TC 3-04.35

AIRCREW TRAINING MANUAL, UTILITY HELICOPTER, MI-17 SERIES

March 2010

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HEADQUARTERS

DEPARTMENT OF THE ARMY

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Change 1

Headquarters
Department of the Army
Washington, DC, 31 August 2010

Aircrew Training Manual, Utility Helicopter, MI-17 Series

1. Change TC 3-04.35, March 2010, as follows:

Remove old pages:	**Insert new pages:**
2-1 and 2-2	2-1 and 2-2
3-7 through 3-10	3-7 through 3-10
4-5 and 4-6	4-5 and 4-6
A-1 through A-4	A-1 through A-4

2. A star (*) marks new, changed, or location of deleted material.

3. File this transmittal sheet in front of the publication.

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

Joyce E. Morrow

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Administrative Assistant to the
Secretary of the Army
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Training Circular
No. TC 3-04.35

Headquarters
Department of the Army
Washington, DC, 24 March 2010

AIRCREW TRAINING MANUAL, UTILITY HELICOPTER, MI-17 SERIES

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Preface

This aircrew training manual (ATM) standardizes aircrew training programs (ATPs) and flight evaluation procedures. This manual provides specific guidelines for executing Mi-17 aircrew training. It is based on the battle-focused training principles outlined in field manual (FM) 7-1. It establishes crewmember qualification, refresher, mission, and continuation training and evaluation requirements. This manual applies to all Mi-17 crewmembers and their commanders.

This is not a stand-alone document. All requirements of Army regulations (ARs) and training circular (TC) 3-04.11 must be met. This manual is the governing authority for training and flight evaluation purposes only if differences exist between the maneuver descriptions in the operator's manual and this ATM. The operator's manual is the governing authority for the operation of the aircraft. Implementing this manual conforms to AR 95-1 and TC 3-04.11.

This manual, in conjunction with the ARs and TC 3-04.11, will help develop a comprehensive ATP. Using this ATM ensures individual crewmember and aircrew proficiency is commensurate with the unit's mission and aircrews routinely employ standard techniques and procedures.

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

Standardization officers, evaluators, and unit trainers will use this manual and TC 3-04.11 as the primary tools in assisting commanders with development and implementation of their ATP.

This publication applies to the Active Army, the Army National Guard/Army National Guard of the United States, and the United States Army Reserve unless otherwise stated.

The proponent of this publication is the United States Army Training and Doctrine Command (TRADOC). Send comments and recommendations on Department of the Army (DA) Form 2028 (Recommended Changes to Publications and Blank Forms) through the aviation unit commander to Commander, United States Army Aviation Center of Excellence (USAACE), ATTN: ATZQ-TDT-F, Fort Rucker, Alabama 36362-5000, or direct e-mail questions to ruck.ATZQ-TDT-F@conus.army.mil.

This publication implements portions of Standardization Agreement (STANAG) 3114 (Edition 8).

This publication has been reviewed for operations security considerations.

Chapter 1

Introduction

This ATM describes training requirements for crewmembers. It will be used with AR 95-1, AR 600-105, AR 600-106, TC 3-04.11, and other applicable publications. The tasks in this ATM enhance training in individual and aircrew proficiency. This training focuses on tasks supporting the unit's mission. The scope and level of training to be achieved, individually by crewmembers and collectively by aircrews, are dictated by the mission essential task list (METL). Commanders must ensure aircrews are proficient in METL.

1-1. CREW STATION DESIGNATION. The commander will designate a crew station(s) for each crewmember. The individual's commander's task list (CTL) must clearly indicate all crew station designations. Training and proficiency sustainment for rated crewmembers (RCMs) are required in each designated crew station with access to the flight controls. Standardization instructor pilots (SPs), instructor pilots (IPs), instrument examiners (IEs), and aviators designated to fly from both pilot seats are evaluated, in each seat, during annual proficiency and readiness test (APART) evaluations. Maintenance test pilot evaluators (MEs) and maintenance test pilots (MPs) will follow chapter 5 for crew station requirements and evaluations. However, not all tasks must be evaluated in each seat. Sustainment training for nonrated crewmembers (NCMs) is required in each designated crew station. NCMs are required to be evaluated from all designated crew stations during the APART, but are not required to be evaluated in all tasks from each station.

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 important and critical instructions.

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

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

(c) ***Note.*** A note highlights essential information of a non-threatening nature.

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

(a) Will, shall, or must indicate a mandatory requirement.

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

(c) May or can indicate an acceptable method of accomplishment.

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

(1) A night vision system (NVS) refers to a system attached to the aircraft.

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

(3) NVD refers to NVS or NVG.

d. **Personnel terminology.**

(1) The RCM is an aviator. Therefore, the terms "rated crewmember," "aviator," and "pilot" are used synonymously.

(2) Pilot in command (PC). The PC has overall responsibility for the operation of the aircraft from premission planning to mission complete and assigns duties to the crew, as necessary. Additionally, he or she is the primary trainer of pilots (PIs) in the development of experience and judgment.

(3) Pilot. The PI will complete all tasks assigned by the PC.

(4) Unit trainer (UT). The UT is a specialized trainer (RCM or NCM) appointed by the commander to assist with unit training. The UT trains readiness level (RL)-2 crewmembers in mission/additional tasks according to the ATM and unit METL. To be qualified as an UT, the crewmember must demonstrate a higher level of knowledge, proficiency and the ability to train other crewmembers in accordance with the IPs handbook.

(5) Instructor pilot. The IP trains and evaluates RCM and NCM, as directed by the commander. The IP may evaluate an IP/SP during primary flight examiner (PFE) resulting from a lapse in aircraft or NVD currency.

(6) Instrument examiner (IE). The IE trains and evaluates instrument tasks, as directed by AR 95-1 and local requirements.

(7) Standardization instructor pilot. The SP trains and evaluates RCM and NCM and supervises and maintains the standardization program.

(8) Maintenance test pilot. The MP conducts maintenance test flight procedures in accordance with chapter 5.

(9) Maintenance test pilot evaluator. The ME trains and evaluates MPs and MEs in accordance with chapter 5.

(10) Nonrated crewmember. The NCM is a nonaviator who performs operation essential duties aboard an aircraft.

(11) Crew chief (CE). The CE assists the flight engineer (FE) with maintaining his assigned aircraft and performs NCM duties.

(12) FE. The FE maintains his assigned aircraft and performs NCM duties. The FE is the supervisor and primary trainer for the CE and mechanics assigned to that aircraft. The commander selects NCMs to perform FE duties based on proficiency and experience.

Note. Unless otherwise specified, the abbreviation CE in the task descriptions refers to either the crew chief or the flight engineer.

(13) Nonrated crewmember flight engineer instructor (FI). The nonrated crewmember FI trains and evaluates nonrated crewmembers in aircraft tasks according to the ATM and unit METL. To qualify as an FI, the crewmember must meet the requirements of AR 95-1.

(14) Nonrated crewmember standardization instructor (SI). The SI trains and evaluates NCMs, FIs, and other SIs. The SI assists the unit SP with supervising and maintaining the standardization program. To qualify as an SI, the crewmember must meet the requirements of AR 95-1.

(15) Noncrewmember. These individuals perform duties directly related to the in-flight mission of the aircraft, but not essential to the operation of the aircraft. AR 600-106 lists the categories for noncrewmember positions and the number authorized in each unit. Noncrewmembers may perform CE/FE/UT/FI/SI duties while on noncrewmember flight status if they are military occupational specialty qualified and fully integrated into the commander's ATP. Additionally, noncrewmembers are trained and designated to perform those duties for NCMs who are unable to fly.

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Chapter 2

Training

This chapter describes requirements for qualification, RL progression, and continuation training. Crewmember qualification requirements will be in accordance with AR 95-1, TC 3-04.11, and this ATM.

2-1. QUALIFICATION TRAINING.

a. **Initial aircraft qualification.**

(1) *RCM. Initial aircraft qualification training in the Mi-17 is conducted at USAACE and DA-approved training sites, in accordance with a USAACE approved program of instruction (POI) or original equipment manufacturer (OEM) training facilities.

(2) *NCM. Aircraft qualification training for NCMs is conducted at the unit according to appendix A, applicable regulations, and the commander's ATP.

b. **NVG qualification.** Initial NVG qualification and aircraft NVG qualification will be in accordance with TC 3-04.11, the USAACE NVG training support package (TSP), and this ATM. The NVG TSP may be obtained by writing to Commander, USAACE ATTN: ATZQ-TDS-O, Fort Rucker, Alabama 36362-5000 or e-mail ATZQ-ATB-NS@conus.army.mil.

(1) Initial NVG qualification. Initial qualification will be conducted at the USAACE or DA-approved training site according to the USAACE-approved POI or locally using the USAACE NVG exportable training package (ETP).

(2) Aircraft NVG qualification.

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

(b) Flight training. The crewmember will receive training and demonstrate a working knowledge of the topics in paragraph 3-4b (7) and (10).

c. **Minimum flight hours (RCM).** There are no minimum flight hour requirements. The qualification is proficiency based, determined by the crewmember's ability to satisfactorily accomplish the designated tasks. NCMs will meet the minimum flight hour requirements outlined in Appendix A.

2-2. REFRESHER TRAINING. Crewmembers are designated RL 3 when they meet the criteria of TC 3-04.11.

a. **Aircraft refresher training.**

(1) Academic training. The crewmember will receive training and demonstrate a working knowledge of the applicable topics listed in paragraph 3-3b (items 1 to 5) and complete an operator's manual written examination.

(2) Flight training. The crewmember will receive training from all designated crew stations. A task performed from either crew station does not need to be evaluated from both stations. Tables 2-1 and 2-2 (page 2-2) are guides for developing refresher flight training. Proficiency must be demonstrated in all modes marked with an **X** in the "**D**," "**I**," and "**N**" columns of tables 2-4 or 2-5 (pages 2-5 to 2-7), as applicable. Actual hours will be based on individual crewmember proficiency. The evaluation may be continuous.

(3) Refresher training as a result of a training or evaluation deficiency. Academic and flight training required as a result of a training deficiency or an unsatisfactory evaluation will consist of the academic training, flight training, and evaluation required to regain proficiency. The evaluation will at a minimum consist of the deficient task(s) and any other tasks selected by the commander or the evaluator. There is no requirement to complete the entire refresher training program outlined in this ATM as a result of a training or evaluation deficiency. The evaluation may be continuous.

Table 2-1. Refresher flight training guide (rated crewmembers)

Flight Instruction	*Hours*
Day and night base task training	6.0
Flight evaluation	2.0
*Instrument base task training (aircraft/simulator)	2.0
Instrument evaluation	2.0
Total hours	**12.0**
*Recommend a minimum of 2 hours of instrument base task training be in the aircraft.	

Table 2-2. Refresher flight training guide (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.**

(1) Academic training. The crewmember will receive training and demonstrate a working knowledge of the applicable topics in paragraph 3-4b (7) and (10).

(2) Flight training. The crewmember will receive training and demonstrated proficiency in all base tasks marked with an **X** in the NVG column of tables 2-4 or 2-5 (pages 2-5 to 2-7), as applicable. The commander may select additional base tasks.

(3) Minimum flight hours. There are no minimum flight hour requirements. The training is proficiency based, determined by the crewmember's ability to accomplish the designated tasks satisfactorily.

2-3. MISSION TRAINING. Crewmembers are designated RL 2 when they meet the criteria of TC 3-04.11.

a. **Training requirements.**

(1) Mission training. Mission training programs help RL-2 crewmembers develop the ability to perform specific tasks selected by the commander to support the unit's METL.

(a) Academic training. The crewmember will receive training and demonstrate a working knowledge of the topics listed in paragraphs 3-4b (8) and (9).

(b) Flight training. The training will consist of those mission tasks in table 2-3 as selected by the commander and additional tasks necessary to complete the unit's mission. This training may be conducted by a UT. The crewmember will receive training from all designated crew stations. A task performed from either crew station does not need to be evaluated from both stations. Flight mission-training hour requirements are based on demonstrated proficiency. The evaluation must be conducted by an SP, IP, SI, or FI and may be continuous.

Table 2-3. Mission training task list (rated/nonrated crewmember)

Task	*Task Title*
2010	Perform Multi-Aircraft Operations
2022	Transmit a Tactical Report
2024	Perform Terrain Flight Navigation
2026	Perform Terrain Flight
2036	Perform Terrain Flight Deceleration
2042	Perform Actions on Contact
2048	Perform Sling Load Operations
2052	Perform Water Bucket Operations
2054	Perform Fast-Rope Insertion and Extraction System (FRIES) Operations
2056	Perform Rappelling Operations

Table 2-4. Task list (rated crewmember)

<table>
<tr><td colspan="7">Legend
D - Tasks performed during day flight.
I - Tasks performed during instrument flight.
N - Tasks performed during unaided night flight. The tasks selected in this column do not need to be evaluated during the standardization evaluation. If tasks are evaluated at night, it will suffice for tasks required in day conditions.
NVG - Tasks performed during NVG flight. Tasks evaluated while using NVG will suffice for tasks required in day conditions.
S, I, or NG in the EVAL column- Mandatory tasks for standardization, instrument, or annual NVG flight evaluations respectively.
Performance tasks are in upper case and bold.
Technical tasks are in lower case and plain type.</td></tr>
<tr><th>Task</th><th>Task Title</th><th>D</th><th>I</th><th>N</th><th>NVG</th><th>EVAL</th></tr>
<tr><td>1000</td><td>Participate in a Crew Mission Briefing</td><td colspan="4">X</td><td>S,I,NG</td></tr>
<tr><td>1004</td><td>Plan a Visual Flight Rules Flight</td><td>X</td><td></td><td>X</td><td>X</td><td>S</td></tr>
<tr><td>1006</td><td>Plan an Instrument Flight Rules Flight</td><td></td><td>X</td><td></td><td></td><td>I</td></tr>
<tr><td>1010</td><td>Prepare a Performance Planning Card</td><td colspan="4">X</td><td>S</td></tr>
<tr><td>1012</td><td>Verify Aircraft Weight and Balance</td><td colspan="4">X</td><td>S</td></tr>
<tr><td>1013</td><td>Operate Mission Planning System</td><td colspan="4">X</td><td>S, I, NG</td></tr>
<tr><td>1016</td><td>Perform Internal Load Operations</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 or I</td></tr>
<tr><td>1024</td><td>Perform Before-Starting Engine through Before-Leaving Helicopter Checks</td><td colspan="4">X</td><td>S, NG</td></tr>
<tr><td>1026</td><td>Maintain Airspace Surveillance</td><td colspan="4">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 Communication 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, NG</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, NG</td></tr>
<tr><td>1046</td><td>Perform Electronically Aided Navigation</td><td colspan="4">X</td><td>S</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>S, NG</td></tr>
<tr><td>1054</td><td>Select Landing Zone/Pickup Zone/Holding Area</td><td>X</td><td></td><td>X</td><td>X</td><td>S, NG</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></td><td>X</td><td>S, NG</td></tr>
<tr><td>1064</td><td>Perform 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, NG</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, NG</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, NG</td></tr>
<tr><td>1155</td><td>Negotiate Wire Obstacles</td><td>X</td><td></td><td></td><td>X</td><td>S, NG</td></tr>
<tr><td>1162</td><td>Perform Emergency Egress</td><td>X</td><td></td><td></td><td></td><td>S</td></tr>
<tr><td>1166</td><td>Perform Instrument Maneuvers</td><td></td><td>X</td><td></td><td></td><td>I</td></tr>
<tr><td>1170</td><td>Perform Instrument Takeoff</td><td></td><td>X</td><td></td><td></td><td>I</td></tr>
</table>

Table 2-4. Task list (rated crewmember)

<table>
<tr><td colspan="7">Legend
D - Tasks performed during day flight.
I - Tasks performed during instrument flight.
N - Tasks performed during unaided night flight. The tasks selected in this column do not need to be evaluated during the standardization evaluation. If tasks are evaluated at night, it will suffice for tasks required in day conditions.
NVG - Tasks performed during NVG flight. Tasks evaluated while using NVG will suffice for tasks required in day conditions.
S, I, or NG in the EVAL column- Mandatory tasks for standardization, instrument, or annual NVG flight evaluations respectively.
Performance tasks are in upper case and bold.
Technical tasks are in lower case and plain type.</td></tr>
<tr><td>1174</td><td>Perform Holding Procedures</td><td></td><td>X</td><td></td><td></td><td>I</td></tr>
<tr><td>1176</td><td>Perform Nonprecision Approach</td><td></td><td>X</td><td></td><td></td><td>I</td></tr>
<tr><td>1178</td><td>Perform Presision Approach</td><td></td><td>X</td><td></td><td></td><td>I</td></tr>
<tr><td>1180</td><td>Perform Emergency Global Positioning System Recovery Procedure</td><td></td><td>X</td><td></td><td></td><td></td></tr>
<tr><td>1182</td><td>Perform Unusual Attitude Recovery</td><td>X</td><td>X</td><td></td><td>X</td><td>S, I</td></tr>
<tr><td>1184</td><td>Respond to Inadvertent Instrument Meteorologicial Conditions</td><td>X</td><td></td><td>X</td><td>X</td><td>S, NG</td></tr>
<tr><td>1188</td><td>Operate Aircraft Survivability Equipment</td><td>X</td><td></td><td></td><td></td><td>S</td></tr>
<tr><td>1190</td><td>Perform/Identify Hand and Arm Signals</td><td colspan="4">X</td><td></td></tr>
<tr><td>1194</td><td>Perform Refueling Procedures</td><td colspan="4">X</td><td></td></tr>
<tr><td>1202</td><td>Perform Auxiliary Power Unit Operations</td><td colspan="4">X</td><td>S</td></tr>
<tr><td>1262</td><td>Participate in a Crew Level After-Action Review</td><td>X</td><td>X</td><td>X</td><td>X</td><td>S,I,NG</td></tr>
<tr><td>2081</td><td>Operate Night Vision Goggles</td><td></td><td></td><td></td><td>X</td><td>NG</td></tr>
<tr><td>2092</td><td>Respond to Night Vision Goggle Failure</td><td></td><td></td><td></td><td>X</td><td>NG</td></tr>
</table>

(2) NVG mission training. NVG mission training will be according to the commander's training program which specifies tasks. When commanders determine a requirement for using NVG in mission profiles, they must specify mission tasks to support the unit's METL. Before undergoing NVG mission training, the crewmember must complete qualification or refresher training and must be NVG current in the Mi-17.

(a) Academic training. The crewmember will receive training and demonstrate a working knowledge of the subject areas in paragraphs 3-4b (7) through (10) and additional subject areas selected by the commander.

(b) Flight training. The crewmember will receive flight training and demonstrate proficiency in the mission and additional NVG tasks, as specified on the task list for the crewmember's position.

(3) MP and ME mission training. MPs and MEs should be limited to duties in one primary and one alternate (or additional) aircraft. The MP/ME will complete tasks outlined in table 2-6 (page 2-7) and should be required to complete those mission/additional tasks selected by the commander. Crewmembers undergoing training in the aircraft must fly with an ME for maintenance training.

(a) Academic training. The MP will receive training and demonstrate a working knowledge of the topics listed in paragraph 3-4b (11).

(b) Flight training. The MP/ME will receive flight training and demonstrate proficiency in all tasks in table 2-6 (page 2-7). See chapter 5 for more guidance.

b. **Minimum flight hours.** There are no minimum flight hour requirements. Training is proficiency based and determined by the crewmember's ability to accomplish the designated tasks satisfactorily. NVG mission training may be included as part of refresher training.

2-4. CONTINUATION TRAINING. Crewmembers are designated RL 1 when they meet the criteria of TC 3-04.11.

Note. UTs and evaluators may credit those hours they fly while performing assigned duties, regardless of their crew station, toward their semiannual flying-hour requirements.

a. **Semiannual flying-hour requirements (aircraft).** The minimum requirements for crewmembers are as follows:

(1) RCMs.

(a) Flight activity category (FAC) 1 – 45 hours, which must be flown while occupying a crew station with access to the flight controls.

(b) FAC 2 – 35 hours, which must be flown while occupying a crew station with access to the flight controls.

(c) FAC 3 – no flying-hour requirements.

(2) NCMs – 24 hours, in the aircraft while performing crew duties.

b. **Semiannual flying-hour requirements (NVG).** The commander will determine semiannual flying-hour requirements for NVG. The requirement will be tailored to the individual crewmember based on proficiency and experience. RCMs will complete the requirements in the aircraft while occupying a crew station with access to the flight controls. NCMs will complete the requirements while performing crew duties.

c. **Annual simulation device flying-hour requirements.** All aviators within 200 statute miles (SMs) of a compatible synthetic flight training system (SFTS) device will complete the following number of hours in the SFTS. The commander will determine flight simulator (FS) requirements for RCMs outside of 200 SMs. RCMs may apply 12 hours of Mi-17 FS time toward their semiannual flying-hour requirement. Time flown in noncompatible FSs will not be credited towards the minimum annual flying hour or FS requirements. The only compatible FS is the Mi-17.

(1) FAC 1 – 18 hours annually.

(2) FAC 2 – 12 hours annually.

(3) FAC 3 – 10 hours semiannually regardless of distance from the FS.

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

(1) FAC 1 and FAC 2. Each crewmember must perform at least one task iteration annually in each required flying mode as indicated in table 2-4 or table 2-5 (page 2-6), the tasks selected from table 2-3 (page 2-3), and additional tasks on the CTL. One iteration of each task must be performed in the aircraft. Tasks performed at night (or while using NVG) may be counted for day iterations. The crewmember is responsible for maintaining proficiency in each task. The commander may require additional iterations of specific tasks.

Table 2-5. Task list (rated crewmember)

Legend

D - Tasks performed during day flight.

I - Tasks performed during instrument flight.

N - Tasks performed during unaided night flight. The tasks selected in this column do not need to be evaluated during the standardization evaluation. If tasks are evaluated at night, it will suffice for tasks required in day conditions.

NVG - Tasks performed during NVG flight. Tasks evaluated while using NVG will suffice for tasks required in day conditions.

S, **I**, or **NG** in the EVAL column- Mandatory tasks for standardization, instrument, or annual NVG flight evaluations respectively.

Performance tasks are in upper case and bold.

Technical tasks are in lower case and plain type.

<table>
<tr><th>Task</th><th>Task Title</th><th>D</th><th>I</th><th>N</th><th>NVG</th><th>EVAL</th></tr>
<tr><td>1000</td><td>Participate in a Crew Mission Briefing</td><td colspan="4">X</td><td>S,I,NG</td></tr>
<tr><td>1004</td><td>Plan a Visual Flight Rules Flight</td><td>X</td><td></td><td>X</td><td>X</td><td>S</td></tr>
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<tr><td>1013</td><td>Operate Mission Planning System</td><td colspan="4">X</td><td>S, I, NG</td></tr>
<tr><td>1016</td><td>Perform Internal Load Operations</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 or I</td></tr>
<tr><td>1024</td><td>Perform Before-Starting Engine through Before-Leaving Helicopter Checks</td><td colspan="4">X</td><td>S, NG</td></tr>
<tr><td>1026</td><td>Maintain Airspace Surveillance</td><td colspan="4">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 Communication 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, NG</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, NG</td></tr>
<tr><td>1046</td><td>Perform Electronically Aided Navigation</td><td colspan="4">X</td><td>S</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>S, NG</td></tr>
<tr><td>1054</td><td>Select Landing Zone/Pickup Zone/Holding Area</td><td>X</td><td></td><td>X</td><td>X</td><td>S, NG</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></td><td>X</td><td>S, NG</td></tr>
<tr><td>1064</td><td>Perform 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, NG</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>
</table>

1082	Perform Autorotation	X		X	X	S, NG
1114	Perform a Rolling Takeoff	X		X	X	S, NG
1155	Negotiate Wire Obstacles	X			X	S, NG
1162	Perform Emergency Egress	X				S
1166	Perform Instrument Maneuvers		X			I
1170	Perform Instrument Takeoff		X			I

Table 2-6. Task list (rated crewmember)—Cont.

<table>
<tr><th>Task</th><th>Task Title</th><th>D</th><th>I</th><th>N</th><th>NVG</th><th>EVAL</th></tr>
<tr><td>1174</td><td>Perform Holding Procedures</td><td></td><td>X</td><td></td><td></td><td>I</td></tr>
<tr><td>1176</td><td>Perform Nonprecision Approach</td><td></td><td>X</td><td></td><td></td><td>I</td></tr>
<tr><td>1178</td><td>Perform Presision Approach</td><td></td><td>X</td><td></td><td></td><td>I</td></tr>
<tr><td>1180</td><td>Perform Emergency Global Positioning System Recovery Procedure</td><td></td><td>X</td><td></td><td></td><td></td></tr>
<tr><td>1182</td><td>Perform Unusual Attitude Recovery</td><td>X</td><td>X</td><td></td><td>X</td><td>S, I</td></tr>
<tr><td>1184</td><td>Respond to Inadvertent Instrument Meteorologicial Conditions</td><td>X</td><td></td><td>X</td><td>X</td><td>S, NG</td></tr>
<tr><td>1188</td><td>Operate Aircraft Survivability Equipment</td><td>X</td><td></td><td></td><td></td><td>S</td></tr>
<tr><td>1190</td><td>Perform/Identify Hand and Arm Signals</td><td colspan="4">X</td><td></td></tr>
<tr><td>1194</td><td>Perform Refueling Procedures</td><td colspan="4">X</td><td></td></tr>
<tr><td>1202</td><td>Perform Auxiliary Power Unit Operations</td><td colspan="4">X</td><td>S</td></tr>
<tr><td>1262</td><td>Participate in a Crew Level After-Action Review</td><td>X</td><td>X</td><td>X</td><td>X</td><td>S,I,NG</td></tr>
<tr><td>2081</td><td>Operate Night Vision Goggles</td><td></td><td></td><td></td><td>X</td><td>NG</td></tr>
<tr><td>2092</td><td>Respond to Night Vision Goggle Failure</td><td></td><td></td><td></td><td>X</td><td>NG</td></tr>
</table>

Table 2-7. Task list (nonrated crewmember)

Legend

D - Tasks performed during day flight.

N - Tasks performed during unaided night flight. The tasks selected in this column do not need to be evaluated during the standardization evaluation. If tasks are evaluated at night, it will suffice for tasks required in day conditions.

NVG - Tasks performed during NVG flight. Tasks evaluated while using NVG will suffice for tasks required in day conditions.

S or **NG** in the EVAL column- Mandatory tasks for standardization, instrument, or annual NVG flight evaluations respectively.

Performance tasks are in upper case and bold.

Technical tasks are in lower case and plain type.

<table>
<tr><th>Task</th><th>Task Title</th><th>D</th><th>N</th><th>NVG</th><th>EVAL</th></tr>
<tr><td>1000</td><td>Participate in a Crew Mission Briefing</td><td colspan="3">X</td><td>S</td></tr>
<tr><td>1002</td><td>Conduct Passenger Briefing</td><td colspan="3">X</td><td>S</td></tr>
<tr><td>1012</td><td>Verify Aircraft Weight and Balance</td><td colspan="3">X</td><td></td></tr>
<tr><td>1014</td><td>Operate Aviation Life Support Equipment</td><td colspan="3">X</td><td>S</td></tr>
<tr><td>1016</td><td>Perform Internal Load Operations</td><td colspan="3">X</td><td>S</td></tr>
<tr><td>1019</td><td>Perform Preventive Maintenance Daily (PMD) Check</td><td colspan="3">X</td><td>S</td></tr>
<tr><td>1022</td><td>Perform Preflight Inspection</td><td colspan="3">X</td><td>S</td></tr>
<tr><td>1024</td><td>Perform Before-Starting Engine through Before-Leaving</td><td>X</td><td>X</td><td>X</td><td>S, NG</td></tr>
</table>

	Helicopter Check				
1026	Maintain Airspace Surveillance		X		S, NG
1028	Perform Hover Power Check		X		S
1032	Perform Radio Communications Procedures		X		S
1034	Perform Ground Taxi	X	X	X	S, NG
1038	Perform Hovering Flight	X	X	X	S, NG
1040	Perform Visual Meteorological Conditions Takeoff	X	X	X	S, NG

Table 2-8. Task list (nonrated crewmember)—Cont.

Task	*Task Title*	*D*	*N*	*NVG*	*EVAL*
1048	Perform Fuel Management Procedures		X		S
1058	Perform Visiual Meteorological Conditions Approach	X	X	X	S, NG
1062	Perform Slope Operations	X	X	X	S, NG
1064	Perform a Roll-On Landing	X	X	X	S, NG
1070	Respond to Emergencies	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		S
1200	Perform NCM Duties during Maintenance Test Flight	X			
1202	Perform Auxiliary Power Unit Operations		X		S
1262	Participate in a Crew-Level After-Action Review	X	X	X	S
2081	Operate Night Vision Goggles			X	NG
2092	Respond to Night Vision Goggle Failure			X	NG

(2) FAC 3. Each crewmember must perform, annually, at least one iteration of each task annotated on the CTL in the FS. The crewmember is responsible for maintaining proficiency in each task. The commander may require additional iterations of specific tasks.

(3) MPs and MEs. In addition to the required minimum annual tasks and iterations, MPs and MEs will perform a minimum of four iterations of maintenance test flight (MTF) tasks annually (table 2-6). MEs will perform a minimum of two of the four iterations mentioned above from each flight crew station with access to the flight controls.

Table 2-9. Task list (maintenance test pilot/flight evaluator)

Task	*Task Title*
4000	Perform Prior to Maintenance Test Flight Check
4081	Perform Before-Starting Engine Check
4088	Perform Starting Engine Check
4090	Perform Engine Run-Up System Check
4112	Perform Taxi Check
4142	Perform Hover Power/Hover Controllability Check
4193	Perform In-Flight Check
4204	Perform Compasses, Turn Rate and Vertical Gyros Check

4236	Perform Autorotation Revolutions Per Minute Check
4274	Perform In-Flight Communication/Navigation/Flight Instruments Check
4276	Perform Special Equipment and/or Detailed Procedures Check
4284	Perform After Landing through Engine Shutdown Check

e. **Hood/weather requirements.** All aviators will complete hood or weather requirements as determined by the commander. This requirement may be completed in the aircraft or FS.

2-5. TASK LIST.

a. **Performance tasks.** For the purpose of clarifying mode and conditions, a performance task is differentiated from a technical task. An ATM performance task is significantly affected by the conditions and the mode of flight. The mode and condition under which the task must be performed is specified (for example, a VMC takeoff, emergency procedure flight, or perform external load operations).

b. **Technical tasks.** Technical tasks measure a crewmember's ability to plan an action such as a flight, preflight, participate in crew mission briefing, and perform hover power check. Technical tasks are not significantly affected by the mode of flight and may be performed or evaluated in any mode.

Note. The requirement to perform instrument tasks in additional aircraft, in category, will be at the discretion of the commander.

Note. RCMs required to perform MP or ME duties in the Mi-17 as an additional or alternate aircraft will perform four iterations of the required tasks.

c. **Base tasks.** Tables 2-4 and 2-5 (pages 2-5 to 2-7) list the RCM and NCM base task requirements.

d. **Mission tasks.** Table 2-3 (page 2-3) lists the RCM and NCM mission tasks. The commander will select mission and additional tasks and iterations supporting the unit's METL and individual proficiency. The commander will determine evaluation requirements for all mission tasks and modes of flight and annotate the air crewmember's CTL accordingly.

e. **Maintenance test pilot tasks.** Refer to chapter 5.

f. **Evaluation guidelines.** Aviators designated to fly from both pilot seats are evaluated, in each seat, during APART evaluations. However, not all tasks must be evaluated from each crew station. Sustainment training for NCMs is required in each designated crew station. NCMs are required to be evaluated from the cabin door position and the left ramp position in the aircraft during the APART, but are not required to be evaluated in all tasks from each position. Other positions may be evaluated at the discretion of the evaluator. APART and annual evaluation tasks are designated by an S, I, and/or NG in the EVAL column of tables 2-4 and 2-5 (pages 2-5 to 2-7). The tasks selected under the "N" column do not need to be evaluated during the standardization evaluation. Tasks evaluated at night (or while using NVG) will suffice for tasks required in day conditions. Mission tasks will be evaluated during the APART if the task is on the individual's CTL and designated with an "E" for evaluation. The commander should select mission/additional mission tasks for evaluation based on the unit's METL. Refer to chapter 5 for MP/ME APART requirements.

2-6. CURRENCY REQUIREMENTS.

a. **Aircraft currency.** Aircraft currency will be in accordance with AR 95-1. A crewmember with lapsed currency must complete a proficiency flight evaluation, administered by an evaluator in the aircraft. The crewmember will demonstrate proficiency in those tasks and modes selected by the commander. If the crewmember fails to demonstrate proficiency, he or she will be placed in the appropriate RL. An appropriate training program will be developed to enable the crewmember to regain proficiency in the unsatisfactory tasks.

b. **NVG currency.** To be considered NVG current, crewmembers will participate, at least once every 60 consecutive days, in a 1-hour flight in the aircraft while wearing NVG. RCMs will occupy a crew station with access to the flight controls. NCMs must be performing crew duties.

(1) Crewmember. If a crewmember's currency has lapsed, he or she must complete (as a minimum) a 1-hour NVG proficiency flight evaluation administered at night in the aircraft by an NVG SP, IP, SI, or FI, as appropriate.

(2) RCM. The RCM must occupy a crew station with access to the flight controls during the evaluation.

(3) NCM. The NCM must occupy a crew station in the aircraft while performing crew duties during the evaluation.

(4) Minimum tasks. Minimum tasks to be evaluated are indicated by an X in the NVG column of tables 2-4 or 2-5, pages 2-5 to 2-7, as applicable. The commander may designate other mission and/or additional tasks.

2-7. CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR TRAINING. In accordance with
TC 3-04.11, crewmembers must wear the complete chemical, biological, radiological, and nuclear (CBRN) ensemble during CBRN training. All CBRN training will be performed in the aircraft. CBRN training is not required for FAC 3 positions and Department of the Army civilians (DACs).

a. Rated crewmember tasks**.** RCMs will receive CBRN training in the following tasks. The commander may select other tasks based on the unit mission.

(1) Task 1024, Perform Before-Starting Engine through Before-Leaving Helicopter Check.

(2) Task 1028, Perform Hover Power Check.

(3) Task 1040, Perform Visual Meteorological Conditions Takeoff.

(4) Task 1058, Perform Visual Meteorological Conditions Approach.

(5) Task 1408, Perform Terrain Flight.

(6) Task 2036, Perform Terrain Flight Deceleration.

b. Nonrated crewmember tasks. NCMs will receive CBRN training in Task 1024. The commander may select other tasks based on the unit mission.

Chapter 3

Evaluation

This chapter describes evaluation principles and grading considerations. It also contains guidelines for conducting academic and hands-on performance testing. Evaluations are a primary means of assessing flight standardization and crewmember proficiency, and will be conducted in accordance with AR 95-1, TC 3-04.11, and this ATM.

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

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

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

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

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

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

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

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

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

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

3-2. GRADING CONSIDERATIONS.

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

b. **Flight evaluation.**

(1) Academic. Some tasks may be identified as those requiring academic evaluation in the training and evaluation requirements section of a task. For these tasks, the examinee must demonstrate a working knowledge of the task. Evaluators may use computer-based instruction, mock-ups, or other approved devices in determining the examinee’s knowledge of the task.

(2) Aircraft or FS. These tasks require evaluation in the aircraft or the Mi-17 FS. Task standards are based on an ideal situation. Grading is based on meeting the minimum standards. The evaluator must consider deviations (high wind, turbulence, or poor visibility) from the ideal during the evaluation. If other than ideal conditions exist, the evaluator must make appropriate adjustments to the standards.

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

3-3. CREWMEMBER EVALUATION. Evaluations are conducted to determine the crewmember’s ability to perform the tasks on the CTL and check understanding of required academic subjects listed in the ATM. The evaluator will determine the amount of time devoted to each phase. When the examinee is an evaluator/trainer or a unit trainer, the recommended procedure is for the evaluator to reverse roles with the examinee. When the evaluator uses this technique, the examinee must understand how the role-reversal will be conducted and when it will be in effect. Initial validation of a crewmember’s qualifications following an additional skill identifier producing course of flight instruction/school (such as the Mi-17 IP, MP, IE, or FI course) will be conducted in the aircraft.

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

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

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

(3) UT. The UT must meet the requirements in paragraph 3-3a(2) or (8). In addition, the UT must be able to instruct in the appropriate tasks and subjects, recognize errors in performance or understanding, make recommendations for improvement, train to standards, and document training.

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

(5) SP/IE. The SP/IE must meet the requirements in paragraph 3-3a(2) and (4). The SP/IE must be able to train and evaluate SPs, IPs, IEs, UTs, PCs, PIs, SIs, and FIs using role reversal as appropriate. 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(2). The ME must be able to train and evaluate other MEs and functional check pilots using role reversal when required. The ME must possess a thorough knowledge of the fundamentals of instruction and evaluation.

(7) CE. The CE must demonstrate an understanding of conditions, standards, descriptions, and appropriate considerations on the CTL. The CE must perform selected tasks to ATM standards while applying aircrew coordination. The CE must also demonstrate a basic understanding of the appropriate academic subjects listed in 3-4b, be familiar with the IATF, and understand the requirements of the CTL.

(8) FE. The FE must meet the requirements in paragraph 3-3a(7). Additionally, the FE must demonstrate sound judgment, and technical/tactical proficiency in the employment of the aircraft, the unit's mission, crew, and assets.

(9) FI. The FI must meet the requirements in 3-3a(8); be able to objectively train, evaluate, and document the performance of the UTs, FEs, CEs, and observers (ORs) (aircraft maintenance personnel, technical observer, gunner, or other personnel performing duties requiring flight) as appropriate; be able to develop and implement an individual training plan; and have a thorough understanding of the requirements and administration of the ATP.

(10) SI. The SI must meet the requirements in 3-3a(10); be able to train and evaluate SIs, FIs, UTs, FEs, CEs, and ORs as appropriate; be able to develop and implement a unit-training plan; and administer the commander's ATP for NCMs.

Note. Evaluators/trainers will be evaluated on their ability to apply the fundamentals of instruction as outlined in paragraph 3-4b (12).

Note. During academic evaluations, evaluators should ask questions addressing specific topics in each area and avoid those requiring laundry list-type answers. Questions should be developed as described in the instructor pilot's handbook.

b. **Academic evaluation criteria.**

(1) PFE. The SP/IP/SI/FI will evaluate appropriate subject areas in paragraph 3-4b.

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

(3) APART instrument evaluation. The IE will evaluate a minimum of two topics from the subject areas in paragraphs 3-4b (1) through 3-4b (5), relative to IFR 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 areas or subjects.

(4) APART MP/ME evaluation. The ME will evaluate a minimum of two topics from the applicable subject areas in paragraph 3-4b, emphasizing how they apply to maintenance test flights.

(5) Other ATP evaluations. The SP/IP/SI/FI will evaluate appropriate subject areas in paragraph 3-4b.

3-4. EVALUATION SEQUENCE. The evaluation sequence consists of four phases—Introduction, Academic Evaluation Topics, Flight Evaluation, and Debriefing. The evaluator will determine the amount of time devoted to each phase.

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

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

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

b. **Phase 2-Academic Evaluation Topics.**

(1) Regulations and publications (AR 95-1, AR 95-2, Department of the Army pamphlet [DA Pam] 738-751, TC 3-04.11, TM 1-1500-328-23, rotorcraft flight manual, Department of Defense flight information publications [DOD FLIPs], the commander's ATP, Federal Aviation Regulations [FARs], and local and unit SOPs). Topics in this subject area are—

- ATP requirements.
- Crew coordination.

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

(2) Aircraft systems, avionics, and mission equipment description and operation. Topics in this subject area are—

- Engines and related systems.
- Emergency equipment.
- Transponder.
- Fuel system.
- Power train system.
- Flight control hydraulic system.
- Utility hydraulic system.
- Rotor system.
- Flight instruments.
- APU.
- Lighting.
- ASE.
- Servicing, parking, and mooring.
- Cargo handling systems.

- Mission equipment.
- Armament.
- Avionics.
- Auto-pilot system
- Heating, ventilation, cooling and environmental control unit.
- Electrical power supply and distribution system.

(3) Operating limitations and restrictions. Topics in this subject area are—

- Wind limitations.
- Rotor limitations.
- Power limitations.
- Engine limitations.
- Aircraft system limitations.
- Airspeed limitations.
- Temperature limitations.
- Loading limitations.
- Weapon system limitations.
- Maneuvering limits.
- Flight envelope limitations (such as extended range fuel system, cargo/rescue hoist, external/internal load operations).
- Weather requirements.
- Environmental limitations/restrictions.

(4) Aircraft emergency procedures and malfunction analysis. Topics in this subject area are—

- Emergency terms and their definitions.
- Engine malfunctions.
- Fires.
- Hydraulic system malfunctions.

- Landing and ditching procedures.
- Mission equipment malfunctions.
- Rotor, transmission, and drive train system malfunctions.
- Emergency exits and equipment.
- Chip detectors.
- Fuel system malfunctions.
- Electrical system malfunctions.
- Flight control malfunctions.
- Auto-pilot malfunctions.

(5) *Aeromedical factors (AR 40-8 and FM 3-04.93). Topics in this subject area are—

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

(6) Aerodynamics (FM 3-04.203). Topics in this subject area are—

- Attitude and heading control.
- Dissymmetry of lift.
- In-ground effect/out-of-ground effect (OGE) hovering flight.
- Characteristics of dynamic roll over.
- Loss of tail rotor effectiveness.
- Retreating blade stall.
- Effective translational lift.

- Settling with power.
- Types of drag.

(7) *Night mission operations (FM 3-04.203 and FM 3-04.93). Topics in this subject area are—

- Unaided night flight.
- Visual illusions.
- Distance estimation and depth perception.
- Night vision limitations and techniques.
- Types of vision.
- Use of internal and external lights.

(8) Tactical and mission operations (FM 1-400, FM 3-04.111, FM 3-04.126, FM 3-04.203, FM 3-52, FM 4-20.197, FM 4-20.198, FM 4-20.199, FM 90-4, FM 55-450-2, the commander's ATP, and unit SOP). Topics in this subject area are—

- CBRN operations.
- ASE employment.
- Downed aircraft procedures.
- Aircraft armament subsystems.
- Communication security.
- Mission equipment.
- Internal load operations.
- Aviation mission planning.
- Fratricide prevention.
- Evasive maneuvers.
- Cargo/rescue hoist operations.
- External load operations.
- High-intensity radio transmission area.

(9) Weapons system operation and deployment (FM 3-04.126, FM 3-04.140, and unit SOP). Topics in this subject area are—

- Weapons initialization, arming, and safety.
- Operation and function of the M240, PKM, and UB-32/BV80 rocket systems.
- Visual search and target detection.
- Door gunner duties.
- Fire and employment techniques.
- Weapons employment during night and NVD operations.

(10) *NVG operations (FM 3-04.140, FM 3-04.203, FM 3-04.93, TM 11-5855-263-10, NVG TSP, and unit SOP). Topics in this subject area are—

- Nomenclature, characteristics, limitations, and operations.
- Mission planning.
- Effects on distance estimation and depth perception.
- Tactical operations, to include lighting.
- Use of internal and external lights.
- Terrain interpretation, map preparation, and navigation.

(11) ME and MP system topics: aircraft systems, avionics, mission equipment description and operation, systems malfunctions analysis, and troubleshooting (operator's manual). Topics in this subject area are (for MEs and MPs only)—

- Local airspace usage.
- Test flight weather requirements.
- Test flight forms and records.
- Electrical system.
- APU.
- Power plant.
- Power train.
- Flight controls.
- Fuel systems.

- Maintenance test flight requirements.
- Communications and navigation equipment.
- Maintenance operations checks.
- Instrument indications.
- Caution panel indications.
- Engine performance checks.
- Hydraulic systems.
- Vibrations.
- Auto-pilot checks.

(12) SP, IP, IE, UT, SI, and FI evaluator/trainer topics (TC 3-04.11 and IP handbook). Topics in this subject area are—

- Learning process.
- Effective communication.
- Teaching methods.
- Flight instruction techniques.
- Human behavior.
- Teaching process.
- Critique and evaluation.
- Effective questions.

c. **Phase 3-Flight Evaluation.**

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

(2) PMD, preflight inspection, engine-start, run-up procedures engine ground operations, and before-takeoff checks. The evaluator will evaluate the examinee's use of the operator's manual 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 designated by this ATM, tasks listed on the CTL as mandatory for the designated crew station(s) for the type of evaluation being conducted, and those mission/additional tasks selected by the commander. In addition to the commander selected tasks, the evaluator may evaluate any task performed during the evaluation as long as the task is listed on the crewmember's CTL. Evaluators/trainers must demonstrate an ability to instruct/evaluate appropriate flight tasks. At a minimum under Task 1070, the following emergency procedures must be conducted during this training in the aircraft while occupying a station with access to the flight controls. These emergency procedures can be performed concurrently: single-engine failure at altitude and engine or fuselage fire-flight.

Note. During instrument evaluation, if the aircraft is not under actual instrument meteorological conditions (IMC), the aviator's vision will be restricted by wearing a vision-limiting device.

(4) Engine shutdown and after-landing tasks. The evaluator will evaluate the examinee's use of the operator's manual as appropriate.

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

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

(2) Offer recommendations for improvement.

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

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

(5) Complete the applicable forms and ensure the examinee reviews and initials the appropriate forms.

3-5. ADDITIONAL EVALUATIONS.

a. **Chemical, biological, radiological, and nuclear evaluation.** This evaluation is conducted in accordance with TC 3-04.11.

b. **Gunnery evaluation.** This evaluation is conducted in accordance with FM 3-04.140 and the unit SOP.

c. **No-notice, post-mishap flight evaluations, and medical flight evaluations.** These evaluations will be conducted in accordance with AR 95-1.

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Chapter 4

Crewmember Tasks

This chapter implements portions of STANAG 3114.

This chapter describes the tasks 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 maneuvers performed in the aircraft.

4-1. TASK CONTENTS.

a. **Task number.** Each ATM task is identified by a 10-digit systems approach to training number. The first three digits of each task in this ATM are 011 (United States Army Aviation School); the second three digits are Mi-17. For convenience, only the last four digits are listed in this training circular. The last four digits of—

- Individual tasks are assigned 1000-series numbers.
- Crew tasks are assigned 2000-series numbers.
- Additional tasks are assigned 3000-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.

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 Mi-17 in the conditions do not apply to nonrated crewmembers. All conditions must be met before task iterations can be credited.

(1) Common conditions are—

(a) In a mission aircraft with mission equipment and crew, items required by AR 95-1, AR 95-2, DA Pam 738-751, FARs, DOD FLIPs, the operator's manual, the commander's ATP, and local and unit SOPs.

(b) Under VMC or IMC.

(c) Day, night, and NVD employment.

(d) In any terrain or climate.

(e) CBRN equipment employment.

(f) Electromagnetic environmental effects.

(2) Common training/evaluation conditions are—

(a) An ME, UT, IP, SP, or IE will be at one set of the flight controls while the training is performed when he or she is required for the training of the task. References to the IP in the task conditions include SP. References to FI in the task conditions include SI. Evaluators/trainers who are evaluating/training NCMs must be at a station without access to the flight controls except when evaluating crew coordination.

(b) The following tasks require an SP, IE, or IP for training/evaluation in the aircraft with access to the flight controls. If the IE is not an IP or SP, he or she may only perform the simulated engine failure emergency procedure and Task 1182 and must be trained and evaluated by an SP or IP on the following tasks:

- Task 1070, Respond to Emergencies.
- Task 1182, Perform Unusual Attitude Recovery.

(c) Unless otherwise specified in the conditions, all in-flight training/evaluations will be conducted under VMC. Simulated IMC denotes flight solely by reference to flight instruments while wearing a vision-limiting device.

(d) 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 and mission-oriented protective posture) or mission equipment (water bucket and rescue hoist) is required for task performance, the availability of the equipment becomes part of the conditions.

(e) The aircrew will not attempt the tasks listed below when performance planning indicates OGE power is not available:

- Task 1170, Perform Instrument Takeoff.
- Task 2026, Perform Terrain Flight.
- Task 2036, Perform Terrain Flight Deceleration.
- Task 2048, Perform External (Sling)-Load Operations.
- Task 2125, Perform Pinnacle/Ridgeline Operations.
- Task 2127, Perform Combat Maneuvering Flight.
- Any task requiring hovering flight in OGE conditions.

(f) The following emergency procedures **cannot** be performed in the aircraft except in an actual emergency:

- Touchdown autorotation.
- Single-engine takeoff from the ground.

- Actual engine stoppage in flight or while taxiing.
- Both engine condition levers are out of the detent position while taxiing/flying.
- Jettison of external load.
- Emergency descent.
- Dual generator failure.
- Three rectifier failures.
- Automatic flight control system (AFCS)-OFF external load hook-up/combat maneuvering flight.

d. **Standards.** Standards describe the minimum degree of proficiency or standard of performance to which the task must be accomplished. The terms “without error,” “properly,” and “correctly” apply to all standards. Standards are based on ideal conditions, and many standards are common to several tasks. Individual trainer, instructor, or evaluator pilot techniques are not standards nor used as grading elements. Alternate or additional standards will be listed in individual tasks. Standards unique to the training environment for simulated conditions are established in the training considerations section of each task. Unless otherwise specified in the individual task, the following common standards apply:

(1) All tasks.

(a) **Do not** exceed aircraft limitations.

(b) Perform crew coordination actions according to chapter 6.

(2) Takeoff.

(a) Takeoff from unimproved surfaces, the NCM will call the aircraft altitude from the ground to 10 feet in 1-foot increments, and the pilot not on the controls (P) will call the aircraft altitude above highest obstacle (AHO) at 25, 50, 75, and 100 feet.

(3) Hover.

(a) Maintain heading ±10 degrees.

(b) Maintain altitude, ±3 feet.

(c) Do not allow drift to exceed 5 feet.

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

(e) Maintain ground track with minimum drift.

(f) NCM(s) will announce all drift/altitude changes.

(4) In-flight.

(a) Maintain heading ±10 degrees.

(b) Maintain altitude ±100 feet.

(c) Maintain airspeed ±10 knots indicated airspeed (KIAS).

(d) Maintain rate of climb or descent ±200 feet per minute (FPM).

(e) Maintain the aircraft in trim.

(5) Approach.

(a) Approaching unimproved surfaces, the P will call the aircraft altitude AHO at 100, 75, 50, 25, and 10 feet.

(b) Landing to unimproved surfaces, the NCM will call the aircraft altitude from 10 feet to the ground in 1-foot increments.

(6) All tasks with the APU/engines operating (RCMs and NCMs).

(a) Maintain airspace surveillance (Task 1026).

(b) Apply appropriate environmental considerations.

(c) Perform crew coordination actions according to chapter 6.

(d) Do not exceed aircraft limitations.

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

(1) Crew actions. These define the portions of a task preformed by each crewmember to ensure safe, efficient, and effective task execution. The designations pilot on the controls (P*), and P 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, announce malfunctions or emergency conditions, monitor engines/systems operations, and avionics (navigation/communication), as necessary. During VMC, crewmembers focus attention primarily outside the aircraft, maintain airspace surveillance, and clear the aircraft. They provide timely warning of traffic and obstacles by announcing the type of hazard, direction, distance, and altitude (relative to the aircraft). Crewmembers also announce when attention is focused inside the aircraft, except for momentary scans, and announce when attention is focused outside the aircraft.

(b) The PC is responsible for conducting of the mission and operating, securing, and servicing the aircraft they command. The PC ensures a crew briefing is accomplished and the mission is performed according to the mission briefing, air traffic control (ATC) instructions, regulations, and SOP requirements.

(c) The PI/FE/CE is responsible for completing tasks as assigned by the PC.

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

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

(f) The FE/CE is responsible for maintaining airspace surveillance, traffic and obstacle avoidance, safety/security of passengers and equipment, and properly executing emergency procedures. They provide assistance to the P* and P as required. They are also responsible for the maintenance of their assigned aircraft.

Note. When the Mi-17 crew consists of one nonrated and two rated crewmembers, the NCM must be a RL-1 FE.

Note. Unless otherwise specified, the abbreviation NCM in the task description refers to either the crew chief or the flight engineer.

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

f. **Considerations.** This section defines consideration for task accomplishment under various flight modes (for example, night, NVG, environmental conditions, snow/sand/dust and mountain/pinnacle/ridgeline operations). Crewmembers must consider additional aspects of a task when performing it in different environmental conditions. The inclusion of environmental considerations in a task does not relieve the commander of the requirement for developing an environmental training program in accordance with TC 3-04.11. Specific requirements for different aircraft or mission equipment may also be addressed as a consideration. Training considerations establish specific actions and standards used in the training environment.

(1) Night and NVG. Wires and other hazards are much more difficult to detect and must be accurately marked and plotted on maps. Use proper scanning techniques to detect traffic and obstacles and to avoid spatial disorientation. The P should make all internal checks (such as computations and frequency changes). Visual barriers (so difficult to view that a determination cannot be made, whether or not they contain barriers or obstacles) will be treated as physical obstacles. Altitude and ground speed are difficult to detect; therefore, artificial illumination may be necessary. Determine the need for artificial lighting before

descending below barriers. Adjust search/landing light for best illumination angle without causing excessive reflection into the cockpit. Entering IMC with artificial illumination may induce spatial disorientation. Cockpit controls will be more difficult to locate and identify; take special precautions to identify and confirm the correct switches and levers.

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

(3) NVG. Use of NVG degrades distance estimation and depth perception. Aircraft in flight may appear closer than they actually are due to the amplification of external lights and the lack of background objects to assist in distance estimation and depth perception. If possible, confirm the distance unaided. Weapons flash may temporarily impair or shut down NVG.

g. **Training and evaluation requirements.** Training and evaluation requirements define whether the task will be trained/evaluated in the aircraft, FS, or academic environment. Listing aircraft/FS 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.

h. **References.** References are sources of information relating to a particular task, some may apply to many tasks. In addition, the following common references apply as indicated.

(1) All flight tasks (tasks with engines operating).

(a) AR 95-1.

(b) FM 1-230.

(c) FM 3-04.203.

(d) *FM 3-04.93.

(e) DOD FLIPs.

(f) FARs/host country regulations.

(g) Unit/local SOPs.

(h) DA Form 2408 series.

(2) All instrument tasks.

(a) AR 95-1.

(b) FM 3-04.240.

(c) DOD FLIPs.

(d) Aeronautical Information Manual (AIM).

(e) Federal Aviation Administration (FAA)-H-8083-15.

(3) All tasks with environmental considerations are addressed in FM 3-04.203.

(4) All tasks used in a tactical situation.

(a) FM 3-04.203.

(b) TC 21-24.

(c) FM 3-04.113

(d) FM 3-04.140.

(e) FM 3-04.111.

4-2. TASKS.

a. **Standards versus descriptions.** Standards describe the minimum degree of proficiency/standard of performance to which the task must be accomplished. Attention to the use of *will, should, shall, must*, or *may* throughout the text of a task standard is crucial. The description explains one or more recommended techniques for accomplishing the task to meet the standards.

b. **Critical task list**. The following numbered tasks are Mi-17 crewmember critical tasks.

TASK 1000

Participate in a Crew Mission Briefing

CONDITIONS: Before flight in a Mi-17 helicopter, DA Form 5484 (Mission Schedule/Brief) information, and a unit-approved crew briefing checklist.

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

1. The PC will actively participate in and acknowledge an understanding of DA Form 5484.
2. The PC will conduct or supervise an aircrew mission briefing (table 4-1, page 4-9) or a more detailed unit-approved crew briefing checklist.
3. Crewmembers will verbally acknowledge a complete understanding of the aircrew mission briefing.

DESCRIPTION:

1. Crew actions.

   a. A designated briefing officer will evaluate and brief essential areas of the mission to the PC in accordance with AR 95-1. The PC will acknowledge a complete understanding of the mission brief and initial DA Form 5484.

   b. The PC has overall responsibility for the crew mission briefing. The PC may direct other crewmembers to perform all or part of it.

   c. Crewmembers will direct their attention to the crewmember conducting the briefing. They will address any questions to the briefer and acknowledge understanding of the assigned actions, duties, and responsibilities. Lessons learned from previous debriefings should be addressed as applicable during the crew briefing. If two or more NCMs will perform flight duties, the FE will brief them on their individual responsibilities.

Note. An inherent element of the mission briefing is establishing the time and location for the crew-level AAR (Task 1262.)

2. Procedures. Brief the mission using a unit-approved crew mission briefing checklist. Table 4-1 (page 4-9) provides a suggested format for the minimum mandatory aircrew briefing checklist. Table 4-2 (page 4-10) provides a suggested format for the minimum mandatory nonrated crew briefing checklist. Crewmembers will identify mission and flight requirements demanding effective communication and proper sequencing and timing of actions.

Table 4-1. Sample aircrew briefing checklist

Aircrew briefing checklist
1. Crew introduction/qualifications.
2. Required items: publications, identification tags, ALSE, personnel, and mission equipment.
3. Analysis of aircraft.
4. Mission overview, flight route, time line, and notices to airmen (NOTAMs).
5. Weather (departure, en route, destination, and void time).
6. Formation/multi-aircraft operations.
7. Tactical considerations; rules of engagement (ROE); weapon engagement rules; weapon status;and identification, friend or foe; combat search and rescue (CSAR) terms, evasion plan.
8. External load operations.
9. Airspace surveillance procedures/visual sectors duties (Task 1026).
a. Logbook and preflight deficiencies.
b. Performance planning. Re-computation of PPC.
c. Mission deviation required based on aircraft analysis.
10. Crew actions, duties, and responsibilities.
a. Transfer of flight controls and two challenge rule.
b. Emergency actions.
(1) Actions to be performed by the P*, P, and NCM.
(2) Emergency equipment/first aid kits/survival kits.
(3) Emergency procedures and rendezvous points.
(4) IIMC, NVG failure.
(5) Mission consideration. Threat situation, emergency squawk/communication, zeroize equipment, disable aircraft, collect/destroy classified materials, weapons security.
11. General crew duties.
a. P*.
(1) Fly the aircraft–primary focus outside when VMC, inside when IMC.
(2) Avoid traffic and obstacles.
(3) Crosscheck systems and instruments.
(4) Monitor/transmit on radios as directed by the PC.
b. P.
(1) Assist in traffic and obstacle avoidance.
(2) Tune radios and set transponder.
(3) Navigate.
(4) Copy clearances, automatic terminal information services, and other information.
(5) Crosscheck systems and instruments.
(6) Monitor/transmit on radios as directed by the PC.
(7) Read and complete checklist items as required.
(8) Announce when focused inside.
c. FE, CE, and other assigned crewmembers.
(1) Complete passenger briefing.
(2) Secure passengers and cargo.
(3) Assist in traffic and obstacle avoidance.
(4) Perform other duties as assigned by the PC.
12. Crew-level AAR–time and location.
13. Crewmembers' questions, comments, and acknowledgment of mission briefing.

Note. The FE is responsible for ensuring all NCMs performing crew duties are briefed on their duties.

Note. A safety harness will be worn and secured when performing crew duties. A seat belt will be worn at all times when seated unless it interferes with crew duties.

Table 4-2. Sample nonrated crew briefing checklist

Nonrated crew briefing checklist
1. Mission overview.
2. Aircraft runup responsibilities.
a. Aft NCM responsibilities.
b. Forward NCM responsibilities.
3. Required items, mission equipment, and personnel.
4. Crew actions, duties, and responsibilities.
a. Sectors of responsibility–assist in traffic and obstacle avoidance.
b. Cruise check responsibilities.
c. Emergency actions.
(1) Mission considerations.
(2) Emergency action with external load.
(3) Egress and rendezvous points.
(4) Actions performed by the FE and CE.
d. Perform other duties assigned by the PC.
e. Hot/closed circuit refueling.
5. Tactical flight.
a. Terrain flight duties.
b. Landing area reconnaissance.
c. Slope.
d. External load procedures.
6. Shut down procedures.
7. Post flight procedures.
8. NCM questions, comments, and acknowledgement of NCM mission briefing..

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references, FM 3-04.300, and DA Form 5484.

TASK 1002

Conduct Passenger Briefing

CONDITIONS: Before flight in a Mi-17 helicopter with current mission information.

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

1. The PC will conduct or direct another crewmember to conduct the passenger briefing according to the operator's manual/CL and the unit's SOP.

2. Briefer will ensure passengers verbally acknowledge a complete understanding of the passenger briefing.

DESCRIPTION:

1. Crew actions.

   a. The PC has overall responsibility for the passenger briefing, but may direct other crewmembers to perform all or part of it.

   b. Briefer commands attention of passengers. Briefer will require each passenger to verbally confirm understanding of the briefing.

2. Procedures. Examples of passenger briefing items are—

   a. Proper direction to approach and depart the aircraft.

   b. Location of emergency entrances, exits, and equipment.

   c. Use of seat belts.

   d. Location of survival equipment.

   e. Security of equipment.

TRAINING AND EVALUATION REQUIREMENTS:

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

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

REFERENCES: Appropriate common references.

TASK 1004

Plan a Visual Flight Rules Flight

CONDITIONS: Before VFR flight in a Mi-17 helicopter or Mi-17 FS, given access to weather information, NOTAMs, flight planning aids, necessary charts, forms, publications, and weight and balance information.

STANDARDS: Appropriate common standards and 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 VFR.

3. Determine the correct departure, en route, and destination procedures.

4 Select route(s) and altitudes that avoid hazardous weather conditions and best ensure mission completion without exceeding aircraft or equipment limitations. If appropriate, select altitudes conforming to VFR cruising altitudes.

5. Determine distance ±1 nautical mile, ground speed ±5 knots, and estimated time en route (ETE) ±2 minutes for each leg of the flight. Compute magnetic headings ±5 degrees.

6. Determine the fuel required ±100 liters.

7. Verify the aircraft will remain within weight and center of gravity (CG) limitations for the duration of the flight according to the operator's manual.

8. Verify aircraft performance data and ensure power is available to complete the mission according to the operator's manual.

9. Complete the flight plan.

10. Perform mission risk assessment according to unit SOP.

DESCRIPTION:

1. Crew actions.

a. The PC may direct the other crewmembers to complete some elements of the VFR flight planning.

b. The other crewmembers will complete the assigned elements and report the results to the PC.

c. The PC will ensure all crewmembers are current/qualified and the aircraft is properly equipped to accomplish the assigned mission.

2. Procedures.

   a. Using appropriate military, FAA, or host-country weather facilities, obtain information about the weather. After ensuring the flight can be completed under VFR in accordance with AR 95-1, check NOTAMs, chart update manuals, and other appropriate sources for any restrictions applying to the flight. Obtain navigational charts covering the entire flight area and allow for any required changes in routing due to weather or terrain.

   b. Select the course(s) and altitude(s) best facilitating mission accomplishment.

   c. Determine the magnetic heading, ground speed, and ETE for each leg, to include the alternate airfield if required. Compute total distance and flight time, and calculate the required fuel using a CPU-26A/P computer/Weems plotter (or equivalent) or the appropriate Mi-17 charts. Determine if the duplicate weight and balance forms in the aircraft logbook apply to the mission in accordance with AR 95-1. Verify that aircraft weight and CG will remain within allowable limits for the entire flight. Complete the appropriate flight plan and file it with the appropriate agency.

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

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references and aircraft logbook.

TASK 1006

Plan an Instrument Flight Rules Flight

CONDITIONS: Before IFR flight in a Mi-17 helicopter or Mi-17 FS, given access to weather information; NOTAMs; flight planning aids; necessary charts, forms, and publications; and weight and balance information.

Note. Aircraft is not certified and will not intentionally be flown in actual IMC conditions.

STANDARDS: Appropriate common standards and 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 in accordance with AR 95-1, applicable FARs/host nation regulations, local regulations, and SOPs.
3. Determine the proper departure, en route, and destination procedures.
4. Select route(s) and altitudes that avoid hazardous weather conditions, best ensure mission completion without exceeding aircraft or equipment limitations, and conform to IFR cruising altitudes. If off-airway, determine the course(s) ±5 degrees and determine the off-airway altitude without error.
5. Select an approach compatible with the weather, approach facilities, and aircraft equipment. Determine if an alternate airfield is required.
6. Determine distance ±1 nautical mile, true airspeed ±5 knots, ground speed ±5 knots, and ETE ±2 minutes for each leg of the flight.
7. Determine the fuel required ±100 liters.
8. Verify aircraft will remain within weight and CG limitations for the duration of the flight according to the operator's manual.
9. Verify aircraft performance data and ensure power is available to complete the mission according to the operator's manual.
10. Complete and file the flight plan.
11. Perform mission risk assessment according to unit SOP.

DESCRIPTION:

1. Crew actions.

   a. The PC will ensure all crewmembers are current/qualified and the aircraft is properly equipped to accomplish the assigned mission. The PC may direct the other 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.

a. Obtain weather information using appropriate military, FAA, or host-country weather facilities.

b. Compare destination forecast and approach minimums, and determine if an alternate airfield is required.

c. Ensure the flight can be completed in accordance with AR 95-1.

d. Check NOTAMs and other appropriate sources for any restrictions applying to the flight.

e. Obtain navigation charts covering the entire flight area and allowing for routing or destination changes due to weather conditions.

f. Select the routes, courses, and altitudes best facilitating mission accomplishment.

g. When possible, select preferred routing.

h. Determine the magnetic heading, ground speed, and ETE for each leg, to include flight to the alternate airfield if required.

i. Compute the total distance, flight time, and calculate the required fuel using a CPU-26A/P computer/Weems plotter (or equivalent) or mission planning system.

j. Determine if the weight and balance forms in the aircraft logbook apply to the mission in accordance with AR 95-1.

k. Verify aircraft weight and CG will remain within allowable limits for the entire flight.

l. Complete the appropriate flight plan and file with the appropriate agency.

Note. GPS IFR navigation is not authorized in the Mi-17 unless the navigation equipment is approved by the FAA; however, crews should consider and plan for its use only as an emergency backup system. The FAA approved IFR GPS possesses specific protected terminal instrument procedure data that cannot be altered by the aircrew. Currently, the Mi-17 GPS does not meet FAA certification requirements.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.

2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

TASK 1010

Prepare a Performance Planning Card

CONDITIONS: Given the aircraft takeoff GWT; the operator's manual; environmental conditions at departure, cruise, and arrival; and a blank Mi-17 PPC.

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

1. Calculate the PPC values according to the operator's manual. Compute values within the following parameters:

   a. Weight values ±500 pounds.

   b. Fuel flow ±100 liters.

   c. Airspeeds ±5 knots.

2. Calculate PPC values using accurate conditions for takeoff time within the following parameters:

   a. Free air temperature ±5 degrees Celsius.

   b. Pressure altitude (PA) ±500 feet.

   c. Gross weight ±500 pounds.

DESCRIPTION: Determine performance planning data necessary to complete the mission.

1. Crew actions.

   a. The PC will compute or direct the other RCM to compute the aircraft performance data in accordance with the operator's manual.

   b. The PC will verify the aircraft meets the performance requirements for the mission and brief the other RCM on performance planning data.

   c. The PC will ensure aircraft limitations and capabilities are not exceeded.

2. Procedures.

   a. The Mi-17 PPC is an aid for organizing performance planning data or for handling emergency procedures potentially arising during the mission. This form will be used during all evaluations.

   b. Use existing conditions to obtain the most accurate performance data. If mission or time constraints preclude using these conditions, use the highest PA and temperature forecast during the mission to determine aircraft performance.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.

2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

TASK 1012

Verify Aircraft Weight and Balance

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

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

1. Verify CG and GWT remain within aircraft limits for the duration of the flight according to the appropriate rotorcraft flight manual.

2. Identify all mission or flight limitations imposed by weight or CG.

3. Ensure DD Form 365-4 has been completed within the preceding 90 days.

DESCRIPTION:

1. Crew actions.

   a. The PC will brief crewmembers on any limitations.

   b. Crewmembers will continually monitor aircraft loading (such as fuel transfers, sling loads, and cargo load) during the mission to ensure CG remains within limits.

2. Procedures.

   a. Using the completed DD Form 365-4, verify aircraft GWT and CG will remain within the allowable limits for the entire flight. Note all GWT and loading task/maneuver restrictions/limitations. If there is no completed DD Form 365-4 meeting mission requirements, the PC will ensure adjustments are made to the 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 will be conducted academically.

2. Evaluation will be conducted academically.

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

TASK 1013

Operate Mission Planning System

CONDITIONS: In a Mi-17 helicopter and given approved computer with mission planning software, a mission briefing, SOI information, weather information, navigational maps, DOD FLIP, intelligence data, and other materials as required.

STANDARDS: Appropriate common standards and 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 device, if applicable.
7. Print out time distance heading (TDH) cards, waypoint lists, crew cards, communication cards, and knee-cards as required.

DESCRIPTION:

1. Crew actions. The 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 will be conducted academically.
2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

TASK 1014

Operate Aviation Life Support Equipment

CONDITIONS: Given the appropriate ALSE for the mission.

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

1. Inspect/perform operational checks on ALSE.
2. Use ALSE according to the appropriate operator's manual/instructions for each piece of equipment.
3. Assist passengers in the use of ALSE.

DESCRIPTION:

1. Crew actions. The PC will verify all required ALSE equipment is onboard the aircraft and meets all serviceability criteria 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 in accordance with AR 95-1, the operator's manual, and appropriate SOPs. Brief passengers on ALSE use.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references, EM 0250, TM 5-4220-202-14, TM 55-1680-317-23&P, and TM 55-1680-351-10.

TASK 1016

Perform Internal Load Operations

CONDITIONS: In a Mi-17 helicopter loaded with passengers/cargo, or academically.

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

1. RCM.

   a. Ensure a thorough passenger briefing had been conducted and a passenger manifest is on file in accordance with AR 95-1. Conduct a passenger briefing (Task 1002) according to the appropriate aircraft operator's manual/CL and unit SOP.

   b. Verify the aircraft will remain within GWT and CG limitations.

   c. Ensure passengers and cargo are properly restrained.

   d. Ensure floor-loading limits are not exceeded.

   e. Ensure cargo meets restraint criteria.

2. NCM.

   a. Perform a thorough passenger briefing and ensure a passenger manifest is on file, if applicable. Conduct the briefing according to the operator's manual/CL and unit SOP.

   b. Load the aircraft according to the load plan, if applicable.

   c. Ensure floor-loading limits are not exceeded.

   d. Secure passengers and cargo.

   e. Ensure cargo meets restraint criteria.

DESCRIPTION:

1. Crew actions.

   a. The PC (with FE assistance) will formulate a load plan. He or she will ensure a DD Form 365-4 is verified (if required) and the aircraft will be within GWT and CG limits. He or she will ensure the crew loads the cargo, uses proper tie-down procedures, and any passengers receive a briefing. The PC will determine whether the aircraft is capable of completing the assigned mission and ensure aircraft limitations will not be exceeded.

   b. The P* will perform a hover power check before takeoff and ensure the maximum allowable GWT of aircraft is not exceeded.

c. The NCM will ensure passengers are seated and wearing seat belts before takeoff in accordance with AR 95-1. He or she will monitor passengers/cargo during the flight for security.

2. Procedures.

a. Load cargo according to the cargo plan or DD Form 365-4, as appropriate. Properly secure and restrain all cargo according to criteria in the appropriate manuals.

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 according to the appropriate aircraft operator's manual/CL or unit SOP and information about the mission. Ensure 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 used according to the appropriate local directives or unit SOP.

Note. If the cargo/rescue winch is used, the NCM must ensure it is correctly operated according to the operator's manual.

Note. Hazardous cargo will be handled, loaded, and transported in accordance with AR 95-27 and the operator's manual/CL.

TRAINING AND EVALUATION REQUIRMENTS:

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

REFERENCES: Appropriate common references, AR 95-27, DD Form 365-4, FM 55-450-2, TM 38-250, and TM 55-1500-342-23.

TASK 1019

Perform Preventative Maintenance Daily Check

CONDITIONS: Given a Mi-17 helicopter and the preventive maintenance daily checklist.

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

1. Correctly check all items in accordance with preventive maintenance daily checklist.
2. Enter necessary information on the appropriate forms in accordance with DA Pam 738-751.

DESCRIPTION:

1. Using preventive maintenance daily checklist, conduct a preventive maintenance daily inspection. When conducting the inspection with another NCM, both NCMs will use the appropriate reference.

2. Obtain a fuel sample from each fuel tank and determine if the sample contains any water or foreign matter. Correctly enter appropriate information in the aircraft logbook.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: If time permits, accomplish the maintenance inspection during daylight hours. During the hours of darkness, use a flashlight with an unfiltered lens to supplement available lighting. Hydraulic leaks, oil leaks, and other defects are difficult to see using a flashlight with a colored lens.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references, aircraft logbook, DA Pam 738-751, FM 3-04.203, TC 3-04.7, and preventive maintenance daily checklist.

TASK 1020

Prepare Aircraft for Mission

CONDITIONS: In a Mi-17 helicopter, given a warning order/mission briefing and available mission/required equipment.

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

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

DESCRIPTION:

1. Crew actions. The PC will determine the equipment required for the mission. He or she will verify aircraft is prepared for the mission. The NCMs will ensure required mission equipment is installed, secured, inventoried and operational before flight.

2. Procedures. After receiving a mission briefing, determine the required mission equipment. Ensure equipment is installed, secured, inventoried, and operational before flight. If an airworthiness release (AWR) is required for mission equipment, ensure a current AWR is in the aircraft logbook and all inspections and checks have been completed according to the AWR. Check the equipment requiring aircraft power for operation according to procedures in the appropriate aircraft operator's manual/CL or appropriate mission equipment operator's manuals.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references, aircraft logbook, and the appropriate AWR.

TASK 1022

Perform Pre-Flight Inspection

CONDITIONS: With a Mi-17 helicopter and given the operator's manual/CL.

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

1. RCM. Perform the preflight inspection according to the appropriate aircraft operator's manual/CL. Enter appropriate information on the DA Form 2408-12 (Army Aviator's Flight Record), DA Form 2408-13 (Aircraft Status Information Record) and DA Form 2408-13-1 (Aircraft Inspection and Maintenance Record) in accordance with DA Pam 738-751.

2. NCM. Complete before preflight and preflight duties according to the operator's manual/CL and unit SOP, for the designated duty position.

DESCRIPTION:

1. Crew actions.

   a. The PC will ensure a preflight per inspection is conducted using the operator's manual/CL. The PC may direct other crewmembers to complete elements of the preflight inspection as applicable, and will verify all checks have been completed according to the operator's manual/CL. He or she will expediently report aircraft discrepancies that may affect the mission. He or she will ensure the necessary information is entered on the appropriate forms in accordance with DA Pam 738-751.

   b. The crewmembers will complete the assigned elements and report to the PC.

2. Procedures.

   a. The NCM will ensure the aircraft is prepared for preflight. He or she will ensure the aircraft is properly serviced, special equipment is installed, entries in the aircraft logbook are current and correct, and covers and tie-downs are removed. The NCM will secure all preloaded cargo.

   b. The NCM will inform the PC of aircraft status to include any special mission equipment installed and all known deficiencies.

   c. The RCM will use the operator's manual to verify each preflight check. The NCM will accompany the RCM during the preflight inspection, time permitting, and answer each question concerning aircraft components or systems based on data in the aircraft. The NCM will request maintenance assistance as determined necessary by the PC.

d. If circumstances permit, accomplish preflight inspection during daylight hours.

e. The NCM will secure cowlings and equipment following completion of the preflight inspection.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: If performing the preflight inspection during the hours of darkness, a flashlight (with an unfiltered lens) should be used to supplement available lighting. Hydraulic leaks, oil leaks, and other defects are difficult to see using a flashlight with a colored lens. Ensure internal and external lighting is operational. FM 3-04.203 contains details regarding nighttime preflight inspection.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references, FM 3-04.203, and DA Pam 738-751.

TASK 1024

Perform Before-Starting-Engine through Before-Leaving-Helicopter Check

Note. The NCM's visor should be down, unless using NVG, anytime he or she is outside the aircraft or inside the aircraft with the cabin door open and clamshell doors or the right side escape panel removed.

CONDITIONS: With a Mi-17 helicopter or Mi-17 FS and given the operator's manual/CL.

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

1. Perform procedures and checks according to the appropriate aircraft operator's manual/CL.
2. Comply with call and response terminology according to chapter 6 and the unit SOP.
3. Enter appropriate information on DA Form 2408-12, DA Form 2408-13, and DA Form 2408-13-1.
4. Properly secure the aircraft after the last flight of the day in accordance with operator's manual .

DESCRIPTION:

1. Crew actions.

   a. Each crewmember will complete the required checks pertaining to his assigned crew duties according to the operator's manual/CL. Crewmembers will coordinate with each other before entering data into aircraft systems.

   b. The P will read the checklist and announce APU and engine starts.

   c. All crewmembers will clear the area around the aircraft before APU start and each engine start.

   d. NCMs will perform duties as required by his duty position and those directed by the PC, according to the unit 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 DA Pam 738-751.

   f. If two or more NCMs will perform flight duties, the FE will determine which crewmember will perform specific portions of each task.

   g. Secure the aircraft after completing the flight according to the operator's manual and the unit SOP.

2. Procedures.

   a. Perform the before-starting-engine through before-leaving-helicopter checks according to the operator's manual/CL. The call and response method should be used, as appropriate.

   b. The crewmember reading the checklist will read the complete checklist item.

   c. The crewmember performing the check will answer with the appropriate response. For example, for the call "Anti-collision/position lights—as required" the response might be "Anti-collision lights, both, night; position lights, steady, bright." Responses that do not clearly communicate action of information should not be used. For example, when responding to the call, "Systems—check" replying with "check" does not clearly indicate the systems are within the normal operating range. A response of "All in the normal operating range" communicates more accurate information.

   d. After the flight, enter all information required on the appropriate DA forms.

   e. During APU start, the NCM will be outside the aircraft to ensure the area is clear and perform fireguard duties.

   f. During engine start, the NCM will assume a position 45 degrees from the front of the engine at the rotor blade tip to ensure the aircraft is clear and ready for the engine start.

   g. The NCM/pilots will complete the postflight according to the operator's manual/CL.

   h. The NCM will verify the aircraft is properly moored and protective covers and security devices are properly installed in accordance with TM 1520-Mi-17-10 and applicable TM 1520-Mi-17-20-1.

   i. Perform additional security duties as directed by the PC.

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

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

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft or FS.

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

TASK 1026

Maintain Airspace Surveillance

> **WARNING**
>
> **While moving about the cabin area during flight, the NCMs must be secured to a tiedown fitting in the cabin area. NCM will not secure their restraining harness to the clamshell door.**

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS in VMC.

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

1. Brief airspace surveillance procedures prior to flight. This will include scan sectors.
2. Announce drift or altitude changes, clear the aircraft, and immediately inform other crewmembers of all air traffic or obstacles posing a threat to the aircraft.
3. Announce when attention is focused inside the aircraft.
4. Maintain airspace surveillance in assigned scan sectors.
5. When landing, the crew will confirm the suitability of the area and that the aircraft is clear of obstacles.

DESCRIPTION:

1. Crew actions.

   a. The PC will brief airspace surveillance procedures prior to the flight. The briefing will include areas of responsibility and scan sectors.

   b. The P* will announce his intent to perform a specific maneuver and remain focused outside the aircraft. He or she is responsible for clearing the aircraft and obstacle avoidance.

   c. The P and NCM will provide adequate warning of obstacles, unusual drift, or altitude changes. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.

   d. When landing, the crew will confirm the suitability of the area and that the aircraft is clear of obstacles. The NCMs will move about the aircraft as necessary to ensure total coverage.

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 posing 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.) For air traffic, give distance in miles or fractions of miles, as appropriate. When reporting air traffic, specify the type of aircraft if known. The altitude of the air traffic should be reported as the same altitude, higher, or lower than the altitude at which you are flying. For ground obstacles, give distance in miles or feet, as appropriate.

   b. Before changing altitude, visually and verbally clear the aircraft for hazards and obstacles inclusive of what is ahead, above, below, to the left, and to the right of the aircraft.

   c. Before 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 NIGHT VISION GOGGLE CONSIDERATIONS: Using proper scanning techniques will assist in detecting traffic and obstacles and avoiding spatial disorientation. Hazards such as wires are difficult to detect.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1028

Perform Hover Power Check

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, at appropriate hover height, with performance planning information available, and the before-hover check completed.

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

1. Position the aircraft in the vicinity of the takeoff point and the direction of takeoff at the appropriate hover height.

2. Determine if aircraft performance is sufficient to complete the mission by noting the engine gas producers (N^1), power turbine inlet temperatures (PTITs), engine pressure ratio (EPR) indications, pitch setting and rotor speed (N^r).

3. Determine if single-engine hover capability exists.

4. Determine if sufficient fuel is available to complete the mission.

5. Determine controllability, CG hang, and proper instrument response.

6. Determine if aircraft performance is sufficient to complete the mission.

7. Ensure aircraft limitations are not exceeded.

DESCRIPTION:

1. Crew actions.

   a. The PC will determine whether the aircraft is capable of completing the assigned mission and ensure aircraft limitations are not exceeded.

   b. The P* will announce his intent to bring the aircraft to a stationary hover for the hover power check.

      (1) During the ascent, check for proper control response.

      (2) Remain focused outside the aircraft and announce when the aircraft is stabilized at the desired hover altitude.

      (3) Use a 10-foot stationary hover near the takeoff point and in the direction of takeoff when performing the hover power check, unless mission or terrain constraints dictate otherwise.

   c. During the ascent, the P will monitor the instruments and verify the power check.

      (1) He or she will ensure aircraft limitations are not exceeded and note the N^1, PTITs, EPR indications, pitch setting, N^r, engine oil temperatures, engine oil pressures, and transmission temperature and pressure. He or she will determine if single-engine capability exists and sufficient fuel is available to complete the mission.

(2) He or she will announce results to the P*.

d. NCM will remain focused primarily outside the aircraft to assist in clearing and provide adequate warning of obstacles.

2. Procedures.

a. While hovering, check for proper control response by applying aft, then forward cyclic followed by left and right cyclic. Attitude indicator will indicate proper attitude changes. Apply left, then right pedal, changing heading 3 to 5 degrees.

b. Note proper changes to heading indicators, magnetic compass, turn needle, and trim ball is free in race.

c. Slightly increase and decrease collective and note changes in radar and barometric altimeters and proper response from the vertical speed indicators. While at a stabilized hover, check control positioning to ensure proper CG and control rigging.

d. The PC will ensure aircraft performance and fuel are sufficient to complete the mission.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: The crew will use proper scanning techniques to avoid excessive drift when hovering at night or using NVG.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1032

Perform Radio Communication Procedures

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS.

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

1. RCMs. RCMs will check and operate aircraft avionics. They establish radio contact with the desired unit or ATC facility. When communicating with ATC facilities, RCMs use correct radio communication procedures and phraseology according to the AIM, DOD FLIPs, and Department of Transportation (DOT)/FAA Order 7110.65 P/CG. RCMs also operate the intercom system and perform or describe two-way radio failure procedures according to the DOD FLIP or host country regulations.

2. NCMs. The internal communication system is used to communicate with the crew.

DESCRIPTION:

1. Crew actions.

    a. The PC will determine radio frequencies according to mission requirements during the crew briefing and indicate whether the P* or 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 or she will copy pertinent information and announce information not monitored by the P*.

    d. During normal operations, the NCM will monitor external communications to prevent interruption when external communications are transmitted or received. (Monitoring external communications may not be desirable during operations requiring extensive internal communication, such as external loads, hoist, or emergencies.)

    e. Crew actions for two-way radio failure are as follows:

        (1) P* or P will announce two-way radio failure to all crewmembers.

        (2) The PC will direct the efforts to identify and correct the avionics malfunction.

        (3) The P* will focus outside the aircraft during VMC or inside on the instruments during IMC, 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.

    f. Crew actions for aircraft intercom failure are as follows:

(1) The PC will direct assistance from the crew to determine the malfunction and corrective action. Alternate actions may include switching to a different internal communication system (ICS) box, changing microphone cords if available, hooking up to a different ICS station, hand and arm signals, or passing notes.

(2) If the problem cannot be corrected, the PC will determine the course of action, which may vary from landing as soon as practical to landing as soon as possible.

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. Procedures for two-way radio failure. Attempt to identify and correct the malfunctioning radio and announce the results. If two-way radio failure is confirmed, comply with procedure outlined in the flight information handbook or host country regulations.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references, AIMs, and DOT/FAA Order 7110.65 P/CG.

TASK 1034

Perform Ground Taxi

CONDITIONS: In a Mi-17 helicopter or a Mi-17 FS on a suitable surface, with the before-taxi/after-landing check completed, and the aircraft cleared.

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

1. RCM.

   a. Maintain a constant speed appropriate for conditions and stay within ground control limitations.

   b. Maintain desired ground track.

   c. Maintain flight controls according to operators manual.

2. NCM.

   a. Perform applicable checks in accordance with operator's manual/CL and the unit SOP when read by the P.

   b. Immediately inform the RCMs of any observed discrepancy or malfunction.

   c. Clear the aircraft.

   d. Use hand-and-arm signals, if required, in accordance with FM 21-60.

DESCRIPTION:

1. The P* will ensure the main-rotor revolutions per minute (RPM) is within limits and the parking brake is released. The P* will announce his intent to begin the taxi, state the taxi plan, and clear the aircraft.

2. The P and CE will assist the P* in clearing the aircraft.

3. The P* will initiate the taxi by increasing the collective slightly (a 1- to 3-degree pitch) and moving the cyclic slightly forward to start movement. Perform taxi check (brakes, heading and turn indicators). When the aircraft starts moving, reduce the collective to the minimum required to maintain movement at the desired speed. Control heading with the pedals. Use left and right pedal input to turn the aircraft and a slightly lateral cyclic into turns to maintain a level fuselage attitude (cyclic movement should be minimized to avoid droop-stop pounding). Regulate taxi speed with a combination of cyclic, collective, and necessary brake applications. Soft, rough, or sloping terrain may require the use of more or less power than would normally be required.

Note. The P* may use lateral cyclic inputs to assist with directional control. These inputs are normally required while taxiing in a crosswind. Adhere to crosswind restrictions.

4. When the NCM is required outside the aircraft during taxi, he or she will be positioned where the P*/P can clearly see all hand-and-arm signals or will remain attached to the aircraft communication system.

Note. Emergency stops may be performed with the wheel brakes or by bringing the aircraft to a hover, depending on ground velocity.

Note. Do not attempt cyclic aerodynamic braking during taxi.

Note. Ground taxi is prohibited with wind speeds in excess of 29 knots (hovering is an alternative).

Note. If during taxi, helicopter vibration increases (ground resonance), immediately reduce collective, center the cyclic, and retard throttle to idle. If vibration persists, perform emergency shutdown (fuel stopcocks closed, fuel pumps off, fuel fire shutoff valves closed).

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Aircraft taxi at night or with NVG requires a constant scan by every crewmember to ensure obstacle clearance. Use of artificial illumination, such as the white or infrared (IR) landing/search lights, taxi light, and/or blade tip lights may be necessary for safe operations as determined by the P*. Position lights; anticollision light should be set to bright. The P* will utilize a ground guide when taxi is required in a congested area. Taxi speeds may need to be reduced.

SNOW/SAND/DUST CONSIDERATIONS: If ground reference is lost due to blowing snow/sand/dust, lower the collective, neutralize the flight controls, and apply wheel brakes until visual reference is reestablished.

Note. Use caution when taxiing near other maneuvering aircraft because of limited visual references and relative motion illusion.

Note. Due to decreased visual references and possibility of relative motion illusion, limit ground speed to a rate appropriate for conditions.

Note. At night, use the landing, search, taxi, blade tip, or anticollision lights may cause spatial disorientation in blowing snow/sand/dust.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted at the aircraft.

2. Evaluation will be conducted at the aircraft.

REFERENCES: Appropriate common references and FM 21-60.

TASK 1038

Perform Hovering Flight

CONDITIONS: In a Mi-17 helicopter or a Mi-17 FS with the before-hover check completed and aircraft cleared.

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

1. Perform a smooth, controlled ascent to hover.
2. Perform a smooth, controlled descent with minimal drift at touchdown.
3. Maintain ground track, ±5 feet during hover taxi.
4. Maintain a constant rate of turn, not to exceed 90 degrees within 4 seconds.

DESCRIPTION:

1. Crew actions.

   a. The 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 or she will ensure and announce the aircraft is cleared prior to turning or repositioning the aircraft. He or she will announce when they terminate the maneuver.

   b. The P and NCM will assist in clearing the aircraft in the direction of any movement and provide adequate warning of obstacles, excessive drift, or excessive altitude changes. They will announce when their attention is focused inside the aircraft and again when their attention is reestablished outside.

   c. The P and NCM should assist the P* in maintaining the position of the aircraft over the pivot point.

2. Procedures.

   a. Takeoff to a hover.

   (1) Position the cyclic, as necessary, and maintain heading with the pedals.

   (2) Smoothly raise the collective control and adjust the cyclic to ascend vertically to a 10-foot hover altitude, unless mission requirements dictate another altitude.

   (3) Release the brakes as necessary.

   b. Hovering flight.

   (1) Adjust the cyclic to maintain a stationary hover or to hover in the desired direction. Control heading with the pedals and maintain altitude with the collective control.

(2) Maintain a constant hover speed appropriate for the conditions. To return to a stationary hover, apply cyclic in the opposite direction while maintaining heading with the pedals and altitude with the collective control.

Note. Air taxi is the preferred method for ground movements on airports, provided ground operations and conditions permit. Unless otherwise requested or instructed, pilots are expected to remain below 100 feet above ground level (AGL). However, if a higher than normal airspeed or altitude is desired, the request should be made prior to lift-off. The pilot is solely responsible for selecting a safe airspeed for the altitude/operation being conducted. 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.

(1) Apply pressure to the desired pedal to begin the turn. Use pressure and counter pressure on the pedals to maintain the desired rate of turn. Coordinate cyclic control to maintain position over the pivot point while maintaining altitude with the collective. Hovering turns can be made around any vertical axis (for example, the nose, mast, tail of the aircraft, or a point in front of the aircraft). However, turns other than about the center of the aircraft will increase the turn radius proportionately.

(2) Around the nose. With the aircraft stationary, pick a point slightly forward of the nose. Control the direction and rate of turn with the cyclic and pedals and maintain altitude with the collective control (cross-control of the cyclic and pedals is required to pivot around the nose).

(3) Around the mast. With the aircraft at a stationary hover and the mast over the pivot point, apply pedal in the desired direction of turn. Maintain a stationary position over the pivot point with the cyclic. Control the rate of turn with the pedals and maintain altitude with the collective; this results in the minimum radius turn.

(4) Around the tail. With the aircraft at a stationary hover and the pivot point under the tail, apply cyclic and pedal in the direction of the intended turn. Use cyclic and pedal to control the rate of turn and movement. Maintain hover altitude with the collective.

d. Landing from a hover.

(1) Lower the collective control to effect a smooth rate of descent until the main gear contacts the ground.

(2) Coordinate collective reduction with the cyclic, as necessary, to maintain pitch attitude and to stop horizontal movement.

(3) Smoothly lower the collective control to allow the nose gear to contact the ground. Continue to lower the collective full down, neutralize the controls, and apply brakes to stop forward movement.

(4) If landing to an improved surface, if clear, allow aircraft to roll forward for proper landing gear positioning.

(5) If sloping conditions are suspected or anticipated, see Task 1062.

3. The P and NCM should assist the P* in maintaining the position of the aircraft over the pivot point.

4. When landing from a hover to an unimproved area, the crew must check for obstacles under the aircraft. Brake may be set prior to touchdown.

Note. Cyclic turns should only be used when necessary.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Movement over areas of limited contrast—such as tall grass, water, or desert—tends to cause spatial disorientation. Seek hover areas providing 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. Night: Unaided hovering flight is difficult due to loss of visual references around the aircraft. If needed, utilize the landing light (white) to help clear the aircraft and to increase awareness of aircraft movement. If hovering is required in a congested area, ground guides will be utilized. Use of the white light will impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching full dark adaptation.

NIGHT VISION GOGGLES: Aided hovering flight requires constant scanning and acute awareness of aircraft movement above the ground. While wearing NVG both depth perception and distance estimation capabilities are reduced. This is primarily due to reduced visual acuity, as opposed to day vision, and the lack of peripheral vision cues. Depth perception in a given situation depends on available light, type and quality of the goggles, degree of contrast in the field of view, and the viewer's experience. Increased scanning techniques and a thorough understanding of the monocular cues will help in performing hovering flight. If hovering is required in a congested area, a ground guide will be utilized.

Note. Hovering is permitted in wind speeds (head, tail, or cross) no higher than limits identified in Chapter 5 of the operator's manual.

SNOW/SAND/DUST CONSIDERATIONS:

1. During ascent to a hover, if visual references do not deteriorate to an unacceptable level, continue ascent to desired hover altitude.

2. Ten-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).

3. Twenty-foot to 100-foot air taxi: Use this maneuver when it is necessary to move the aircraft over terrain 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 appropriate for conditions.

Note. Ensure 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 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 will be conducted in aircraft or FS.

2. Evaluation will be conducted in aircraft.

REFERENCES: Appropriate common references.

TASK 1040

Perform Visual Meteorological Conditions Takeoff

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS with the hover power and before-takeoff checks completed and the aircraft cleared.

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

1. Maintain takeoff heading ±10 degrees below 50 feet AGL.
2. Maintain ground track aligned with takeoff direction.
3. Maintain aircraft in trim above 50 feet AGL.
4. Maintain takeoff power until reaching minimum single-engine airspeed, desired climb airspeed, or transition to mission profile.

DESCRIPTION:

1. Crew actions.

   a. The PC will determine the direction of takeoff by analyzing the tactical situation, the wind, the long axis of the takeoff area, and the lowest obstacles, and will confirm required power is available. He or she will ensure the required fuel for the mission is available or add sufficient fuel, abort, or revise the mission.

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

   c. The P and 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.

Note. NCM will verify that passengers, cargo, and mission equipment are properly secured.

   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.

      (1) The P* will announce his or her intent to take off from the ground. The P* will focus his or her attention primarily outside the aircraft but will occasionally cross-check the flight instruments.

(2) The P and 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.

(3) The P* will select reference points to maintain ground track. With the cyclic and pedals in the neutral position, the P* will release the brakes and raise the collective control until the aircraft is airborne and accelerating.

(4) All landing gear should leave the ground at the same time. As the aircraft leaves the ground, the P* will apply forward cyclic as required to smoothly accelerate through effective translational lift (ETL) at an altitude appropriate for the terrain and obstacles.

(5) The P* will adjust the cyclic as necessary to continue the acceleration (approximately 5 degrees nose down, not to exceed 10 degrees nose down), obtain the desired climb airspeed, and maintain ground track. He or she will position the collective control as necessary to clear obstacles in the flight path and obtain the desired rate of climb. He or she will use the pedals to maintain heading when below 50 feet AGL and in trim when above 50 feet AGL.

(6) When the P* obtains the desired climb airspeed, he or she will adjust the cyclic as necessary to stop the acceleration. He or she will adjust the collective to continue or to stop the rate of climb.

(7) 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.

b. From a hover.

(1) The P* will announce his or her intent to take off from a hover and will focus his or her attention primarily outside the aircraft.

(2) The P and 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.

(3) The P* will select reference points to maintain ground track. He or she will apply forward cyclic to smoothly accelerate the aircraft through ETL while adjusting the collective, as required, to maintain the appropriate hover height. The P* will perform the rest of the maneuver similar to a takeoff from the ground.

(4) 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.

Note. Performing this maneuver in certain environments may require hover OGE power. Evaluate each situation for power required versus power available, such as terrain flight takeoff.

Note. The P* must avoid excessive and unnecessary nose-low accelerative attitudes.

Note. The NCMs should remain seated during this maneuver.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. If sufficient illumination exists to view obstacles, the P* should accomplish the takeoff at night similar to a VMC takeoff during daylight. Visual obstacles, such as shadows, should be treated the same as physical obstacles.

2. 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 the ground or a hover. Maintain takeoff power setting until reaching climb airspeed. Adjust the collective as required to establish the desired rate of climb and cyclic to maintain the desired airspeed. The P* and NCM should maintain orientation outside the aircraft and concentrate on obstacle avoidance. The P should make all internal checks. The P will advise the P* when the altimeter and vertical speed indicator (VSI) show climb has been established (phrased "you have a climb outside and inside [altimeters and VSI]). Reduced visual references during takeoff and throughout ascent at night may make it difficult to maintain the desire ground track. Knowledge of surface wind direction and velocity will assist in maintaining the desired ground track. Use proper scanning techniques to avoid spatial disorientation. Ensure the searchlight or landing light (white light) is in the desired position when performing operations during unaided night flight. Using the white light will impair night vision several minutes. Exercise added caution if resuming flight before reaching full dark adaptation.

SNOW/SAND/DUST CONSIDERATIONS: Apply collective and cyclic as required to ascend vertically. As the aircraft leaves the ground, 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 the collective to blow away loose snow/sand/dust from around the aircraft is beneficial before performing this maneuver.

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

Note. Be prepared to transition to instruments and execute an instrument takeoff if ground reference is lost.

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

MOUNTAIN/PINNACLE/RIDGELINE CONSIDERATIONS: Analyze winds, obstacles, and density altitude. Perform a hover power check. 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 downslope to gain airspeed.

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

1. 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. 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, it is important to understand dynamic rollover characteristics.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in aircraft or FS.

2. Evaluation will be conducted in aircraft.

REFERENCES: Appropriate common references.

TASK 1044

Navigate by Pilotage and Dead Reckoning

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS and given a plotter, a computer, the flight log, and appropriate maps.

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

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

DESCRIPTION:

1. Crew actions.

   a. The P* will focus primarily outside the aircraft and respond to navigation instructions or cues given by the P. The P* will acknowledge commands issued by the P for the heading, altitude, and airspeed changes necessary to navigate the desire 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 or she will announce all plotted wires before approaching their location. The P and NCM will monitor aircraft instruments, assist in clearing the aircraft, and provide adequate warning to avoid traffic and obstacles. The P and NCM will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.

   c. The FE and/or CE will continually watch for traffic and obstacles along the flight path.

2. Procedures.

   a. Both pilotage and dead reckoning will be used to maintain the position of the aircraft along the planned route. Planned heading 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 time for subsequent legs of the flight route using the computed ground speed. Compare planned ground speed with computed ground speed and adjust airspeed as required to arrive at each control point at its original ETA.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: More detailed flight planning is required when the flight is conducted at night. Interior cockpit lighting should be considered when selecting colors for preparing navigation aids such as maps and kneeboard notes. FM 3-04.203 contains details on night navigation and mission planning.

TRAINING AND EVALUATION REQUIRMENTS:

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

REFERENCES: Appropriate common references.

TASK 1046

Perform Electronically Aided Navigation

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS with an electronically aided navigation system installed and operational.

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

1. Operate the installed electronically aided navigation system according to the appropriate technical manual or manufacture's operating manual.

2. Determine the position of the aircraft along the route of flight within 200 meters.

3. Arrive at check points/destination at ETA ±1 minute.

DESCRIPTION:

1. Crew actions.

   a. The P* will focus primarily outside the aircraft and respond to navigation instructions or cues given by the P. The P* will acknowledge commands issued by the P for the heading, altitude, and airspeed changes necessary to navigate the desire course. The P* will announce significant surface features to assist in navigation.

   b. The P will be primary operator of the electronically aided navigation system. He or she 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 or she will announce all plotted wires before approaching their location.

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

   c. The P and NCM will monitor aircraft instruments, assist in clearing the aircraft, and provide adequate warning to avoid traffic and obstacles.

   d. The P and NCM will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.

2. Procedures. Perform the turn-on, test, and programming procedures according to the appropriate technical manual. The proper updating and shutdown procedures will be perform according to the appropriate technical manual or manufacture's operators manual. The P* will use the heading indicators with the GPS system when flying the selected course.

Note. Use of any "VFR ONLY" GPS system as an IFR navigational system is not authorized; however, the crew should consider and plan for its use as an emergency backup system.

TRAINING AND EVALUATION REQUIRMENTS:

1. Training will be conducted in the aircraft or FS.

2. 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 Mi-17 helicopter or Mi-17 FS with a CPU-26A/P computer or calculator.

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

1. RCM.

a. Verify 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 CG limits.

2. RCM/NCM.

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 liters 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 P or NCM will record the initial fuel figures, fuel flow computation, burnout, and reserve times. The P or NCM will announce when initiating the fuel check and when completing the fuel check. The P or NCM also will announce the results of the fuel check.

b. The P* will acknowledge the results of the fuel check.

c. The 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 whether 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 internal to external tanks before using external tank fuel quantities in fuel reserve/burnout computations.

Note. Do not perform fuel consumption checks while transferring fuel from internal fuel tank(s) to external 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 the system is operating properly.

d. Auxiliary fuel management. Follow procedures outlined in the appropriate aircraft operator's manual when using the external extended range fuel system. Refer to the appropriate manufacturer's operator's manual when using nonstandard auxiliary fuel systems.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation may be conducted in the aircraft or FS.

REFERENCES: Appropriate common references.

TASK 1052

Perform Visual Meteorological Conditions Flight Maneuvers

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS with the aircraft cleared and given VMC.

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

1. Turns.
   a. Clear the aircraft.
   b. Maintain aircraft in trim.
   c. Maintain selected airspeed ±10 knots.
   d. Maintain altitude ±100 feet.
   e. Maintain selected bank angle ±10 degrees.
   f. Roll out on desired heading ±10 degrees.
2. Climbs and descents.
   a. Clear the aircraft.
   b. Maintain aircraft in trim.
   c. Maintain selected airspeed ±10 knots.
   d. Maintain rate of climb or descent ±200 FPM.
   e. Maintain desired heading ±10 degrees.
3. Straight and level flight.
   a. Maintain aircraft in trim.
   b. Maintain selected airspeed ±10 knots.
   c. Maintain altitude ±100 feet.
   d. Maintain desired heading ±10 degrees.
4. Traffic pattern flight. Enter, operate in, and depart a traffic pattern.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused primarily outside the aircraft. He or she will announce and clear each turn, climb, and descent.

   b. The P and 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 according to ATC directives, local SOP, and FM 3-04.203.

   a. VMC climb. The P* will raise the collective lever to initiate climb. He or she will adjust pedals to maintain aircraft in trim. The P* will lower the collective lever to stop climb at desired altitude.

   b. VMC climbing turns. The P* will raise the collective lever to initiate climb. He or she will adjust pedals to maintain aircraft in trim and apply cyclic in the desired direction of turn. The P* will adjust the cyclic as required to stop turn on heading and lower the collective lever to stop climb at desired altitude.

   c. VMC straight-and-level flight. The P* will adjust the collective lever to maintain altitude. He or she will adjust pedals to maintain aircraft in trim. The P* will maintain airspeed and heading.

   d. VMC level turns. The P* will apply cyclic in the desired direction of turn. He or she will adjust the collective lever to maintain altitude and adjust pedals to maintain aircraft in trim. The P* will apply cyclic opposite the direction of turn to stop the turn on the desired heading.

   e. VMC descents. The P* will lower the collective lever to initiate the descent. He or she will adjust pedals to maintain aircraft in trim. The P* will raise the collective lever to stop rate of descent at the desired altitude.

   f. VMC descending turns. The P* will lower the collective lever to initiate descent. He or she will adjust pedals to maintain aircraft in trim and apply cyclic in the desired direction of turn. The P* will adjust cyclic as required to stop turn at the desired heading. He or she will raise the collective lever to stop the descent at desired altitude.

g. Traffic pattern flight.

(1) The P* will maneuver the aircraft into position to enter the downwind leg midfield at a 45-degree angle (or according to local procedures), at traffic pattern altitude, and at the desired airspeed. (A straight-in or base-leg entry may be used if approved by ATC.) On downwind, the P will complete the before-landing check. Before turning base, the P* will lower the collective lever and adjust airspeed as required and initiate a descent. If performing a straight-in or a base-leg entry, the P* will reduce airspeed at a point to facilitate the approach. The P* will turn base and final leg, as appropriate, to maintain the desired ground track. The P* will perform the desired approach. The P* will announce each turn in the pattern and the type of approach planned. The P and NCM will assist in clearing the aircraft throughout each turn in the traffic pattern.

(2) For a closed traffic pattern after takeoff, the P* will climb straight ahead at climb airspeed to the appropriate altitude, turn to crosswind, and continue the climb. The P* will initiate the turn to downwind as required to maintain the desired ground track. He or she will adjust the collective lever and cyclic as required to maintain traffic pattern altitude and airspeed.

h. Before-landing check.

(1) The P will perform the before-landing check before turning base.

(2) The P will call out the before-landing check and announce when it is completed.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. The P* will focus primarily outside the aircraft and should concentrate on obstacle avoidance and aircraft control. The P will make all internal cockpit checks.

2. For NVG training in a traffic pattern, the recommended maximum airspeed is 100 knots indicated airspeed, and the maximum bank angle is 30 degrees.

TRAINING CONSIDERATIONS: For traffic pattern training, the recommended airspeed is 80 KIAS and a 500 FPM rate climb/descent on crosswind and base legs and 100 KIAS on the downwind leg.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. 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 Mi-17 helicopter or Mi-17 FS and given a map or photo data.

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

1. Perform map, photo, or visual reconnaissance.

2. Determine the 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 PC will confirm suitability of the area for the planned mission.

   b. The P* will remain focused primarily outside the aircraft throughout the maneuver for aircraft control and obstacle avoidance. He or she will announce his or her intent to deviate from the maneuver.

   c. The P and 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 3-04.203.

Note. Depending on the mission, an in-flight suitability check may not be feasible. Suitability may be determined by a map reconnaissance. Make a final determination of suitability upon arrival to the LZ/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. IIMC 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 multiaircraft operation must respond to IIMC, 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. High PA may limit loads and, therefore, require more sorties.

Note. Avoid planning approach or departure routes into a rising or setting sun or moon.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Unimproved and unlit areas are more difficult to evaluate at night because of low contrast. Knowledge of the various methods for determining the height of obstacles is critical to successfully completing this task. Visual obstacles such as shadows should be treated the same as physical obstacles.

2. When performing operations during unaided night flight, ensure 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 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 may be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1058

Perform Visual Meteorological Conditions Approach

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS with the before-landing check completed.

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

1. Verify sufficient power for the approach.

2. Maintain a constant approach angle clear of obstacles to desired point of termination (hover) or touchdown (surface).

3. Maintain rate of closure appropriate for the conditions.

4. Maintain ground track alignment with the landing direction, as appropriate.

5. Align aircraft with landing direction below 50 feet AGL or as appropriate for transition from terrain flight.

6. Perform a smooth and controlled termination to a hover or touchdown to the surface.

7. Verify crew, passengers, cargo, and mission equipment is secured.

DESCRIPTION:

1. Crew actions.

   a. The P* will select a suitable landing area (analyze suitability, power available, barriers, winds, approach path, touchdown point, and takeoff directions). The P* will focus his attention primarily outside the aircraft to ensure obstacle clearance throughout the approach and landing. The P* will announce when he or she begins the approach and whether they will terminate the approach to a hover or to the ground. The P* will announce the intended point of landing and any deviation from the approach, to include execution of a go-around if necessary.

   b. The P and NCM will confirm the suitability of the landing area as requested and will assist the P* in clearing the aircraft and warn of any traffic or obstacles. If a go-around is necessary, the P and NCM will remain focused outside the aircraft for obstacle avoidance. The P* will acknowledge any pertinent observations made during the approach. The P and NCM will announce when focused inside the aircraft and again when attention is reestablished outside.

2. Procedures. Evaluate winds. Select an approach angle allowing obstacle clearance while descending to the desired point of termination. Once the termination point is sighted and the approach angle is intercepted, adjust 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, touchdown) or until a decision is made to perform a go-around.

a. To a hover. The approach to a hover may terminate with a full stop over the planned termination point or 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 ground. The decision to terminate to the surface with zero speed or with forward movement will depend on the aircraft's loading/environmental conditions. Touchdown with minimum forward or lateral movement. After ground contact, ensure the aircraft remains stable with all movement stopped. Smoothly lower the collective to full down and neutralize the pedals and cyclic. Apply brakes if required.

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

Note. The P* should perform a go-around if a successful landing is doubtful or if visual reference with the intended termination point is lost (Task 1068).

Note. If wind conditions are perceived to be a factor, a wind evaluation should be performed. Techniques for evaluating wind conditions are found in FM 3-04.203.

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

Note. Performing this maneuver in certain environments may require hover OGE power. Evaluate each situation for power required versus power available.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

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

2. Surrounding terrain or vegetation may decrease contrast and cause degraded depth perception during the approach. Before descending below obstacles, determine the need for artificial lighting.

3. Use proper scanning techniques to avoid spatial disorientation.

4. When performing operations during unaided night flight, ensure the searchlight or landing light (white light) is in the desired position. Use of the white light will impair night vision for several minutes. Therefore, exercise added caution if resuming flight before reaching fully dark adaptation.

SNOW/SAND/DUST CONSIDERATIONS:

1. Termination to a point OGE.

   a. This approach requires OGE power and may be used for most snow landings and some sand/dust landings.

   b. Make the approach to a hover OGE over the intended landing point.

   c. 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.

   d. 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 fully down and neutralize the flight controls.

2. Termination to the surface with forward speed.

   a. This termination may be made to an improved landing surface with minimal ground references.

   b. Once the appropriate approach angle is intercepted, adjust the collective as necessary to establish and maintain the angle.

   c. As apparent rate of closure appears to increase, progressively decrease the rate of descent and rate of closure to arrive at the touchdown area slightly above ETL. At this point, maintain the minimum rate of closure to ensure the snow/sand/dust cloud remains behind the pilot's station.

   d. When the wheels or heels of the skis contact the ground, lower the collective and allow the aircraft to settle. Apply slight aft cyclic at touchdown to prevent burying the wheels or toes of the skis. When the wheels or heels of the skis contact the 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.

   a. This termination should be made for landing areas where slopes, obstacles, or unfamiliar terrain preclude a landing with forward speed.

   b. It is not recommended when new or powder snow or fine dust is present because white/brown out conditions will occur.

   c. The termination is made directly to a reference point on the ground with no forward speed. After ground contact, smoothly lower the collective to full down position and neutralize the flight controls.

Note. Brakes set or released may be determined by the type of surface, hard or soft, during the reconnaissance.

d. Packed surface area. Thin layer of snow or dust atop hard subsurface with some visible terrain elements, such as rocks. Set the brakes to minimize forward roll after landing.

e. Soft surface area. Thick layer of snow or dust with no visible subsurface, release the brakes to minimize abrupt stop after landing and unnecessary stress on the aft landing gear.

Note. When landing in deep snow, 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, use of the landing, search, or strobe light may cause spatial disorientation while in blowing snow/sand/dust.

CONFINED AREA CONSIDERATIONS: An approach to the forward one-third of the 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 ETL. After touching down, check aircraft stability as the collective is lowered.

MOUNTAIN/PINNACLE/RIDGELINE CONSIDERATIONS: Select a shallow to steep approach angle depending on the wind, density altitude, gross weight, and obstacles. Before 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 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 ETL. After touchdown, check aircraft suitability as the collective is lowered.

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

Note. Motion parallax may make the rate of closure 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.

Note. On approach, avoid descents greater than 300 FPM.

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. Verify aircraft stability while lowering the collective. If the area is determined by the P* to be suitable, lower the collective fully down and neutralize the cyclic and pedals.

TRAINING AND EVALUATION REQUIRMENTS:

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

REFERENCES: Appropriate common references.

TASK 1062

Perform Slope Operations

CONDITIONS: In a Mi-17 helicopter with aircraft cleared.

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

1. RCM.

   a. Select a suitable landing area (within the allowable slope limits).

   b. Set the parking brakes prior to landing.

   c. Execute a smooth and controlled descent.

   d. Maintain heading ±5 degrees.

   e. Maintain minimum drift (±1 foot) before touchdown and then no drift allowed after wheel contact.

   f. Execute a smooth, controlled ascent.

2. NCM.

   a. Confirm suitable landing area.

   b. Clear the aircraft throughout the landing and/or sequence.

DESCRIPTION:

1. Crew actions.

   a. The P* will announce his intent to perform a slope operation and will establish the aircraft over the slope. He or she will set the brakes, requesting assistance if needed. The P* will remain within slope limitations. He or she will announce his or her 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.

Note. The Mi-17 wheel brake control lever is installed only on the pilot's cyclic stick (left seat position); therefore, the left seat pilot will set the brakes and the right seat pilot will verify they are set.

   b. The P and NCM will confirm the suitability of the intended landing area and provide adequate warning of obstacles, excessive drift, or excessive attitude changes. They will announce when their attention is focused inside the aircraft and again when attention is reestablished outside.

c. The P will assist in setting the parking brakes (when necessary), and verify when they are set. The P will note the aircraft attitude on the attitude indicator and notify the P* prior to exceeding aircraft slope limitations.

d. The NCM will assume a position where he or she can observe the slope operation. He or she will clear his sector while checking that the rotor blades are clear of obstacles and the ground. If requested, the NCM will call out wheel height from 10 feet in 1-foot increments until the landing gear contacts the ground. He or she will advise the P* when all landing gear are on the ground and the aircraft is stable.

2. Procedures.

a. Upslope landings.

(1) With the aircraft heading upslope, the P* will lower the collective until the nose gear contacts the ground, maintain heading with the pedals, and adjust cyclic as necessary to maintain the position of the aircraft. The P* will continue to lower the collective control until the main landing gear contacts the ground.

(2) When the landing gear are on the ground, the P* will smoothly lower the collective to full down position. The P* will then neutralize the controls while checking the stability of the aircraft.

(3) The P* will perform the takeoff from the upslope in the reverse sequence.

b. Downslope landings.

(1) With the aircraft heading downslope the P* will lower the collective until the main landing gear contacts the ground. The P* will adjust pitch attitude to maintain a stabilized position on the slope by coordinating collective reduction with aft cyclic movement (avoiding droop-stop pounding).

(2) The P* will maintain heading with the pedals and smoothly and continuously lower the collective until the nose gear contacts the ground. If the aircraft slides down the slope, the P* will smoothly and deliberately bring it back to a hover and reposition the aircraft.

(3) When the landing gear are on the ground, the P* will smoothly lower the collective to the full down position. The P* will then neutralize the controls while checking the stability of the aircraft.

(4) The P* will perform the takeoff from the downslope in the reverse sequence.

c. Cross-slope landings.

(1) With the aircraft heading cross slope, the P* will lower the collective until the upslope main landing gear contacts the ground. The P* will maintain heading with the cyclic and pedals as required without encountering droop-stop pounding.

(2) The P* will maintain pitch attitude by coordinating collective reduction with aft cyclic movement. This will normally place the downslope main landing gear in contact with the ground. The P* will coordinate the cyclic and pedals as necessary and continue to lower the collective until the nose gear is on the ground.

(3) The P* will smoothly lower the collective to the full down position and neutralize the controls while checking the stability of the aircraft.

(4) The P* will perform the takeoff from the cross slope in the reverse sequence.

d. 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 upslope wheel. Continue to increase the collective to raise the downslope 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 conducting slope operations, RCMs will understand the characteristics of droop-stop pounding and dynamic rollover.

Note. If at any time successful completion of the landing is in doubt, the P* will abort the maneuver.

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

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: When conducting slope operation, 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. When performing operations during unaided night flight, ensure 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 will be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1064

Perform Roll-On Landing

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, given a suitable landing area, with the before-landing check completed.

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

1. Select a suitable landing area.
2. Maintain a constant approach angle clear of obstacles to desire point of touchdown.
3. Maintain a ground track alignment that aligns with the landing direction.
4. Execute a smooth, controlled touchdown at speed appropriate for the conditions, but not exceeding 27 knots ground speed.
5. Touchdown with a maximum of 10-degree nose high pitch attitude aligned with the landing directions ±5 degrees.

DESCRIPTION:

1. Crew actions.

   a. The P* will focus primarily outside the aircraft to clear the aircraft throughout the approach and landing. He or she will announce his intent to perform a roll-on landing, the intended point of landing, and any deviation from the approach.

   b. The P will verify the brakes are released before starting the approach.

   c. The P and NCM will confirm the suitability of the landing area as requested and will assist the P* in clearing the aircraft to warn of any traffic or obstacles.

2. Procedures.

   a. Before starting the approach and touchdown.

      (1) The P will verify the brakes are released. When the desired approach angle is intercepted, the P* will lower the collective as required to establish the descent and adjust as necessary to maintain a constant angle of approach.

      (2) The P* will maintain entry airspeed until reaching approximately 100 feet AGL or a point from which the obstacles can be cleared. He or she will then assume a decelerating attitude (approximately 5 to 10 degrees, nose high) to effect a touchdown on the main landing gear.

      (3) The NCM will inform the P* when the rear of the aircraft is clear of all obstacles in the flight path.

(4) The P* will slip the aircraft during the deceleration to achieve runway alignment upon touchdown.

(5) The P* will maintain the desired angle of descent with the collective. Prior to touchdown, the P* will adjust the collective control to affect a smooth touchdown on the main landing gear before going below ETL.

Note. For training, establish entry airspeed 70 KIAS, ±10 KIAS.

b. After landing.

(1) The P* will maintain the landing attitude with the cyclic and collective control (not to exceed 10 degrees nose high) until forward speed is sufficiently slowed or stopped. The P* will smoothly lower the collective until the nose gear contacts the ground.

(2) The P* will then neutralize the flight controls and apply brakes as necessary to stop forward movement.

Note. Do not use aerodynamic braking to slow the aircraft down once the nose gear is in contact with the ground.

WARNING

Do not allow the tail bumper to contact the ground during this procedure.

CAUTION

When performing a roll-on landing because of a single-engine failure, or when performing a simulated single-engine failure, the aircraft should not be decelerated below minimum single-engine indicated airspeed (IAS) until obstacles in the flight path have been cleared.

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 stronger aerodynamic braking after touchdown may be appropriate.

Note. 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.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. After establishing the descent, the P* should reduce airspeed to approximately 70 KIAS and maintain airspeed until the apparent ground speed and rate of closure appear to be increasing. 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. The P* should progressively decrease the rate of descent and forward speed until he or she terminates the maneuver.

TRAINING AND EVALUATION REQUIRMENTS:

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

REFERENCES: Appropriate common references.

TASK 1068

Perform Go-Around

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS.

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

1. Determine when a go-around is required.
2. Immediately apply climb power (not to exceed aircraft limits).
3. Accelerate to climb airspeed ±10 knots.
4. Maintain aircraft in trim.
5. Maintain appropriate ground track.

DESCRIPTION:

1. Crew actions.

   a. The P* will announce the intent to perform a go-around and will remain primarily focused outside to avoid obstacles.

   b. The P and the 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.

   c. The P or NCM may call for a "go-around" if they detect an unsafe landing area. The P* will acknowledge and initiate the "go-around."

2. Procedures.

   a. When it becomes doubtful a safe landing can be accomplished, announce "go-around." Immediately increase power and simultaneously adjust pitch attitude to stop the descent and start a climb to clear any obstacles.

   b. Maintain aircraft in trim and accelerate to the appropriate climb speed for conditions.

   c. 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 ETL.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: A go-around should 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 immediately. Be prepared to transition to instruments and perform an instrument takeoff. Once VMC is regained, continue with the go-around.

MOUNTAINOUS AREA CONSIDERATIONS: If, at any time during an approach, insufficient power is available or 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 will be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1070

Respond to Emergencies

CONDITIONS: In a Mi-17 helicopter, Mi-17 FS with an IP, or academically and given a specific emergency condition or the indications of a specific malfunction.

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

1. RCM.

   a. Recognize, announce, and analyze indication of an emergency. Perform or describe the immediate action emergency checks in accordance with Mi-17-10 and Mi-17-CL.

   b. Perform appropriate emergency procedure.

   c. Confirm suitability of the landing area if required.

2. NCM.

   a. Recognize, announce, and analyze indication of an emergency. Perform or describe the immediate action emergency checks in accordance with Mi-17-10 and Mi-17-CL.

   b. Perform appropriate emergency procedure.

   c. Prepare the aircraft and passengers for an emergency landing.

   d. Assist in confirming the suitability of the landing area if required.

   e. Assist in evacuating passengers to designated assembly area.

DESCRIPTION:

1. Crew actions. A crewmember detecting an emergency will immediately announce the emergency to the other crewmembers.

   a. The crew will perform the underlined and nonunderlined steps as appropriate according to the operator's manual/CL and initiate the appropriate type of landing if required.

      (1) During VMC, the P* will focus primarily outside the aircraft to maintain aircraft control and obstacle clearance.

      (2) During IMC, the P* will remain focused inside the aircraft on the flight instruments to maintain aircraft control. If time permits, RCMs will also lock shoulder harnesses, make a mayday call, and tune transponder to emergency as required.

   b. If time permits, the P will verify all emergency checks with the operator's manual/CL. He or she will request appropriate emergency assistance.

c. The NCM will prepare the passengers for an emergency landing, ensuring passengers' seatbelts are fastened and cargo is secured.

(1) During the descent, the NCM will assist in clearing the aircraft.

(2) After landing, the NCM will assist in evacuating the passengers to the designated assembly area. If normal exits cannot be used, the NCM will use the nearest emergency exit to expedite the evacuation.

(3) 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. Analyze the emergency situation (for example, aircraft response and caution light indications).

b. Determine the malfunction and select the appropriate emergency procedures according to the operator's manual/CL.

Note. Only qualified and current IPs/SPs may simulate emergency procedures when at one set of flight controls.

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

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1082

Perform Autorotation

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, with an IP, and the before landing check completed; given entry altitude and airspeed.

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

1. Establish entry altitude as directed ±100 feet.
2. Establish entry airspeed as directed ±10 KIAS.
3. Establish correct lane/landing ground track.
4. Select the correct entry point.
5. Visually check N^r, engine speed (N^g), and aircraft in trim.
6. Ensure throttle is returned to full on (full right) by 500 feet AGL.
7. Ensure the airspeed at 125 feet AGL is not less than 80 KIAS.
8. Execute a deceleration.
9. Execute a termination as directed by the IP.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused primarily outside the aircraft throughout the maneuver and announce when the maneuver is initiated. The P* will announce the intended point of termination. Prior to initiating the autorotation, the P* will direct the IP or P to monitor Nr, Ng, aircraft trim, altitude/radar altitude, and airspeed. The P* will announce initiation of the autorotation and any deviation during the autorotation.

   b. The IP or P will announce adequate warning for corrective action if limits for N^r, N^g, aircraft trim, or airspeed may be exceeded.

   c. The IP will announce "Power recovery," "Roll on landing," or "Terminate with power."

2. Procedures.

   a. When the P* reaches the correct entry point, he or she will smoothly lower the collective to the full down position. The P* will apply pedals required to compensate for the decrease in torque, apply cyclic as required to assume an 80 knot attitude and initiate a turn as required (bank angle not to exceed 20 degrees). When aligned with the runway, the P* will reduce the throttle to the ground idle position (full left). The P* will ensure that N^r is in the normal range.

b. During the descent, the P* will closely monitor Nr for an over-speeding condition and adjust the collective as appropriate. The P* will maintain 80 KIAS and the aircraft in trim during the descent. By 500 feet AGL the IP will announce and the P* will acknowledge the type of termination. Prior to passing through 500 feet AGL, the P* will smoothly turn the throttle to flight idle (full right). If any of the above conditions are not met, the P*/IP will correct the condition(s) and execute a go-around. Between 125 and 100 feet AGL, the P* will apply aft cyclic as necessary to assume a deceleration attitude.

c. Power recovery. Upon receiving the command "Power Recovery" the P* will increase the throttle to flight idle (full right) and adjust the collective as necessary while simultaneously maintaining trim with the pedals. He/she will apply sufficient collective to establish a normal climb prior to reaching 200 feet AGL.

d. Roll on landing. Upon receiving the command "Roll on landing", the P* will increase the throttle to flight idle (full right), adjust the collective as necessary to maintain rotor RPM and trim with the pedals. At 100 to 120 feet AGL, decelerate the aircraft by adding 15 to 20 degrees nose up pitch to arrive at 30 to 40 feet AGL/30 KIAS. Put the aircraft into a landing attitude, 4 to 6 degrees nose high prior to touchdown. Complete a roll on landing in accordance with Task 1064.

e. Terminate with power. Upon receiving the command "Terminate with power", the P* will increase the throttle to flight idle (full right) and adjust the collective as necessary, trim the aircraft with the pedals, and maintain autorotation. During the final portion of the maneuver, the P* will apply sufficient power to arrest the descent no lower than 25 feet AGL. Ground speed at his point should be the same as if a touchdown were affected.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Training in this maneuver at night or when crewmembers are wearing NVG is only to be conducted during IP training or method of instruction training.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1114

Perform Rolling Takeoff

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, given a suitable takeoff area.

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

1. Before the liftoff.

   a. Establish and maintain power, as necessary.

   b. Maintain alignment with takeoff direction ±5 degrees.

   c. Accelerate to desired liftoff speed not to exceed 27 knots ground speed.

2. After the liftoff.

   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 KIAS.

   d. Maintain aircraft in trim immediately after lift-off.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused primarily outside the aircraft during the maneuver. The P* will announce when he or she initiates the maneuver and the intent to abort or alter the takeoff.

   b. The P and NCM will announce when ready for takeoff and remain focused primarily outside the aircraft to assist in clearing and to provide adequate warning of obstacles. The P will announce when his or her attention is focused inside the cockpit. He or she will monitor power requirements, ground speed, and advise the P* when power limits are being approached.

2. Procedures.

   a. A rolling takeoff is used when hover power for takeoff is marginal or insufficient and a takeoff must be made. The concept is to use rotor system power to accelerate the aircraft to a more efficient speed while not having to produce lift sufficient for flight.

   b. Verify the takeoff surface is suitable for the maneuver, and select ground reference points. Neutralize the cyclic, and raise the collective to establish the aircraft light on the wheels. Use the pedals to maintain heading. Coordinate forward cyclic, and raise the collective as necessary to accelerate the aircraft. Maintain heading with pedals and accelerate to maximum rate-of-climb IAS, not to exceed 27 knots ground speed. Upon reaching lift-off speed, adjust power to maximum and cyclic as necessary to allow the aircraft to become airborne. After lift-off, 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 3-degree pitches to initiate the roll and 1-degree pitch below hover power as maximum power available.

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

Note. Aircraft tends to come off the surface nose-gear last, which may result in excessive nose low condition. As collective is increased to maximum available, adequate aft cyclic will bring all gear off simultaneously.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. If sufficient illumination or 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.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1155

Negotiate Wire Obstacles

CONDITIONS: In a Mi-17 or Mi-17 FS helicopter or academically.

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

1. Locate and accurately 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 P* will remain focused primarily outside the aircraft.

   b. The P and NCMs will announce adequate warning to avoid hazards, wires, and poles or supporting structures, as well as announce when the aircraft is clear and when their attention is focused inside the aircraft.

2. Procedures.

   a. Announce when wires are seen. Confirm the location of wire obstacles with other crewmembers.

   b. Discuss the characteristics of wires and accurately estimate the amount of available clearance between the wires and the ground to determine the preferred method of crossing the wires. Locate guy wires and supporting poles.

   c. Announce the method of negotiating the wires and when the maneuver is initiated. Before crossing the wires, identify the highest wire. Cross near a pole to aid in visual perception and minimize the time the aircraft is unmasked. When under-flying wires, maintain a minimum clearance of hover height plus 30 feet and a ground speed no greater than that of a brisk walk. Ensure lateral clearance from guy wires and poles.

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

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Wires are difficult to detect with NVG. This task should not be performed while using NVG, unless the location has been checked during daylight conditions and each hazard has been identified.

TRAINING AND EVALUATION REQUIRMENTS:

1. Training will be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft or FS.

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 Mi-17 helicopter or orally.

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

1. Perform or describe the use of emergency exits according to the operator's manual.
2. Perform or describe the emergency egress of pilot, NCM or passenger from his seat.
3. Perform or describe the emergency engine shutdown according to the operator's manual.
4. Marshall passengers to designated assembly area.
5. Perform or describe duties as briefed in the crew mission briefing.

DESCRIPTION:

1. Crew actions.

   a. The PC will direct an emergency evacuation. He or she will determine if the evacuation will be accomplished before the rotor blades have stopped. (If the PC is incapacitated, the next ranking RCM/NCM will perform this function.) He or she will also determine and announce if an emergency engine shutdown will be performed.

   b. The P* and 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 cargo/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.

   b. Account for all personnel.

c. Perform the emergency egress of a pilot from his seat according to the appropriate operator's manual.

d. Perform the emergency engine shutdown procedures according to the appropriate aircraft operator's manual.

OVERWATER CONSIDERATIONS: 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. Swim clear of the aircraft and do not activate the life preserver until clear of the aircraft and on the surface.

WARNING

When an evacuation is performed with the rotor blades turning beware of making contact with the rotor blades.

If egress must be made from an aircraft that has gone into the water, do not exit until rotor blades have stopped.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1166

Perform Instrument Maneuvers

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, while wearing a hood or during simulated IMC.

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

1. Turns.

   a. Standard rate turn–Two needle width deflection of the turn needle obtained/maintained (4-minute turn and slip) and turns in the correct direction.

   b. Half standard rate turn–One needle width deflection of the turn needle obtained/maintained.

   c. Desired airspeed maintained ±10 KIAS.

   d. Timed turns–Recovery to straight and level flight based on time rather than slaved gyro-compass indications.

   e. Assigned altitude maintained (unless climbing or descending) ±100 feet.

   f. Rollout made on assigned/desired heading ±10 degrees.

   g. Aircraft maintained in trim.

2. Climb/descent.

   a. Clearance acknowledged-climb/descent initiated as soon as practical.

   b. Obtained/maintained airspeed ±10 KIAS.

   c. Power adjusted to climb/descend as rapidly as practical to ±1000 feet of assigned altitude, then 500 FPM ±100 FPM.

   d. Level off at assigned altitude ±100 feet.

   e. Heading maintained (unless turning) ±10 degrees.

   f. Aircraft maintained in trim.

3. Straight and level.

   a. Altitude maintained ±100 feet.

   b. Heading maintained ±10 degrees.

   c. Airspeed maintained ±10 KIAS.

   d. Aircraft maintained in trim.

DESCRIPTION: For a detailed description see FM 3-04.240.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1170

Perform Instrument Takeoff

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, under simulated IMC, with reference to instruments only, with hover power check and before-takeoff checks completed and aircraft cleared.

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

1. Correctly determine takeoff power.

2. Maintain power as required.

3. Maintain accelerative climb attitude ±1 bar width (not to exceed 10 degrees nose low) until climb airspeed is attained.

4. Maintain takeoff heading ±10 degrees.

5. Maintain the aircraft in trim after 40 KIAS.

6. Maintain an appropriate rate of climb ±200 FPM.

7. Maintain desired climb airspeed (±10 KIAS).

DESCRIPTION:

1. Crew actions.

   a. The P* will focus primarily outside the aircraft during the VMC portion of the maneuver. The P* will announce when he or she initiates the maneuver and any intentions to alter or abort the takeoff. Before the aircraft enters simulated IMC, the P* will make the transition to the flight instruments.

   b. The 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. As the aircraft enters simulated IMC, the P will monitor the flight instruments to assist in maintaining coordinated flight.

2. Procedures.

   a. From the ground.

      (1) Align the aircraft with the desired takeoff heading. Ensure the attitude indicator is set for takeoff.

      (2) Initiate the takeoff by increasing the collective smoothly and steadily, while maintaining a level attitude, until instrument-takeoff power is reached. When instrument-takeoff power is established and the altimeter and VSI show a positive climb, adjust pitch attitude below the horizon as required for the initial acceleration (not to exceed 10 degrees nose low).

(3) Visually maintain runway clearance and alignment on takeoff and transition to the flight instruments before entering simulated IMC. At approximately 40 KIAS, the P* will check the turn-and-slip indicator to ensure the aircraft is in trim.

(4) Maintain the heading/course required by the departure procedure or ATC instructions. When the desired climb airspeed is reached, adjust cyclic to maintain airspeed and adjust the collective to maintain the desired climb rate.

b. From a hover.

(1) The P* will align the aircraft with the desired takeoff heading at the appropriate hover height. He or she will check the attitude indicator for the appropriate attitude.

(2) The P* will initiate the takeoff by increasing the collective smoothly and steadily, while maintaining a level attitude, until instrument-takeoff power is reached.

(3) When the altimeter and VSI show a positive rate of climb, the P* will continue as in a takeoff from the ground.

Note. Performing this maneuver in certain environments may require hover OGE power. Evaluate each situation for power required versus power available.

Note. As the aircraft enters simulated IMC, the P should monitor the flight instruments and be prepared to accept a transfer of controls.

Note. When the crew is operating under simulated IMC, the NCM will take a position on the P* side of the aircraft for obstacle clearance and airspace surveillance.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation may be conducted in the aircraft or FS.

REFERENCES: Appropriate common references.

TASK 1174

Perform Holding Procedures

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS under IMC or simulated IMC and given holding instructions and appropriate DOD FLIPs.

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

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

DESCRIPTION:

1. Crew actions.

   a. Before arrival at the holding fix, the PC will analyze the holding instructions and determine the holding pattern and proper entry procedures. The PC will brief the other crewmembers on the proposed entry, outbound heading, and inbound course. (The PC may delegate this task to another RCM.)

   b. The P will select radio frequencies and monitor radios. The P will announce ATC information not monitored by the P*. The P 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. The P* will announce any deviation as well as ATC information not monitored by the P.

   d. 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. 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. When holding at an intersection, begin timing the outbound leg upon establishing the outbound heading.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation may be conducted in the aircraft or FS.

REFERENCES: Appropriate common references.

TASK 1176

Perform Non-Precision Approach

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, under simulated IMC, with reference to instruments only, given approach information and appropriate DOD FLIP approach clearance, with the before-landing checks complete.

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

1. Execute the approach in accordance with AR 95-1, FM 3-04.240, AIM, and the DOD FLIP.
2. Maintain very high frequency omnidirectional range or GPS course centerline ±5 degrees (1-dot course deviation indicator [CDI] deflection).
3. Maintain localizer course centerline ±2.5 degrees (2-dot deflection).
4. During airport surveillance radar approaches, make immediate heading and altitude changes issued by ATC and maintain heading ±5 degrees.
5. Comply with descent minimums prescribed for the approach.
6. Perform the correct missed approach procedure according to DOD FLIP or ATC instructions upon reaching the missed approach point (MAP), if landing cannot be accomplished in accordance with AR 95-1.

DESCRIPTION:

1. Crew actions.

    a. Each RCM will review and confirm the specific approach to be flown before initiating the procedure. The crew will confirm the correct NAVAID/communication frequencies; the horizontal situation indicator (HSI) are set as required.

    b. The P* will focus primarily inside the aircraft on the instruments and perform the approach. He or she will follow the heading/course, altitude, and missed approach directives issued by the P/ATC. He or she will announce any deviation not directed by ATC or the P and will acknowledge all navigation directives given by the P.

    c. The P will call out the approach procedure to the P* and will advise the P* of any unannounced deviations. The P will monitor outside for the landing environment; announce when he or she makes visual contact suitable to complete the landing in accordance with AR 95-1; and, if directed by the P*, take the controls to complete the landing.

    d. The P will announce if he or she does not make visual contact by the MAP and call out the missed approach procedures. During simulated IMC, the P and NCM will focus primarily outside the aircraft to provide adequate warning of traffic or obstacles. The NCM will take a position on the P* side of the aircraft.

2. Procedures. Perform the desired approach procedures in accordance with AR 95-1, the appropriate DOD FLIP, FM 3-04.240, and the operator's manual.

Note. GPS IFR navigation must be certified by the FAA or host country regulations prior to GPS IFR navigation. However, they should consider and plan for its use as an emergency backup system only.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation may be conducted in the aircraft or FS.

REFERENCES: Appropriate common references.

TASK 1178

Perform Precision Approach

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, under simulated IMC, with reference to instruments only, given approach information and the appropriate DOD FLIP approach clearance, and the before-landing checks complete.

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

1. Execute the approach in accordance with AR 95-1, FM 3-04.240, AIM, and the DOD FLIP.

2. For an instrument landing system approach, maintain the localizer centerline ±2.5 degrees (2-dot CDI deflection) and the glide slope indicator within full scale deflection.

3. For a precision approach radar (PAR) approach, make immediate heading and altitude changes issued by ATC and maintain heading ±5 degrees; for final approach, maintain glide slope as directed by ATC.

4. Comply with the decision height (DH) prescribed for the approach.

5. Perform the correct MAP according to the appropriate DOD FLIP or ATC instruction upon reaching the DH if landing cannot be accomplished in accordance with AR 95-1.

DESCRIPTION:

1. Crew actions.

   a. Each RCM will review and confirm the specific approach to be flown before initiating the procedure. The crew will confirm the correct NAVAID/communication frequencies, HSI are set as required.

   b. The P* will focus primarily inside the aircraft on the instruments and perform the approach. He or she will follow the heading/course, altitude, and missed approach directives issued by the P/ATC. He or she will announce deviations not directed by ATC or the P and will acknowledge all navigation directives given by the P.

   c. The P will call out the approach procedure to the P* and will advise the P* of unannounced deviations.

   d. The P will monitor outside for the landing environment, announce when he or she makes visual contact suitable to complete the landing in accordance with AR 95-1, and, if directed by the P*, take the controls to complete the landing. The P will announce if he or she does not make visual contact by the MAP and call out the missed approach procedures.

   e. During simulated IMC, the P and NCM will focus primarily outside the aircraft to provide adequate warning of traffic or obstacles. The NCM will take a position on the P*'s side of the aircraft.

2. Procedures. Perform the desired approach procedures in accordance with AR 95-1, the appropriate DOD FLIP, FM 3-04.240, and the operator's manual.

Note. GPS IFR navigation must be certified by the FAA or host country regulations prior to GPS IFR navigation. However, they should consider and plan for its use as an emergency backup system only.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation may be conducted in the aircraft or FS.

REFERENCES: Appropriate common references.

TASK 1180

Perform Emergency Global Positioning System Recovery Procedure

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS under VMC or simulated IMC, given an approved emergency GPS recovery procedure.

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

1. Enter or confirm the appropriate waypoints (initial approach fix [IAF], intermediate approach fix [IF], final approach fix [FAF], MAP) into the navigation system.

2. Execute the procedure according to an approved recovery procedure.

3. Maintain a briefed airspeed not to exceed 90 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 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 PC performs a thorough map reconnaissance to determine the highest obstruction in the area of operations.

2. Before initiating the procedure, the 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. The P* will adjust the aircraft ground track to cross the IAF, IF, and then the FAF on the prescribed course. When over the FAF, the P*begins the final descent as appropriate.

3. The P remains primarily focused outside the aircraft to provide adequate warning for avoiding obstacles/hazards and will announce when his or her attention is focused inside the cockpit. The P and 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. The NCM alerts the crew immediately if VMC is encountered.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS. The P should be in a position to assume control of the aircraft 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 should 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 ATC or with other aircraft using the approach procedure.

Note. IIMC multiaircraft 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 may be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft or FS.

REFERENCES: Appropriate common references.

TASK 1182

Perform Unusual Attitude Recovery

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, with an IP and under VMC or simulated IMC.

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

1. Analyze aircraft attitude.
2. Without delay, perform recovery procedures in the following sequence:
   a. Attitude–Level the wings on the attitude indicator.
   b. Heading–Maintain heading; turn only to avoid known obstacles.
   c. Power–Adjust power as necessary.
   d. Trim–Trim aircraft as necessary.
   e. Airspeed–Adjust airspeed as necessary.
3. Clear the aircraft.
4. Recover with a minimum loss of altitude.

DESCRIPTION:

1. Crew actions.

   a. The IP will place the aircraft in unusual attitude and transfer aircraft control to the P. The P will acknowledge the transfer of controls, the unusual attitude, and recover the aircraft as 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 or she will call out attitude, power, and trim as necessary.

   d. During VMC, the P and NCMs 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.

Note. NCM tasks may include checking for fire, preparing passengers for an emergency landing, and/or executing any portion of an emergency procedure pertaining to the NCM.

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

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

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft or FS.

REFERENCES: Appropriate common references.

TASK 1184

Respond to Inadvertent Instrument Meteorological Conditions

CONDITIONS: In a Mi-17 helicopter under simulated IMC, Mi-17 FS, or academically.

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

1. Announce "IMC," maintain proper aircraft control, and make the transition to instrument flight immediately.
2. Immediately initiate a climb.
3. Continue IMC recovery procedures as follows:

   a. Attitude–Level the wings and adjust pitch for desired airspeed while maintaining the aircraft in trim.

   b. Heading–Maintain heading; turn only to avoid known obstacles.

   c. Power–Maintain climb power until reaching appropriate cruise altitude.

   d. Airspeed–Adjust to appropriate climb airspeed.

   e. Altitude–Climb to a minimum safe altitude as prescribed by the appropriate DOD FLIP, local regulation, or SOP after establishing aircraft control.
4. Complete the inadvertent IMC recovery according to local regulations and policies.

DESCRIPTION:

1. Crew actions.

   a. The P* will announce "IMC," immediately initiate a climb, and establish aircraft control while transitioning to the instruments.

   b. The P* will immediately announce if he or she becomes disoriented.

   c. The P will announce "IMC" and monitor the cockpit instruments to assist in recovery.

   d. He or she will announce when the aircraft is in a positive climb, the current altitude and altitude climbing to, and the heading.

   e. He or she will adjust the transponder to emergency, adjust the navigational radios as appropriate, and make the appropriate radio calls.

   f. He or she will perform any other tasks as directed by the P* and will always remain prepared to take the controls should the P* become disoriented.

   g. The NCM will focus primarily outside the aircraft to provide adequate warning for avoiding terrain or obstacles and will announce if VMC are encountered.

h. The NCM will perform any other tasks as directed by the P*/P.

2. Procedures.

a. The crew should consider establishing a torque and airspeed appropriate for the mission environment to use in the event of encountering IMC. If briefed during the crew briefing, this can help eliminate confusion during the actual emergency.

b. The most important action when encountering IMC is to immediately begin climbing while establishing aircraft control via the instruments. Once this is accomplished, the transponder should be set to emergency to alert ATC. Tuning navigational radios or making radio calls will be determined by local procedures. The crew should contact ATC on guard and allow ATC to assign an appropriate altitude and heading/course and, if necessary, a frequency. If radio contact cannot be established first, the crew must ensure navigational radios are tuned as quickly as possible to determine the aircraft's position and appropriate course for recovery.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: When using NVG, it may be possible to see through a thin obscuration, such as fog and drizzle, with little or no degradation. The NVG may be removed (or flipped up) once flight is stabilized.

Note. If IMC are entered with the IR searchlight or landing light on, spatial disorientation may occur. Low-level ambient light may induce visual illusions and spatial disorientation. During 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 these procedures be initiated immediately to prevent ground contact.

TACTICAL CONSIDERATIONS: In tactical environments without NAVAIDs, the crew should consider flying a GPS route to a point where an instrument approach (GPS, PAR) is established. The GPS route can be the planned mission route with sufficient terrain/obstacle clearance established in the event of IIMC.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft, FS, or academically.

2. Evaluations will be conducted in the aircraft or FS.

REFERENCES: Appropriate common references.

TASK 1188

Operate Aircraft Survivability Equipment

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS equipped with ASE, or academically.

> **WARNING**
>
> **ASE systems, when energized, may cause thermal burns or other injuries to personnel too close to an active system. Observe all operator's manual warnings and cautions. Ensure missile approach warning system (MAWS) or ASE variant safety pin is installed whenever aircraft is in a nonhostile environment or in a position where inadvertent flare/chaff launch may cause injury to personnel and or may cause destruction of equipment or property.**

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

1. RCM. Describe the purpose of each installed item of ASE. Perform/describe preflight inspection, turn-on, test, operation, emergency procedures, and shutdown of installed ASE. Determine partial failure alternatives. Employ/describe use of installed ASE.

2. NCM. Prepare equipment for operation.

DESCRIPTION:

1. Crew actions.

   a. The PC will ensure crewmembers understand the employment of installed ASE during the conduct of the mission. The PC will also ensure all ASE payloads and settings are in accordance with the mission briefing.

   b. When the crew encounters a radar directed threat, the P* will remain primarily focused outside to avoid obstacles, perform the required evasive maneuver, reposition the aircraft as necessary to break lock, deploy to cover, and then avoid the threat. The P will dispense chaff prior to performing break lock evasive maneuvers for break lock. The P and NCM will assist in clearing the aircraft and provide adequate warning of obstacles.

   c. The P will begin dispensing chaff by pressing the chaff dispense button or ensuring the mode switch is in PGRM as required. The P and NCM will assist in clearing the aircraft and provide adequate warning of obstacles.

   d. When the crew encounters an IR directed threat, the P* will remain primarily focused outside to avoid obstacles, employ evasive maneuvers after defeating the threat with MAWS, deploy to cover, and then avoid the threat. Allow MAWS and variant ASE systems to automatically launch flares. If reliability of equipment is questionable or system has not reacted to observed threat, then P and NCM will launch flares manually.

e. The NCM will remove and install safety pin(s) in accordance with the operator's manual/CL.

2. Procedures.

a. Perform or describe preflight inspection, turn-on, test, operation, emergency procedures, and shutdown of installed ASE equipment.

b. Evaluate and interpret the ASE visual and aural indications.

c. Execute mission employment according to doctrine, and determine failure alternatives.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references, computer-based aircraft survivability equipment trainer (CBAT), aircraft survivability equipment trainer (ASET) programs, MAWS, ASE operator manuals, and the unit S-2.

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 and the following additions/modifications:

1. RCM. Identify at a minimum the hand and arm signals required for moving an aircraft left, right, forward, backward, and for takeoff and landing in accordance with FM 21-60.

2. NCM. Identify and perform at a minimum the hand and arm signals required for moving an aircraft left, right, forward, backward, and for takeoff and landing in accordance with 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 REQUIRMENTS:

1. Training will be conducted academically.

2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references and FM 21-60.

TASK 1194

Perform Refueling Operations

CONDITIONS: With a Mi-17 helicopter with refueling equipment or academically.

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

1. Ensure safety procedures are complied with and all individuals are wearing appropriate protective clothing in accordance with FM 10-67-1, the operator's manual/CL, and FM 3-04.113.

2. Hot refueling operations are prohibited.

3. Ensure the aircraft is refueled in accordance with FM 10-67-1, operator's manual/CL, FM 3-04.113, and the unit's SOP.

4. Enter the appropriate information on DA Form 2408-12.

DESCRIPTION: Crew actions, cold refueling. A crewmember will guide the refueling vehicle to the aircraft. Ensure the driver parks the vehicle the proper distance from the aircraft in accordance with FM 10-67-1. Verify all personnel not involved with the refueling operation are a safe distance away. Ground and refuel the aircraft in accordance with FM 10-67-1, operator's manual/CL, and the unit SOP. Ensure the tanks are filled to the required level. When the refueling is completed, ensure 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.

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

TRAINING AND EVALUATION REQUIREMENTS:

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

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

REFERENCES: Appropriate common references, FM 10-67-1, and FM 21-60.

TASK 1198
Obtain Fuel Sample

CONDITIONS: With a Mi-17 helicopter and given a fuel sample bottle and fuel-sampling equipment.

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

1. Obtain fuel sample.
2. Determine if fuel is contaminated.
3. Dispose of fuel sample according to applicable SOPs.

DESCRIPTION: Obtain a fuel sample before or during the preflight inspection of the aircraft and when directed by the PC. Take a sample from all fuel cells and, if installed, the range extension tanks. Insert the tubing attached to the fuel-sampling hand pump into the guide in the fuel cell. The hand pump draws the fuel from the bottom of the fuel cell and the fuel is directed into the sample bottle. Any water contaminants and foreign material in the fuel will settle to the bottom of the fuel sample bottle. If necessary, obtain additional fuel samples to remove the materials from the fuel cell. After taking the necessary fuel samples, stow the hand pump and tubing and dispose of the fuel sample according to the unit SOP.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: When supplemental lighting is needed, an unfiltered explosion-proof flashlight will be used.

TRAINING AND EVALUATION REQUIRMENTS:

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

REFERENCES: Appropriate common references and FM 10-67-1.

TASK 1200

Perform Nonrated Crewmember Duties during Maintenance Test Flight

CONDITIONS: In a Mi-17 helicopter or academically in a classroom environment and given a Mi-17 MTF.

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

1. Perform or describe appropriate maintenance procedures and checks in accordance with Mi-17 MTF.

2. Perform or describe maintenance procedures and checks directed by the MP.

3. Immediately inform the MP of any malfunction or discrepancy detected during the maintenance procedures or checks.

DESCRIPTION:

1. Crew actions.

   a. If two or more NCMs are performing crew duties during the test flight, the FE will ensure they are briefed on their duties and responsibilities.

   b. NCMs will perform duties and responsibilities in accordance with Mi-17 MTF. If any procedure is conducted, or the result is not in accordance with the applicable maintenance or troubleshooting manual, the MP will be notified.

2. Procedures.

   a. Before and during the test flight, the NCM must constantly monitor all aircraft systems and components. He or she will inform the MP of any unusual vibrations, noises, smells, leakage, or component malfunctions. The CE will also perform any maintenance procedures and checks required by the MP.

   b. Prior to flight, the NCM will remove any additional panels, covers, and cowlings required by the MP.

   c. The NCM will make the following checks:

      (1) Cargo hook and winch (if installed). The NCM will ensure the cargo hook area and winch are clear of obstructions, and nonflight personnel are at a safe distance. He or she will also ensure the cargo hook and winch operational check is conducted in accordance with Mi-17 MTF.

      (2) Lights. The NCM will assist the P* in checking and setting their searchlights and will notify the MP that the anticollision, position, and formation lights are operational.

      (3) Pitot anti-ice system check. The NCM will check both pitot tubes for proper operation.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluations will be conducted in the aircraft or academically.

REFERENCES: Appropriate common references.

TASK 1202

Perform Auxiliary Power Unit Operations

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS.

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

1. Preflight all systems to be operated during APU operations.
2. Operate APU, systems, and equipment in accordance with the operator's manual/CL.
3. Shutdown systems, equipment, and APU in accordance with the operator's manual/CL.
4. Perform or describe appropriate emergency procedures for APU fire according to operator's manual.
5. Enter appropriate information, if required, on DA Form 2408-12, DA Form 2408-13, and DA Form 2408-13-1.

DESCRIPTION:

1. Crew actions.

   a. The pilot will coordinate with and brief any additional ground support personnel before APU start. Perform preflight inspection of the APU. He or she will ensure the rotor blade tiedowns are removed and the rotor blades are not positioned over the APU exhaust. He or she will brief all necessary personnel on procedures to be followed in an emergency. The pilot will direct assistance from any additional ground support personnel to aid in maintaining the clearance of APU exhaust areas during the APU start sequence and any subsequent ground checks.

   b. Additional ground support personnel should assist the NCM as directed.

2. Procedures.

   a. Before starting APU. Brief the additional ground support personnel as necessary.

   b. Review aircraft logbook for any faults that would prevent operation of the APU, or the APU generator.

   c. Perform preflight inspection of the APU and check APU exhaust cover, rotor blade tiedowns, and fluid levels.

   d. Ensure the emergency fuel shut-off valve is OPEN and, at least, the service cell boost pump is on.

3. APU starting procedures.

> **CAUTION**
>
> Abort APU-start if any of the following conditions occur after initiating the start sequence:
>
> Exhaust gas temperature (EGT) indication-None indicated in 9 seconds.
>
> EGT Rise-Rise above 880 degrees Celsius.
>
> System voltage-Drops below 18 voltage direct current (VDC).
>
> Auto–Start–Light illuminated after 30 seconds.
>
> Max speed light-Light illuminates.
>
> System malfunction-Shut down if detected.

Note. The oil pressure light may flash during the APU start sequence.

a. Main rotor blades-Check clear, untied and blade not over the APU exhaust.

b. Standby generator switch-Off (down).

c. APU start mode switch-Start (up).

d. Clock-Start.

e. APU start button-Press and hold for 2 to 3 seconds.

f. Time sequence:

(1). 0 seconds-Auto ignition light-ON. Check that the battery system voltage is not below 18 VDC.

(2). 9 seconds-Check for a rise in EGT and not to exceed 880 degrees Celsius during the start sequence.

(3). 20 seconds-Check that normal oil pressure and RPM lights have illuminated.

(4). 30 seconds-Check that the auto ignition light has extinguished and the APU air bleed line pressure is according to the PPC.

g. Idle speed-check that EGT is <720 degrees Celsius.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: During night operations, ensure adequate lighting (anticollision or position lights) is on and the fire guard has a flashlight. This task is prohibited while wearing NVG.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1262

Participate in a Crew-Level After-Action Review

CONDITIONS: After flight in a Mi-17 helicopter or Mi-17 FS, and given a unit-approved, crew-level after-action review (AAR) checklist.

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

1. The PC/air mission commander (AMC) will conduct a detailed crew-level AAR using a unit-approved, crew-level AAR checklist (table 4-3, page 107) after each flight.

2. All crewmembers will actively participate in the review.

DESCRIPTION:

1. Crew actions.

   a. The PC will conduct a crew-level AAR. He or she will use a unit-approved checklist. The PC will actively seek input from all crewmembers. The PC will ensure the results of the review are passed to 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.

   a. Using an AAR checklist, participate in a crew-level AAR of the mission. The review should be an open and frank discussion of all aspects of the mission. It should include all mission factors and incorporate all crewmembers.

   b. The results of the review should be passed to operations and flight standards.

Table 4-3. Suggested format for a crew-level after-action review checklist

1. Restate mission objectives with mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (METT-TC).			
2. Conduct a 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 were the lessons learned?		
		(1) Each crewmember states in own words.	
		(2) Are changes necessary to the following areas?	
			(a) Crew coordination techniques.
			(b) Flying techniques.
			(c) SOP.
			(d) Doctrine, ATM, TMs.
3. Determine the 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.			

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.

2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

TASK 2010

Perform Multi-Aircraft Operations

CONDITIONS: In a Mi-17 helicopter with the mission briefing completed.

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

1. RCM.

   a. Participate in a formation flight briefing in accordance with unit SOP. Table 4-4 lists the minimum items to be briefed.

   b. Maneuver into the flight formation.

   c. Change position in the flight formation when required.

   d. Maintain proper horizontal and vertical separation for the type of formation flight being conducted.

   e. If visual contact is lost, immediately make a radio call to the flight and begin reorientation procedures.

   f. Perform techniques of movement, if required.

2. NCM.

   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.

Note. The most important consideration when an aircraft has lost visual contact with the formation is to announce loss of visual contact and reorientation. Except for enemy contact, all mission requirements are subordinate to this action.

   a. The P* will focus primarily outside the aircraft for clearing and tracking other aircraft. He or she will announce any maneuver or movement before execution and inform the P and NCM if visual contact is lost with other aircraft. If visual contact is lost with other aircraft, complete the following.

      (1) The crew will immediately make a radio call to the flight and begin reorientation procedures (example: "chalk 3 has loss of visual contact with the formation").

      (2) Lead will announce and maintain heading, altitude and airspeed until all aircraft have rejoined the flight. He or she will also announce his or her position relative to the next waypoint.

(3) The aircraft that has lost visual contact with the flight will immediately assume leads heading, airspeed and maintain vertical separation as briefed.

(4) If IMC are encountered, execute IIMC breakup as briefed. He or she will ensure that appropriate radio calls are made during 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 or if an enemy is sighted. Also, when their attention is focused inside the aircraft and again when attention is reestablished outside along with the seat position. The PC will call out direction and altitude in case of IMC breakup. The NCMs will position themselves in the aircraft to observe other aircraft in the formation and to assist in maintaining aircraft separation and obstacle clearance.

2. Procedures.

a. Perform formation flight according to the unit's SOP and the common references in this ATM.

b. The following procedures will be performed unless otherwise established in unit SOPs.

(1) Takeoff: All helicopters should leave the ground simultaneously. The trailing aircraft must remain at a level altitude or stack up 1 to 10 feet vertically to remain out of the disturbed air of the aircraft in front of them. In the event an aircraft in the flight loses visual contact with the formation, the crew will immediately make a radio call to the formation and the P* will initiate a climb above the briefed cruise altitude and attempt reorientation of the formation.

(2) Cruise: Free cruise formation should be employed when operating at terrain flight altitudes or in a combat environment. This will allow the individual aircraft more flexibility to move within the formation, avoiding terrain, obstacles, and enemy threat. Consideration should be given to door gunner's fields-of-fire to aid in protecting the entire formation. During periods of degraded visibility, crews are more susceptible to losing other aircraft in the formation. Crews should consider flying a close formation to maintain orientation on the flight.

In the event an aircraft in the flight loses visual contact with the formation, they will immediately make a radio call to the formation, and lead will announce and maintain heading, altitude, and airspeed. If sufficient altitude exists, a descent may allow the crew to reestablish visual contact with the formation. If sufficient altitude does not exist, the P* should initiate a climb to provide vertical separation from the flight.

(3) Approach: The lead aircraft must maintain a constant approach angle so other aircraft in the formation will not have to execute excessively steep, shallow, or slow approaches. Aircraft should not descend below the aircraft ahead of them in the formation and entering their rotor-wash. This could result in an over-torque, loss of aircraft control, or entering a settling with power condition.

In the event an aircraft in the flight loses visual contact with the formation, they will immediately make a radio call to the formation and execute a go-around in the briefed direction.

c. Reorientation procedures:

(1) After announcing the aircraft has a loss of visual contact with the formation, lead will announce and maintain heading, altitude and airspeed, turning only to avoid known obstacles or enemy threat. Lead will also announce his or her position relative to the next waypoint or rally point. The remainder of the formation will continue to follow lead. The crewmember who has lost visual contact will announce his or her position relative to the same waypoint or rally point to assist in reorientation to the flight. This procedure will continue until the formation is reoriented and joined.

(2) Considerations should include, but are not limited to, rallying to a known point, use of covert/overt lighting, and ground rally. METT-TC, power available and ambient light will influence how contact is reestablished.

(3) Situations may occur when an aircraft rejoins the flight in another position than briefed. Only after the entire flight is formed can the mission commander proceed with the mission.

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

Table 4-4. Multiaircraft operations briefing checklist

1.	Formation type(s): takeoff, cruise, approach.
2.	Altitude.
3.	Airspeed: outbound to release point, cruise, inbound from start point.
4.	Aircraft lighting.
5.	Loss communications procedures.
6.	Lead change procedures.
7.	Loss of visual contact/in-flight link-up/rally points.
8.	Actions on contact.
9.	IIMC procedures.
10.	Downed aircraft procedures/personnel recovery/CSAR.

NIGHT OR NIGHT VISION GOGGLE 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. During unaided night flight, the crew should use formation and position lights to aid in maintaining the aircraft's formation position. Lighting will be in accordance with AR 95-1 and unit SOP.

2. When conducting NVG formation flight, the crew should use the IR formation lights and IR anticollision lights to maintain the aircraft's position in the formation. The NCM not engaged in observing other aircraft in the formation will perform flight duties as directed by the PC.

SNOW/SAND/DUST CONSIDERATIONS:

1. Takeoff: A simultaneous formation takeoff may not be possible due to loss of visual contact with other aircraft in the formation. Crews should consider taking off single ship then conducting an in-flight link up once clear of the snow/sand/dust cloud. During single-ship takeoff, it is important to notify the formation when clear of the dust cloud to notify the next aircraft ready for takeoff.

2. Approach: A landing should be made to the ground with forward groundspeed and heading for all aircraft off-set by 10 degrees from lead's landing direction. This will ensure lateral separation during periods of degraded visibility. For example, lead lands heading 360 degrees, chalk 2 lands 350 degrees, chalk 3 lands 010 degrees, chalk 4 lands 350 degrees, and chalk 5 lands 010 degrees.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references and FM 90-4.

TASK 2012

Perform Tactical Flight Mission Planning

CONDITIONS: Before flight in a Mi-17 helicopter or Mi-17 FS, and given a mission briefing, navigational maps, a navigational computer, Army-approved mission planning station and software if available, and other flight planning materials as required.

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

1. Analyze the mission using the factors of METT-TC.
2. Operate the Army-approved mission planning station and software, if available.
3. Perform a map/photo reconnaissance using the available map media, photos, and Army-approved mission planning station and software. Ensure all known hazards to terrain flight are plotted.
4. Select the appropriate flight altitudes.
5. Develop load plan and verify aircraft weight and balance (Task 1012).
6. Select appropriate primary and alternate routes and enter all of them on a map, route sketch, or into the Army-approved mission planning station and software if available.
7. Determine the distance ±1 kilometer, ground speed ±5 knots, and ETE ±2 minutes for each leg of the flight.
8. Determine the fuel required and reserve in accordance with AR 95-1, ±100 liters.
9. Obtain and analyze weather briefing to determine that weather and environmental conditions are adequate to complete the mission.
10. Load mission data to data transfer cartridge, or data load unit if available.
11. Print out time distance heading cards, waypoint lists, crew cards, communication cards, and kneeboard cards as required.
12. Conduct a thorough crew mission briefing.

DESCRIPTION:

1. Crew actions.

   a. The PC/AMC will delegate mission tasks to crewmembers, will have the overall responsibility for mission planning, and will conduct a thorough crew mission briefing. He or she will analyze the mission in terms of METT-TC.

   b. The P and NCM will perform the planning tasks directed by the PC/AMC. The P and NCM will report their planning results to the PC/AMC.

2. Procedures.

   a. Analyze the mission using the factors of METT-TC.

   b. Conduct a map or an aerial photoreconnaissance.

   c. Obtain a thorough weather briefing covering the entire mission; include sunset and sunrise times, density altitudes, winds, and visibility restrictions. If it is to be a night mission, the briefing would include moonset and moonrise times and ambient light levels, if available.

   d. Determine primary and alternate routes, terrain flight modes, and movement techniques. Determine time, distance, and fuel requirements using the navigational computer or Army-approved mission planning station and software if available.

   e. Annotate the map or Army-approved mission planning station and software, if available, with sufficient information to complete the mission according to the unit's SOP. This includes waypoint coordinates that define the entry routes into the GPS/Army-approved mission planning station and software, if available. Consider such overlay items as hazards, check points, 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 NIGHT VISION GOGGLE CONSIDERATIONS: More detailed flight planning is required when the flight is conducted in reduced visibility, at night, or in the NVG environment. FM 3-04.203 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 will be conducted academically.

2. Evaluations will be conducted academically.

REFERENCES: Appropriate common references.

TASK 2022

Transmit Tactical Report

CONDITIONS: In a Mi-17 helicopter, a Mi-17 FS, or academically, 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:

1. Crew actions.

    a. The P* and NCM will focus primarily outside the aircraft to clear the aircraft and provide adequate warning of traffic or obstacles. The P* will announce any maneuver or movement before execution.

    b. The P will assemble and transmit the report. He or she will use the correct format, as specified in the SOI, and transmit the report to the appropriate agency. The NCM(s) should also be able to transmit the report if the P is unable to do so.

2. Procedures.

    a. Use an established format to report information to save time, minimize confusion, and ensure completeness.

    b. 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 only required if information is transmitted by nonsecure means.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft, FS, or academically.
2. Evaluations will be conducted in the aircraft or academically.

REFERENCES: Appropriate common references, FM 2-0, and the SOI.

TASK 2024

Perform Terrain Flight Navigation

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS and given a mission briefing and required maps and materials.

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

1. During nap-of-the-earth (NOE) flight, know the en route location within 200 meters.
2. During contour flight or low-level flight, know the en route location within 500 meters.
3. Locate each objective within 100 meters.
4. Arrive at each objective at the planned time ±2 minutes (if an objective arrival time was given in the mission briefing).

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused outside the aircraft and respond to navigation instructions and cues given by the P. He or she will acknowledge commands issued by the P for heading and airspeed changes necessary to navigate the desired course. The P* will announce significant terrain features to assist the P in navigation.

   b. The P will furnish the P* with the information required to remain on course. He or she will announce all plotted wires/hazards 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 during low-level flight, 80 feet AHO, the P may include headings. The P should use electronically aided navigation to help arrive at a specific checkpoint, turning point, or objective.

   c. The P*, P, and 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 located some distance ahead of the aircraft and lying along or near the course.

      (1) Using these terrain features to key on, the P* maneuvers the aircraft to take advantage of the terrain and vegetation for concealment.

      (2) If this navigational technique does not apply, identify the desired route by designating a series of successive checkpoints.

(3) To remain continuously oriented, compare actual terrain features with those on the map.

(4) An effective technique is to combine the use of terrain features and rally terms when giving directions. This will allow the P* to focus his or her attention outside the aircraft.

b. For low-level navigation, the time and distance can be computed effectively. This means the P* can fly specific headings and airspeeds. Each of the methods for stating heading information is appropriate under specific conditions.

(1) 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 a terrain feature in view.

(2) When forward visibility is restricted and frequent changes are necessary, controlled turning instructions are more appropriate.

(3) Clock headings are recommended when associated with a terrain feature and with controlled turning instructions.

Note. For additional information, see Tasks 1044 and 1046.

Note. The aircrew should incorporate the use of Army-approved mission planning station and software, if available, with this task.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Conducting the flight in reduced visibility (or at night) requires more detailed and extensive flight planning and map preparation. FM 3-04.203 contains details on night navigation. NVG navigation with standard maps can be difficult because of map colors, symbology, and colored markers used during map preparation.

2. Use proper scanning techniques to ensure obstacle avoidance.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluations will be conducted in the aircraft.

REFERENCES: Appropriate common references and FM 3-25.26.

TASK 2026

Perform Terrain Flight

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS with tactical flight mission planning completed.

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

1. Maintain altitude and airspeed appropriate for the selected mode of flight, visibility, and METT-TC.

2. Maintain aircraft in trim during contour and low-level flight.

DESCRIPTION:

1. Crew actions.

   a. The P* will focus primarily outside the aircraft and acknowledge all navigational and obstacle-clearance instructions given by the P. The P* will announce the intended direction of flight or any deviation from instructions given by the P. During terrain flight, the P* is primarily concerned with threat and obstacle avoidance.

   b. During terrain flight, the P* is primarily concerned with threat and obstacle avoidance.

   c. The P will provide adequate warning to avoid obstacles detected in the flight path or identified on the map. The P and 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 when attention is reestablished outside.

   d. 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-lever control input. The P will raise the collective-lever when it is apparent the aircraft will descend below 25 feet AHO.

   e. During NOE flight, the P will advise the P* whenever an unannounced descent is detected. The P will immediately raise the collective-lever when it is apparent the P* is not taking corrective action and the aircraft will descend below 10 feet AHO.

2. Procedures. Terrain flight is close to the earth's surface. The modes of terrain flight are NOE, contour, and low-level. Crewmembers will seldom perform pure NOE or contour flight. Instead, they will alternate techniques while maneuvering over the desired route.

   a. NOE flight. Perform NOE flight at varying airspeeds and altitudes as close to the earth's surface as vegetation, obstacles, and ambient light 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. Performing this maneuver in certain environments may require hover OGE power. Evaluate each situation for power required versus power available.

Note. Terrain flight is considered sustained flight below 200 feet AGL, except during takeoff and landing.

Note. The aircrew should incorporate the use of Army-approved mission planning station and software, if available, with this task.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. When wearing NVG, the P* will not exceed 40 KIAS when flying at or below 25 feet AHO. Between 25 feet and 80 feet AHO, the P* will not exceed 70 KIAS. Above 80 feet AHO, the P* may use any airspeed up to velocity not to exceed (V_{ne}).

2. Wires are difficult to detect with the NVG.

3. Use proper scanning techniques to ensure obstacle avoidance.

OVERWATER CONSIDERATIONS:

1. All crewmembers will wear floatation devices in accordance with AR 95-1.

2. Overwater flight, at any altitude, is characterized by a lack of visual cues, and, therefore, has the potential of causing visual illusions. To minimize spatial disorientation, the crew should use radar altitude hold during overwater flight.

3. 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.

4. Operations become increasingly 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).

5. Hazards to flight such as harbor lights, buoys, wires, and birds must be considered during overwater flight.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluations will be conducted in the aircraft.

REFERENCES: Appropriate common references and FM 3-25.26.

TASK 2036

Perform Terrain Flight Deceleration

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS.

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

1. Maintain heading alignment with the selected flight path ±10 degrees.
2. Maintain the tail rotor clear of all obstacles.
3. Decelerate to the desired airspeed or to a full stop at the selected location ±50 feet.

DESCRIPTION:

1. Crew actions.

   a. The P* will focus primarily outside the aircraft to clear the aircraft throughout the maneuver. He or she will announce their intention to decelerate or come to a full stop, any deviation from the maneuver, and completion of the maneuver.

   b. The P and NCM will provide adequate warning to avoid obstacles detected in the flight path and will announce when their attention is focused inside the cockpit and again when attention is reestablished outside.

2. Procedures.

   a. The P* will initially raise the collective to maintain the altitude of the tail rotor. (Collective control application may not be necessary when initiation of the maneuver is at higher airspeeds.)

   b. The P* must consider variations in the terrain and obstacles when determining tail rotor clearance. He or she will apply aft cyclic to slow to the desired airspeed (or come to a full stop) while adjusting the collective to maintain the altitude of the tail rotor.

   c. The P* will maintain heading with the pedals and will make all control movements smoothly. If the altitude of the tail rotor increases during the deceleration, the P* may need to lower the collective to return to the desired altitude.

   d. 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. Performing this maneuver in certain environments may require hover OGE power. Evaluate each situation for power required versus power available.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: The P* must avoid making abrupt changes in aircraft attitude as the NVG will limit the field of view. He or she should maintain proper scanning techniques to ensure obstacle avoidance and clearance.

TRAINING AND EVALUATION REQUIRMENTS:

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

REFERENCES: Appropriate common references and FM 3-25.26.

TASK 2042

Perform Actions on Contact

CONDITIONS: In a Mi-17 helicopter, Mi-17 FS, or academically.

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 fire.

2. Continue observation as appropriate for the mission.

3. Transmit tactical report according to SOI, the unit's 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. Proper premission planning and intelligence data may aid in developing flight profiles and route selection to avoid hostile fire.

   b. Fly the helicopter to a concealed area using the evasive techniques below and suppressive fire, as required. Choose a course of action supporting the mission and the intent of the unit commander's directives. For additional information, see Task 1405.

   c. If engaged by the enemy, the crew will announce the nature of the threat (hostile fire or radar detection) and the direction of the threat. The crewmember first identifying the threat is responsible for announcing the threat bearing, relative to the aircraft, and launching countermeasures/suppressive fire as necessary.

   d. The P* will announce the direction of flight to deploy to cover and remain focused outside the aircraft during the evasive maneuver and clearing.

   e. Avoid over-controlling/excessive maneuvering that may result in loss of aircraft control (or insufficient power) to recover from the maneuver.

   f. The P and NCM will remain focused primarily outside the aircraft and announce adequate warning to avoid obstacles detected during the evasive maneuver.

   g. The P will remain oriented on threat location. He or she will announce warnings to avoid obstacles when his or her attention is focused inside the aircraft, again when his or her attention is reestablished outside, and will transmit a tactical report.

   h. The NCM will remain focused primarily outside the aircraft and announce adequate warning to avoid obstacles. The NCM will also provide suppressive fire as required.

Note. The NCMs must be able to transmit a tactical report according to the SOI, unit SOP, or mission briefing.

2. Procedures. The specific maneuver required will depend on the type of hostile fire encountered. The guidance below may assist with developing actions-on-contact for the given threat system. A thorough intelligence briefing will help to identify actions-on-contact the crew can expect to take for the most probable threat system employment.

a. Tanks, rocket propelled grenade, and small arms.

(1) If concealment is available, deploy toward the area of concealment.

(2) If concealment is not readily available, immediately turn to an oblique angle while applying forward cyclic. Turn to an oblique angle from the hostile fire to minimize the aircraft's profile and to make it a more difficult target. Apply forward cyclic to accelerate while descending in an attempt to mask the aircraft. Make turns of unequal magnitude, at unequal intervals, and small altitude changes to provide the best protection until beyond the effective range of hostile weapons.

(3) If the situation permits, employ immediate suppressive fire.

b. Large caliber, anti-aircraft fire (radar-controlled).

(1) Execute an immediate 90-degree turn and mask the helicopter.

(2) After turning, do not maintain a straight line of flight or the same altitude for more than 10 seconds before initiating a second 90-degree turn.

(3) To reduce the danger, descend immediately to NOE altitude.

c. Fighters.

(1) On sighting a fighter, try to mask the helicopter.

(2) 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 the attack angle.

(3) Depending on the fighter's dive angle, it may be advantageous to turn sharply and maneuver away once attacker is committed. The fighter pilot will then have to break off the attack to recover from the maneuver.

(4) Once the fighter breaks off the attack, maneuver the helicopter to take advantage of terrain, vegetation, and shadow for concealment.

d. Heat-seeking missiles.

(1) As appropriate, employ the ASE to counter heat-seeking devices while maneuvering to avoid the threat. If a missile is detected, apply forward cyclic and turn the heat source

away from the threat. Attempt to mask the aircraft while orienting crew served weapons for suppressive fire.

(2) MAWS—If a missile is detected, initially maintain course/altitude and allow the countermeasure system to defeat the threat. Perform the appropriate combat maneuvering flight (Task 2127) maneuver and turn to an oblique angle from the threat to minimize the profile of the aircraft while evading. Delay a descent momentarily after last flare launch to allow for IR missile decoy. Attempt to mask the aircraft while orienting/employing crew served weapons for suppressive fire.

e. Radar-guided missiles. Perform the appropriate combat maneuvering flight (Task 2127) maneuver to break the line of sight to the radar source while simultaneously activating chaff if available. Maneuver away from the threat source and attempt to keep the threat system to the right rear 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.

f. Antitank-guided missiles. Some missiles fly relatively slowly and are avoidable by rapidly repositioning the helicopter. If terrain or vegetation is unavailable 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.

g. Artillery. Depart the impact area, and determine CBRN requirements.

Note. Dispensing chaff while maneuvering may cause tracking radars to break lock.

h. After successfully deploying to cover, the crew will—

(1) Report the situation.

(2) Develop the situation.

(3) Choose a course of action, if not directed by the unit commander. (The P*/P will announce the unit commander's directive if not monitored by the other crewmember.)

i. If hit by hostile fire, rapidly assess the situation and determine an appropriate course of action.

(1) Assess aircraft controllability.

(2) Check all instruments, and warning and caution lights. If a malfunction is indicated, initiate the appropriate emergency procedure.

(3) If continued flight is possible, take evasive action.

(4) Radio call your situation, location, action, and request for assistance if desired.

(5) Continue to be alert for unusual control responses, noises, and vibrations.

(6) Monitor all instruments for an indication of a malfunction.

(7) After landing, inspect the aircraft to determine the extent of damage and if flight can be continued.

Note. Proper employment of terrain flight techniques will reduce exposure to enemy threat weapon systems.

Note. 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.

Note. Performing this maneuver in certain environments may require hover OGE power. Evaluate each situation for power required versus power available.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. At low ambient light levels, obstacle detection is difficult. The P* may experience spatial disorientation if he or she executes abrupt maneuvers. Proper scanning techniques and good cockpit communication are necessary to avoid these hazards.

2. The crew should consider using artificial lighting if the ambient light level is insufficient for obstacle detection.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft, FS, or academically.

2. Evaluations will be conducted in the aircraft or academically.

REFERENCES: Appropriate common references, ASET, and FM 34-25-7.

TASK 2048

Perform External (Sling)-Load Operations

CAUTION

A static electricity discharge wand will be utilized IAW FM 4-20.197.

CONDITIONS: In a Mi-17 helicopter with the crew briefing completed, aircraft cleared and a certified load.

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

1. RCM.

   a. Ensure the aircraft remains clear of the load and any obstacles.

   b. Perform a vertical ascent with the load to a load height of 10 feet, ±3 feet, AGL.

   c. Perform a vertical descent with the load to the desired touchdown point ±5 feet.

   d. Ensure the load remains clear of any obstacles and is not dropped or dragged.

   e. Correctly perform crew coordination actions.

2. NCM.

   a. Direct the P* over the load for hookup using no more than two directions at a time.

   b. Properly direct the P* to the release area and clear the load for release.

   c. Correctly perform crew coordination actions.

DESCRIPTION: The following are crew actions.

1. P.

   a. Makes every radio call.

   b. Informs the P* when any aircraft limits are being reached/exceeded.

   c. Perform hover power check.

   d. Perform before takeoff check.

   e. Clear aircraft for takeoff.

2. P*.

   a. Ground taxi the aircraft into position adjacent the load.

   b. Turn off (flip down) ICS radio switches prior to liftoff.

   c. Follow NCM's directions. The NCM will ensure radio switches on the ICS are off and the intercom switch is set to "hot mike" while bringing the aircraft to a hover over the load. The NCM will ensure the restraint harness is attached to a cargo tie-down ring. The NCM will position himself at the right corner of the rescue (cargo) hatch for hookup. It is not normal procedure for airborne systems aircraft to hook up an external load from a hover; therefore, the following is a procedure for both NCM positions, one at the cabin door and the other over the rescue (cargo) hatch.

3. NCM's duties from the cabin door.

   a. Prior to calling the load, turn off (flip down) ICS radio switches.

   b. Advise when the load is in sight.

   c. Direct the pilot to a position adjacent the load.

   d. Advise the pilot when the hook up man is under the aircraft.

   e. Advise the pilot when the hook up man is clear of the aircraft.

   f. Direct the pilot to a stabilized hover over the load.

   g. Monitor ground personnel and obstacles.

4. NCM's duties from the rescue (cargo) hatch.

   a. Prior to sling-load operations turn off (flip down) ICS radio switches.

   b. Advise the pilot when the load is hooked.

   c. After the NCM from the cabin door has stabilized the aircraft over the load, advise the pilot when the load is in sight.

   d. Maintain the pilot stabilized over the load (no more than two directions at once).

   e. Advise when the aircraft is clear to come up.

   f. Advise when the slings are coming tight.

5. NCMs from the rescue (cargo) hatch will state the following advisories.

   a. Load is off the ground.

   b. Load height to 10 feet in 1-foot increments.

   c. Load is cleared for flight.

d. Load height to 25 feet in 5-foot increments.

e. Load clear of the barriers.

f. Load height to 100 feet in 25-foot increments.

g. Monitor the load in flight for any unusual conditions.

6. On final approach the P will call the aircraft down to 100 feet using the radar altimeter (100 feet plus hover height). The NCM over the rescue (cargo) hatch will call the load down from 100 feet to the ground. Once the load is on the ground, the NCM will call for sling slack, advising the load is clear to release. When the load is released, the aircraft is clear to reposition. Hook authority will remain with the pilots; however the NCM over the rescue (cargo) hatch may release the load during emergencies. In case of lost communications, prior to hook up or the slings becoming tight, open the hook; or, if in flight, the NCM at the cargo door will notify the pilots.

Note. Avoid flight over populated areas.

Note. Before the mission, the PC will ensure each crewmember is familiar with the hand and arm signals contained 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.

Note. Hover OGE power is required for this maneuver.

Note. Prior to conducting an external load operation, crewmembers must ensure they can communicate with each other.

Note. The CE should place the intercom switch to "hot mike" when using the cargo loading pole.

Note. The P* will not allow the external load to descend below the hover height until the CE has cleared the load to the ground.

Note. If a load oscillation develops, the primary method for arresting the oscillation is to decrease airspeed. Additional measures may include shallow turns or banks, small climbs or descents, or a combination of any or all methods.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. For unaided night flight, both searchlights should be operational. If an NVG filter is installed, it should be removed.

2. Hovering with minimum drift is difficult and requires proper scanning techniques and crew coordination. If possible, the crew should select an area with adequate ground contrast and reference points.

3. The NCM should wear NVG during NVG external load operations. A flashlight with an NVG compatible lens may be used to view the load.

4. During load hookup and after the slings are tight, the P should refer to the radar altimeter for actual aircraft height AGL. The P should round-up the height to the nearest 5 feet and add 10 feet for the appropriate hover height.

5. During the approach, the P should monitor the radar altimeter from 100 feet to the hover height obtained in 4 above. The P will call out the altitude in increments of 25 feet down to the sling altitude. The CE will monitor the load and inform the P* if it is determined that the rate of descent or airspeed is excessive or if the accuracy of the radar altimeter is in doubt. When the P announces the sling altitude, the CE will clear the load down to the release area, calling out altitude in 1-foot increments to the ground.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references, AR 95-27, FM 4-20.197, FM 4-20.198, FM 4-20.199, FM 21-60, and TM 10-1670-295-23&P.

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 any personnel in the cabin area are wearing a safety harness secured to a tiedown ring or are sitting in a seat with seat belt fastened.**

Note. The water bucket, when loaded, is a high-density load with favorable flight characteristics. Reduced V_{ne} and bank angle limits must be kept in mind. Much of the mission profile is flown at high GWT and low airspeed. In addition, density altitude is greatly increased in the vicinity of a major fire. Performance planning must receive special emphasis.

CONDITIONS: In a Mi-17 helicopter with an operational cargo hook, water bucket, required briefings, checks completed, and an AWR.

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

1. RCM.

   a. Conduct permission planning to determine fuel and bucket cinching requirements. Verify the aircraft will remain within GWT and CG limitations for the duration of the flight.

   b. Conduct a thorough crew briefing.

   c. In conjunction with the NCMs, complete the required checks to ensure proper system operation before mission departure.

   d. Operate the water bucket system according to manufacturer specifications.

   e. Recognize and respond to a water bucket system malfunction.

   f. Use proper dipping procedures for the water bucket type.

   g. Demonstrate knowledge of fire behavior and terminology.

   h. Hookup and hover.

      (1) Maintain vertical ascent heading ±10 degrees.

      (2) Maintain altitude of load ± 10 feet AGL, +3 foot.

      (3) Complete hover power checks.

i. En route, maintain load obstacle clearance (minimum 50 feet AHO).

j. Approach and water release.

(1) Evaluate fire/simulated fire for flight path and altitude requirements.

(2) Maintain a constant approach angle to ensure the load safely clears obstacles.

(3) Maintain ground track alignment with selected approach path.

(4) Execute a smooth and controlled pass or termination over the intended point/area of water drop.

(5) Deploy water as directed in proper location, orientation, and/or length.

2. NCM. In conjunction with RCMs, complete required water bucket checks to ensure proper system operation before mission departure and attach water bucket to the aircraft.

a. Ensure the water bucket is configured for the condition and mode of flight.

b. Recognize and respond to a water bucket system malfunction.

c. Demonstrate knowledge of fire behavior and terminology.

DESCRIPTION:

1. Crew actions.

a. The PC will conduct a thorough crew, external load, and water bucket briefing. The PC will ensure all crewmembers are familiar with water bucket operations and emergency and communication procedures. He or she will ensure a DA Form 7382 (Sling Load Inspection Record) has been completed. The PC will confirm required power is available by comparing the information from the PPC to the hover power check.

b. The P* will remain focused primarily outside the aircraft throughout the maneuver. The P* will monitor altitude and avoid obstacles.

c. The P will monitor the cockpit instruments and assist the P* in clearing the aircraft. The P will set cargo hook switches, as required, and should make all radio calls. When directed by the P* during the approach, the P will place the cargo hook master switch to the ARMED position. The NCM will release the water in accordance with the crew briefing.

d. The P and NCM will assist in clearing the aircraft and will provide adequate warning of obstacles. They will announce when their attention is focused inside and again when attention is reestablished outside.

e. The NCM will remain focused primarily on the bucket. The NCM will guide the P* during the bucket pickup, advise of the bucket condition in flight, provide directions and assistance when the water is dumped, and direct the P* when setting down the bucket.

f. The NCM will advise the P* of any water bucket faults or failures.

g. External load procedures in accordance with Task 1063 will be used for normal external load techniques and load call outs. The NCM will advise the P* when the water bucket is in the water, filling, full, water deploying, and empty. The NCM will instruct the P* as necessary to keep the electrical attachment assembly from entering the water.

2. Procedures. Crewmembers will follow the water bucket guide provided in table 4-5.

Table 4-5. Water bucket procedure guide

Water bucket preflight check
1. Bottom of chain for tears in fabric. 2. Shackle and lockwire or tie-wrap condition. 3. Sidewall battens. 4. Diagonal M-straps connecting the suspension cables for wear. 5. Purse lines on the fabric dump valve. 6. Cinch strap belt—the end opposite the D-ring shall have a knot. 7. Suspension lines for frays, kinks, and conditions. 8. Ballast pouch in the bucket for rips or holes. 9. Control head for secure fittings. 10. Tripline for kinks, frays, or loose swages. 11. Perform operational check of control head.
Dumping water
1. Pilot calls—altitude, airspeed, and monitors radar altimeter during pass. 2. Nonrated crewmember (NCM)—calls “prepare to open bucket/doors” approximately 10 seconds from target. 3. Nonrated crewmember (NCM)—calls over target “open bucket/doors.” 4. Nonrated crewmembers respond—“bucket/doors open, bucket is ¾, ½, ¼, bucket empty.”
Note. Water bucket doors are opened or closed depending on bucket type and clear for flight, as required.
Landing
1. Normal load approach. 2. Clear bucket to ground. 3. Clear to slide (direction) away from load. 4. Release the slings and disconnect electrical lines. 5. Recover bucket and secure in aircraft.
Emergency procedures
1. Open the bucket, if necessary. 2. Call bucket open, bucket empty 3. Jettison the load, if necessary. 4. Call load jettisoned. 5. Hook operations—normal and emergency. 6. Lost communication procedures.

a. Preflight.

(1) The PC will analyze the mission using 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 NCMs will ensure the water bucket is installed and all installation checks are completed according to the unit's SOPs.

(3) The crew will conduct the ground checks in accordance with the manufacturer's procedures to confirm the proper operation of the water bucket before takeoff.

b. Hookup and hover.

(1) Once the water bucket is placed on the ground beside the aircraft and all associated wiring is installed, place the cargo hook master switch in the ARM position.

(2) 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.

(3) Once in this position, smoothly apply collective input until all slack is removed from the suspension cable. Maintain heading with pedals.

(4) Apply additional collective to raise the bucket to 10 feet AGL. Monitor aircraft instruments to ensure aircraft limitations are not exceeded.

c. Water pickup. Evaluation of the water pickup should include depth, obstacles, water current, and availability of hover references.

(1) Bambi bucket water pickup.

(a) Arrive over water source with no forward ground speed and a bucket height of 10 feet above water level.

(b) Slowly reduce the collective and apply a slight amount of forward cyclic until the Bambi bucket contacts the water. Follow the NCM's verbal guidance to remain centered over the bucket as it fills, applying cyclic, collective, and pedals as necessary.

(c) 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.

(d) When the NCM indicates the bucket is ready (or full), increase the collective-lever until all slack is removed from the suspension cable and the lip of the bucket is clear of the water; maintain heading with pedals.

(e) Apply additional collective to raise the filled bucket clear of the water's surface to a height of 10 feet. Ensure the bucket is holding the water and monitor aircraft instruments to ensure aircraft limitations are not exceeded.

(2) Sims and simplex water pickup.

(a) Arrive over water source with no forward ground speed and a bucket height of 10 feet above water level.

(b) Ensure the bucket doors are open.

(c) Slowly reduce the collective until the bucket makes contact with the water. Once the bucket has submerged in the water, follow the NCM's verbal guidance to remain centered over the bucket as it fills, applying cyclic, collective, and pedals as necessary.

(d) When the NCM indicates the bucket is full, he or she will close the bucket doors and ensure the bucket is ready.

(e) Then the P* can 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.

(f) Apply additional collective to raise the filled bucket clear to the water's surface to a height of 10 feet. Ensure the bucket is holding the water and monitor aircraft instruments to ensure aircraft limitations are not exceeded.

Note. Use the manufacturer's recommended en route airspeeds for each type of water bucket. This prevents the buckets from twisting and pinching the cables.

d. Takeoff. Establish a constant angle of climb that will permit safe obstacle clearance. When above 100 feet AGL or when clear of obstacles, adjust attitude and power as required to establish the desired rate of climb and airspeed. Smoothly adjust flight controls to prevent bucket oscillation.

Note. Ensure the cargo hook master switch is in the ARMED position when operating at altitudes below 300 feet AHO and in the OFF 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 an oscillation occurs, perform the same procedures as in FM 3-04.203, paragraph 2-70.

f. Approach and water release.

(1) The PC will determine the most appropriate height and speed for the pattern desired, or in accordance with the mission briefing.

(2) Evaluation of the fire should include wind direction, velocity, terrain, and type of fire. Fires usually require a drop height of 100 to 200 feet AGL and a ground speed of 30 to 60 knots.

(3) The aircraft's ground track should be upwind and adjusted so the spray will provide maximum cooling to hot spots, as well as dampen unburned vegetation. Altitude and airspeed may be adjusted for fires of varying intensity and types. However, it must be noted that low, slow passes may tend to increase the fire's intensity due to rotor down wash.

(4) When the approach angle is intercepted, decrease the collective-lever to establish the descent. When passing below 300 feet AGL, place cargo hook master switch in the ARM position. When reaching the desired airspeed and altitude, the recommended crew coordination terms for bucket operations are as follows:

(a) Approaching the target-"prepare to open the doors" (approximately 10 seconds out).

(b) Over the target-"open doors."

(c) When the drop is complete-"close doors."

g. Postmission. Ensure the water bucket is serviceable, de-rig aircraft and water bucket, and ensure all documentation is complete on water bucket usage and inspection.

Note. The NCM will advise the P* of the condition of the bucket and call out the water level while releasing water. The bucket manufacturer does not recommend dumping at airspeeds above 50 KIAS.

Note. There is a delay of appropriately 0.5 to 1.0 second between the activation of the dump switch and discharge of the water.

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 if a crewmember announces "climb, climb, climb." This phrase will only be used when there is not enough time to give detailed instructions to avoid obstacle.

SAND/DUST/SMOKE CONSIDERATIONS: If during the approach, visual reference with the water release area (or obstacles) is lost, immediately initiate a go-around or ITO as required. Be prepared to transition to instruments. Once VMC are regained, continue with the go-around. (If required, releasing the water reduces the GWT of the aircraft and minimizes power demand).

MOUNTAINOUS AREA CONSIDERATIONS: During an approach, if sufficient power is unavailable or turbulent conditions or wind shift create an unsafe condition, immediately perform a go-around. (If required, releasing the water reduces the GWT of the aircraft and minimizes power demand.)

OVERWATER CONSIDERATIONS:

1. All crewmembers will wear floatation devices in accordance with AR 95-1.

2. Overwater flight, at any altitude, is characterized by a lack of visual cues and, therefore, has the potential of causing visual illusions. To minimize spatial disorientation, the crew should use radar altitude hold during overwater flight.

3. 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.

4. Operations become increasingly 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).

5. Hazards to flight such as harbor lights, buoys, wires, and birds must be considered during overwater flight.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Not recommended.

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 crewmembers' 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.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references, AR 70-62, FM 4-20.197, and water bucket AWR.

TASK 2054

Perform Fast-Rope Insertion and Extraction System Operations

Note. Headquarters, Department of the Army (HQDA) policy specifies that fast-rope insertion and extraction system (FRIES) is not approved for Army-wide use and names the Commanding General, United States Army Special Operations Command (USASOC), as the executive agent for FRIES doctrine. The use of FRIES is restricted to special operations forces, pathfinders, long-range surveillance units, and HQDA-approved schools with a USASOC-approved FRIES program of instruction. Approval for FRIES operation is only required for ground forces and should be verified by the aviation supporting unit. It is highly recommended the aviation unit review United States Special Operations Command (USSOCOM) 350-6 prior to conducting FRIES operations.

WARNING

Ensure crewmembers in the cabin area are wearing a safety harness secured to a tiedown ring anytime the door or ramp is open. Also, ensure all ropers are on the ground before any ropes are released.

CONDITIONS: In a Mi-17 helicopter with FRIES equipment installed.

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

1. RCM. Conduct a thorough crew and passenger briefing. Maintain entry altitude as directed ±10 feet. Maintain entry airspeed of 80 KIAS, ±5 KIAS. Maintain track aligned with landing direction. Perform a smooth, controlled termination to a hover over the insertion point. Deceleration attitude is not to exceed 20 degrees. Maintain appropriate hover height ±5 feet, not to exceed rope height. Table 4-6 provides a fast-rope operations checklist.

2. NCM. Ensure the aircraft is configured for FRIES operations in accordance with TC 21-24.

Table 4-6. Fast-rope operations checklist

Pre-roping actions	
	1. Receive a briefing from the officer in charge or the AMC.
	2. Coordinate and brief all participants.
	3. Rig aircraft and conduct a joint inspection.
	4. Brief roper, safety, assistant fast-rope masters (AFRMs), and fast-rope master (FRM).
	5. Rig and inspect ropers.
	6. Conduct a static rehearsal.
Aircraft loading	
	1. Position equipment and personnel.
	2. Ensure all personnel have straps or seat belts.

Table 4-6. Fast-rope operations checklist—Cont.

Actions in flight	
	1. Monitor the command net.
	2. Monitor the aircrew net.
	3. Monitor the flight route.
Actions at 10-minute warning (applies to long infiltrations)	
	1. Issue the 10-minute time warning and GET READY.
	2. Check equipment and belay system hookup.
	3. Check fast-rope hookup.
	4. Secure fast-rope bar in position.
	5. Ensure the fast-rope is back coiled and markers are attached.
Actions at 6-minute warning	
	1. Issue the 6-minute warning.
	2. Remove personnel restraints or seat belts.
	3. Position personnel and equipment.
	4. Break chemlights, for night operations.
	5. Open aircraft doors, if required.
Actions at 1-minute warning	
	1. Issue the 1-minute time warning and STANDBY.
	2. Position ropers in stick formation.
Actions at flare	
	1. Identify the target area.
	2. Deploy bundles/equipment (safeties) and clear ropes.
	3. Deploy FRIES ropes (FRM and AFRM).
	4. Check ropes to ensure 15 feet of rope is on the surface (FRM).
Actions for descent	
	1. FRM, AFRM, or safety positions the number 1 man at the rope. (The FRM may exit first or last.)
	2. FRM issues the command "GO," AFRM echoes GO command, and the ropers exit the aircraft.
	3. Safety informs the PC, "ROPERS OUT."
	4. AFRM or safety controls the ropers' rate of exit.
	5. AFRM exits last.
	6. Aircrew or safeties observe the last roper. Safety tells the PC, "ALL ROPERS AWAY," after the last roper is on the surface and signals.
	7. PC issues command "JETTISON" or "RECOVER ROPES."
	8. Aircrew or safeties jettison or recover ropes and issue "ROPES CLEAR" report to the PC.

DESCRIPTION:

1. Crew actions.

   a. The PC will conduct a crew and passenger briefing and ensure personnel are familiar with normal and emergency procedures. The PC will ensure the aircraft is rigged.

   b. The P* will remain focused primarily outside the aircraft throughout the maneuver and announce when he or she begins the maneuver. The P* will also announce the intended point of insertion.

   c. The P and NCM will assist in clearing the aircraft and provide adequate warning of obstacles. They will also assist the P* in maintaining a stable hover. The NCM will inspect the rigging to ensure the aircraft is configured for fast-rope operations.

2. Procedures.

   a. To perform a FRIES assault, execute a VMC approach to the insertion point. On final approach, 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. Tasks 1038 and 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 visual hover cues.

NIGHT OR NIGHT VISION DEVICE CONSIDERATIONS: Due to loss of forward references during decelerations, recommend maximum pitch attitude of 15 degrees. Use IR bypass band filter searchlight, as necessary, to maintain position and hover altitude for NVG operations. Proper scanning techniques are necessary to detect aircraft drift and to avoid spatial disorientation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluations will be conducted in the aircraft.

REFERENCES: Appropriate common references, FRIES AWR, TC 21-24, and USSOCOM 350-6.

TASK 2056

Perform Rappelling Operations

WARNING

Ensure the rappel master is secured to a tiedown ring. Also ensure all ropers are on the ground before any ropes are released. If the roper's equipment becomes fouled on the ramp or probe, ensure the roper is "locked in" on the rope before freeing the equipment. Maintain visual contact with the roper until equipment is freed.

CAUTION

Weight bags must remain attached to any rope retrieved into the aircraft.

CONDITIONS: In a Mi-17 helicopter properly configured and hover OGE power is available.

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

1. RCM.

   a. Conduct a thorough crew and passenger briefing.

   b. Maintain appropriate hover altitude ±5 feet.

   c. Maintain ropes in continuous contact with the ground.

   d. Do not allow drift to exceed 5 feet from the intended hover point.

   e. Hover symbology selected at P* station.

2. NCM general duties.

   a. Properly clear aircraft and make rope calls informing pilots of status of ropes and passengers.

   b. Check that all equipment is installed properly.

   c. Ensure load/passenger weight does not exceed aircraft limitations.

   d. Ensure equipment is rigged properly when performing equipment drops.

   e. Ensure ropes are on ground before releasing ropers.

   f. Use proper terminology.

DESCRIPTION:

Note. The PC will ensure the intended P* for the maneuver is assigned the seat position affording the greatest visibility for conducting the maneuver.

1. Crew actions.

   a. The PC conducts or directs a crewmember to conduct a crew and passenger briefing and ensure personnel are familiar with normal and emergency procedures. The NCM will verify rope lengths with the supportive unit and inform the PC. The NCM will inspect rigging to ensure the aircraft is configured properly for rappelling operations. The PC confirms the ropes are rigged properly.

   b. The P* remains focused primarily outside the aircraft throughout the maneuver and will announce when he or she begins the maneuver. The P* will also announce the intended point of insertion and pass the rappelling execution command to the NCMs.

   c. The P and NCM assist in clearing the aircraft and provide adequate warning of obstacles. They will also assist the P* in maintaining a stable hover.

   d. NCMs will determine who will make specific calls and inform the pilots (normally, right ramp makes primary calls). NCMs will be responsible for passing the 10-, 6-, 3-, and 1-minute calls. The right ramp usually will be responsible for making the primary rope calls.

   e. NCMs will use preestablished procedures and communications, including hand and arm signals, with the FRM. NCMs will deploy, release, or retrieve the ropes.

   f. NCMs will inform the PC once all ropes are clear of the aircraft, have been retrieved back into the aircraft, or are secure during elevator training.

2. Procedures.

   a. Ten minutes before ETA, the P will announce, "TEN MINUTES OUT." Each NCM or rope master will inform the passengers at his or her station of the timed call and announce when the station is ready, "AFT READY," "FORWARD READY." The same procedures will be conducted at the 6-, 3-, and 1-minute timed calls. At night, the NCMs at each station will break the chemlights attached to the ropes by the 6-minute call.

   b. When the objective is sighted and the P* judges that he or she can initiate the maneuver to stop at a stabilized hover over the target point, the P* will apply aft cyclic and adjust collective, as necessary. If the closure rate to the intended hover point is too fast, the P* may adjust the aircraft attitude, but will not exceed 20 degrees nose high. Maintain appropriate roping height ±5 feet. The P should call out aircraft parameters, attitude, and radar height during the maneuver. NCMs will get into roping position by 1-minute out.

   c. When stabilized at a hover, the right ramp should announce "OVER THE TARGET," and the P* will call "ROPES, ROPES, ROPES." The NCM at each station will deploy, direct, or help ropes when the ropes have been deployed. The right ramp should announce "AFT

ROPES OUT" (if applicable) and the right gun will announce "FORWARD ROPES OUT" (if applicable) when personnel/equipment exit the aircraft. The right ramp should announce, "AFT ROPING IN PROGRESS," the forward CE will announce "FORWARD ROPING IN PROGRESS" (if applicable). Although all NCMs are responsible for maintaining the aircraft at a stabilized hover with minimum drift, and clear of obstructions, the right ramp should make the primary calls.

d. Each NCM at a station will visually confirm personnel/equipment are clear and release (or retrieve) ropes as briefed. The right ramp should announce "AFT ROPES RELEASED, AFT READY." The right gun will announce "FORWARD ROPES RELEASED (if applicable), FORWARD READY, CLEARED FOR FLIGHT."

e. The P* will announce his or her intent to depart the target area. The P* will maintain outside visual reference and depart the area maintaining obstacle clearance along the intended ground track.

f. Standard terminology (table 4-7) will be used during rappelling insertion.

Table 4-7. Standard rappelling insertion terminology

Speaker	***Reason***	***Statement***
P* to the crew	Indicates ready for rope deployment.	* "Ropes, ropes, ropes"
FE/CE to pilots	Indicates the ropes are deployed over target.	* "Ropes out"
FE/CE to pilots.	Indicates the first roper is exiting aircraft.	* "Roping in progress"
FE/CE to pilots	Indicates the ropes have been cut away.	* "Ropes released"
FE/CE to pilots	Indicates the ropes have been pulled back into the aircraft and are secured.	* "Ropes retrieved"
FE/CE to pilots	Hold position.	"Hold"
FE/CE to pilots	Indicates direction in which to reposition the aircraft.	"Move" (left, right, forward, back)
FE/CE to pilots	Indicates all ropers are clear from the aircraft.	"Aft ready, forward ready"
Forward CE	Will be the only one to say this.	"Clear for flight"
FE/CE to pilots	Indicates a problem at a station; all roping ceases until problem is rectified.	"Stop stick"
FE/CE to pilots	Indicates aircraft is over the target.	"Over the target"
* Aft, forward from CE to pilots, will preclude calls to indicate appropriate station.		

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, causing 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. NVG lighting will be according to unit standing operating procedure (SOP) or the tactical environment.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
   a. Pilot training does not require ropers.
   b. NCM training requires personnel/gear to go down the ropes.
2. Evaluations will be conducted in the aircraft.
   a. Pilot evaluations do not require ropers.
   b. NCM evaluations require personnel/gear to go down the ropes.

REFERENCES: Appropriate common references, FM 90-4, and TC 21-24.

TASK 2058

Perform Special Patrol Infiltration and Exfiltration System Operations

WARNING

Ensure the special patrol infiltration and exfiltration system (SPIES) master and crew chief wear a safety harness secured to a tiedown ring anytime the clamshell doors are removed.

CAUTION

Ensure SPIES rope remains secured to the cargo floor 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 Mi-17 helicopter with special patrol infiltration/exfiltration equipment installed and SPIES crew assigned.

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

1. RCM. Conduct a thorough crew and passenger safety briefing. Maintain obstacle clearance between team members, obstacles, and the ground. Maintain airspeed ±5 knots; the maximum airspeed with team members attached is 70 KIAS in moderate climates and 50 KIAS in cold climates. Bank angle not to exceed 30 degrees.

2. NCM. Ensure the aircraft is prepared for SPIES operations in accordance with TC 21-24 and the unit's SOP.

DESCRIPTION:

1. Crew actions.

   a. The PC will conduct a thorough crew briefing and ensure all crewmembers are familiar with SPIES operations, emergency, and communication procedures. The PC will ensure the aircraft is rigged.

   b. The P* will remain focused primarily outside the aircraft throughout the maneuver to ensure aircraft control and obstacle avoidance. The P* will announce the intended point of extraction and remain centered over the target, incorporating corrections from the SPIES master as required.

   c. The P and NCM will assist in clearing the aircraft and will provide adequate warning of obstacles. They will assist the P* during the pickup phase of the operation. They will advise the P* when the slack is out of the ropes, and when the SPIES members are off the ground and AHO. During forward flight, the NCM must constantly monitor the SPIES members and keep the P* informed of their stability and clearance.

2. Procedures.

a. Establish communications with personnel at extraction site. The approach should be terminated into the wind at a 90-foot hover. Normal length of SPIES ropes is 120 feet. Once stabilized over the extraction site, the NCM (when authorized by the PC) will throw out the deployment bags. The NCM will inform the P* when all ropers are ready and hookup is complete. The NCM verifies extraction harnesses are secure and safe as the ropers are lifted off the ground.

b. 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 ropes must be removed cautiously. Do not start forward flight until all obstacles are cleared.

c. Maximum en route airspeed will not be 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.

d. Upon arrival at the dismount area, transition to hovering flight at an altitude of 250 feet AGL. Start vertical descent with the rate not to exceed 100 foot per minute (at touchdown). Maintain a stable hover until SPIES team members clear the rope.

OVERWATER CONSIDERATIONS:

1. The SPIES is suitable for extracting teams from the water. For this procedure, three inflatable life vests (or any type of floatation device) are tied to the SPIES rope to provide buoyancy for the rope while in the water.

2. Takeoff, en route, and landing are the same for water 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.

3. All crewmembers will wear floatation devices in accordance with AR 95-1.

4. Overwater flight, at any altitude, is characterized by a lack of visual cues and, therefore, has the potential of causing visual illusions. To minimize spatial disorientation, the crew should use radar altitude hold during overwater flight.

5. 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.

6. Operations become increasingly 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).

7. Hazards to flight such as harbor lights, buoys, wires, and birds must be considered during overwater flight.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. For unaided night flight, the landing light and searchlight should be operational. If a NVG filter is installed, it should be removed.

2. Due to the high hover altitude of SPIES operations, it is very difficult to determine altitudes and relative position over the ground. The barometric altimeter is not reliable for this maneuver, but can be used as an aid to help maintain a constant altitude. References (such as tops of trees, lights, and manmade objects) can be used to help prevent drift by lining up the objects and maintaining their relative position once the aircraft is at a stable altitude.

3. If possible, select an area with good contrast and several reference points at the same or greater height as the SPIES hover altitude. Proper scanning techniques are necessary to avoid spatial disorientation.

4. Spatial disorientation can be overwhelming during nighttime overwater operations. If there are visible lights on the horizon or if the shoreline can be seen, the pilot may opt to approach the survivor(s) so the aircraft is pointed toward these references, if the wind permits. If no other references exist, deploy chemlights to assist in maintaining a stable hover.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references, TC 21-24, and SPIES AWR.

TASK 2060

Perform Rescue Hoist Operations

WARNING

Ensure crewmembers in the cabin area are wearing a safety harness secured to a tiedown ring anytime the cabin door is open. The crewmember riding the hoist will be secured either to the aircraft or to the jungle penetrator. Ensure the cable touches the ground or the water before ground personnel touch the cable. Cable will be charged in excess of 300,000 volts of static electricity.

CAUTION

Care must be taken not to snag terrain features or foliage with the rescue-hoist cable. This may result in exceeding the structural limitation of the overhead pulley support.

CONDITIONS: In a Mi-17 helicopter equipped with a rescue-hoist/winch system.

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

1. RCM.

a. Conduct a thorough crew and passenger safety briefing.

b. Perform rescue-hoist procedures in accordance with the operator's manual.

c. Perform rescue-hoist/winch procedures in accordance with the operator's manual, FM 8-10-6, FM 3-04.203, and the unit's SOP.

d. Maintain appropriate hover altitude ±5 feet.

e. Do not allow drift to exceed ±5 feet from the intended hover point.

2. NCM.

a. Perform a preflight inspection of the rescue-hoist/winch in accordance with the operator's manual and the unit SOP.

b. Ensure the crew, passengers, cargo, and mission equipment are secured.

c. Operate the rescue hoist/winch.

DESCRIPTION:

1. Crew actions. Rescue hoist operations include the following:

   a. The 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. The PC will also ensure all crewmembers understand “CUT CABLE” procedures.

   b. The P* will remain focused primarily outside the aircraft throughout the maneuver to ensure aircraft control and obstacle avoidance. The P* will announce the intended point of hover and remain centered over the target, incorporating corrections from the NCM.

   c. The 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 the hoist is configured and 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 ensure the winch is configured for rescue-hoist operations and the appropriate write-up is entered on a DA Form 2408-13-1 for the midhook being removed in accordance with the operator’s manual.

   f. The NCM will conduct the hoist operation in accordance with FM 3-04.203, the operator’s manual, and the unit SOP.

2. Procedures.

   a. General recovery procedures over land.

      (1) Crewmembers alerted approximately 5 minutes before arrival at pickup site.

      (2) Crewmembers complete all required checks (such as rescue-hoist control panel switches set, hoist circuit breakers set, ICS selector switches set, and crewmembers reposition for hoist operations).

      (3) Make the approach into the wind if possible and plan to terminate the approach at an altitude that will clear the highest obstacle.

      (4) Select an appropriate reference point to maintain heading and position over the ground. Once stabilized over pickup site, perform hoist operations in accordance with FM 8-10-6, FM 3-04.203, the operator’s manual, and the unit SOP.

   b. Inert patient recovery.

(1) General format is the same as over land, except the NCM/medical officer (MO) is lowered on the hoist and secures the patient to the recovery device.

(2) Before 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 NCM/MO.

c. General recovery procedures overwater.

(1) 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.

(2) 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 in accordance with the standard words and phrases in accordance with 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.

OVERWATER CONSIDERATIONS:

1. All crewmembers will wear floatation devices in accordance with AR 95-1.

2. Overwater flight, at any altitude, is characterized by a lack of visual cues and, therefore, has the potential of causing visual illusions. To minimize spatial disorientation, the crew should use radar altitude hold during overwater flight.

3. 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.

4. Operations become increasingly 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).

5. Hazards to flight such as harbor lights, buoys, wires, and birds must be considered during overwater flight.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Use proper scanning techniques to avoid spatial disorientation.

1. For unaided night flight, the landing light and searchlight should be operational. If an NVG filter is installed, it should be removed.

2. When NVG are used, hovering with minimum drift is difficult and requires proper scanning techniques and crewmember coordination. If possible, use an area with adequate ground contrast and reference points.

3. Visual obstacles such as shadows should be treated the same as physical obstacles.

4. Spatial disorientation can be overwhelming during nighttime overwater operations. If there are visible lights on the horizon or if the shoreline can be seen, the pilot may opt to approach the survivor(s) so the aircraft is pointed toward these references, if the wind permits. If no other references exist, deploy chemlights to assist in maintaining a stable hover.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references, FM 8-10-6, and TM 55-4240-284-12&P.

TASK 2064

Perform Paradrop Operations

CONDITIONS: In a Mi-17 helicopter with a jumpmaster and given a designated altitude and appropriate publications.

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

1. RCM.
   a. Properly conduct a thorough crew/passenger briefing.
   b. Ensure the aircraft is properly prepared for the mission.
   c. Maintain airspeed ±5 knots.
   d. Maintain appropriate altitude ±100 feet.
   e. Maintain appropriate ground track over the drop zone.
   f. Correctly perform crew coordination actions.
2. NCM.
   a. Properly prepare the aircraft for the mission in accordance with operator’s manual.
   b. Correctly perform crew coordination actions.

WARNING

Ensure the crew chief and jumpmaster are wearing a safety harness secured to a tiedown ring.

Note. Mi-17 aircraft are only cleared for military free fall parachute operations.

DESCRIPTION:

1. The CE will remove the clam shell doors and ensure the cabin floor is clean and dry. The CE will properly install the static line anchor cable and retriever, as needed, in accordance with operator’s manual. The CE will ensure the static line anchor cable does not sag more than 6 inches and will check the turnbuckle for safety. The CE will pad and tape every clamp on the cable with cellulose wadding and masking tape. The CE will rig the troop seats for the mission; adjust the seat backs as required; and ensure airsick bags are available.

2. The P*/P will thoroughly brief the crewmembers, jumpmaster, and parachutists and ensure the aircraft is properly rigged in accordance with operator’s manual. The P* will maintain altitude, airspeed, and ground track as determined during premission planning. Ground track corrections for wind drift may be received by radio from the drop zone control officer or by

intercom from the jumpmaster. The crew will conduct the paradrop according to the procedures covered in the briefing and the references listed below. The PC will verify the jumpmaster or 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 or she will communicate with the CE via hand-and-arm signals. The CE will relay necessary information to the P*/P using the intercom.

CAUTION

Ensure the static lines remain secured to the anchor cable until the aircraft has landed. If recovery of the static lines is impossible, execute a running landing to avoid entangling the deployment bags in the rotor system.

CAUTION

When parachutists are equipped with automatic parachute openers and the mission is aborted, ensure the openers are disarmed before beginning the descent.

TRAINING AND EVALUATION REQUIRMENTS:

1. Training will be conducted in the aircraft and/or academically.

2. Evaluation will be conducted in the aircraft and/or academically.

REFERENCES: Appropriate common references and FM 90-26.

TASK 2066

Perform Extended Range Fuel System Operations

CONDITIONS: In a Mi-17 helicopter with internal auxiliary fuel system installed, consisting of one or two 242-gallon fuel tanks or academically.

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

1. RCM.

   a. Perform procedures and checks in accordance with operator's manual, manufacturer's technical manual, or unit SOP.

   b. Operate aircraft within CG/GWT limitations.

2. NCM.

   a. Configure aircraft in accordance with operator's manual.

   b. Complete all before flight, in-flight, and preflight duties in accordance with operator's manual, manufacturer's technical manual, or unit SOP.

   c. Perform all fuel servicing in accordance with operator's manual, manufacturer's technical manual, or unit SOP, FM 3-04.111, and FM 10-67-1.

DESCRIPTION: Monitor the left and right fuel quantity indicators and the auxiliary fuel level indicator to ensure the system is operating normally.

TRAINING AND EVALUATION REQUIRMENTS:

1. Training will be conducted in the aircraft and/or academically.

2. Evaluation will be conducted in the aircraft and/or academically.

REFERENCES: Appropriate common references, manufacturer's technical manuals for the systems installed, FM 3-04.111, and FM 10-67-1.

TASK 2081

Operate Night Vision Goggles

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards plus describe and demonstrate correct terminology and usage of the AN/AVS-6 in accordance with TM 11-5855-263-10.

DESCRIPTION: Perform operational procedures for the AN/AVS-6. These include assembly, preparation for use, operating procedures, and equipment shutdown.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references and TM 11-5855-263-10.

TASK 2090

Perform Landing Area Reconnaissance for Simulated Maximum Gross Weight

Note. This is a training maneuver unto itself and should not be rushed or performed haphazardly. The pilots must anticipate the aircraft's limits and their own limits.

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, with appropriate maps, navigational charts, and reconnaissance cards or photos of the pickup or landing zone or academically.

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

1. Establish altitude, airspeed, and flight path for conducting a high reconnaissance commensurate with terrain and environmental conditions.

2. Determine approximate wind direction and velocity at touchdown point and identify other pertinent wind characteristics in proximity to LZ.

3. Assess the LZ size, axis, surface conditions, and obstacles.

4. Plan ingress and egress routes to include escape routes required above and below ETL.

5. Confirm the winds and tentative plan formulated in the high reconnaissance by performing a thorough low reconnaissance.

DESCRIPTION:

1. Crew actions.

   a. The P* will establish a high reconnaissance pattern appropriate for the terrain and wind and focus primarily outside the aircraft.

   b. The P will determine if OGE capability exists and if sufficient power is available.

   c. The NCM will focus primarily outside the aircraft.

   d. The P and NCM will warn the P* of obstacles and unusual or unanticipated drift and altitude changes. The P will announce when attention is focused inside the aircraft and again when focus is reestablished outside the aircraft.

2. Procedures.

   a. On approaching the landing area, the crew will identify the LZ and determine its suitability for landing and takeoff.

   b. 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 suitable ingress and egress routes and select the landing point. The routing should reflect power available, wind conditions, and escape options available for an aircraft at simulated 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 one 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 used to manage unplanned events. The collective will usually be maintained or reduced during an escape maneuver.

c. The tentative plan for the landing and takeoff is established in the high reconnaissance.

d. 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 landing point, confirm the escape routes identified are viable, confirm the 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.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 2092

Respond to Night Vision Goggle Failure

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, with NVG, under actual or simulated NVG conditions, or orally in a classroom environment.

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

1. Correctly identify or describe indications of impending NVG failure.
2. Correctly perform or describe emergency procedures for NVG failure as described in the description.
3. Correctly perform crew coordination actions.

DESCRIPTION: Impending NVG failure is usually indicated by the illumination of the 30-minute, low-voltage warning indicator (AN/AVS-6). Upon indication of NVG failure, perform one of the following procedures:

a. AN/AVS-6 (ANVIS). Immediately announce, "Goggle failure," and initiate a climb if obstacle clearance is questionable. Switch to the second battery and advise the other RCM of restored vision or continued failure (transfer the flight controls if on the controls at the time of failure and vision is not restored).

b. If the NVG fails or indicates impending failure, the P will announce “goggle failure” and switch batteries or troubleshoot the goggles. If the NVG are not restored to operation, make the appropriate report and modify the mission as briefed.

Note. NVG tube failure is infrequent and usually provides ample warning. Only occasionally will a tube fail completely in a short time. Rarely will both tubes fail at the same time. There is no remedy for in-flight tube failure.

Note. If an NCM experiences goggle failure, he or she will immediately inform the other crewmembers and attempt to restore vision. The NCM will advise the P*/P of restored vision or of continued failure.

Note. The P*/P should consider aborting or changing the mission if a crewmember's NVG fails and another set is not available. A thorough understanding of options to be used under emergency conditions should be covered in the crew briefing prior to takeoff to avoid any confusion during critical flight maneuvers.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references and TM 11-5855-263-10.

TASK 2093

Perform Simulated Maximum Gross Weight Approach and Landing

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS with landing area reconnaissance for simulated maximum gross weight complete.

STANDARDS: Appropriate common standards plus the following 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. Determine wind direction and velocity at the landing point.

DESCRIPTION:

1. Crew actions.

   a. The 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 P will cross monitor CI and alert the P* when briefed parameters are being approached or exceeded. The P and 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 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 measures the presence and strength of updrafts and downdrafts.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: Using CI 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 will be conducted in the aircraft or FS.
2. Evaluation will be conducted in the aircraft or FS.

REFERENCES: Appropriate common references.

TASK 2095

Perform Simulated Maximum Gross Weight Takeoff

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS with the maximum torque available known and aircraft clear.

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

1. Determine the type of takeoff requiring the minimum amount of power to clear the obstacles.
2. Estimate the point where the aircraft will enter ETL and establish an abort line.
3. Use the minimum power necessary for the type of takeoff being performed.
4. Determine whether sufficient power is available for the maneuver.

DESCRIPTION:

1. Crew actions.

   a. After assessing the LZ, wind, and obstacles, the 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 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 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 GW 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 P and 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 the power selected for the maneuver is insufficient for obstacle clearance, the abort will be executed or additional power will be applied as necessary to clear the obstacles.

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 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. 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. 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 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 will be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft or FS.

REFERENCES: Appropriate common references.

TASK 2112

Operate Armament Subsystem

> **WARNING**
>
> **Observe all safety precautions for uploading ammunition. To prevent accidental firing, do not retract bolt and allow it to go forward if belted ammunition is in feed tray or a live round is in chamber. Move cocking handling forward by hand.**

CONDITIONS: In a Mi-17 helicopter with the armament subsystem installed.

Note. This task only applies to NCMs.

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

1. Install and preflight the armament subsystem according to the aircraft and subsystem operator's manual.
2. Load and safe the weapon.
3. Acquire and identify target.
4. Estimate range to target.
5. Engage targets according to weapon mission briefing, control measures, and ROE.
6. Apply firing techniques.
7. Suppress, neutralize, or destroy as applicable.
8. Describe or perform emergency procedures for misfire, hang-fire, cook-off, runaway gun, and double feeding.
9. Clear and safe the weapon.
10. Enter appropriate information, if required, on DA Form 2408-12, DA Form 2408-13, and DA Form 2408-13-1.

DESCRIPTION:

1. Crew actions. The NCM will coordinate with and brief any additional ground support personnel before installing and loading the weapon system. Perform installation and preflight inspection of the weapons system. The NCM will brief all necessary personnel on emergency procedures. The NCM will direct assistance from any additional ground support personnel to aid with installing and loading the weapon. The NCM will ensure the proper amount of ammunition is loaded onboard the aircraft in accordance with the mission briefing.

2. Procedures. Additional ground support personnel will be briefed as necessary. Perform installation and preflight inspection of the weapon, ensuring the gun is safetied to the pintle. Ensure the ejector control bag and ammunition can are installed. During loading of ammunition, observe all safety precautions while loading. After loading the ammunition, ensure the safety button is in the **S** (safety) position. To initiate the firing sequence, push the safety button to the **F** (fire) position, press the trigger fully, and hold. Low cycle rate of fire of the machine gun allows single round firing 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 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 the threat, as applicable. Consideration must be given to the visibility 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, hang-fire, cook-off, runaway gun, or double feeding of cartridges. Firing malfunctions and corrective actions must be committed to memory. Weapons will be cleared and safetied after target engagement. Ensure the safety button is in the **S** position. After completion of the mission, record information as required on DA Form 2408-12, DA Form 2408-13, or DA Form 2408-13-1. Refer to FM 3-04.140 for details on helicopter gunnery qualification.

MULTI-HELICOPTER 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 fire on these targets. The unit must develop SOPs covering the employment of door gunners during formation flights.

NIGHT OR NIGHT VISION GOGGLE 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. When wearing NVG during firing, target loss may accrue momentarily due to muzzle blast and the brightness of the tracers.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft and academically.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references, FM 3-04.140, TM 9-1005-262-13, and TM 9-1005-313-10.

TASK 2125

Perform Pinnacle/Ridgeline Operations

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS with the before-landing check completed and hover OGE power available.

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

1. RCM.

   a. Correctly determine power requirements/weight limitations before conducting this task.

   b. Cross major ridgelines at a 45-degree angle.

   c. Correctly determine wind direction for pinnacle landing.

   d. Maintain a constant approach angle.

   e. For transition from terrain flight, align aircraft with landing direction below 100 feet or as appropriate.

   f. Maximum rate of descent during the last 100 feet of a pinnacle approach will not exceed 300 FPM.

   g. Properly clear the aircraft for the landing area.

2. NCM.

   a. Assist in determining the suitability of the landing area for the operation being performed.

   b. Properly clear the aircraft for the landing area.

DESCRIPTION:

1. Crew actions.

   a. Determine power requirements.

      (1) Use current/forecast pressure altitude and temperature to determine power requirements for the conditions at takeoff, cruise, and arrival.

      (2) Before takeoff, analyze winds, obstacles, and density altitude. Perform a hover power check, if required.

      (3) The P* will select a takeoff angle, depending on the wind (demarcation line), density altitude, GWT, and obstacles. After clearing obstacles, accelerate the aircraft to the desired airspeed.

   b. When flying in a valley—

(1) The aircraft should be flown in the smoother up-flowing air on the lifting side of the valley (windward side).

(2) Under light winds, the aircraft should be flown closer to the side of the valley. This allows maximum distance to turn 180 degrees should it become necessary for weather or enemy situation. Additionally, less populated areas are present on the side of the valleys as opposed to the center of the valley. Caution should be used when flying on the leeward side due to potentially significant downdrafts.

(3) At higher GWTs and pressure altitudes, the maximum allowable airspeed will decrease. It may be necessary to decrease airspeed to remain within aircraft limitations and prevent blade stall.

c. Select an approach angle.

(1) Depending on winds (demarcation line), density altitude, GWT, and obstacles, select an approach angle. An approach angle of 3 degrees or less will minimize the possibility of settling-with-power.

(2) 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 ETL until the rate of closure can be determined.

(3) Before reaching the edge of the landing area, reconfirm performance planning and determine if sufficient power will be available.

(4) Based on the performance data, 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).

(5) After touching down, check aircraft stability as the collective-lever is lowered.

Note. Performing this maneuver in certain environments may require hover OGE power. Evaluate each situation for power required versus power available.

Note. A mountain environment is defined in accordance with the FAR Part 91 for the continental United States. Areas not depicted in FAR Part 91 or host country publications will be identified as mountainous when in an area of steeply sloping terrain, with more than 500-feet elevation relief and terrain elevation more than 5,000 feet above mean sea level [MSL]).

Note. To successfully operate in small areas, it may be necessary to place the nose of the aircraft over the edge of the landing area. This may cause a loss of important visual references on final approach. In some locations, it may not be possible to lower the forward or aft landing gear on the ground while on/off loading. The description of performing a slope landing in Task 1062 may be used for this type of landing. All crewmembers must assist in providing information on aircraft position in the landing area.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: More detailed flight planning is required for nighttime flights. When selecting colors for navigational aids (such as maps and kneeboard notes), interior cockpit lighting should be considered.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS. Academic and flight training may be conducted at High-Altitude Army Aviation Training Site (HAATS), or using the HAATS mountain training POI if available, or the recommended POI in FM 3-04.203, chapter 4. The optimal flight training area is an actual mountain environment. If unforeseen circumstances prevent the accomplishment of this training in the aircraft, then a compatible visual FS may be used for training and evaluation. If a FS is used for training, the datum plane will be set no lower than 5,000 feet MSL for the training area selected. The temperature, wind, and aircraft GWT should be varied to achieve the maximum training effect.

2. An evaluation may be required at the discretion of the commander in the aircraft (or Crewmember Tasks FS).

REFERENCES: Appropriate common references.

TASK 2127

Perform Combat Maneuvering Flight

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS in a training area or tactical environment with combat maneuvering flight briefing complete.

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

1. RCM.

   a. Properly operate the Mi-17 without exceeding the limitations listed in the Mi-17 operator's manual.

   b. Operate within the requirements of the aircraft procedures guide and ROE.

2. NCM.

   a. Properly operate weapons FSs.

   b. Properly operate video equipment.

   c. Correctly perform crew coordination actions.

DESCRIPTION: The purpose of air combat maneuvering is to demonstrate to United States forces the capabilities of threat aircraft and their weapon systems. To accomplish this, some services require air combat maneuvers be flown.

PROCEDURES: Following are examples of the types of maneuvers/procedures potentially employed. It is not possible to list each potential scenario. It can be emphasized that pilots must operate their aircraft within the limitations set forth in the relevant operator's manual and crewmembers must use acceptable scanning techniques to avoid mishaps.

1. Ranging exercise: The ranging exercise is used to allow both the Hip crew and the opposing crews a visual reference as to when certain weapons may be employed. The Hip will start at a predetermined location (normally 4 miles out) and will proceed inbound towards the opposing aircraft. The opposing aircraft will be on the ground, facing the direction the Hip will be arriving from. The Hip will begin at an altitude of approximately 800 feet AGL and will fly at varying altitudes (not to exceed 800 feet AGL) performing "**S**" turns. The Hip crew will call out "Rifle at 3 miles", "Fox 2 at 2 miles", "Rockets at 1 mile" and call "Snap" or "Track at 0.5 miles". The Hip will continue to close, ending up at 100 feet AGL and approximately 500 feet slant range from the opposing aircraft. The Hip will fly a right hand pattern around the Opposing aircraft, calling out "Right on right", until the call "terminate" is heard. At that time, the Hip will reposition for the next maneuver.

2. Counter pitch back. A maneuver normally performed following a chance encounter with an opposing helicopter. The maneuver begins as a frontal attack with the aircraft passing to the left or right. Immediately after reaching the abeam point, the P* will initiate a maximum angle bank turn into the opponent concurrently with a maximum performance climb. Angle of bank in the

Mi-17 is not to exceed 30 degrees. The P* should not allow the airspeed to reach below 60 KIAS in order to maintain sufficient maneuver energy. The P* will continue the turn and climb to prevent the opponent from obtaining a clear shot. The P and CE will maintain visual contact with the opponent when turning to the right. The maneuver is terminated when either opponent is determined to be a kill or, after 720 degrees of turn, it is determined that neither opponent will gain the advantage.

3. 1v1 frontal attack (one opposition aircraft against one Hip). This maneuver is used to demonstrate the aircraft's maneuverability. The aircraft will begin at opposite ends of a predetermined course and fly towards each other. Maneuver the aircraft to bring weapons to bear on the opposing aircraft. Attempt to obtain a lock using the antitank guided missile (ATGM), followed by air-to-air weapons, guns, and lastly rockets. Be mindful concerning which side the air-to-air weapons simulator is installed. The P* may need to lead the target slightly to allow the crewmember operating the "game boy" to get a good lock.

4. 1v1 stern attack. In this scenario, the Hip is initiating its attack from the stern of the opposing aircraft. The opposing aircraft may turn left or right of its original course and attempt to maneuver into a kill position while avoiding the Hip's weapons. The Hip will continue to press the fight until the opposition has the advantage or until the Hip has a kill.

5. 2v1 frontal attack (two opposition aircraft against one Hip). In 2v1 frontal, the opposition and the Hip will approach each other. The opposition aircraft, once sighting the Hip, should begin to maneuver. Once the Hip has committed to a target aircraft the other opposing aircraft should assume a support role, attempting to gain the advantage over the Hip.

6. 2v1 stern attack (split-to-bracket). In the 2v1 stern attack, split-to-bracket, the Hip approaches the opposing aircraft from the stern. Once the opposition visually spots the Hip, they should break (left aircraft left, right aircraft right) to cause the attacking Hip to select an aircraft to commit to an attack. Once the Hip is committed to an attack, the other opposing aircraft should assume a support roll and should attempt to attack the Hip.

7. 2v1 stern attack (cross-to-bracket). Cross-to-bracket stern attack is similar to the maneuver identified in paragraph 5 above; however, the left aircraft breaks right and the right aircraft breaks left. Again, the point is to surprise the Hip and force the Hip to commit to a specific target, allowing the free opposing aircraft to attack the Hip. Depending on the range, the Hip crew may be able to obtain at least a "Snap" when the opposition aircraft crosses.

8. Random. In the random attack, the hip and opposing aircraft begin at opposite ends of a predetermined route, out of visual range. The opposing aircraft's purpose is to pass the hip and proceed to a target area. At a predetermined time, the aircraft will proceed towards each other. The hip and opposing aircraft will maintain their briefed altitudes until they have a visual of each other, at which time they may use any altitude needed to maneuver. The hip will be successful if they get a kill or if they are able to draw the opposition away from their intended goal.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. At reduced ambient light levels, the crew will use proper scanning techniques when making the transition from inside the aircraft to outside the aircraft. When the P* is firing the simulated weapon system, the P and CE's will assist in obstacle avoidance. Crewmembers will announce when their focus is inside or outside the aircraft.

2. When employing weapons firing blanks, the crew should use short bursts to minimize "flash" effects of the weapons system.

3. The crew should consider using artificial lighting when ambient light level is insufficient for obstacle detection.

4. Before operating weapons systems during unaided night flight, crewmembers will ensure searchlight or landing light (white light) is in the desired position. If white light is used, night vision will be impaired for several minutes. Therefore, added caution will be exercised when resuming flight before reaching full dark adaptation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the FS or aircraft.

2. Evaluations will be conducted in the aircraft.

REFERENCES: Appropriate common references, any manuals available for the tasks being performed, and The Army Aviator's Handbook for Maneuvering Flight and Power Management.

TASK 2131

Perform Diving Flight

CONDITIONS: In a Mi-17 helicopter or Mi-17 FS, in an approved area, and with a clearing turn completed.

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

1. RCM.

   a. Establish entry altitude ±100 feet.

   b. Establish entry airspeed 100 KIAS (normal) or 50 KIAS (steep), ±10 knots.

   c. Establish a 13-degree dive angle (normal), ±2 degrees, or a 30-degree dive angle (steep), +0 degrees to –5 degrees.

   d. Maintain the aircraft in trim.

   e. Recover to level flight before reaching computed V_{ne} or 1,000 feet AGL.

   f. Correctly perform crew coordination actions.

2. NCM.

   a. Properly maintain airspace surveillance.

   b. Correctly perform crew coordination actions.

DESCRIPTION:

1. The P* will remain focused outside the aircraft to clear the aircraft throughout the maneuver and announce a normal or steep dive prior to initiating the maneuver and any deviation from the maneuver. The P* will announce recovery from the maneuver.

2. The P and CE (s) will provide adequate warning to avoid traffic or obstacles detected in the flight path and announce any deviation from the parameters of the maneuver. The P and CE (s) will announce when their attention is focused inside the aircraft.

3. The P* will perform the following actions:

   a. Normal. From straight and level flight at a designated altitude and 100 KIAS, smoothly apply cyclic to establish an 11- to 15-degree dive angle. Maintain a constant power setting (power required to maintain straight and level flight prior to entry) and constant trim. Apply additional right pedal as airspeed increases. Maintain a constant dive angle until the recovery. Adjust collective as necessary to maintain the desired power setting and N^r. Start recovery by smoothly applying aft cyclic at an altitude allowing recovery to be completed before reaching 1,000 feet AGL. Do not exceed the computed V_{ne} during the maneuver.

b. Steep. From straight and level flight at a designated altitude and 50 KIAS, smoothly apply cyclic to establish a 25- to 30-degree dive angle. Maintain a constant power setting (power required to maintain 50 KIAS) and constant trim. Apply additional right pedal as airspeed increases. Maintain a constant dive angle until reaching recovery. Adjust collective as necessary to maintain desired power setting and N^r. Initiate recovery by smoothly applying aft cyclic at an altitude allowing recovery to be completed before reaching 1,000 feet AGL. Do not exceed the computed V_{ne} during the maneuver.

Note. During initial qualification, and for training, the minimum entry altitude is 2,500 feet AGL.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS:

1. Avoid “target fixation” by using proper scanning techniques.

2. Diving flight is more difficult to evaluate at night because of low contrast.

3. Before conducting diving flight during unaided night flight, crewmembers will ensure searchlight or landing light (white light) is in the desired position. When white light is used, crewmembers’ night vision will be impaired for several minutes. Therefore, crewmembers will exercise added caution when resuming flight before reaching full dark adaptation.

SNOW/SAND/DUST CONSIDERATIONS: If visual reference with the target area or obstacles is lost during the dive, the P* will initiate a recovery immediately and be prepared to transition to instruments and perform an instrument climb out. Once VMC is regained, the PC will need to evaluate the situation and determine whether to amend, modify, or abort the diving flight.

MOUNTAINOUS AREA CONSIDERATIONS: If, at any time during the dive, insufficient power is available or turbulent conditions or wind shifts and create an unsafe condition, perform a recovery 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, as possible. Accelerate the aircraft to an appropriate airspeed for conditions and complete the recovery.

2. Where escape routes do not exist, adjust the aircraft for maximum rate of climb in the recovery to ensure obstacle clearance. Upon clearing obstacles, accelerate aircraft to an appropriate airspeed for the existing conditions and complete the recovery.

3. In mountainous terrain the decision to perform a recovery must and will be done much earlier than when operating in flat terrain. Therefore, the decision to recover cannot be delayed if power or safeties are in question, and must be done much earlier.

OVERWATER CONSIDERATIONS:

1. Over water diving flight is more difficult to evaluate at night because of low contrast and no distance or height contrast. To perform successfully over water diving flight, crewmembers must and will know the various methods of determining the distance and height of obstacles.

2. Before conducting over water diving flight during unaided night flight, crewmembers must and will ensure the searchlight or landing light (white light) is in the desired position. If white light is used, night vision will be impaired for several minutes. Therefore, added caution must and will be exercised if flight is resumed before reaching full dark adaptation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the FS or aircraft.

2. Evaluations will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 2169

Perform Aerial Observation

CONDITIONS: In a Mi-17 helicopter, Mi-17 FS, or orally in a classroom environment.

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

1. Detect the target using visual search techniques.
2. Identify the target.
3. Locate the target.
4. Report the target as briefed.

DESCRIPTION:

1. Crew actions.

   a. The P* is responsible for clearing the aircraft and obstacle avoidance. The P* will maintain aircraft orientation and perform reconnaissance of assigned sector as duties permit.

   b. The P will operate the communications systems. When scanning the area, the P should concentrate on avenues of approach while periodically scanning adjoining terrain. The P will select mutually supportive fields of view when working with other aircrews (This will ensure coverage of "dead spaces" that may exist in front of the aircraft). The P will perform reconnaissance of assigned sector and announce when attention is focused inside the cockpit.

   c. NCMs will assist in clearing the aircraft and provide adequate warning of traffic or obstacles. They will perform observation duties as assigned by the PC. 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 in which every part of the area is observed or scanned. The purpose of a visual search is to detect objects or activities.

      (1) Detection. Detection requires determination that an object or an activity exists.

      (2) Identification. Major factors in identifying a target are size, shape, and type of armament. Targets are classified as friendly or enemy.

(3) Location. Determining the exact location of targets is the objective of the mission.

(4) Reporting. Spot reports provide commanders with critical information during the conduct of missions. The method of spot reporting is specified by the requesting agency. Reports of no enemy sightings are frequently just as important as actual enemy sightings.

b. The ability of a crewmember 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 of survivability considerations.

(2) Airspeed. Selection of the airspeed is determined by the altitude, the terrain, the threat, and meteorological conditions.

(3) Terrain and meteorological conditions. The size and details of the area that can be effectively covered largely depend on the type of terrain, such as dense jungle or barren wasteland. The prevailing terrain and meteorological conditions often mask objects and allow only a brief exposure period, especially at 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. Colors in nature tend to be subdued. Look for colors that stand out against, and contrast with, natural backdrops.

(b) Texture. Smooth surfaces, such as glass windows or canopies, will shine when reflecting light. Rough surfaces will not.

(c) Shadows. Man-made objects cast distinctive shadows characterized by regular shapes and contours, as opposed to the random patterns occurring naturally.

(d) Trails. Trails leading into an area should be observed for clues as to the type and quantity of traffic, and how recently it passed.

(e) Smoke. Smoke should be observed for color, smell, and volume.

(f) Movement and light. The most easily detectable sign of enemy activity is movement and, at night, light. Movement may include disturbance of foliage, snow, soil, or birds.

(g) Obvious sightings. The enemy is skillful in the art of camouflage. The P*/P must be aware that obvious sightings may be intentional due to high concentrations of antiaircraft weapons.

c. Systematic methods for conducting visual aerial observation include side scan, motive, and stationary techniques. The technique used depends on the altitude flown and the type of terrain.

(1) Side-scan technique. This technique is normally used when the aircraft is operating at an altitude of 100 feet AGL or higher. Over most terrain, the observer systematically—

(a) Looks out approximately 1,000 meters and searches in toward the aircraft.

(b) Looks out one-half the distance (500 meters) and searches in toward the aircraft.

(c) Looks out one-fourth the distance (250 meters) and searches in toward the aircraft.

(d) Motive technique. This technique is used when the aircraft is operating at terrain flight altitudes and at airspeeds of generally 10 KIAS or faster. The entire area on either side of the aircraft is divided into two major sectors: the nonobservation sector and the observation work sector. The nonobservation sector is the area where the crewmember's field of vision is restricted by the physical configuration of the aircraft. 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 and recognition sectors.

(e) The acquisition sector is the forward 45-degree area of the observation work sector. This is the primary area of search.

(f) The recognition sector is the remainder of the observation work sector. In using the motive technique, the crewmember looks forward of the aircraft and through the center of the acquisition sector for obvious sightings. The crewmember then scans through the acquisition sector, gradually working back toward the aircraft.

(2) Stationary technique. This technique is used at NOE altitudes with the helicopter hovering in a concealed position. When using the stationary technique, the crewmember makes a quick overall search for sightings, unnatural colors, outlines, or movements. The crewmember starts scanning to the immediate front, searching an area approximately 50 meters in depth. The crewmember continues to scan outward from the aircraft, increasing the depth of the search area by overlapping 50-meter intervals until the entire search area has been covered.

NIGHT OR NIGHT VISION GOGGLE CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations. Crew coordination is crucial. Transfer of controls should be covered in detail. When maneuvering the aircraft, the P* must consider obstacles and other aircraft. The P should announce when attention is focused inside or outside the cockpit. The P should ensure the P* maintains attention outside the cockpit. All crewmembers must avoid fixation by using proper scanning techniques.

TRAINING AND EVALUATION REQUIREMENTS:

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

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

REFERENCES: Appropriate common references and FM 17-95.

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Chapter 5

Maintenance Test Pilot Tasks

This chapter describes the tasks 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 a qualified Mi-17 maintenance test pilot in accordance with AR 95-1. If discrepancies are found between this chapter and appropriate TMs and MTFs, the appropriate TMs and MTFs taking precedence.

5-1. TASK CONTENTS.

a. **Task number.** Each ATM task is identified by a ten-digit systems approach to training number corresponding to the MP tasks listed in table 2-8 (page 2-10).

b. **Task title.** This identifies a clearly defined and measurable activity. Task titles may be the same in many ATMs, but task content will vary with the airframe.

c. **Conditions.** The conditions specify the common wartime or training/evaluation conditions under which the MP tasks will be performed.

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.

(1) Perform procedures and checks in sequence according to the appropriate MTF manual.

(2) Brief the RCM/NCM on the applicable procedures, warnings, and cautions for the task to be performed.

(3) Perform crew coordination actions according to the task description and chapter 6.

(4) Assess and address any malfunctions or discrepancies as they occur and apply appropriate corrective actions or troubleshooting procedures.

(5) Use the oral callout and confirmation method and announce the initiation and completion of each check.

(6) The MP must occupy the left seat for the following tasks: 4022, 4046, 4076, 4086, and 4087. The MP may perform other maintenance tasks from either seat. This restriction does not apply to initial ME training or evaluations.

(7) The MP/ME will confirm after moving the engine control levers that they are back in the detent and the engine(s) are stabilized.

e. **Description.** The description explains how the elements of the task should be completed to meet the standards. When specific crew actions are required, the task will be broken down 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. When required, MP responsibilities are specified. All tasks in this chapter are to be performed only by qualified MPs/MEs, or student MPs undergoing qualification training 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 are applicable to MEs. When two MEs are conducting training/evaluation together, or two MPs are jointly performing test flight tasks, the mission brief will designate the aviator assuming PC responsibilities. MEs may perform MP/ME evaluations from the flight engineers seat provided a MP/ME with access to the flight controls is briefed as the PC.

(2) Procedures. This section describes the actions a MP/ME performs or directs the RCM/NCM to perform in order to execute tasks to standard.

Note. Tasks 4010, 4042, 4044, 4093, 4142, 4226, 4236, and 4254 require additional information for the crew. The MP will ensure the crew is familiar with maneuver (RCM/NCM responsibilities), abort criteria, limitations, and response to associated emergency procedures.

f. **Considerations.** This section defines training, evaluation, and other considerations for task accomplishment under various NVG conditions.

(1) General.

(a) Crew selection and aircrew coordination are essential to successful and safe NVG MTFs.

(b) Tasks may require extra time, altitude, and terrain analysis at night.

(c) Use of supplemental lighting will aid in identifying switches/position, control positions, and engine control levers.

(d) Use additional crewmembers to record data as required.

(e) Use proper scanning techniques to minimize the probability of spatial disorientation.

(2) Hover checks.

(a) Select an area with good visual references and room to maneuver during checks.

(b) Use landing and search lights as required.

(3) In-flight checks.

(a) Due to the airspeeds involved while performing several of these checks, select an altitude appropriate for the task.

(b) Utilize airfields and improved landing environments when available.

g. **Training and evaluation requirements.** Some of the tasks incorporate more than one check from the applicable aircraft MTF manual. For initial MP and RL progressions, all tasks listed in chapter 5 will be evaluated. For APART, the minimum evaluated tasks will be according to table 2-8 (page 2-10). Other tasks/checks will be at the discretion of the ME. Tasks involving dual systems (such as engines) require only one system to be evaluated. Training and evaluation requirements define whether the task will be trained or evaluated in the aircraft, FS, or academic environment. If one or more tasks/checks are not performed to standard, the evaluation will be graded as unsatisfactory. However, when reevaluated, only those unsatisfactory checks must be reevaluated. Evaluations may be conducted in aircraft that are MTF status at the discretion of the ME.

h. **References.** The references are sources of information relating to that particular task. In addition to the common references listed in chapter 4, the following references apply to all MP tasks:

(1) Aircraft logbook and historical records.

(2) DA Pam 738-751.

(3) TM 1-1500-328-23.

(4) Operator’s manual.

(5) Applicable airworthiness directives or messages.

5-2. TASK LIST. The following numbered tasks are Mi-17 MP tasks.

TASK 4001

Verify Forms and Records

CONDITION: In a Mi-17 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The MP should direct assistance from the RCM and NCM as necessary.

   b. The RCM/NCM should assist the MP as directed.

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. Ensure logbook, phase book, and historical entries are made in accordance with DA Pam 738-751.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4002

Conduct a Maintenance Test Flight

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

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

1. Perform the preflight inspection according to the appropriate aircraft operator's manual/CL.
2. Determine the suitability of the aircraft for flight and the mission to be performed.
3. Determine the maneuvers, checks, and tasks required during the MTF.
4. Ensure logbook entries are made in accordance with DA Pam 738-751.

DESCRIPTION:

1. Crew actions.

   a. The MP should direct assistance from the RCM and NCM as necessary.

   b. The RCM/NCM should assist the MP as directed.

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. Ensure a thorough preflight inspection is conducted with special emphasis on areas or systems where maintenance was performed.

   c. Verify all test equipment is installed and secured as required.

   d. The MP will conduct the final walk-around inspection.

   e. Conduct a thorough crew briefing.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4004
Perform Interior Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
    a. The MP should direct assistance from the RCM and NCM as necessary.
    b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4010

Perform Starting APU Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The MP should direct assistance from the RCM and NCM as necessary.

   b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual with the following additional information:

   a. Brief the RCM, NCM, and any additional ground support personnel as follows:

      (1) APU start abort criteria.

      (2) Monitor and call out times as requested.

   b. Prior to checks, confirm the following:

      (1) Rotor disk clear of APU exhaust.

      (2) Personnel are clear and fire guard posted.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4014

Perform Master Warning Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4022
Perform Brake Check

CONDITION: In a Mi-17 helicopter Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
    a. The MP should direct assistance from the RCM and NCM as necessary.
    b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4038

Perform Instrument Display System Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The MP should direct assistance from the RCM and NCM as necessary.

   b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4042

Perform Heater and Vent System Check

CONDITION: In a Mi-17 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

Note. Before starting, heater system should be purged of moisture by operating the blower for 2 minutes. Ensure heater circuit breaker is in the on/forward position. Check air coming out of all vented areas.

> **CAUTION**
>
> Never start the heater in recirculation mode if cabin temperature exceeds 15 degrees Celsius.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4043

Perform Windshield Wiper Check

CONDITION: In a Mi-17 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

Note. Ensure windshield remains wet during check to avoid burning out wiper motor and scratching windows.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4044

Perform Flight Control Hydraulic System Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4046

Perform Flight Collective Friction Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4049

Perform Tail Rotor Pitch Limiter Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4064
Perform Beep Trim Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4070

Perform Fuel Quantity Indicator Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

Note. Use the outer scale for total fuel readings and the inner scale for individual and auxiliary tanks.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4072

Perform Barometric Altimeter Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

Note. Discrepancies greater than ±50 feet require corrective maintenance action. Errors exceeding ±70 feet instrument are not useable for IFR flight.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4073

Perform Radar Altimeter Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

Note. Allow 2 minutes for warm up prior to checking.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4074

Perform Fire Detection System Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The MP should direct assistance from the RCM and NCM as necessary.

   b. The RCM/NCM should assist the MP as directed.

2. Procedures.

   a. Perform the checks according to the applicable MTF manual.

   b. Fire extinguisher continuity check.

Note. Ensure the fire extinguishing switch is in the OFF (down) position. Some relays have a 6-second delay prior to light activation when selecting different positions with the fire detector rotary knob.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4076

Perform Windshield Anti-Ice Check

CONDITION: In a Mi-17 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The MP should direct assistance from the RCM and NCM as necessary.

   b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

Note. Do not perform this check at or above 20 degrees Celsius. Ensure the #2 engine 1919 valve is closed prior to and after completing check.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4078

Perform Pilot Heat Systems Check

CONDITION: In a Mi-17 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

Note. Do not grab pitot tubes after they have turned on.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4082

Perform Fuel Boost Pump Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The MP should direct assistance from the RCM and NCM as necessary.

   b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4086
Perform Engine Starting System Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual with the following additional information:

    a. Brief the RCM, NCM, and any additional ground support personnel as follows:

        (1) Engine start abort criteria.

        (2) Monitor the flight controls.

        (3) Monitor master fire warning light.

        (4) Call out or note speeds, lights, times, etc., as directed by MP/ME.

    b. Prior to checks, confirm the following:

        (1) The parking brake is set.

        (2) Rotor disk area is clear.

        (3) Ensure fuel fire shutoff valves are “ON.”

        (4) Personnel are clear and fire guard posted.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4087

Perform Engine Abort System Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual with the following additional information:

    a. Brief the RCM, NCM, and any additional ground support personnel as follows:

        (1) Engine start abort criteria.

        (2) Monitor the flight controls.

        (3) Monitor master fire warning light.

        (4) Call out or note speeds, lights, times, and other information as directed by MP/ME.

    b. Prior to checks, confirm the following:

        (1) The parking brake is set.

        (2) Rotor disk area is clear.

        (3) Ensure fuel fire shutoff valves are ON.

        (4) Personnel are clear and fire guard posted.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4088

Perform Starting Engine Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The MP should direct assistance from the RCM and NCM as necessary.

   b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual with the following additional information:

   a. Brief the RCM, NCM, and any additional ground support personnel as follows:

      (1) Engine start abort criteria.

      (2) Monitor the flight controls.

      (3) Monitor master fire warning light.

      (4) Call out or note speeds, lights, and times as directed by MP/ME.

   b. Prior to checks, confirm the following:

      (1) The parking brake is set.

      (2) Rotor disk area is clear.

      (3) Ensure fuel fire shutoff valves are ON.

      (4) Personnel are clear and fire guard posted.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4090

Perform Engine Run-Up System Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The MP should direct assistance from the RCM and NCM as necessary.

   b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or FS.

2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 4091

Perform Engine Partial Acceleration Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4092
Perform Engine Dust Cover Protector Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4093

Perform Engine Governor Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4102

Perform Electrical System Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4112

Perform Taxi Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
    a. The MP should direct assistance from the RCM and NCM as necessary.
    b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4119

Perform Systems Instruments Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4142

Perform Hover Power/Hover Controllability Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4151

Perform Automatic Flight Control System Axis Channel Hold Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4193
Perform In-Flight Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4194
Perform Flight Instruments Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4204

Perform Compasses, Turn Rate, and Vertical Gyros Checks

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4210

Perform Takeoff and Climb Checks

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The MP should direct assistance from the RCM and NCM as necessary.

   b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4218

Perform In-Flight Controllability Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4226

Perform Automatic Flight Control System In-Flight Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

    a. The MP should direct assistance from the RCM and NCM as necessary.

    b. The RCM/NCM should assist the MP as directed.

2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4236

Perform Autorotation Revolutions Per Minute Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4252

Perform Vibration Analysis Check

CONDITION: In a Mi-17 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4254
Perform Velocity Not Exceed Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

Note. Do not exceed limit as computed on PPC.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4262

Perform Communication and Navigation Equipment Checks

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4268
Perform Cruise Instrument Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
    a. The MP should direct assistance from the RCM and NCM as necessary.
    b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4274

Perform In-Flight Communication/Navigation/Flight Instruments Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4276

Perform Special Equipment and/or Detailed Procedures Checks

CONDITION: In a Mi-17 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4284

Perform Engine Shutdown Check

CONDITION: In a Mi-17 helicopter or Mi-17 FS.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The MP should direct assistance from the RCM and NCM as necessary.
   b. The RCM/NCM should assist the MP as directed.
2. Procedures. Perform the checks according to the applicable MTF manual.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

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Chapter 6

Crew Coordination

6-1. BACKGROUND

a. Most ATM tasks contain elements requiring crew coordination. The importance of crew coordination has been reinforced by research and studies conducted by the USAACE, United States Army Aviation Combat Readiness/Safety Center, and United States Army Aeromedical Research Laboratory. An analysis of rotary-wing aircraft accidents showed a significant percentage resulted from a total lack of crew coordination in the aircraft or from crew coordination errors. Examples of the crew coordination errors identified are listed below.

(1) Failure of the P* to properly direct assistance from the other crewmembers.

(2) Failure of a crewmember to announce a decision or an action that affected the ability of the other crewmembers to perform their duties properly.

(3) Failure of crewmembers to communicate positively (verbally and nonverbally).

(4) Failure of the PC to assign crew responsibilities properly before and during the mission.

(5) Failure of the P or other crewmembers to offer assistance or information that was needed or had been requested previously by the P*.

(6) Failure of the P* to execute flight actions in proper sequence with the actions of other crewmembers.

b. As a result of the analysis, crew coordination is defined as the crewmember interaction (communication) and actions (sequencing and timing) necessary for the efficient, effective, and safe performance of tasks. The essential elements of crew coordination are explained below.

(1) Communicate positively. Good teamwork requires positive communication among crewmembers. Communication is positive when the sender directs, announces, requests, or offers: the receiver acknowledges; and the sender confirms, based on the receiver's acknowledgment and/or action. Crewmembers must use positive communication procedures specified above for the essential crew coordination actions identified in the description of each task. They should remain aware of the potential for misunderstandings and make positive communication a habit in the aircraft. Positive communication—

(a) Is quickly and clearly understood.

(b) Permits timely actions.

(c) Makes use of a limited vocabulary of explicit terms and phrases to improve understanding in a high-ambient-noise environment.

(2) Direct assistance. A crewmember will direct assistance when he or she cannot maintain aircraft control, position, or clearance. The crewmember also will direct assistance when he or she cannot properly operate or troubleshoot aircraft systems without help from the other crewmembers. Directives are necessary when one crewmember cannot reasonably be expected to know what or when assistance is needed by the other crewmembers. Examples are emergencies; the P*'s decision to change the sequence, timing, or priority of the P's or CE's assistance; and a P or CE who is relatively inexperienced in the mission being flown or the flight environment. Directives normally are not needed when the assistance required is part of a crewmember's assigned responsibility in the task description.

(3) Announce actions. To ensure effective and well-coordinated actions in the aircraft, each crewmember must be aware of expected aircraft movements and unexpected individual actions. Each crewmember will announce any action that affects the actions of the other crewmembers. Such announcements are essential when the decision or action is unexpected and calls for supporting action from the other crewmembers to avoid a potentially hazardous situation.

(4) Offer assistance. A crewmember will provide the assistance or information requested in a timely manner. The crewmember also will offer assistance when he or she sees that another crewmember needs help. Each crewmember must be aware of the flight situation and recognize when the P* deviates from normal or expected actions. Crewmembers must never assume the P* recognizes a hazard or the need for assistance.

(5) Acknowledge actions. Communications in the aircraft must include supportive feedback to ensure that each crewmember correctly understand announcements and directives. Acknowledgments need to be short and need to positively indicate the message was received and understood. "Roger" or "Okay" may not be sufficient. The preferred method is to repeat critical parts of the message in the acknowledgment. Table 6-1 shows an example of positive communication.

Table 6-1. Example of positive communication in the aircraft

P:	"Wires, 12 o'clock."
P*:	"Wires in sight; climbing right to cross at the pole. Clear right and above."
CE:	"Clear right and above."
P:	"Clear left and above."
CE:	"Clear of the wires."
P*:	"Descending left."
P:	"Clear left and below."

(6) Be explicit.

(a) Crewmembers must avoid using terms that have multiple meanings; misinterpretations can cause confusion, delays, or accidents. Examples are "Right," "Back up," and "I have it." Crewmembers also must avoid using indefinite modifiers such as "Do you see **that** tree?" or "You are coming in a **little** fast." In such cases, one crewmember may mistakenly assume the other crewmember's attention is focused on the same object or event. More confusion arises when each crewmember interprets the terms differently.

(b) Crewmembers should use clear terms and phrases and positively acknowledge critical information. During terrain flight, for example, the P must give enough information to permit the P* to fly the aircraft efficiently and safely over the intended route. He or she must provide navigation directions and information so the P* does not have to concentrate on reading the instruments. Examples of acceptable navigation statements are in table 6-2, page 6-4.

Table 6-2. Example of acceptable navigation statements

Orientation to terrain feature relative to the aircraft's current heading:	"Directly ahead," "Out your right door," or "On your right side."
Terrain locator information:	"The hill at your 2 o'clock position" or "Straight ahead to the pond."
Initial turning command:	"Turn left" or "Turn right." When the aircraft is above NOE altitudes, a heading may be given; for example, "Turn right to 320 degrees."
Command given when the P has verified that the desired heading has been achieved:	"Stop turn."
Clock position associated with a specific terrain feature to prevent the P* from misinterpreting the exact heading described:	"Along the tree line at 2 o'clock."

(7) Provide aircraft control and obstacle advisories.

(a) Although the P* is responsible for aircraft control during terrain flight, the other crewmembers may need to provide aircraft control information regarding airspeed, altitude, or obstacle avoidance. Because wires are difficult to see, they are a major hazard to helicopters at NOE altitudes. Aircrews must anticipate wires along roadways; near buildings, antennas, and towers; or in combat areas where wire-guided missiles have been launched. Obstacles are even more difficult to see with the NVG. Therefore, crewmembers wearing NVG must consider obstacle clearance a primary task directive.

(b) Crewmembers should precede aircraft control and obstacle advisories by a positive command that immediately conveys the required action to the P*. A brief explanation of why the change is necessary should follow; for example, "Slow down, wires, 12 o'clock, 100 meters" or "Stop now, Wires." In some instances, the CE may notice the P* has let the aircraft move laterally or vertically away from a sling load. The CE should precede the advisory by a positive directive; for example, "Up 2 feet, hold" or "Right 2 feet, hold." When the P* reaches the desired altitude or position, the CE should announce "Hold."

(8) Coordinate sequencing and timing. Proper sequencing and timing ensures the actions of one crewmember are compatible with the actions of the other crewmembers. An example of properly sequenced and timed actions is in table 6-3.

Table 6-3. Example of properly sequenced and timed actions

P*	While at a hover, announces his intent to turn right before doing so.
P	Focuses his attention outside the aircraft in the direction of movement to provide adequate warning of obstacles and announces, "Tail clear left."
CE	Depending on seat assignment announces, "Tail clear left' or "Tail clear right."
P*	Initiates the right turn.

c. Crew coordination begins with training and proceeds through mission planning, and culminates in the effective execution of aircrew tasks. Research has shown that crew coordination is related to successful mission performance. The research also defined specific aspects of crew coordination, to include the following:

(1) Involvement of the entire crew in mission planning and rehearsal of critical mission events and contingencies.

(2) Development of standardized communication techniques, including the use of confirmation and acknowledgment.

(3) Assignment of specific task priorities and responsibilities to each crewmember and individual acknowledgment of those responsibilities during the preflight crew briefing.

(4) Involvement of each crewmember in monitoring the need for assistance in coping with difficult aspects of the mission.

(5) Development of positive team relationships to preclude overconfidence or subconscious intimidation because of rank or experience differences.

6-2. CREW COORDINATION ELEMENTS.

a. Aircrews must use the crew coordination procedures in the relevant task descriptions during day operations so they develop good habits that will transfer to more critical night and NVG operations.

b. When operations are conducted close to the ground or under conditions of restricted or reduced visibility, crew coordination becomes more critical.

c. The P must warn the P* anytime an unexpected deviation from the intended airspeed or altitude is detected. These deviations include aircraft drift, unusual attitude, excessive change in rate of closure, and any other unsafe condition.

d. The P must warn the P* when ground reference is marginal or is lost.

e. If the P* experiences a visual illusion or disorientation, he or she will inform the P and transfer the flight controls.

f. RCM will follow the practice of "see and avoid" at all times. When used to describe a task condition, the term "clearing" or "aircraft cleared" applies to each crewmember. This means they will clear the immediate area in all directions during hovering, taxi operations, and left/right/overhead before and during takeoff. It also indicates that RCMs will use clearing turns to clear the area before climbing or descending.

g. During NVG operations, crewmembers will clear within their field of view. The P* will reposition the aircraft if necessary.

h. Good crew coordination requires that each crewmember have a complete mental picture of the mission. This includes critical map features, flight segments and events, tactical options, emergency procedures, and operational risks. Crewmembers must actively participate in mission planning and rehearsal. No crewmember should merely brief the other crewmembers on the results of an individually planned effort.

6-3. BASIC QUALITIES. Crew coordination elements are further broken down into a set of 13 basic qualities. Each basic quality is defined in terms of observable behaviors. The paragraphs below summarize these basic qualities.

a. Flight team leadership and crew climate are established and maintained. This quality addresses the relationships among the crew and the overall climate of the flight deck. Aircrews are teams with a designated leader and clear lines of authority and responsibility. The PC sets the tone for the crew and maintains the working environment. Effective leaders use their authority but do not operate without the participation of other crewmembers. When crewmembers disagree on a course of action, they must be effective in resolving the disagreement. Specific goals include the following:

(1) The PC actively establishes an open climate where crewmembers freely talk and ask questions.

(2) Crewmembers value each other for their expertise and judgment. They do not allow differences in rank and experience to influence their willingness to speak up.

(3) Alternative viewpoints are a normal and occasional part of crew interaction. Crewmembers handle disagreements in a professional manner, avoiding personal attacks or defensive posturing.

(4) The PC actively monitors the attitudes of crewmembers and offers feedback when necessary. Each crewmember displays the proper concern for balancing safety with mission accomplishment.

b. Premission planning and rehearsal are accomplished. Premission planning includes all preparatory tasks associated with planning the mission. These tasks include planning for VFR, 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 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 critical items are addressed within the available planning time.

(2) The crew identifies alternate courses of action in anticipation of potential changes in 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 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 decisionmaker. 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 these distractions do not impact on task performance.

(2) The PC actively manages the distribution of mission tasks to prevent the overloading of 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 involving 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 each crewmember is used effectively when responding to the emergency, and the workload is efficiently distributed.

f. Ensure statements and directives are clear, timely, relevant, complete, and verified. This quality refers to the completeness, timeliness, and quality of information transfer. It includes the crew's use of standard terminology and feedback techniques to verify information transfer. Emphasis is on the quality of instructions and statements associated with navigation, obstacle clearance, and instrument readouts. Specific goals include the following.

(1) Crewmembers consistently make the required callouts. Their statements and directives are always timely.

(2) Crewmembers use standard terminology in all communications. Their statements and directives are clear and concise.

(3) Crewmembers actively seek feedback when they do not receive acknowledgment from another crew member. They always acknowledge understanding of intent and request clarification when necessary.

g. Mission situational awareness is maintained. This quality considers the extent to which crew members 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 crew members are kept informed of decisions made and actions taken by another crew member. Crewmembers should respond verbally or by appropriately adjusting their behaviors, actions, or control inputs to clearly indicate they understand when a decision has been made and what it is. Failure to do so may confuse crews and lead to uncoordinated operations. Specific goals include the following.

(1) Crewmembers announce decisions and actions, stating their rationale and intentions as time permits. The P verbally coordinates the transfer of or inputs to controls before action.

(2) Crewmembers always acknowledge announced decisions or actions and provide feedback on how these decisions or actions will affect other crew tasks. If necessary, they promptly request clarification of decisions 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 crew member, 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 crew members 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 leading 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 more prone to make errors. Specific goals include the following:

(1) Crewmembers acknowledge crew error is a common occurrence and the active involvement of the entire crew is required to detect and break the error chains leading 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 or she is aware of the aircraft position or attitude. If the P* does not acknowledge this challenge, the P issues a second challenge. If the P* fails to acknowledge the second challenge, the P assumes control of the aircraft.

k. Supporting information and actions are offered by the crew. This quality addresses the extent to which crew members anticipate and offer supporting information and actions to the decisionmaker—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 crew members 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, crew members 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 crew members 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 crew members to speak up despite their rank or experience. Junior crew members do not hesitate to speak up when they disagree with senior members; they understand 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 levels are conducted. This quality addresses the extent to which crew members 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. 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 allowing the crew to communicate openly and freely and to operate in a concerted manner.

b. Mission planning and rehearsal. 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 intra-crew communications using effective patterns and techniques that allow for the flow of essential data between crew members.

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 TERMINOLOGY. Crewmembers should use standard words and phrases to communicate with each other in the aircraft. They must keep the number of words to a minimum and use clear, concise terms that can be easily understood and complied with in an environment full of distractions. A list of standard words and phrases with their meanings is found in the glossary.

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Appendix A

Nonrated Crewmember Training and Qualification

A-1. *NONRATED CREWMEMBERS. Aircraft qualification training: Presently, no formal Army military occupational specialty (MOS) producing school exists for the Mi-17 NCM. Training can be obtained at USAACE, at the unit by completing the aircraft systems, academic and flight training subjects as listed in tables A-1 thru A-3, or at an OEM certified training facility.

a. Academic qualification training. The NCM must receive sufficient instruction to be knowledgeable in the aircraft manuals, systems, and flight-training subjects listed below. Academic instruction will be IAW this manual. The academic instruction may be completed in any order, but must be completed (to include the examination) and documented in the IATF on DA Form 7122-R (Crew Member Training Record) before flight training. The academic classes are mandatory, but the hour requirements are based on crewmember retention. Crewmembers must pass the examinations with a grade of at least 70 percent. The required examinations for each subject area are identified in table A-1. Commanders will develop written examinations covering the subject areas listed in this appendix. Each of the following subject areas requires a 50 question open book examination:

(1) Operators manual/systems subjects (to include emergency procedures).

(2) Maintenance manuals.

(3) Academic subjects.

(4) Flight training subjects.

Table A-1. Subject area examinations

SYSTEM SUBJECTS

Aircraft systems, structure, and airframe.	Maintenance forms and records.
Avionics and mission equipment.	Weight and balance.
Flight control hydraulic system.	Electrical system.
Power plant and related systems.	Flight control system.
Auxiliary power unit.	Rotor system.
Transmission and drive systems.	Fuel and oil systems.
Landing gear, wheels, and brake systems.	Environmental systems.
Utility systems.	Prepare aircraft for preflight.
Inspection requirements.	Cargo winching and loading.
Aircraft limitations	Cargo tie down and storage.
Advanced flight control system.	Armaments subsystems.
Aircraft mooring	Refueling operations.
Required examinations: Maintenance manual written exam System subject written exam Malfunction analysis (emergency procedures) written exam	
ACADEMIC SUBJECTS	
Aeromedical factors.	DA regulations and publications.
Aviation life support equipment.	Passenger briefings.
Unit SOPs and local regulations.	Aircrew training program introduction.
Hand and arm signals.	ATM introduction.
Logbook and forms.	In flight duties.
Crew mission briefing.	Confined area and slope operations.
Engine start-through-before takeoff checks.	Aircraft refueling procedures.
External load operations.	Internal load operations.
Crew coordination training/qualification.	Armament system/operations.
Environmental operations.	Aircraft survivability equipment.
Night mission operations and deployment.	Operating limits and restrictions.
Emergency procedures.	
Required examination: Academic subject written exam	

Table A-1. Subject area examinations—Cont.

FLIGHT TRAINING SUBJECTS	
Operating limitations and restrictions.	Preflight procedures.
Internal/external load operations.	In flight duties.
Start and run up procedures.	Radio communication procedures.
Confined area and slope operations.	Before takeoff checks.
Aircraft survivability equipment.	Refueling procedures.
Environmental operations.	Egress procedures.
Required examination: Flight training subject written exam	

b. *Flight training. The NCM will be required to demonstrate proficiency in all individual base tasks listed in table 2-7 (page 2-8) and crew coordination and airspace surveillance proficiency. An X in the night column of table 2-7(page 2-8) identifies night tasks required for qualification training. Flight hour requirements for aircraft qualification training are based on individual crewmember proficiency. The flight time shown in table A-2 may be used as a guide. Total flight training for aircraft qualification will not be less than 10 hours. Table A-3 (page A-4) may be used as a guide for flight time allotted during each training day.

Table A-2. Guide for nonrated crewmember flight training

Flight Instruction	*Flying Hours*
Base Tasks [1]	9.0
Emergency procedures [2]	2.0
Evaluation [3]	2.0
Total Hours	**13.0**
Notes: [1]-A minimum of one hour will be at night. [2]-Emergency procedures are required in each mode of flight. [3]-The evaluation may be a continual evaluation.	

Table A-3. Guide for flight training sequence

Training Day	1	2	3	4	5
Daily	2.5	2.5	2.5	2.5	3.0E*
Cumulative time	2.5	5.0	7.5	10	13.0
Note: The * denotes night flight and E denotes evaluation. All measurements are in hours					

c. Documentation. Upon completion of training, an entry will be made in the remarks section of DA Form 7122-R of the NCM's IATF. At the NCM's next closeout, training will be documented on the crewmember's DA Form 759 (Individual Flight Record and Flight Certificate–Army), part V, remarks section. A separate entry in the closeout is required for completion of aircraft qualification training.

(1) NVG qualification. NVG qualification will be accomplished according to paragraph 2-1b, page 2-1.

(2) Refresher training. Refresher training will be accomplished according to paragraph 2-2, page 2-1.

(3) Mission training. Mission training will be accomplished according to paragraph 2-3, page 2-4.

(4) Continuation training. Continuation training will be accomplished according to paragraph 2-4, page 2-6.

(5) CBRN training. CBRN training will be accomplished according to paragraph 2-7, page 2-11.

A-2. STANDARDIZATION INSTRUCTORS, FLIGHT ENGINEER INSTRUCTORS, AND NONRATED CREWMEMBER UNIT TRAINERS.

a. SI/FI training/qualification.

(1) Prerequisites for FI qualification. U.S. Army service members in the rank of sergeant through sergeant first class or DAC must be qualified as a FI/SI in MOS 15T or 15U with a minimum of 1 year of experience, possess a current flight physical, and be listed on crewmember orders. Foreign military and civilian personnel must have qualifications as a Mi-17 maintainer/CE/FE and possess a current flight physical.

(2) *Initial FI training. This training is conducted at USAACE, Fort Rucker, Alabama. An SP, IP, or SI will conduct initial validation of a crewmember's qualification following this course of instruction and at each new duty station in the aircraft. Additional academic and flight hour requirements are at the discretion of the unit commander.

(3) SI qualification. An SI must be an FI, and it is recommended the SI have a minimum of 1-year experience as a Mi-17 FI. The SI must be able to supervise and implement the commander's ATP for NCMs and assist the unit SP with the supervision and maintenance of the standardization program.

(4) Documentation. Upon completion of the SI/FI qualification training and evaluation, the SP/IP/SI/FI (as appropriate) will enter the evaluation results on the NCM's IATF DA Form 7122-R. Upon completion of a satisfactory evaluation, the DA Form 7120-R (Commander's Task List) will be changed to reflect the new flight duty position and obtain the commander's approval (initial and date on the DA Form 7120-R). At the NCM's next closeout, training will be documented on the crewmember's DA Form 759, part V, remarks section.

b. UT qualification training. The NCM UT was created to lessen the training burden on the FIs/SIs. The UT can instruct RL-2/RL-1 crewmembers on certain tasks for which they show an expert knowledge. It was not created to make additional FIs/SIs. Once designated as a UT, he or she may conduct FE duties or conduct training in the mission/additional tasks he or she is designated to instruct. UTs will not conduct training on RL-3 crewmembers, nor will they perform evaluations.

Note. The goal should not be to make all FEs into UTs in all mission/additional tasks, but rather to give the FEs the ability to instruct tasks in which they are subject matter experts.

(1) Prerequisites for UT qualification. The unit commander is responsible for conducting UT qualification in accordance with this ATM. Recommended Active Army, DAC, must be a current Mi-17 RL-1 FE, possess a current flight physical, and be on crewmember orders.

(2) Academic training. Academic training will be conducted at the unit level. The NCM must receive sufficient instruction to demonstrate proper method of instruction (MOI) and be knowledgeable in the mission/additional task(s) the NCM is designated to instruct. He or she must be able to effectively impart that knowledge to an RL-2 crewmember.

(3) Flight training. The UT will be evaluated on his or her ability to perform, train, and provide MOI for the specific mission/additional tasks in which he or she is designated to instruct. The UT will be required to demonstrate MOI proficiency in designated task(s) and must be able to instruct crew coordination and airspace surveillance in those tasks. All flight tasks will be performed to proficiency.

(4) Documentation. Upon completion of the UT qualification training and evaluation, the SP/IP/SI/FI (as appropriate) will enter the evaluation results on the NCM's IATF DA Form 7122-R. Upon completion of a satisfactory evaluation, the DA Form 7120-R will be changed to reflect the new flight duty position and obtain the commander's approval (initial and date on the DA Form 7120-R). At the NCM's next closeout, training will be documented on the crewmember's DA Form 759, part V, remarks section.

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Glossary

AAR	after-action review
AFCS	automatic flight control system
AFRM	assistant fast-rope master
AGL	above ground level
AHO	above highest obstacle
AIM	aeronautical information manual
ALSE	aviation life support equipment
AMC	air mission commander
APU	auxiliary power unit
ANVIS	aviation night vision imaging system
APART	annual proficiency and readiness test
AR	Army regulation
ASE	aircraft survivability equipment
ASET	aircraft survivability equipment trainer
ATC	air traffic control
ATGM	anti-tank guided missile
ATM	aircrew training manual
ATP	aircrew training program
AWR	airworthiness release
CBAT	computer based aircraft survivability equipment trainer
CBRN	chemical, biological, radiological, nuclear
CDI	course deviation indicator
CE	crew chief
CG	center of gravity
CI	cockpit indicator
CL	Checklist
CSAR	combat search and rescue
CTL	commander's task list
DA	Department of the Army
DA Pam	Department of the Army pamphlet
DAC	Department of the Army civilian
DAFIF	digital aeronautical flight information file

DD	Department of Defense
DH	decision height
DOD FLIP	Department of Defense flight instruction publication
DOT	Department of Transportation
EGT	exhaust gas temperature
EPR	engine pressure ratio
ETA	estimated time of arrival
ETE	estimated time en route
ETL	effective translational lift
ETP	exportable training package
FAA	Federal Aviation Administration
FAC	flight activity category
FAF	final approach fix
FAR	federal aviation regulation
FE	flight engineer
FI	flight engineer instructor
FM	field manual
FPM	feet per minute
FRIES	fast-rope insertion and extraction
FRM	fast-rope master
FS	flight simulator
GPS	global positioning system
GWT	gross weight
HAATS	High-Altitude Army Aviation Training Site
HSI	horizontal situation indicator
HQDA	Headquarters, Department of the Army
IAF	initial approach fix
IAS	indicated airspeed
IATF	individual aircrew training folder
ICS	internal communication system
IE	instrument flight examiner
IF	intermediate approach fix
IFR	instrument flight rules
IIMC	inadvertent instrument meteorological conditions

IMC	instrument meteorological conditions
IP	instructor pilot
IR	infrared
ITO	instrument takeoff
KIAS	knots indicated airspeed
LZ	landing zone
MAP	missed approach point
MAWS	missile approach warning system
ME	maintenance test pilot evaluator
METL	mission-essential task list
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, and civil considerations
MO	medical officer
MOI	method of instruction
MP	maintenance test pilot
MSA	minimum safe altitude
MSL	mean sea level
MTF	maintenance test flight
N^1	gas producer (speed)
NAVAID	navigation aid
NCM	nonrated crewmember
NOE	nap-of-the-earth
NOTAM	notice to airmen
N^r	rotor speed
NVD	night vision device
NVG	night vision goggle
NVS	night vision system
OEM	original equipment manufacturer
OGE	out-of-ground effect
OR	Observer
P	pilot not on the controls
P*	pilot on the controls
PA	pressure altitude
PAR	precision approach radar

PC	pilot in command
PFE	primary flight examiner
PI	Pilot
PMD	preventative maintenance daily
POI	program of instruction
PPC	performance planning card
PTIT	power turbine inlet temperature
PZ	pickup zone
RCM	rated crewmember
RL	readiness level
ROE	rules of engagement
RPM	revolutions per minute
SFTS	simulated flight training systems
SI	standardization instructor
SM	statute mile
SOI	signal operating instructions
SOP	standing operating procedure
SP	standardization instructor pilot
SPIES	special patrol infiltration/exfiltration
STANAG	Standardization Agreement
TC	training circular
TM	technical manual
TRADOC	United States Army Training and Doctrine Command
TSP	training support package
USAACE	United States Army Aviation Center of Excellence
USASOC	United States Army Special Operations Command
USSOCOM	United States Special Operations Command
UT	unit trainer
VDC	voltage direct current
VFR	visual flight rules
VMC	visual meteorological conditions
V_{ne}	velocity not to exceed
VSI	vertical speed indicator

Abort	Terminate a preplanned aircraft maneuver.
Affirmative	Yes.
Bandit	An identified enemy aircraft.
Blocking	Announcement made by the crewmember who intends to block the pedals.
Bogey	An unidentified aircraft assumed to be enemy.
Braking	Announcement made by the RCM who intends to apply brake pressure.
Break	Immediate action command to perform an emergency maneuver to deviate from the present ground track; will be followed by the word "right " or "left."
call out	Command by the 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 is present to impede aircraft movement along the intended ground track. Will be preceded by the word "nose," "tail," or "aircraft" and followed by the direction; for example, "left," "right," "slide left," or "slide right." Also indicates that ground personnel are authorized to approach the aircraft.
come up/down	Command to change altitude up or down; normally used to control masking and unmasking operations.
Contact	Establish communication with . . . (followed by the name of the element).
Controls	Refers to aircraft flight controls.
Drifting	An alert of the unintentional or undirected movement of the aircraft; will be followed by the word "right," "left," "backward," or "forward."
Egress	Command to make an emergency exit from the aircraft; will be repeated three times in a row.
Execute	Initiate an action.
Fire	Confirmation of illumination of the master fire warning light.
Firing	Announcement that a specific weapon is to be fired.
fly heading	Command to fly an assigned compass heading. This term generally is used in low-level or contour flight operations.
go ahead	Proceed with your message.
go plain	Directive to discontinue secure operations.
go secure	Directive to activate secure communications.

Hip	North Atlantic Treaty Organization term for the Mi-17 helicopter.
Hold	Command to maintain present position.
Inside	Primary focus of attention is inside the cockpit.
Jettison	Command for the emergency or unexpected release of an external load or stores; when followed by the word “door,” will indicate the requirement to perform emergency door removal.
Maintain	Command to continue or keep the same.
mask/unmask	To conceal the aircraft by using the available terrain, and to position the aircraft above the terrain features
Mickey	A HaveQuick time-synchronized signal.
move back	Command to hover aft, followed by a distance in feet.
move forward	Command to hover forward, followed by distance in feet.
Negative	Incorrect or permission not granted.
negative contact	Unable to establish communication with . . . (followed by name of element).
no joy	Target, traffic, or obstruction not positively seen or identified.
Now	Indicates that an immediate action is required.
Outside	Primary focus of attention is outside the aircraft.
put me up	Command to place a frequency in a specific radio.
Release	Command for the planned or expected release of a slingload.
Report	Command to notify.
Roger	Message received and understood.
say again	Repeat your transmission.
Sked	Litter produced by the Skedco Corporation.
Slide	Intentional horizontal movement of an aircraft perpendicular to its heading; will be followed by the word “right” or “left.”
slow down	Command to reduce ground speed.
speed up	Command to increase ground speed.
stand by	Wait; duties of a higher priority are being performed and request cannot be complied with at this time.
Stokes	Specialized litter developed by Stan Stokes.
Stop	Command to go no further; halt present action.
Strobe	Indicates the aircraft AN/APR-39 has detected a radar threat; will be followed by a clock direction.

Tally	Target, traffic, or obstruction positively seen or identified; will be followed by a repeat of the word “target,” “traffic,” or “observation” and the clock position.
Traffic	Refers to friendly aircraft that present a potential hazard to the current route of flight; will be followed by an approximate clock position and the distance from your aircraft with a reference to altitude (high or low).
transfer of controls	Positive three-way transfer of the flight controls between the RCMs; for example, “I have the controls,” “You have the controls,” and “I have the controls.”
troops on/off	Command for troops to enter/exit the aircraft.
Turn	Command to deviate from present ground track; will be followed by words "right" or "left," specific heading in degrees, a bearing ("Turn right 30 degrees"), or instructions to follow a well-defined contour ("Follow the draw at 2 o'clock").
Unable	Indicates the inability to comply with a specific instruction or request.
up on	Indicates primary radio selected; will be followed by radio position numbers on the ICS panel; for example, “Up on 1, up on 3.”
weapons hot/cold/off	Weapon switches are in the ARMED, SAFE, or OFF position.
Wilco	I have received your message, I understand, and I will comply.

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24 March 2010

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