirm the stabilator is programming by 30 to 50 knots indicated airspeed (KIAS), perform any required avionics switching functions, and maintain airspace surveillance during climb out. Brief the NCM to assist with maintaining airspace surveillance.
   a. Make a normal takeoff. During climb out, verbally confirm and compare flight instrument readings with the RCM in checklist sequence.
   b. Climb to a predetermined altitude.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4218

Perform in-flight controllability checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) should direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as necessary.
   b. The RCM and NCM should assist the MP as directed.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual.
   b. Brief the RCM and NCM on conducting the maneuver.
   c. Direct the RCM and NCM to assist with maintaining airspace surveillance.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4220

Perform maximum power check

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Determine the appropriate check altitude with the copilot altimeter set at 29.92.
2. Verbally confirm all bleed air is OFF before starting task.
3. Record all required readings according to the maintenance test flight (MTF) check sheet taken at the performance limit.
4. Brief the pilot on the controls (P*) of his duties as explained in procedure description.

DESCRIPTION:

1. Crew actions. The MP will perform pilot not on the controls (P) duties during this check and will guard the collective anytime the P* is on the controls.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual.
   b. Brief the P* and nonrated crewmember (NCM) on conducting the maneuver. The briefing may vary in content but at a minimum will include the following topics:
      - A brief description of the maneuver.
      - The check airspeed and altitude to be maintained.
      - The maneuver abort criteria and limitations.
      - The proper response to a steady or beeping audio tone.

   c. Direct the NCM to remain secured, assist in clearing the aircraft, and maintain airspace surveillance.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus TM 1-2840-248-23.

TASK 4225

Perform cruise stabilator checks

CONDITION: In a H-60 helicopter.

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

1. Establish aircraft at 120 knots indicated airspeed (KIAS), level flight, and in trim before initiating each check.
2. Maintain fixed collective.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) should direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as necessary.
   b. The RCM and NCM should assist the MP as directed.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual.
   b. Brief the RCM and NCM on conducting the maneuver.
   c. Direct the RCM and NCM to assist with maintaining airspace surveillance.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4226

Perform automatic flight control system in-flight checks

CONDITION: In a H-60 helicopter.

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

1. Establish 120 knots indicated airspeed (KIAS), level flight, and in trim before initiating each check.
2. Maintain fixed collective throughout each procedure.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) should direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as necessary.
   b. The RCM and NCM should assist the MP as directed.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual.
   b. Brief the RCM and NCM on conducting the maneuver.
   c. Direct the RCM and NCM to assist with maintaining airspace surveillance.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. The following checks will be evaluated on evaluation flights:

- Flight path stabilization/stability augmentation system (FPS/SAS) checks.
- Beep trim checks.

REFERENCES: Appropriate common references.

TASK 4228

Perform vibration absorber check and tuning

CONDITIONS: In an H-60 helicopter, aviation vibration analyzer (AVA) installed (if required by maintenance). If available, third crewmember should be used to operate AVA equipment.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Verbally confirm all bleed air OFF prior to start of task.
2. Complete digital electronic control unit / environmental control unit (DECU/ECU) ground lockout checks before performing this task.
3. Brief the pilot on the controls (P*) of his duties as explained in the description procedures.

DESCRIPTION:

1. Crew actions.
   a. The MP will perform pilot not on the controls (P) duties during this check. The MP will use the #1 power control lever (in lockout) to attain revolutions per minute rotor (RPM R) settings above 100 percent and closely monitor the collective during lockout operations. The MP should direct the nonrated crewmember (NCM) to assist with AVA operation, clear the aircraft, and maintain airspace surveillance (when available).
   b. The rated crewmember (RCM) and NCM should assist the MP as directed.

   Note. If large variances exist in engine torque factors (ETFs), the MP may elect to use the #2 engine during this task.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual.
   b. Brief the RCM and NCM on conducting the maneuver. The briefing may vary in content, but at a minimum will include the following topics:
      (1) A brief description of the maneuver.
      (2) Directing the RCM to monitor the flight controls, remain focused outside, and minimize flight control inputs.
      (3) The maneuver abort criteria and pertinent limitations
      (4) The proper response to a steady/beeping audio tone.

Note. All references to #1 engine power control lever in MTF manual description may apply to #2 engine power control lever, if appropriate.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4236

Perform autorotation revolutions per minute check

CONDITION: In a H-60 helicopter.

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

1. Select a suitable autorotation area.
2. Accomplish the power recovery above 500 feet above ground level (AGL).
3. Record readings taken in a stabilized autorotational descent, at 80 ±5 knots indicated airspeed (KIAS), in trim, with collective full down.
4. Calculate any revolutions per minute (RPM) correction and necessary adjustment.
5. Verbally confirm all bleed air OFF before performing task.
6. Brief the pilot on the controls (P*) of his duties as explained in procedure description.

DESCRIPTION:

1. Crew actions.
   a. The MP will perform pilot not on the controls (P) duties during this check and will guard the collective any time the rated crewmember (RCM) is on the controls. The MP will brief the RCM and nonrated crewmember (NCM) on conducting the maneuver and any specific crew actions or duties to be performed. The intended check altitude should be determined and target RPM R calculated during the mission-planning phase—but in any case should be determined before initiating the maneuver.
   b. The RCM and NCM should assist the MP as directed.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual.
   b. Brief the RCM and NCM on conducting the maneuver. The briefing may vary in content, but at a minimum will include the following topics:
      (1) Maintaining 80 KIAS in trim.
      (2) The maneuver abort criteria.
      (3) The proper response to a steady/beeping audio tone.
      (4) Not attempting a power recovery until "power recovery" is announced.
      (5) Maintaining main rotor RPM between 90-120 percent.
   c. Direct the NCM to remain secured, assist in clearing the aircraft, and maintain airspace surveillance.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4254

Perform Vh check

CONDITION: In a H-60 helicopter.

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

1. Verbally confirm all bleed air OFF before starting task.
2. MP will monitor collective during this maneuver.
3. Brief the pilot on the controls (P*) of his duties as explained in procedure description.

DESCRIPTION:

1. Crew actions.
   a. The MP will perform pilot not on the controls (P) duties during this check. He should direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as necessary.
   b. The RCM and NCM should assist the MP as directed.
2. Procedures.
   a. Perform the check according to the maintenance test flight (MTF) manual.
   b. Brief the RCM and NCM on conducting the maneuver. The briefing may vary in content, but at a minimum will include the following topics:
      (1) Briefly describe the maneuver.
      (2) Brief RCM on actions to take in the event of engine or stabilator failures.
      (3) State the limitations and abort criteria concerning this maneuver.
   c. Direct the RCM and NCM to assist with maintaining airspace surveillance and to confirm that the maneuver area is clear.

Note. If the high pitch stop is reached before obtaining Vh conditions, recheck the autorotation RPM setting. Although the aircraft autorotation RPM may fall within the allowable ±3 percent RPM R tolerance range, an autorotation RPM adjustment may still be required in the event that the aircraft does not pass the collective high pitch stop portion of the Vh check.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4274

Perform in-flight communication/navigation/flight instruments checks

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) may perform these checks or direct assistance from the rated crewmember (RCM) to perform them, as appropriate. The pilot on the controls (P*) will remain focused outside during the procedures, maneuver as appropriate for the procedure, and maintain airspace surveillance. The MP should direct the nonrated crewmember (NCM) to assist with maintaining airspace surveillance.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures.

   a. Brief the RCM and NCM on conducting the maneuver.

   b. Transfer the flight controls to the RCM as appropriate.

   c. Perform the communication and navigation equipment checks per the detailed procedures in the appropriate aircraft MTF manual section IV.

   d. Confirm proper operation of the flight instruments in checklist sequence by making minor attitude, altitude, and airspeed changes and noting that the flight instruments respond appropriately.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4276

Perform special/detailed procedures

CONDITION: In a H-60 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) should direct assistance from the rated crewmember (RCM) or nonrated crewmember (NCM) as necessary to complete the checks and/or maintain obstacle avoidance or airspace surveillance as appropriate.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures.

   a. Brief the RCM and NCM on conducting the check(s) to be performed.

   b. Perform any required checks for installed equipment when special/detailed procedures are published in section IV of the MTF manual, and for which no specific task has been separately published in TC 1-237 or elsewhere. Use additional reference publications as required.

Note. If these checks are performed during an MP or ME evaluation, the evaluated crewmember should demonstrate a working knowledge of the system, familiarity of published operational checks, and an ability to interpret and apply relevant published charts, graphs, and work sheets.

TRAINING AND EVALUATION REQUIREMENTS:

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

Note. Minimum two tasks from section IV of the MTF manual will be evaluated during annual proficiency and readiness test (APART).

REFERENCES: Appropriate common references.

TASK 4284

Perform engine shutdown checks

CONDITION: In a H-60 helicopter.

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

1. Perform the post flight inspection according to the appropriate aircraft operator's manual/checklist (CL).
2. Determine the aircraft status.
3. Make appropriate entries in the logbook according to DA Pam 738-751.

DESCRIPTION:

1. Crew actions.

    a. The maintenance test pilot (MP) should direct assistance from the rated crewmember (RCM) and nonrated crewmember (NCM) as necessary. The MP will ensure that the post flight inspection is conducted using the appropriate aircraft operator's manual/CL. He may direct the RCM, and NCM if available, to assist with securing and tie-down of the aircraft while he conducts the post-flight inspection. The MP will ensure that the aircraft status is entered in the logbook and that appropriate entries from the maintenance test flight (MTF) check sheet are transcribed to the aircraft forms and historical records per DA Pam 738-751. He will back brief the NCM and/or maintenance support personnel concerning the condition of the aircraft and will coordinate for repairs or corrective adjustments as necessary.

    b. The RCM and NCM should assist the MP as directed.

2. Procedures. Transfer the flight controls to the RCM. Direct the RCM to monitor the flight controls and maintain the tip path level with respect to the airframe. If available, direct the NCM to assist with chocking the gear, locking the external stores racks, and providing feedback concerning droop stop position and shutdown drainage. Guard the collective until both engine power control levers are retarded to IDLE.

    a. Confirm the tail wheel is locked, the parking brake is set, and the rotor disk area is clear. Perform the shutdown steps in sequence.

    b. Review the aircraft forms and records to determine the necessary remedial procedures to be performed resulting from your findings during the mission. Use additional publications and references as necessary.

    c. Perform post-flight check of the aircraft with special emphasis on areas or systems where maintenance was performed (check for security, condition, and leakage as appropriate). Verify all test equipment is removed and secured unless another maintenance test flight requiring the equipment is anticipated. If the mission is complete, close out the MTF check sheet and the mission brief sheet.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4288

Perform gust lock operations

CONDITION: In a H-60 helicopter.

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

1. The maintenance test pilot (MP) will sit in the left seat during this task.
2. Aircraft oriented appropriate for wind conditions, with engine cowling(s) open.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the gust lock engine operation. He will coordinate with, brief, and direct assistance from the rated crewmember (RCM), nonrated crewmember (NCM), and any ground support personnel as necessary. Only one engine at a time will be operated against the gust lock, and at no time shall the engine power control lever of the running engine be advanced beyond the IDLE detent. If available, he should direct the RCM to assist with monitoring the flight controls and systems instruments. The NCM should be directed to assist with fireguard and maintenance operational check (MOC) duties, as appropriate.

   b. The RCM and NCM should assist the MP as directed.

2. Procedures. If winds are over 20 knots, if possible, reposition the aircraft facing into the wind. Do not operate the engine against the gust lock under conditions where main rotor blade safety clearance is inadequate from other aircraft, vehicles, equipment, and buildings or other structures. Do not operate the engine against the gust lock to dry out the engine following an engine flush procedure.

   a. Perform a preflight inspection of the aircraft with special emphasis on areas where maintenance was performed and systems or equipment for which the MOC is being conducted. If available, brief the additional cockpit crewmember on the maintenance test flight (MTF) manual 45-second abort criteria (minus RPM R and Np requirements) and all crewmembers and ground support personnel on procedures to be followed in the event of an emergency. Monitor the flight controls and systems instruments during the engine start sequence, or if available, direct the additional cockpit crewmember to do so.

   b. Confirm the tail wheel is locked, the parking brake is set, and the rotor disk area is clear. Visually confirm the GUST LOCK is IN and the caution capsule is illuminated before initiating the engine start. Guard the collective during the start and throughout engine run procedure.

   c. Visually, or by intercom, reconfirm the location of any crewmembers or support personnel not visible from the cockpit before engine start initiation. Start the engine using the appropriate procedures in the -CL or MTF manual. Start the clock or note the time, and observe the single engine gust lock run time limitation.

Note. During the preflight, inspect the gust lock lever pawl for complete engagement in the drive shaft mating flange. Do not run the engine against the gust lock if the pawl is worn or rounded off, or the pawl is not completely seated in the mating flange when the gust lock lever is in the locked position.

Note. It is recommended that when performing the first start of a newly installed or reinstalled engine with the gust lock engaged that the crewmember(s) performing the leak checks initially observe the engine from the open cabin doorway or the ground—to minimize the risks associated with the potential hazards of sprayed fuel and/or oil or fire. If no fluid leaks are observed, the bleed air portion of the leakage check can be performed on the subsequent start, after the crewmember(s) has safely relocated to the engine cowling area. Engine gust lock operations, with or without personnel stationed on the open engine cowling, should be kept to the minimum time required to adequately perform the checks. Any personnel observing from the engine cowling area should be cautioned to remain below the rotor disk at all times.

Note. Maintain situational awareness. There will be no Np or RPM R indications during a gust lock engine run. Do not advance the engine power control lever beyond IDLE in response to a lack of Np or RPM R indications. The first indication of a gust lock failure is usually a hammering noise resulting from the gust lock pawl being rounded off by the mating flange as the main rotor blades start to turn. Be prepared to immediately shutdown the engine at the first indication of gust lock failure.

SOLO MP CONSIDERATIONS: If no additional cockpit crewmember is available to assist with operating one engine against the gust lock for engine MOC or troubleshooting purposes, at least one NCM or ground support individual must be present and briefed to perform fireguard duties.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

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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 Enhancement 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 himself rather than seek assistance from the other crewmember. It is essential for the PC to brief specific duties before 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 can 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 acknowledgment) or correct 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. Pilot on the controls will divert his attention from outside 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 action that affects the actions of the other crewmembers.

d. **Offer assistance.** Offer assistance for the following: (1) when the pilot on the controls demonstrates difficulty in aircraft control or deviates from normal or expected actions, (2) anytime information or assistance is requested, or (3) 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 acknowledgment 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 little fast.”

g. **Provide aircraft control and obstacle advisories.** Although the pilot on the controls (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 helps 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 pilot in command (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. **Premission planning and rehearsal are accomplished.** Premission 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. Premission 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 mission, enemy, terrain and weather, troops and support available, time available (METT-T) 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 decisionmaking techniques are applied.** Decisionmaking is the act of rendering a solution to a problem and defining a plan of action. It must involve risk assessment. The quality of decisionmaking 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 decisionmaking 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 decisionmaking 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 premission 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 call outs. 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 of intent and request clarification when necessary.

g. **Mission situational awareness is maintained.** This quality considers 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 areas of scanning.

(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 pilot not on the controls (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 or 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 the 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 P first asks the P* if he 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 improvement of 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 as 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 mission and rehearse.** 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. Department of Defense flight information publication (DOD FLIP) contains standard terminology for radio communications. Operator's manuals contain standard terminology for items of equipment. The following is a list of other standard words and phrases that crewmembers may use.

- 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 an enemy.
- Braking–announcement made by the rated crewmember (RCM) who intends to apply brake pressure.
- Break–immediate action command to perform a maneuver to deviate from the present ground track (will be followed by "right" or "left.")

- Call out–command by the P* for a specified procedure to be read from the checklist by 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 a direction (for example, "right" or "slide left"). Also indicates that ground personnel are clear to approach the aircraft.
- Come up/down–command to change altitude up or down.
- Contact–establish communication with… (followed by the name of the element).
- Controls–refers to the 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 unannounced movement of the aircraft (will be followed by direction).
- Egress–immediate action command to get out of the aircraft.
- 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–command to discontinue secure operations.
- Go secure/green–command to activate secure operations.
- Hold–command to maintain present position.
- 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 aircraft.
- In sight–preceded by the word "traffic," "target," "obstacle," or descriptive term. Used to confirm the traffic, target, or obstacle is positively seen or identified.
- Jettison–command for emergency release of a sling load or stores; when followed by "door," indicates the requirement to perform emergency door removal.
- Maintain–command to keep or continue the same.
- Mask–command to conceal aircraft.
- Mickey–have quick time synchronized signal.
- Move forward/backward—command to hover the aircraft forward or backward (followed by distance). Also used to announce intended forward or backward movement.
- Negative–incorrect or permission not granted.
- Negative contact–unable to establish communication with… (followed by the name of the element).
- No joy–target traffic or obstacle not positively seen or identified.
- Now–indicates that an immediate action is required.
- Outside–the primary focus is outside the aircraft.
- Put me up–command to place a frequency in a specific radio.
- Release–command for the planned 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 decrease ground speed.
- Speed up–command to increase ground speed.
- Stand by–wait; duties of a higher priority are being performed and the request cannot be complied with at this time.
- Stop–command to go no further; halt present action.
- Strobe–indicates that the AN/APR-39 has detected a radar threat (will be followed by a clock position).
- Talley–target traffic or obstacle positively seen or identified (will be followed by a repeat of the word target traffic or obstacle and the clock position).
- Target–an alert that a ground target has been spotted.
- Traffic–refers to any friendly aircraft that presents a collision hazard (followed by a clock position, distance, and reference to altitude).
- Troops on/off–command for troops to enter/exit the aircraft.
- Turn–command to deviate from the current heading (will be followed by the word "right" or "left" and a specific heading or rally term).
- Unable–indicates the inability to comply with a specific instruction or request.
- Unmask–command to position the aircraft above terrain features.
- Up on–indicates the radio selected (will be followed by the position number on the intercommunication system (ICS) panel; for example, "Up on 3.")
- Weapons hot/cold/off–indicates weapon switches are in the ARMED, SAFE, or OFF position.
- Wilco–I have received your message and I understand and 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 TRAINING

A-1. This section describes training requirements for crew chief (CE) crewmembers.

A-2. CE 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 the following list of academic training subjects. 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 the following list 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 according to TC 1-210, chapter 3. The following academic training will be included in the commander's written examination:

- Aircrew training program introduction.
- Aircrew coordination training (academic training will be conducted according to current United States Army Aviation Center training support package [USAAVNC TSP]).
- CE qualification written examination.
- Operator's manual written examination.

b. **Flight training.** The CE will be required to demonstrate proficiency in all performance-based tasks listed in the DAY and NIGHT column with an "X" in chapter 2, table 2-5 (page 2-10) and demonstrate crew coordination and airspace surveillance proficiency in all other tasks listed in the DAY and NIGHT column of chapter 2, table 2-4 (page 2-7). Technical tasks listed in chapter 2, table 2-4 and table 2-5 will be completed regardless of flight mode. 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 instructor (SI), or nonrated crewmember instructor (FI) concerning the crewmember's proficiency. This recommendation will be annotated in the remarks section of the crewmembers DA Form 7122-R (*Crewmember Training Record*). If the commander has selected nuclear, biological, and chemical (NBC) 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 TRAINING

A-3. This section describes training requirements for 91W flight medic crewmembers.

A-4. 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 medical officer (MO) must receive sufficient instruction to be knowledgeable in all applicable topics of chapter 3 and the following list. 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 the following list 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 according to TC 1-210, chapter 3. Flight medic academic training subjects include the following:

- Maintenance forms and records.
- MO qualification written examination.
- Aircrew training program introduction.
- Patient care reporting procedures.
- Aircrew coordination training (academic training will be conducted according to the current USAAVNC TSP).
- Operator's manual written examination.
- Medical protocols.

b. **Flight training.** The MO will be required to demonstrate proficiency in all performance-based tasks listed in the DAY and NIGHT column with an "X" in chapter 2, table 2-6 (page 2-11) and demonstrate crew coordination and airspace surveillance proficiency in all other tasks listed in the DAY and NIGHT column of chapter 2, table 2-4 (page 2-7). Technical tasks listed in chapter 2, table 2-4 and table 2-6 will be completed regardless of flight mode. 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 crewmembers 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 INSTRUCTOR AND STANDARDIZATION INSTRUCTOR TRAINING

A-5. This section describes qualification training requirements for FI and SI training.

A-6. QUALIFICATION TRAINING. The unit commander is responsible for conducting FI and SI qualification training according to AR 95-1, TC 1-210, and this aircrew training manual (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 the 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 table A-1 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 table A-1. 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.

Table A-1. Nonrated crewmember instructor academic subjects

System Subjects	Hours	Night and Night Vision Goggle Subjects	Hours
H-60 introduction	1.0	Night operations	2.5
Flight control system	0.5	AN/AVS-6 operations	0.5
Hydraulic system	1.0	Night vision techniques	0.5
Rotor system	0.5	NVG ETP review	2.0
Fuel system	0.5	**Total Hours**	**5.5**
Power plants	1.0		
Auxiliary power plant	1.0	**Academic Subjects**	**Hours**
Power train system	0.5	NCM aircrew training program	8.0
Environmental systems	0.5	In-flight duties	1.0
Utility hydraulic system	0.5	Aeromedical factors	4.0
Landing gear system	0.5	Regulation and publications	1.0
Electrical system	1.0	Aviation life support equipment	1.0
Malfunction analysis	1.0	Aircrew coordination instructor training*	7.0
Internal load operations	0.5	Operating limitations and restrictions	0.5
External load operations	0.5	Refueling operations	0.5
Total hours	**10.5**	**Total hours**	**23.0**
Fundamentals of Instruction Subjects	**Hours**	**MO Subjects**	**Hours**
Instructor fundamentals	2.0	Medical protocols	2.0
Planning Instructional activity	1.0	Medical equipment deployment	2.0
Flight Instructor characteristics and responsibilities	1.0	Patient care documentation	1.0
Total hours	**4.0**	**Total hours**	**5.0**
Total academic hours	**50.0**	**FI qualification written examination**	**2.0**
* This training will be conducted according to current USAAVNC TSP.			

(2) Flight training. The crewmember will be required to demonstrate method of instruction (MOI) proficiency in all tasks listed in chapter 2, table 2-5 (page 2-10) or table 2-6 (page 2-11), as appropriate, 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 according to 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 SIs ability to conduct training and evaluations of other FIs and SIs. His ability to use role reversal is a key element in his 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 (91W) FI qualification.**

(1) Academic training. The crewmember must receive sufficient instruction to conduct training and evaluations in the applicable subjects listed in table A-1 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 table A-1. 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 table A-1. 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 MOI proficiency in all tasks listed in chapter 2, table 2-6 (page 2-11), 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 according to 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. He 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 SIs ability to conduct training and evaluations of other FIs and SIs. His ability to use role reversal is a key element in his training and evaluation process. There is no designated flight training hour requirement; however, all modes of flight will be trained and evaluated.

Appendix B
Aircraft Series Qualification

B-1. ADDITIONAL AIRCRAFT SERIES QUALIFICATION. Additional aircraft series qualifications will be done according to this ATM. A qualified SP, IP, SI, or FI will conduct all qualifications. An entry will be made on the DA Form 7122 upon the completion of the training. At the crewmember's next closeout, the qualification will be documented in Part V remarks section of the DA Form 759.

B-2. UH-60L SERIES QUALIFICATION. Initial UH-60L series qualification may be conducted locally. UH-60L qualification will consist of the following training.

a. **Academic training.** The RCM will receive training and demonstrate a working knowledge of the RCM academic training topics (UH-60L) listed below. TM 1-1520-237-10 is the reference for the following academic training topics:

- Performance planning.
- Operating limitations.
- Emergency procedures.
- T700-GE-701C engines.
- Improved durability gearbox.
- Miscellaneous aircraft improvements.

b. **Flight training.** The RCM will receive 1 hour of flight training in the aircraft. As a minimum, he will perform the tasks in table B-1.

Table B-1. Rated crewmember flight tasks for UH-60L series qualification

Task	Task Title
1010	Prepare a performance planning card
1022	Perform preflight inspection
1024	Perform before-starting-engine through before-leaving-helicopter checks
1070	Respond to emergencies (ENG failure at altitude and ECU/DECU lockout as a minimum)

Flight Instruction	Hours
Qualification training	1.0

B-3. UH-60L SERIES MP/ME QUALIFICATION. Initial UH-60L series MP/ME qualification may be conducted locally by a qualified ME. UH-60L MP/ME qualification will consist of the following training.

a. **Academic Training.** The MP/ME will receive training and demonstrate a working knowledge of the topics listed below. TM 1-1520-237-10 and TM 1-1520-237-MTF are the references for the following MP/ME academic training topics (UH-60L):

- Starting engine checks.

- Engine run-up and system checks.
- Maximum power check.

b. **Flight Training.** The MP/ME will receive 1 hour of flight training in the aircraft. As a minimum, he will perform the tasks listed in table B-2.

c. Flight time listed in table B-2 will not be combined with flight time required by table B-1.

Table B-2. Flight tasks for UH-60L series maintenance test pilot/maintenance test pilot evaluator qualification

Task	Task Title
4088	Perform starting-engine checks
4090	Perform engine run-up and systems checks
4220	Perform maximum power check

Flight Instruction	Hours
Qualification training	1.0

B-4. UH-60Q/HH-60L SERIES QUALIFICATION. Crew requirements for operating the UH-60Q/HH-60L will be according to AR 95-1. Initial UH-60Q/HH-60L series qualification may be conducted locally by a SP, IP SI, or FI qualified in the UH-60Q/HH-60L, as appropriate. UH-60Q/HH-60L qualification will consist of the following training.

a. **Academic training (RCM).** The RCM will receive training and demonstrate a working knowledge of the topics listed below. TM 1-1520-253-10 is the reference for the following academic RCM training topics (UH-60Q/HH-60L).

- Performance planning.
- Operating limitations.
- Emergency procedures.
- Mission medical interior cabin systems.
- UH-60Q/HH-60L avionics systems.
- AMCOM computer based training for MFD/CDU.
- UH-60L academics (if not previously UH-60L qualified).

b. **Academic training (NCM).** The NCM will receive training and demonstrate a working knowledge of the topics listed below. TM 1-1520-253-10 is the reference for the following NCM academic training topics (UH-60Q/HH-60L).

- Cockpit familiarization.
- Emergency procedures.
- Mission medical interior cabin systems.

c. **Ground training (RCM).** Prior to flight training, the RCM will receive 1 hour of static ground training in the aircraft performing tasks 1253 and 1254.

d. **Flight training (RCM).** The RCM will receive 4 hours of flight training in the aircraft to include 1 hour of night unaided (5 hours if designated to fly NVGs on the RCM's DA Form 7120-R. The 1 additional hour will be NVG). As a minimum, he will perform the tasks listed in table B-3.

Table B-3. Rated crewmember flight tasks for UH-60Q/HH-60L series qualification

Task	Task Title
1010	Prepare a performance planning card
1022	Perform preflight inspection
1024	Perform before-starting-engine through before-leaving-helicopter checks
1032	Perform radio communication procedures
1016	Perform internal load operations
1062	Perform slope operations
1070	Respond to emergencies (ENG failure at altitude and ECU/DECU lockout as a minimum)
1162	Perform emergency egress
1168	Perform command instrument system procedures
1253	Operate central display unit
1254	Operate multifunction display

Ground Instruction	Hours
ATM tasks 1253 and 1254	1.0
Flight Instruction	
Qualification training	4.0 day (1.0 night unaided)
NVG (if applicable)	1.0
Total hours	6.0

d. **Flight training (NCM).** The NCM will receive 3 hours of flight training in the aircraft. (4 hours if designated to fly NVGs on the NCM's Commander's Task List, DA Form 7120-R—the 1 additional hour will be NVG). As a minimum, he will perform the tasks listed in table B-4.

Table B-4. Nonrated crewmember flight tasks for UH-60Q/HH-60L series qualification

Task	Task Title
1016	Perform internal load operations
1020	Prepare aircraft for mission
1022	Perform preflight inspection
1024	Perform before-starting-engine through before-leaving-helicopter checks
1032	Perform radio communication procedures
1162	Perform emergency egress
1230	Perform litter and ambulatory patients load, secure and unload procedures
1258	Operate mission medical interior cabin system

Flight Instruction	Hours
Qualification training	3.0 (1.0 night unaided)
NVG (if applicable)	1.0
Total hours	4.0

B-5. UH-60Q/HH-60L SERIES MP/ME QUALIFICATION. Initial UH-60Q/HH-60L series MP/ME qualification may be conducted locally by a qualified ME. UH-60Q/HH-60L MP/ME qualification will consist of the following training.

a. **Academic training.** The MP/ME will receive training and demonstrate a working knowledge of the topics listed below. TM 1-1520-253-10 and TM 1-1520-253-MTF are the references for the following MP/ME academic training topics (UH-60Q/HH-60L):

- Starting engine checks.
- Engine run-up and system checks.
- Maximum power check.

b. **Flight training.** The MP/ME will receive 1 hour of flight training in the aircraft. As a minimum, he will perform the tasks listed in table B-5.

c. Flight time listed in table B-5 will not be combined with flight time required by table B-3.

d. If the aviator is a previously qualified MP/ME in a UH60L aircraft, the 1 hour flight requirement may be reduced at the discretion of the evaluator.

Table B-5. Flight tasks for UH-60Q/HH-60L series maintenance test pilot/maintenance test flight evaluator qualification

Task	**Task Title**
4088	Perform starting engine checks
4090	Perform engine run-up and systems checks
4220	Perform maximum power check

Flight Instruction	**Hours**
Qualification training	1.0
Total hours	1.0

Appendix C

Aviator's Night Vision Imaging System Heads-Up Display

ANVIS HEADS-UP DISPLAY QUALIFICATION TRAINING. Qualification training will provide the aviators with the knowledge, skills, and techniques required to integrate heads-up display (HUD) operations into NVG flight. Training in the aircraft will be with the aviator at a station with access to the flight controls and wearing ANVIS with HUD attached. A HUD-qualified IP, SP, or UT will be at the other station with access to the flight controls. HUD qualification training may be conducted concurrently with NVG refresher and mission training.

> ***Note.*** The academic training and all training flights (except the last one) may be conducted by a HUD-qualified NVG UT providing the RCM receiving the training is designated NVG RL 2. A HUD-qualified NVG IP/SP must conduct the last flight.

> ***Note.*** Once qualified, the RCM has no currency or evaluation requirements for HUD operations, unless specified by the commander. Also, the HUD display is considered supplemental information. Therefore, one RCM may fly with the HUD and the other without. There is no requirement for both RCMs to fly with the HUD, unless specified by the commander. Academic training must be completed before flight training starts.

a. **Academic training**. Using either the HUD computer based trainer (CBT) or other training aids, the trainee will receive instruction in the following subject areas:

- AN/AVS-7 HUD system components.
- HUD symbology.
- HUD system operations (programming, adjusting, and operating).

> ***Note.*** After completing the academic training, the trainee will receive an evaluation on HUD symbology and HUD operations. This evaluation may be either a written evaluation or a practical exercise evaluation using the CBT or a HUD-modified SFTS.

b. **HUD flight training.** There are two flight training programs available depending on access to a HUD-modified SFTS. These programs outline the minimum flight requirements for HUD qualification. Some RCMs may require additional flight periods to achieve a satisfactory level of proficiency with the ANVIS HUD. ANVIS HUD training requires the RCM to develop new scanning habits. Time must be allowed to absorb this new information and develop the new scan patterns. Therefore, training days will not be combined. Each aircraft training day will be completed in sequence on a separate night.

(1) HUD qualification. Units using a HUD-modified SFTS will use the training program in table C-1.

Table C-1. Heads-up display qualification using SFTS			
Training day	***1***	***2***	***3***
Aircraft		1.2	1.2
SFTS	(1.5)*		
Cumulative	(1.5)*	1.2	2.4
*(1.5) indicates 1.5 hours of time logged in a HUD-modified SFTS. This must be done before the first aircraft flight if the SFTS program is used to conduct qualification.			

(2) HUD qualification. Units not using a HUD-modified SFTS will use the training program in table C-2.

Table C-2. Heads-up display qualification without using SFTS			
Training Day	***1***	***2***	***3***
Aircraft	(1.0)*	1.5	1.5
Cumulative	(1.0)*	1.5	3.0
*(1.0) indicates 1 hour of static aircraft training in HUD programming and operations. This must be completed before the first flight. This may be reduced to 0.5 hour if the trainee has demonstrated proficiency in HUD programming and operations with the CBT. ***Note.*** As an option, units may conduct the flight training as three 1-hour flights. The first flight may be performed immediately following the static aircraft training period.			

Appendix D

Aircraft System/Equipment Qualification

D-1. ADDITIONAL SYSTEM QUALIFICATIONS. During system qualifications, RL status will not be affected. Additional systems qualifications will be conducted according to the appropriate TSP, new equipment training (NET), Interim Statement of Airworthiness Qualification, or AWR, as applicable. If a TSP is applicable, it may be obtained by writing to Commander, U.S. Army Aviation Center, ATTN: ATZQ-TDS-T, Fort Rucker, Alabama 36362-5000. As new equipment is fielded, the level of training required will be determined by Commander, U.S. Army Aviation Center, Fort Rucker, Alabama. A qualified SP, IP, SI or FI will conduct all qualifications. Document additional qualifications on Part V, remarks section of DA Form 759 (*Individual Flight Record and Flight Certificate—Army*) closeout and DA Form 7122-R (*Crew Member Training Record)*.

D-2. EXTENDED RANGE FUEL SYSTEM QUALIFICATION TRAINING. The ERFS TSP outlines procedures that units will use for initial ERFS qualification. The TSP may be obtained by writing to Commander, U.S. Army Aviation Center, ATTN: ATZQ-TDS-T, Fort Rucker, Alabama 36362-5000. ERFS qualification will consist of the following training.

a. **Academic training.** The crewmember will receive training and demonstrate a working knowledge of the topics in table D-1.

Table D-1. Extended range fuel system academic training for crewmembers

ESSS/ERFS Academic Instruction	Hours
ESSS/ERFS familiarization	1.0
ESSS/ERFS preflight, system test, and operation	2.0
ERFS fault analysis	1.0
ERFS airworthiness, limitations, handling qualities	2.0
ERFS emergency procedures	1.0
ERFS performance planning and weight and balance*	1.0
Total Hours	**8.0**

*This applies to RCMs only.

b. **Flight training.** The crewmember will receive 1 to 3 hours of flight training in the aircraft. As a minimum, he will perform the tasks listed in table D-2. Flight training will be conducted with the appropriate amount of fuel in the main and external fuel tanks to demonstrate the performance and handling qualities of the aircraft.

Table D-2. Flight tasks for initial external stores support system qualification

Tasks	Task Titles
1010	Prepare a performance planning card*
1012	Verify aircraft weight and balance*
1020	Prepare aircraft for mission
1022	Perform preflight inspection
1024	Perform before-starting-engine through before-leaving-helicopter checks
1028	Perform hover power check*
1034	Perform ground taxi*
1038	Perform hovering flight*
1040	Perform VMC takeoff*
1048	Perform fuel management procedures
1052	Perform VMC flight maneuvers*
1058	Perform VMC approach*
1062	Perform slope operations
1064	Perform a roll-on landing*
1070	Respond to emergencies
1114	Perform a rolling takeoff*
2066	Perform extended range fuel system operations*
Total hours: 1.0 - 3.0	
*These tasks are performed by RCMs only.	

D-3. VOLCANO QUALIFICATION TRAINING. The Volcano TSP outlines procedures that units will use for initial volcano qualification. The TSP may be obtained by writing to Commander, U.S. Army Aviation Center, ATTN: ATZQ-TDS-T, Fort Rucker, Alabama 36362-5000. This training provides the crewmember with the knowledge, skills, and techniques required for installation, loading, preflight, in-flight system operations, emergency procedures, and basic employment considerations associated with Volcano. Volcano qualification will consist of the following training.

a. **Academic training.** Crewmembers will receive training and demonstrate a working knowledge of the topics in table D-3.

Table D-3. Volcano academic training

Volcano Academic Training	Hours
Volcano introduction and familiarization	2.0
Fault analysis/emergency procedures and limitations	1.0
Preflight	1.0
Performance planning, drag, and weight and balance*	2.0
Employment doctrine/plan scenario*	1.0
Pre-installation requirements	0.5
Installation procedures	2.5
Loading and unloading	0.5
Programming the system	1.0
Total Hours	11.5
*These apply to RCMs only.	

b. **Fight Training.** The crewmember will receive 2 hours of flight training followed by a 1 hour evaluation flight in the aircraft. As a minimum, he will perform the tasks listed in table D-4.

Table D-4. Volcano flight training

Task	**Task Title**
1010	Prepare a performance planning card*
1012	Verify aircraft weight and balance*
1020	Prepare aircraft for mission
1022	Perform preflight inspection
1024	Perform before-starting-engine through before-leaving-helicopter checks
1028	Perform hover power check*
1034	Perform ground taxi*
1038	Perform hovering flight*
1040	Perform VMC takeoff*
1048	Perform fuel management procedures
1052	Perform VMC flight maneuvers*
1058	Perform VMC approach*
1062	Perform slope operations*
1064	Perform roll-on landing*
1070	Respond to emergencies*
1114	Perform a rolling takeoff*
2070	Perform M-139 Volcano operations
Flight Instruction	2.0
Evaluation	1.0
Total Hours	3.0

*These tasks are performed by RCMs only.

Note. Evaluation may be continuous.

Note. One hour will be conducted under NVGs, if designated to fly NVGs on DA Form 7120-R.

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Glossary

SECTION I – ACRONYMS AND ABBREVIATIONS

AC	alternating current
ACCUM	accumulator
ACLS	advanced cardiac life support
ADF	automatic direction finder
AED	automated external defibrillator
AFCS	automatic flight control system
AFMS	auxiliary fuel management system
AGL	above ground level
AHO	above highest obstacle
AIM	aeronautical information manual
ALSE	aviation life support equipment
ALT	altitude, altimeter
AMC	air mission commander
AMCOM	aviation and missile command
AMP	amplifier
ANVIS	aviator's night vision imaging system
APART	annual proficiency and readiness test
APU	auxiliary power unit
ARNG	Army national guard
ASE	aircraft survivability equipment
ASR	airport surveillance radar
ATC	air traffic control
ATF	aircraft torque factor
ATIS	automatic terminal information service
ATM	aircrew training manual
ATP	aircrew training program
attn	attention
AUTO	automatic
AVA	aviation vibration analyzer
AWR	airworthiness release
BATT	battery
BIT	built-in test

BTLS	basic trauma life support
C	Celsius
CBAT	computer based ASE trainer
CBI	computer based instruction
CBT	computer based trainer
CDU	central display unit
CE	crew chief
CEFS	crashworthy external fuel system
CG	center of gravity
CHUM	chart updating manual
CI	cockpit indicators
CIS	command instrument system
CL	checklist
CLC	calculator
COM	communication
COMSEC	communication security
CONTR	control
CT	critical torque
CTL	commander's task list
d	day
DA	Department of the Army
DAC	Department of the Army civilian
DC	direct current
DCU	dispenser control unit
DD	Department of Defense
DECR	decrease
DECU	digital electronic control unit
DEG	degree
DETR	detector
DF	direction finder
DGNS	Doppler global positioning system navigation system
DH	decision height
DIR	direct
DME	distance measuring equipment
DOD	Department of Defense
DOT	Department of Transportation
DSP	droop stop pounding

DTAC	Digital Training Access Center
DTD	data transfer device
DTG	date-time group
E3	electromagnetic environmental effects (JP1-02)
EAT	external air transportability
ECCM	electronic counter-countermeasures
ECM	electronic countermeasures
ECS	electronic control system
ECU	environmental control unit
EGI	embedded global positioning system/inertial navigation system
ELA	en route low altitude
EMS	emergency medical services
EMT-B	emergency medical technician-basic
EMT-I	emergency medical technician-intermediate
EMT-P	emergency medical technician-paramedic
ENG	engine
ERFS	extended range fuel system
ESSS	external stores support system
ETA	estimated time of arrival
ETE	estimated time en route
ETF	engine torque factor
ETL	effective translational lift
FAA	Federal Aviation Administration
FAC	flight activity category
FAF	final approach fix
FAR	Federal Aviation regulation
FARE	forward area refueling equipment
FARP	forward arming and refueling point
FAT	free air temperature
FI	nonrated crewmember instructor
FIH	flight information handbook
FLIP	flight information publication
FLIR	forward looking infrared
FM	field manual
FOV	field of view
FPM	feet per minute

FPN	flight plan
FPS	flight path stabilization
FRIES	fast-rope infiltration/exfiltration system
ft	feet
FT/MIN	feet per minute
GCU	generator control unit
GEN	generator
GPS	global positioning system
GWT	gross weight
HAL	height above landing
Hg	mercury
HIRTA	high intensity radio transmission area
HIT	health indicator test
HMMWV	high-mobility multipurpose wheeled vehicle
HMU	hydromechanical unit
HP	pressure altitude (height pressure)
HR	hour
HSI	horizontal situation indicator
HUD	heads-up display
HYD	hydraulic
IAF	initial approach fix
IAS	indicated airspeed
IATF	individual aircrew training folder
ICP	interface control panel
ICS	intercommunication system
IE	instrument examiner
IF	intermediate approach fix
IFF	identification, friend or foe
IFR	instrument flight rules
IFRF	individual flight records folder
IGE	inground effect
IIMC	inadvertent instrument meteorological condition
ILS	instrument landing system
IMC	instrument meteorological condition
IND	indicator
INI	initialization
IP	instructor pilot

IR	infrared
IRP	intermediate rated power
ITO	instrument takeoff
IV fluids	intravenous fluids
JOG	joint operations graphic
JSIR	joint spectrum interference resolution (JP1-02)
KIAS	knots indicated airspeed
km	kilometer
KPH	kilometers per hour
kts	knots
LAT	latitude
LONG	longitude
LSE	landing signal enlisted
LZ	landing zone
MAHF	missed approach holding fix
MAP	missed approach point
MAX	maximum
MCP	maximum continuous power
MDA	minimum descent altitude
ME	maintenance test pilot 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
MFD	multifunction display
MIJI	meaconing, interference, jamming, and intrusion
MIN	minimum, minute
MISC	miscellaneous
MO	medical officer (flight)
MOC	maintenance operational check
MOI	method of instruction
MOPP	mission-oriented protective posture
MOS	military occupational specialty
MP	maintenance test pilot
MSA	minimum safe altitude
MSL	mean sea level

MTF	maintenance test flight
NA	not applicable
NAV	navigation
NAVAID	navigational aids
NBC	nuclear, biological, and chemical
NCM	nonrated crewmember
NDB	nondirectional beacon
NET	new equipment training
Ng	engine gas generator speed
NGR	National Guard regulation
NM	nautical mile
NOE	nap of the earth
NOTAM	notice to airmen
NREMT-B	National Registry of Emergency Medical Technician-Basic
NREMT-I	National Registry of Emergency Medical Technician-Intermediate
NREMT-P	National Registry of Emergency Medical Technician-Paramedic
NVD	night vision device
NVG	night vision goggle
NVS	night vision system
OBOGS	onboard oxygen generation system
ODS	oxygen delivery system
OGE	out of ground effect
OIS	obstacle identification surface
OR	observer
OROCA	off route obstruction clearance altitude–continental United States
ORTCA	off route terrain clearance altitude–outside the continental United States
OVSPD	overspeed
P	pilot not on the controls
P*	pilot on the controls
PA	pressure altitude
PALS	pediatric advance life support
PAR	precision approach radar
PC	pilot in command
PDU	pilot display unit

PFE	proficiency flight evaluation
PHTLS	advanced prehospital trauma life support
PI	pilot
PLGR	precision lightweight global positioning system receiver
PLS	Personnel Locater System
POI	program of instruction
POS	position
PPC	performance planning card
PPS	precise positioning system
PRI	primary
PWR	power
PZ	pickup zone
QTY	quantity
R position	right position
R/C	rate of climb
RCM	rated crewmember
RETRAN	retransmission
RL	readiness level
RL 1	readiness level 1
RL 2	readiness level 2
RL 3	readiness level 3
ROC	required obstacle clearance
ROE	rules of engagement
RPG	rocket-propelled grenade
RPM	revolutions per minute
RPM R	revolutions per minute rotor
RSVR	reservoir
RTR	rotor
SACMS-VT	semiannual combat medic skills-validation test
SAS	stability augmentation system
SAS 1	stability augmentation system 1
SAS 2	stability augmentation system 2
SAT	system approach to training
SCATMINWARN	scatterable minefield warning
SE	single engine
SEL	select
SFTS	synthetic flight training systems

SI	standardization instructor
SM	statute mile
SMGW	simulated maximum gross weight
SOI	signal operating instructions
SOP	standing operating procedure
SP	standardization instructor pilot
SPIES	special patrol infiltration/exfiltration system
SQ FT	square feet
STG	synthetic target generator
STS	standard transfer specification
SVO	servo
TACAN	tactical air navigation
TAS	true airspeed
TC	training circular
TDH	time distance heading
TEMP	temperature
TERPS	terminal instrument procedures
TGT	turbine gas temperature
TM	technical manual
TR	torque ratio
TRANS	transmit
TRQ	torque
TSP	training support package
TTV	target torque value
U.S.	United States
USAASA	United States Army Aeronautical Services Agency
USAASD-E	United States Army Aeronautical Services Agency Detachment-Europe
USAAVNC	United States Army Aviation Center
USAR	United States Army Reserve
UT	unit trainer
VFR	visual flight rules
VIDS	vertical instrument display system
VMC	visual meteorological conditions
Vne	velocity never exceed (airspeed limit)
VOR	VHF omnidirectional range radio beacon
VSI	vertical situation indicator

WOW	weight on wheels
XFD	crossfeed

SECTION II – TERMS

ΔF	Change in flat plate drag area
ΔTRQ	Change in torque
DRAG	Force of aerodynamic resistance caused by the violent currents behind the shock front (JP1-02)
MACH	The ratio of an aircraft's true speed as compared to the local speed of sound at a given time or place
Np	Power turbine speed
Nr	Rotor speed
ram-air	Any air system which uses the air pressure created by vehicle motion to increase the air pressure inside of the engine.
Vh	Maximum airspeed in level flight with maximum continuous power being applied

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READINGS RECOMMENDED

These readings contain relevant supplemental information.

None

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27 September 2005

By order of the Secretary of the Army:

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