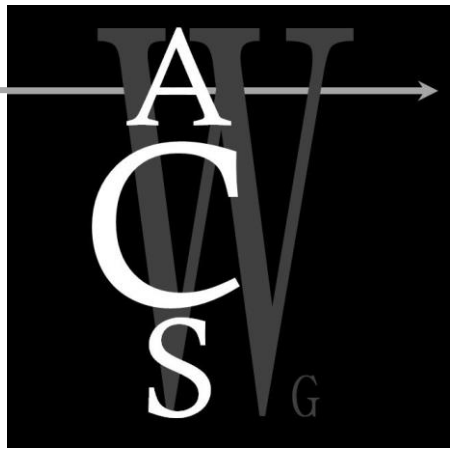


Aviation Rulemaking Advisory Committee

Airman Certification System Working Group

Interim Recommendation Report

August 8, 2018

August 8, 2018

Yvette A. Rose
Chair, Aviation Rulemaking Advisory Committee
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Dear Ms. Rose,

On behalf of the Airman Certification System Working Group (ACSWG), we submit the following interim recommendation report to the Aviation Rulemaking Advisory Committee (ARAC) for consideration and implementation.

The FAA and the aviation industry have continued its collaborative effort to improve airman training and testing by establishing an integrated, holistic airman certification system that clearly aligns testing with the certification standards, guidance, and reference materials, and maintains that alignment.

As part of its ongoing effort, the ACSWG is presenting feedback on draft standards for the Private Pilot Rotorcraft Pilot Helicopter and Instrument Rating – Powered-Lift. Additionally, we have included recommendations on the Aviation Instructor Handbook (FAA-H-8083-9B) and the Helicopter Flying Handbook (FAA-H-8083-21B).

Collectively, we recommend and endorse the committee's transmittal of the working group recommendations to the FAA for further review, incorporation, and execution. We are confident that, by doing so, the safety of aviation will continue to markedly improve.

Sincerely,

David Oord
ARAC Vice-Chair & ACSWG Chair
Senior Director, Regulatory Affairs
Aircraft Owners and Pilots Association

Susan Parson
FAA Representative
Flight Standards Service Federal
Aviation Administration

Eric Crump
ACSWG Subgroup Lead
Aerospace Program Director
Polk State College

Janeen Kochan, PhD, FRAeS,
AMT ACS Subgroup Co-chair
Human Factors
Scientist/Designated Pilot Examiner/
Instructor Pilot
Aviation Research, Training, and Services, Inc.

John "Mac" McWhinney
ACSWG Subgroup Lead
Senior Course Developer
King Schools, Inc.

Jackie Spanitz
ACSWG Subgroup Lead General
Manager
Aviation Supplies & Academics, Inc.

TABLE OF CONTENTS

Private Pilot Rotorcraft Pilot Helicopter

Airman Certification Standards

FAA-S-ACS-15

U.S. Department
of Transportation

**Federal Aviation
Administration**

FAA-S-ACS-15

Private Pilot Rotorcraft Pilot Helicopter

Airman Certification Standards

Xxxx 2018

**Flight Standards Service
Washington, DC 20591**

Acknowledgments

The U.S. Department of Transportation, Federal Aviation Administration (FAA), Airman Testing Standards Branch, AFS-630, P.O. Box 25082, Oklahoma City, OK 73125 developed this Airman Certification Standards (ACS) document with the assistance of the aviation community. The FAA gratefully acknowledges the valuable support from the many individuals and organizations who contributed their time and expertise to assist in this endeavor.

Availability

This ACS is available for download from www.faa.gov. Please send comments regarding this document to AFS630comments@faa.gov.

Material in FAA-S-ACS-15 will be effective Xxxx XX, 2018. All previous editions of the Private Pilot – Practical Test Standards (PTS) will be obsolete as of this date for helicopter applicants.

Foreword

The Federal Aviation Administration (FAA) has published the Private Pilot Helicopter Airman Certification Standards (ACS) document to communicate the aeronautical knowledge, risk management, and flight proficiency standards for the private pilot certification in the rotorcraft category, helicopter class. This ACS incorporates and supersedes FAA-S-8081-15A, Private Pilot-Rotorcraft Practical Test Standards, Change 1 for helicopter applicants only.

The FAA views the ACS as the foundation of its transition to a more integrated and systematic approach to airman certification. The ACS is part of the safety management system (SMS) framework that the FAA uses to mitigate risks associated with airman certification training and testing. Specifically, the ACS, associated guidance, and test question components of the airman certification system are constructed around the four functional components of an SMS:

- Safety Policy that defines and describes aeronautical knowledge, flight proficiency, and risk management as integrated components of the airman certification system;
- Safety Risk Management processes through which both internal and external stakeholders identify changes in regulations, safety recommendations, or other factors. These changes are then evaluated to determine whether they require modification of airman testing and training materials;
- Safety Assurance processes to ensure the prompt and appropriate incorporation of changes arising from new regulations and safety recommendations; and
- Safety Promotion in the form of ongoing engagement with both external stakeholders (e.g., the aviation training industry) and FAA policy divisions.

The FAA has developed this ACS and its associated guidance in collaboration with a diverse group of aviation training experts. The goal is to drive a systematic approach to all components of the airman certification system, including knowledge test question development and conduct of the practical test. The FAA acknowledges and appreciates the many hours that these aviation experts have contributed toward this goal. This level of collaboration, a hallmark of a robust safety culture, strengthens and enhances aviation safety at every level of the airman certification system.

/s/ May XX, 2018
John S. Duncan
Director, Flight Standards Service

Revision History

Document #	Description	Revision Date
FAA-S-8081-15A	Private Pilot Practical Test Standards for Rotorcraft, (Change 1)	July, 2005
FAA-S-ACS-15	Private Pilot – Rotorcraft Helicopter Airman Certification Standards	Xxxx, 2018

Record of Changes

Original – June XX, 2018

Major Enhancements to Version FAA-S-ACS-15

This page intentionally left blank.

Table of Contents

Introduction

Airman Certification Standards Concept

The goal of the airman certification process is to ensure the applicant possesses the knowledge, ability to manage risks, and skill consistent with the privileges of the certificate or rating being exercised, in order to act as Pilot-in-command (PIC).

In fulfilling its responsibilities for the airman certification process, the Federal Aviation Administration (FAA) Flight Standards Service (AFS) plans, develops, and maintains materials related to airman certification training and testing. These materials have included several components. The FAA knowledge test measures mastery of the aeronautical knowledge areas listed in Title 14 of the Code of Federal Regulations (14 CFR) part 61. Other materials, such as handbooks in the FAA-H-8083 series, provide guidance to applicants on aeronautical knowledge, risk management, and flight proficiency.

Safe operations in today's National Airspace System (NAS) require integration of aeronautical knowledge, risk management, and flight proficiency standards. To accomplish these goals, the FAA drew upon the expertise of organizations and individuals across the aviation and training community to develop the Airman Certification Standards (ACS). The ACS integrates the elements of knowledge, risk management, and skill listed in 14 CFR part 61 for each airman certificate or rating. It thus forms a more comprehensive standard for what an applicant must know, consider, and do for the safe conduct and successful completion of each Task to be tested on both the qualifying FAA knowledge test and the oral and flight portions of the practical test.

Through the ground and flight portion of the practical test, the FAA expects evaluators to assess the applicant's mastery of the topic in accordance with the level of learning most appropriate for the specified Task. The oral questioning will continue throughout the entire practical test. For some topics, the evaluator will ask the applicant to describe or explain. For other items, the evaluator will assess the applicant's understanding by providing a scenario that requires the applicant to appropriately apply and/or correlate knowledge, experience, and information to the circumstances of the given scenario. The flight portion of the practical test requires the applicant to demonstrate knowledge, risk management, flight proficiency, and operational skill in accordance with the ACS.

Note: *As used in the ACS, an* evaluator *is any person authorized to conduct airman testing (e.g., an FAA Aviation Safety Inspector (ASI), Designated Pilot Examiner (DPE), or other individual authorized to conduct test for a certificate or rating).*

Using the ACS

The ACS consists of ***Areas of Operation*** arranged in a logical sequence, beginning with Preflight Preparation and ending with Postflight Procedures. Each Area of Operation includes ***Tasks*** appropriate to that Area of Operation. Each Task begins with an ***Objective*** stating what the applicant should know, consider, and/or do. The ACS then lists the aeronautical knowledge, risk management, and skill elements relevant to the specific Task, along with the conditions and standards for acceptable performance. The ACS uses ***Notes*** to emphasize special considerations. The ACS uses the terms "will" and "must" to convey directive (mandatory) information. The term "may" denotes items that are recommended but not required. The ***References*** for each Task indicate the source material for Task elements. For example, in Tasks such as "Weather products required for preflight planning, current and forecast weather for departure, en route, and arrival phases of flight." (PH.I.C.K2), the applicant should be prepared for questions on any weather product presented in the references for that Task.

Note: *The references listed in this ACS generally leave off any suffix. You are expected to use the latest revision. However, due a similar number being assigned to the Rotorcraft Flying Handbook (for gyroplanes only), FAA-8083-H-21, and the Helicopter Flying Handbook, FAA-8083-H-21A, the Helicopter Flying Handbook is listed with its current suffix as of the date of this ACS publication.*

The ACS codes each Task according to a scheme that includes four elements separated by periods. For example:

PH.XI.A.K1:

PH = Applicable ACS (Private Pilot – Helicopter)
XI = Area of Operation (Night Operations)
A = Task (Night Preparation)
K1 = Task element Knowledge 1 (Physiological aspects of night flying as it relates to vision.)

Knowledge test questions are linked to the ACS codes, which ultimately replace the system of Learning Statement Codes (LSC). After this transition occurs, the Airman Knowledge Test Report (AKTR) will list an ACS code that correlates to a specific Task element for a given Area of Operation and Task. Remedial instruction and re-testing will be specific, targeted, and based on specified learning criteria. Similarly, a Notice of Disapproval for the practical test will use the ACS codes to identify the deficient Task elements.

The current knowledge test management system does not have the capability to print ACS codes. Until a new test management system is in place, the LSC (e.g., "PLT058") code will continue to be displayed on the AKTR. The LSC codes are linked to references leading to broad subject areas. By contrast, each ACS code is tied to a unique Task element in the ACS itself. Because of this fundamental difference, there is no one-to-one correlation between LSC codes and ACS codes.

Because all active knowledge test questions for the Private Pilot Airplane (PAR) Knowledge Test have been aligned with the corresponding ACS, evaluators can continue to use LSC codes in conjunction with the ACS for the time being. The evaluator should look up the LSC code(s) on the applicant's AKTR in the Learning Statement Reference Guide available using the following link: Learning Statement Reference Guide. After noting the subject area(s), the evaluator can use the corresponding Area(s) of Operation/Task(s) in the ACS to narrow the scope of material for retesting, and to evaluate the applicant's understanding of that material in the context of the appropriate ACS Area(s) of Operation and Task(s).

Applicants for a combined Private Pilot Certificate with Instrument Rating, in accordance with 14 CFR part 61, section 61.65 (a) and (g), must pass all areas designated in the Private Pilot – Helicopter ACS and in the Instrument Rating – Rotorcraft/Helicopter PTS. Evaluators need not duplicate Tasks. For example, only one preflight demonstration would be required; however, the Preflight Task from the Instrument Rating – Rotorcraft/Helicopter ACS would be more extensive than the Preflight Task from the Private Pilot – Rotorcraft PTS to ensure readiness for Instrument Flight Rules (IFR) flight.

A combined checkride should be treated as one practical test, requiring only one application and resulting in only one temporary certificate, disapproval notice, or letter of discontinuance, as applicable. Failure of any Task will result in a failure of the entire test and application. Therefore, even if the deficient maneuver was instrument related and the performance of all visual flight rules (VFR) Tasks was determined to be satisfactory, the applicant will receive a notice of disapproval.

The applicant must pass the appropriate Private Pilot Helicopter Knowledge Test before taking the private pilot practical test. The practical test is conducted in accordance with the ACS and FAA regulations that are current as of the date of the test. Further, the applicant must pass the ground portion of the practical test before beginning the flight portion.

The ground portion of the practical test allows the evaluator to determine whether the applicant is sufficiently prepared to advance to the flight portion of the practical test. The oral questioning will continue throughout the entire practical test.

The FAA encourages applicants and instructors to use the ACS when preparing for knowledge tests and practical tests. The FAA will revise the ACS as circumstances require.

I. Preflight Preparation

Task	***A. Pilot Qualifications***
References	14 CFR parts 61, 67, 68, 91; FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-25; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with airman and medical certificates including privileges, limitations, currency, and operating as pilot-in-command (PIC) as a private pilot.
Knowledge	The applicant demonstrates understanding of:
PH.I.A.K1	Certification requirements, currency, and record keeping.
PH.I.A.K2	Privileges and limitations.
PH.I.A.K3	Medical certificates: class, expiration, privileges, temporary disqualifications, and operations under BasicMed.
PH.I.A.K4	Documents required to exercise private pilot privileges.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.I.A.R1	Proficiency versus currency.
PH.I.A.R2	Personal minimums.
PH.I.A.R3	Fitness for flight.
PH.I.A.R4	Flying an unfamiliar helicopter, or operating with unfamiliar flight display systems, and avionics.
Skills	The applicant demonstrates the ability to:
PH.I.A.S1	Apply requirements to act as PIC under Visual Flight Rules (VFR) in a scenario given by the evaluator.

I. Preflight Preparation

Task	***B. Airworthiness Requirements***
References	14 CFR part 39, 43, 91; FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with airworthiness requirements, including aircraft certificates.
Knowledge	The applicant demonstrates understanding of:
PH.I.B.K1	General airworthiness requirements and compliance for a helicopter, including:
PH.I.B.K1a	a. Certificate location and expiration dates
PH.I.B.K1b	b. Required inspections and aircraft logbook documentation
PH.I.B.K1c	c. Airworthiness Directives and Special Airworthiness Information Bulletins
PH.I.B.K1d	d. Purpose and procedure for obtaining a special flight permit
PH.I.B.K2	Pilot-performed preventive maintenance.
PH.I.B.K3	Equipment requirements for day and night VFR flight, to include:
PH.I.B.K3a	a. Flying with inoperative equipment
PH.I.B.K3b	b. Using an approved Minimum Equipment List (MEL)
PH.I.B.K3c	c. Kinds of Operation Equipment List (KOEL)
PH.I.B.K3d	d. Required discrepancy records or placards
PH.I.B.K4	Special airworthiness certificate aircraft operating limitations, if applicable to the helicopter.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.I.B.R1	Actions taken when inoperative equipment is discovered prior to flight.
Skills	The applicant demonstrates the ability to:
PH.I.B.S1	Locate and describe helicopter airworthiness and registration information.
PH.I.B.S2	Determine the helicopter is airworthy in a scenario given by the evaluator.
PH.I.B.S3	Apply the procedures for operating with inoperative equipment in a scenario given by the evaluator.

I. Preflight Preparation

Task	***C. Weather Information***
References	14 CFR part 91; FAA-H-8083-2, FAA-H-8083-25; AC 00-6, AC 00-45; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with weather information for a flight under VFR.
Knowledge	The applicant demonstrates understanding of:
PH.I.C.K1	Acceptable sources of weather data for flight planning purposes.
PH.I.C.K2	Weather products required for preflight planning, current and forecast weather for departure, en route, and arrival phases of flight.
PH.I.C.K3	Meteorology applicable to the departure, en route, alternate, and destination under VFR in Visual Meteorological Conditions (VMC) to include expected climate and hazardous conditions such as: ***Note:*** *If K3 is selected, the evaluator must assess the applicant's knowledge of at least three of the following sub-elements.*
PH.I.C.K3a	a. Atmospheric composition and stability
PH.I.C.K3b	b. Wind (e.g., crosswind, tailwind, windshear, etc.)
PH.I.C.K3c	c. Temperature
PH.I.C.K3d	d. Moisture/precipitation
PH.I.C.K3e	e. Weather system formation, including air masses and fronts
PH.I.C.K3f	f. Clouds
PH.I.C.K3g	g. Turbulence
PH.I.C.K3h	h. Thunderstorms and microbursts
PH.I.C.K3i	i. Icing and freezing level information
PH.I.C.K3j	j. Fog
PH.I.C.K3k	k. Frost
PH.I.C.K3l	l. Density and pressure altitude
PH.I.C.K4	Pilot station instrument displays of digital weather and aeronautical information.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.I.C.R1	Making the go/no go and continue/divert decisions, to include:
PH.I.C.R1a	a. Circumstances that would make diversion prudent
PH.I.C.R1b	b. Personal weather minimums
PH.I.C.R2	Limitations of:
PH.I.C.R2a	a. Onboard weather equipment
PH.I.C.R2b	b. Aviation weather reports and forecasts
PH.I.C.R2c	c. Inflight weather resources
Skills	The applicant demonstrates the ability to:
PH.I.C.S1	Use available aviation weather resources to obtain an adequate weather briefing.
PH.I.C.S2	Correlate weather information to make a go/no-go decision.

I. Preflight Preparation

Task	***D. Cross-Country Flight Planning***
References	14 CFR part 91; FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-25; Navigation Charts; Chart Supplements; NOTAMs; POH/RFM; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with cross-country flights and VFR flight planning.
Knowledge	The applicant demonstrates understanding of:
PH.I.D.K1	Route planning, to include consideration of different classes and special use airspace and selection of appropriate navigation/communication systems and facilities.
PH.I.D.K1a	a. Use of Electronic Flight Bag (EFB), if applicable
PH.I.D.K2	Altitude selection accounting for terrain and obstacles, autorotation requirements of the helicopter, VFR cruising altitudes, and the effect of wind.
PH.I.D.K3	Calculating:
PH.I.D.K3a	a. Time, course, distance, heading, true airspeed, and groundspeed
PH.I.D.K3b	b. Estimated time of arrival to include conversion to universal coordinated time (UTC)
PH.I.D.K3c	c. Fuel requirements, to include reserve, climb, descent, and any delays
PH.I.D.K4	Elements of a VFR flight plan.
PH.I.D.K5	Procedures for filing, activating, and closing a VFR flight plan.
PH.I.D.K6	In-Flight Intercept Procedures.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.I.D.R1	Pilot.
PH.I.D.R2	Aircraft.
PH.I.D.R3	Environment (e.g., weather, airports, airspace, terrain, obstacles including wire strikes hazards).
PH.I.D.R4	External pressures.
PH.I.D.R5	Limitations of air traffic control (ATC) services.
PH.I.D.R6	Fuel planning.
PH.I.D.R7	The use of EFB.
Skills	The applicant demonstrates the ability to:
PH.I.D.S1	Prepare, present and explain a cross-country flight plan assigned by the evaluator including a risk analysis based on real-time weather, to the first fuel stop. ***Note:*** *Preparation, presentation, and explanation of a computer generated flight plan is an acceptable option.*
PH.I.D.S2	Apply pertinent information from appropriate and current aeronautical charts, Chart Supplements, NOTAMs relative to airport/heliport, and other flight publications.
PH.I.D.S3	Create a navigation log and prepare a VFR flight plan.
PH.I.D.S4	Recalculate fuel reserves based on a scenario provided by the evaluator.
PH.I.D.S5	Use of EFB, if applicable.

I. Preflight Preparation

Task	***E. National Airspace System***
References	14 CFR parts 71, 91, 93; FAA-H-8083-2; Navigation Charts; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with the National Airspace System (NAS) operating under VFR as a private pilot.
Knowledge	The applicant demonstrates understanding of:
PH.I.E.K1	Airspace classes and associated requirements and limitations.
PH.I.E.K2	Charting symbology.
PH.I.E.K3	Special use airspace (SUA), special flight rules areas (SFRA), temporary flight restrictions (TFR), and other airspace areas.
PH.I.E.K4	Airport movement area.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.I.E.R1	Various classes of airspace.
PH.I.E.R2	Integration of UAS into the national airspace system.
Skills	The applicant demonstrates the ability to:
PH.I.E.S1	Adhere to the requirements for basic VFR weather minimums and flying in particular classes of airspace, to include SUA, SFRA, and TFR.
PH.I.E.S2	Correctly identify airspace and operate in accordance with associated communication and equipment requirements.

I. Preflight Preparation

Task	***F. Performance and Limitations***
References	FAA-H-8083-1, FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-25; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with operating a helicopter safely within the parameters of its performance capabilities and limitations.
Knowledge	The applicant demonstrates understanding of:
PH.I.F.K1	Elements related to performance and limitations by explaining the use of charts, tables, and data to determine performance.
PH.I.F.K2	Atmospheric conditions.
PH.I.F.K3	Pilot technique.
PH.I.F.K4	Helicopter condition.
PH.I.F.K5	Airport/Heliport environment, as applicable to the helicopter supplied.
PH.I.F.K6	Loading and weight and balance.
PH.I.F.K7	Aerodynamics.
PH.I.F.K8	H/V diagram according to the Rotorcraft Flight Manual.
PH.I.F.K9	Autorotational performance.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.I.F.R1	Inaccurate use of manufacturer's performance charts, tables and data.
PH.I.F.R2	Helicopter limitations.
PH.I.F.R3	Possible differences between actual helicopter performance and published helicopter performance data.
PH.I.F.R4	Retreating Blade Stall and operations within "avoid areas" of the height/velocity diagram.
PH.I.F.R5	Situations that lead to loss of tail rotor/antitorque authority (unanticipated yaw).
Skills	The applicant demonstrates the ability to:
PH.I.F.S1	Compute the weight and balance, correct out-of-center of gravity (CG) loading errors and determine if the weight and balance remains within limits during all phases of flight.
PH.I.F.S2	Demonstrate use of the appropriate manufacturer's approved performance charts, tables and data.

I. Preflight Preparation

Task	***G. Operation of Systems***
References	FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-25; POH/RFM, GFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with the safe operation of systems on the helicopter provided for the flight test.
Knowledge	The applicant demonstrates understanding of:
PH.I.G.K1	Helicopter systems and/or indications of abnormalities or failures, to include:
PH.I.G.K1a	a. Primary flight controls, trim, and if installed, stability control
PH.I.G.K1b	b. Powerplant
PH.I.G.K1c	c. Main Rotor and antitorque systems
PH.I.G.K1d	d. Transmission and associated drive shafts
PH.I.G.K1e	e. Landing gear, brakes, steering, skids, or floats, as applicable
PH.I.G.K1f	f. Fuel, oil, and hydraulic
PH.I.G.K1g	g. Electrical
PH.I.G.K1h	h. Avionics
PH.I.G.K1i	i. Pitot-static, vacuum/pressure, and associated flight instruments
PH.I.G.K1j	j. Environmental
PH.I.G.K1k	k. Anti-icing including carburetor heat, if applicable
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.I.G.R1	Pilot attitudes toward aircraft system management.
PH.I.G.R2	Managing of automated systems, if applicable.
Skills	The applicant demonstrates the ability to:
PH.I.G.S1	Explain and operate at least three of the helicopter's systems listed in K1a thru K1k above.
PH.I.G.S2	Properly use appropriate checklists.

I. Preflight Preparation

Task	***H. Human Factors***
References	FAA-H-8083-2, FAA-H-8083-25; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with personal health, flight physiology, aeromedical and human factors, as it relates to safety of flight. ***Note:*** *See Appendix 6: Safety of Flight.*
Knowledge	The applicant demonstrates understanding of:
PH.I.H.K1	Symptoms, recognition, causes, effects, and corrective actions associated with aeromedical and physiological issues including:
PH.I.H.K1a	a. Hypoxic hypoxia due to altitude increase or oxygen displacement
PH.I.H.K1b	b. Hyperventilation
PH.I.H.K1c	c. Middle ear and sinus problems
PH.I.H.K1d	d. Spatial disorientation
PH.I.H.K1e	e. Motion sickness
PH.I.H.K1f	f. Carbon monoxide poisoning and other forms of hypemic hypoxia
PH.I.H.K1g	g. Stress and fatigue
PH.I.H.K1h	h. Dehydration and nutrition
PH.I.H.K1i	i. Hypothermia
PH.I.H.K1j	j. Optical illusions
PH.I.H.K1k	k. Dissolved nitrogen in the bloodstream after scuba dives for pilots and passengers
PH.I.H.K2	Regulations regarding alcohol and drugs.
PH.I.H.K3	Effects of alcohol, drugs, and over-the-counter medications.
PH.I.H.K4	Aeronautical Decision-Making (ADM).
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.I.H.R1	Aeromedical and physiological issues.
PH.I.H.R2	Hazardous attitudes.
PH.I.H.R3	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.I.H.S1	Describe symptoms, recognition, causes, effects, and corrective actions for at least three of the conditions listed in K1a through K1k above.
PH.I.H.S2	Perform self-assessment, including fitness for flight and personal minimums, for actual flight or a scenario given by the evaluator.

II. Preflight Procedures

Task	***A. Preflight Assessment***
References	14 CFR part 39; FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-25; AC 91-32; POH/RFM,
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with preparing for safe flight.
Knowledge	The applicant demonstrates understanding of:
PH.II.A.K1	Pilot self-assessment.
PH.II.A.K2	Determining that the helicopter to be used is in an airworthy condition.
PH.II.A.K3	Helicopter preflight inspection including:
PH.II.A.K3a	a. Which items must be inspected
PH.II.A.K3b	b. The reasons for checking each item
PH.II.A.K3c	c. How to detect possible defects
PH.II.A.K3d	d. The associated regulations
PH.II.A.K4	Environmental factors including weather, terrain, route selection, and obstructions.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.II.A.R1	The Pilot.
PH.II.A.R2	The Aircraft.
PH.II.A.R3	Environment (e.g., weather, airports, airspace, terrain, obstacles).
PH.II.A.R4	External pressures.
PH.II.A.R5	Aviation security concerns.
Skills	The applicant demonstrates the ability to:
PH.II.A.S1	Inspect the helicopter with reference to an appropriate checklist.
PH.II.A.S2	Verify the helicopter is in condition for safe flight and conforms to its type design.

II. Preflight Procedures

Task	***B. Aircraft Management***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM, GFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with safe aircraft management practices.
Knowledge	The applicant demonstrates understanding of:
PH.II.B.K1	Passenger briefing requirements, to include operation and required use of safety restraint systems.
PH.II.B.K2	Use of appropriate checklists.
PH.II.B.K3	Requirements for current and appropriate navigation data.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.II.B.R1	Use of systems or equipment, to include automation and portable electronic devices.
PH.II.B.R2	Flying with unresolved discrepancies.
Skills	The applicant demonstrates the ability to:
PH.II.B.S1	Secure all items at the aircraft and in the cabin.
PH.II.B.S2	Conduct an appropriate pre-takeoff briefing, to include identifying the PIC, use of safety belts, shoulder harnesses, doors, sterile aircraft, rotor blade avoidance, and emergency procedures.
PH.II.B.S3	Properly program and manage helicopter automation, as applicable.

II. Preflight Procedures

Task	***C. Powerplant Starting and Rotor Engagement***
References	FAA-H-8083-2, FAA-H-8083-21; AC 91-42, AC 91-55; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with recommended powerplant starting procedures.
Knowledge	The applicant demonstrates understanding of:
PH.II.C.K1	Starting under various atmospheric conditions.
PH.II.C.K2	Starting the powerplant by use of external power, if appropriate.
PH.II.C.K3	Powerplant limitations as they relate to starting.
PH.II.C.K4	Rotor engagement considerations.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.II.C.R1	Rotor and anti-torque engagement.
PH.II.C.R2	Use of external power unit, as appropriate.
Skills	The applicant demonstrates the ability to:
PH.II.C.S1	Position the helicopter properly considering structures, surface conditions, other aircraft, wind, and the safety of nearby persons and property.
PH.II.C.S2	Use of flight control frictions, if required.
PH.II.C.S3	Start the powerplant in accordance with the appropriate checklist.
PH.II.C.S4	Properly engage the rotor system.
PH.II.C.S5	Properly manage rotor system as applicable to the helicopter.

II. Preflight Procedures

Task	***D. Before Takeoff Check***
References	FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-25; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with the before takeoff check.
Knowledge	The applicant demonstrates understanding of:
PH.II.D.K1	Purpose of pre-takeoff checklist items including:
PH.II.D.K1a	a. Reasons for checking each item
PH.II.D.K1b	b. Detecting malfunctions
PH.II.D.K1c	c. Configuring the helicopter as recommended by the manufacturer
PH.II.D.K2	Normal operating procedures and checklists.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.II.D.R1	Division of attention while conducting before takeoff checks.
PH.II.D.R2	Changes in ATC clearances or instructions, if applicable.
Skills	The applicant demonstrates the ability to:
PH.II.D.S1	Complete the appropriate checklist.
PH.II.D.S2	Accomplish the before takeoff check and ensure that the helicopter is in safe operating condition.
PH.II.D.S3	Review takeoff performance airspeeds and emergency procedures.
PH.II.D.S4	Perform the takeoff briefing.
PH.II.D.S5	Complete passenger and crew brief, as necessary.
PH.II.D.S6	Verify that the powerplant temperature(s) and pressure(s) are suitable for run-up and takeoff.
PH.II.D.S7	Maintain powerplant and rotor RPM within normal limits.
PH.II.D.S8	Properly position the helicopter considering other aircraft, wind and surface conditions.
PH.II.D.S9	Divide attention inside and outside the helicopter.
PH.II.D.S10	Avoid runway incursions and/or ensure no conflict with traffic prior to takeoff.

III. Airport and Heliport Operations

Task	***A. Communications and Light Signals***
References	14 CFR part 91; FAA-H-8083-2, FAA-H-8083-25; AIM; Chart Supplements
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with normal and emergency radio communications and ATC light signals to conduct radio communications safely while operating the helicopter.
Knowledge	The applicant demonstrates understanding of:
PH.III.A.K1	How to obtain proper radio frequencies.
PH.III.A.K2	Proper radio communication procedures and ATC phraseology.
PH.III.A.K3	ATC light signal recognition.
PH.III.A.K4	Appropriate use of transponders.
PH.III.A.K5	Lost communication procedures.
PH.III.A.K6	Equipment issues that could cause loss of communications.
PH.III.A.K7	Radar assistance.
PH.III.A.K8	National Transportation Safety Board (NTSB) accident/incident reporting.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.III.A.R1	Communication.
PH.III.A.R2	Recognizing and declaring an emergency.
PH.III.A.R3	Confirmation or expectation bias.
PH.III.A.R4	Use of non-standard phraseology.
Skills	The applicant demonstrates the ability to:
PH.III.A.S1	Select appropriate frequencies.
PH.III.A.S2	Transmit using standard phraseology and procedures as specified in the AIM and P/CG.
PH.III.A.S3	Acknowledge radio communications and comply with ATC instructions.

III. Airport and Heliport Operations

Task	***B. Traffic Patterns***
References	14 CFR part 91; FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-25; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with traffic patterns.
Knowledge	The applicant demonstrates understanding of:
PH.III.B.K1	Towered and non-towered airport operations.
PH.III.B.K2	Take-off direction for the current conditions.
PH.III.B.K3	Right-of-way rules.
PH.III.B.K4	Use of automated weather and airport/heliport information.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.III.B.R1	Collision hazard management.
PH.III.B.R2	Distractions, loss of situational awareness, and/or improper task management.
PH.III.B.R3	Wake turbulence and/or windshear.
Skills	The applicant demonstrates the ability to:
PH.III.B.S1	Properly identify and interpret airport runways, airport/heliport taxiways, markings, signs, and lighting, as appropriate.
PH.III.B.S2	Comply with recommended helicopter traffic pattern procedures, as appropriate.
PH.III.B.S3	Correct for wind drift to maintain the proper ground track.
PH.III.B.S4	Maintain orientation with the runway/landing area in use, as applicable.
PH.III.B.S5	Maintain traffic pattern altitude, ±100 feet, and the appropriate airspeed, ±10 knots.
PH.III.B.S6	Maintain situational awareness and proper spacing from other traffic or avoid the flow of fixed wing traffic.

III. Airport and Heliport Operations

Task	***C. Airport Runway/Taxiway/Heliport/Helipad Signs, Markings, and Lighting***
References	14 CFR part 91; FAA-H-8083-2, FAA-H-8083-25; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with runway/taxiway/heliport/helipad signs, markings and lighting normally encountered by the applicant.
Knowledge	The applicant demonstrates understanding of:
PH.III.C.K1	Airport runway, heliport, helipad, taxiway signs, markings, and lighting.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.III.C.R1	Interpretation of signs, markings and/or lighting.
PH.III.C.R2	Helicopter profile including the rotor blades and additional aircraft extensions
PH.III.C.R3	Conflict with aircraft, vehicles, and persons.
PH.III.C.R4	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.III.C.S1	Comply with airport/heliport/helipad signs, markings, and lighting encountered, as applicable to the helicopter supplied.

IV. Hovering Maneuvers

Task	***A. Vertical Takeoff and Landing***
References	14 CFR part 91; FAA-H-8083-2, FAA-H-8083-21; AC 90-95; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with vertical takeoff and landing from a hover.
Knowledge	The applicant demonstrates understanding of:
PH.IV.A.K1	Elements related to a vertical takeoff to a hover and landing from a hover.
PH.IV.A.K2	Effect of wind and flight control inputs.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.IV.A.R1	Conditions that might lead to loss of tail rotor/antitorque effectiveness.
PH.IV.A.R2	Dynamic rollover.
PH.IV.A.R3	Ground resonance
Skills	The applicant demonstrates the ability to:
PH.IV.A.S1	Maintain powerplant and rotor RPM within normal limits.
PH.IV.A.S2	Ascend to and maintain recommended hovering altitude, and descend from recommended hovering altitude in headwind, crosswind, and tailwind conditions.
PH.IV.A.S3	Establish recommended hovering altitude, if within 10 feet of the surface ±1/2 of that altitude; if above 10 feet, ±5 feet.
PH.IV.A.S4	Maintain position within 4 feet of a designated point, with no aft movement.
PH.IV.A.S5	Descend vertically to within 4 feet of the designated touchdown point.
PH.IV.A.S6	Maintain specified heading, ± 10°.

IV. Hovering Maneuvers

Task	***B. Slope Operations***
References	14 CFR part 91; FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with slope operations.
Knowledge	The applicant demonstrates understanding of:
PH.IV.B.K1	Factors used for selecting an appropriate slope.
PH.IV.B.K2	The effect of wind on an approach to a slope.
PH.IV.B.K3	Dynamic rollover considerations during slope operations and preventative/recovery techniques.
PH.IV.B.K4	Helicopter slope limitations, if applicable.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.IV.B.R1	Operations on a steep slope.
PH.IV.B.R2	Conditions leading to loss of tail rotor/antitorque effectiveness.
PH.IV.B.R3	Embarking and/or disembarking passengers and rotor blade hazards.
PH.IV.B.R4	Conditions leading to dynamic rollover.
PH.IV.B.R5	Exceeding the slope limitations.
PH.IV.B.R6	Surface conditions.
Skills	The applicant demonstrates the ability to:
PH.IV.B.S1	Select a suitable slope.
PH.IV.B.S2	Properly approach the slope considering wind effect and obstacles.
PH.IV.B.S3	Maintain powerplant and rotor RPM within normal limits.
PH.IV.B.S4	Maintain heading and ground position, and prevents movement of aircraft on slope.
PH.IV.B.S5	Make a smooth positive descent to touch the upslope skid on the sloping surface.
PH.IV.B.S6	Recognize if slope is too steep and abandon the operation prior to reaching cyclic control stops.
PH.IV.B.S7	Neutralize controls after landing.
PH.IV.B.S8	Make a smooth transition from the slope to a stabilized hover parallel to the slope.
PH.IV.B.S9	Properly move away from the slope.
PH.IV.B.S10	Maintain a specified heading throughout the operation, ±10°.

IV. Hovering Maneuvers

Task	***C. Taxiing with Wheel-Type Landing Gear***
References	FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-25; AC 91-73; Chart Supplements; POH/RFM; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with safe ground taxi operations, including runway incursion avoidance.
Knowledge	The applicant demonstrates understanding of:
PH.IV.C.K1	Current airport aeronautical references and information resources including Chart Supplement information, airport diagram, and appropriate references.
PH.IV.C.K2	Taxi instructions/clearances.
PH.IV.C.K3	Airport/Heliport markings, signs, lights.
PH.IV.C.K4	Visual indicators for wind.
PH.IV.C.K5	Aircraft lighting.
PH.IV.C.K6	Procedures for:
PH.IV.C.K6a	a. Appropriate flight deck activities during taxiing including taxi route planning, briefing the location of Hot Spots, communicating and coordinating with ATC
PH.IV.C.K6b	b. Safe taxi at towered and non-towered airports
PH.IV.C.K6c	c. Entering or crossing runways
PH.IV.C.K6d	d. Night taxi operations
PH.IV.C.K6e	e. Low visibility taxi operations
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.IV.C.R1	Inappropriate activities and distractions.
PH.IV.C.R2	Confirmation or expectation bias regarding taxi instructions.
PH.IV.C.R2	Other aircraft, vehicles, persons, and hazards.
Skills	The applicant demonstrates the ability to:
PH.IV.C.S1	Complete the checklist, as appropriate to the helicopter.
PH.IV.C.S2	Perform a brake check immediately after the helicopter begins moving.
PH.IV.C.S3	Maintain positive control of the helicopter during ground operations.
PH.IV.C.S4	Position the flight controls properly for the existing wind conditions, with the landing gear in contact with the surface, avoiding conditions that might lead to loss of yaw control.
PH.IV.C.S5	Properly use cyclic, collective, and brakes as applicable to control speed while taxiing.
PH.IV.C.S6	Maintain powerplant and rotor RPM within normal limits.
PH.IV.C.S7	Maintain specified track within 4 feet.
PH.IV.C.S8	Properly position the helicopter relative to hold lines or a specified point within 4 feet.
PH.IV.C.S9	Receive, correctly read back and comply with clearances/instructions, if applicable.
PH.IV.C.S10	Exhibit situational awareness.
PH.IV.C.S11	Use an airport diagram or taxi chart during taxi, if published.
PH.IV.C.S12	Comply with airport/heliport taxiway markings, lights, signals.

IV. Hovering Maneuvers

Task	***D. Hover Taxi***
References	FAA-H-8083-2, FAA-H-8083-21; AC 90-95, AC 91-73; Chart Supplements; POH/RFM; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with safe hover taxi operations, including runway incursion avoidance.
Knowledge	The applicant demonstrates understanding of:
PH.IV.D.K1	Airport information resources including Chart Supplement information, airport diagram, and appropriate references.
PH.IV.D.K2	Taxi instructions/clearances.
PH.IV.D.K3	Airport markings, signs, and lights.
PH.IV.D.K4	Visual indicators for wind.
PH.IV.D.K5	Aircraft lighting.
PH.IV.D.K6	Procedures for:
PH.IV.D.K6a	a. Appropriate pilot activities during taxiing
PH.IV.D.K6b	b. Safe hover taxi at airports/heliports
PH.IV.D.K6c	c. Entering crossing runways
PH.IV.D.K7	Elements related to hover taxiing:
PH.IV.D.K7a	a. Height/velocity considerations
PH.IV.D.K7b	b. Yaw-rate limitations, as appropriate
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.IV.D.R1	Inappropriate activities and distractions.
PH.IV.D.R2	Tail rotor strike hazards.
PH.IV.D.R3	Reduced visibility taxi operations.
PH.IV.D.R4	Other aircraft, vehicles, persons, and hazards.
Skills	The applicant demonstrates the ability to:
PH.IV.D.S1	Complete the appropriate checklist.
PH.IV.D.S2	Hover taxi over specified ground references, demonstrating forward, sideward, and rearward hovering and hovering turns.
PH.IV.D.S3	Maintain a ground track within ±4 feet of a designated reference on straight legs.
PH.IV.D.S4	Maintain powerplant and rotor RPM within normal limits.
PH.IV.D.S5	Maintain recommended hovering altitude, ±1/2 of that altitude within 10 feet of the surface, if above 10 feet, ±5 feet.
PH.IV.D.S6	Comply with airport/heliport taxiway markings, signals, and signs.
PH.IV.D.S7	Maintain a constant rate of turn at pivot points.
PH.IV.D.S8	Maintain a position within 4 feet of each pivot point during turns.
PH.IV.D.S9	Make a 90°, 180°, and/or 360° pivoting turns, stopping or landing within 10° of specified headings.
PH.IV.D.S10	Make smooth, timely, and correct control application during the maneuver.

IV. Hovering Maneuvers

Task	***E. Air Taxi***
References	FAA-H-8083-2, FAA-H-8083-21; AC 90-95, AC 91-73; Chart Supplements; POH/RFM; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with safe air taxi operations, including runway incursion avoidance.
Knowledge	The applicant demonstrates understanding of:
PH.IV.E.K1	Airport information resources including Chart Supplement information, airport diagram, and appropriate references.
PH.IV.E.K2	Taxi instructions/clearances.
PH.IV.E.K3	Elements related to air taxiing.
PH.IV.E.K4	Airport markings, signs, and lights.
PH.IV.E.K5	Visual indicators for wind.
PH.IV.E.K6	Aircraft lighting.
PH.IV.E.K7	Procedures for:
PH.IV.E.K7a	a. Appropriate flight deck activities during taxiing
PH.IV.E.K7b	b. Safe hover taxi at towered and non-towered airports
PH.IV.E.K7c	c. Entering crossing runways
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.IV.E.R1	Inappropriate activities and distractions.
PH.IV.E.R2	Low visibility air taxi operations.
PH.IV.E.R3	Height/velocity diagram limitations in case of powerplant failure.
PH.IV.E.R4	Environmental conditions, other aircraft and relative hazards.
Skills	The applicant demonstrates the ability to:
PH.IV.E.S1	Complete the appropriate checklist, if applicable.
PH.IV.E.S2	Select a safe airspeed and altitude.
PH.IV.E.S3	Maintain desired track and groundspeed in headwind and crosswind conditions, avoiding conditions that might lead to loss of tail rotor/antitorque effectiveness.
PH.IV.E.S4	Maintain powerplant and rotor RPM within normal limits.
PH.IV.E.S5	Comply with airport taxiway markings, lights, and signs.
PH.IV.E.S6	Maintain specified altitude, ±10 feet.

V. Takeoffs, Landings and Go-Arounds

Note: *The evaluator must require Tasks A, B, C, D, E and at least one other Task from confined area, pinnacle, running landing, or go-around.*

Task	***A. Normal Takeoff and Climb***
References	FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-21, POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a normal takeoff, climb operations, and rejected takeoff procedures. ***Note:*** *If a crosswind condition does not exist, the applicant's knowledge of crosswind elements must be evaluated through oral testing.*
Knowledge	The applicant demonstrates understanding of:
PH.V.A.K1	Effects of atmospheric conditions, including wind, on takeoff and climb performance.
PH.V.A.K2	Factors affecting the height/velocity diagram information.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.V.A.R1	Selection of runway/takeoff path based on pilot capability, helicopter performance and limitations, available distance, and wind.
PH.V.A.R2	The effects of:
PH.V.A.R2a	a. Crosswind
PH.V.A.R2b	b. Windshear
PH.V.A.R2c	c. Tailwind
PH.V.A.R2d	d. Wake turbulence
PH.V.A.R2e	e. Runway surface/takeoff path condition/length
PH.V.A.R3	Identify possible threats and plan for:
PH.V.A.R3a	a. Rejected takeoff
PH.V.A.R3b	b. Powerplant failure in takeoff/climb phase of flight
PH.V.A.R4	Collision hazard management.
PH.V.A.R5	The risk of the maneuver versus the operational value.
PH.V.A.R6	Dividing attention appropriately inside and outside the aircraft.
PH.V.A.R7	White out, brown out and flat light conditions.
PH.V.A.R8	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.V.A.S1	Complete the appropriate checklist.
PH.V.A.S2	Make radio calls as appropriate.
PH.V.A.S3	Verify assigned/correct runway, if at an airport.
PH.V.A.S4	Ascertain wind direction with or without visible wind direction indicators.
PH.V.A.S5	Clear the area; taxi into the takeoff position and align the helicopter on the runway centerline or takeoff path.
PH.V.A.S13	Establish a stationary position on the surface or a stabilized hover, prior to takeoff in headwind and crosswind conditions.
PH.V.A.S14	Perform the approved/recommended take-off profiles.
PH.V.A.S15	Accelerate to manufacturer's recommended climb airspeed, ±10 knots.
PH.V.A.S16	Maintain powerplant and rotor RPM within normal limits.
PH.V.A.S17	Maintain proper ground track with crosswind correction, as needed..
PH.V.A.S18	Comply with noise abatement procedures.
PH.V.A.S19	Demonstrate runway incursion avoidance procedures.

V. Takeoffs, Landings, and Go-Arounds

Task	***B. Normal Approach***
References	FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-25; AIM; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a normal approach with emphasis on proper use and coordination of flight controls. ***Note*****:** *If a crosswind condition does not exist, the applicant's knowledge of crosswind elements must be evaluated through oral testing.*
Knowledge	The applicant demonstrates understanding of:
PH.V.B.K1	Elements related to a stabilized approach, to include energy management concepts.
PH.V.B.K2	Effects of atmospheric conditions, including wind, on approach and landing performance.
PH.V.B.K3	Wind correction techniques on approach and landing.
PH.V.B.K4	Performance data, to include height/velocity diagram information, where appropriate.
PH.V.B.K5	Landing surface, obstructions, and selection of a suitable touchdown point.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.V.B.R1	Selection of runway/touchdown point based on pilot capability, helicopter performance and limitations, available distance, and wind.
PH.V.B.R2	Effects of:
PH.V.B.R2a	a. Crosswind
PH.V.B.R2b	b. Windshear
PH.V.B.R2c	c. Tailwind
PH.V.B.R2d	d. Wake turbulence
PH.V.B.R2e	e. Vortex Ring State
PH.V.B.R2f	f. Touchdown surface and condition
PH.V.B.R3	Planning for:
PH.V.B.R3a	a. Go-around
PH.V.B.R3b	b. Land and hold short operations (LAHSO)
PH.V.B.R4	Collision hazard management.
PH.V.B.R5	Division of attention inside and outside the aircraft.
PH.V.B.R6	White out, brown out and flat light conditions.
PH.V.B.R7	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.V.B.S1	Complete the appropriate checklist.
PH.V.B.S2	Make radio calls as appropriate.
PH.V.B.S3	Consider the wind, landing surface, and obstructions and select a suitable touchdown point.
PH.V.B.S4	Align the helicopter with the correct/assigned runway or touchdown point.
PH.V.B.S5	Scan the landing runway/touchdown point and adjoining area for traffic and obstructions.
PH.V.B.S6	Maintain proper ground track with crosswind correction throughout the approach.
PH.V.B.S7	Perform the approved/recommended approach profiles.
PH.V.B.S8	Establish and maintain a normal approach angle, and proper rate of closure.
PH.V.B.S9	Maintain powerplant and rotor RPM within normal limits.
PH.V.B.S10	Arrive over the touchdown point, on the surface or at a stabilized hover, ±4 feet.
PH.V.B.S11	Execute a timely go-around if the approach cannot be made within the tolerances specified above or for any other condition that may result in an unsafe approach or landing.
PH.V.B.S12	Demonstrate runway incursion avoidance procedures.

V. Takeoffs, Landings, and Go-Arounds

Task	***C. Advanced Takeoff Profile and Climb***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with an advanced takeoff profile and climb.
Knowledge	The applicant demonstrates understanding of:
PH.V.C.K1	Situations where this maneuver is recommended.
PH.V.C.K2	Factors related to takeoff and climb performance to include height/velocity diagram information.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.V.C.R1	Delayed recognition of the need to reject the takeoff.
PH.V.C.R2	Application of power and/or exceeding powerplant limitations.
PH.V.C.R3	Rotor control.
PH.V.C.R4	Collision hazard management.
PH.V.C.R5	Windshear.
PH.V.C.R6	Distractions, loss of situational awareness, and/or improper task management.
PH.V.C.R7	Passenger and crew briefings, as appropriate.
PH.V.C.R8	A powerplant failure.
Skills	The applicant demonstrates the ability to:
PH.V.C.S1	Complete the appropriate checklist.
PH.V.C.S2	Make radio calls as appropriate.
PH.V.C.S3	Utilize proper control technique to initiate from the takeoff position and forward climb attitude.
PH.V.C.S4	Maintain powerplant and rotor RPM within normal limits while applying proper control input.
PH.V.C.S5	Utilize the takeoff power as specified by the evaluator.
PH.V.C.S6	Determine when to transition to a normal climb airspeed ±10 knots.
PH.V.C.S7	Maintain directional control, ground track, and proper wind-drift correction throughout the maneuver.
PH.V.C.S8	Demonstrate runway incursion avoidance procedures.

V. Takeoffs, Landings, and Go-Arounds

Task	***D. Steep Approach***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a steep approach.
Knowledge	The applicant demonstrates understanding of:
PH.V.D.K1	Effects of atmospheric conditions, including wind, on the approach.
PH.V.D.K2	Situations when a steep approach is appropriate.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.V.D.R1	Selection of landing path based on pilot capability, helicopter performance and limitations, and wind.
PH.V.D.R2	Effects of:
PH.V.D.R2a	a. Crosswind
PH.V.D.R2b	b. Windshear
PH.V.D.R2c	c. Wake turbulence
PH.V.D.R3	Planning for:
PH.V.D.R3a	a. Height/velocity diagram information
PH.V.D.R3b	b. Go around
PH.V.D.R3c	c. Powerplant failure during approach/landing phase of flight
PH.V.D.R4	Collision hazard management.
PH.V.D.R5	Vortex Ring State.
PH.V.D.R6	Landing surface.
PH.V.D.R7	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.V.D.S1	Complete the appropriate checklist.
PH.V.D.S2	Make radio calls as appropriate.
PH.V.D.S3	Ascertain wind direction with or without visible wind direction indicators.
PH.V.D.S4	Consider the wind conditions, landing surface, and obstacles.
PH.V.D.S5	Select a suitable termination point.
PH.V.D.S6	Establish and maintain a steep approach angle, (15° maximum) and proper rate of closure.
PH.V.D.S7	Maintain proper ground track with crosswind correction, if necessary.
PH.V.D.S8	Maintain powerplant and rotor RPM within normal limits.
PH.V.D.S9	Arrive at the termination point, on the surface or at a stabilized hover, ±4 feet.
PH.V.D.S10	Demonstrate runway incursion avoidance procedures.

V. Takeoffs, Landings, and Go-Arounds

Task	***E. Rolling Takeoff (Wheel-Type Landing Gear Only)***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a rolling takeoff operation.
Knowledge	The applicant demonstrates understanding of:
PH.V.E.K1	Effects of atmospheric conditions, including density altitude and wind, on takeoff and climb performance.
PH.V.E.K2	Situations when a rolling takeoff is recommended and factors related to takeoff and climb performance, to include height/velocity diagram information.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.V.E.R1	Selection of takeoff path based on pilot capability, aircraft performance and limitations, and wind.
PH.V.E.R2	Effects of:
PH.V.E.R2a	a. Crosswind
PH.V.E.R2b	b. Windshear
PH.V.E.R2c	c. Wake turbulence
PH.V.E.R3	Planning for:
PH.V.E.R3a	a. Height/velocity diagram information
PH.V.E.R3b	b. Rejected takeoff
PH.V.E.R3c	c. Powerplant failure during takeoff/climb phase of flight
PH.V.E.R4	Collision hazard management.
PH.V.E.R5	Takeoff surface and length.
PH.V.E.R6	Landing gear.
PH.V.E.R7	Low altitude maneuvering.
PH.V.E.R8	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.V.E.S1	Complete the appropriate checklist.
PH.V.E.S2	Make radio calls as appropriate.
PH.V.E.S3	Ascertain wind direction with or without visible wind direction indicators.
PH.V.E.S4	Verify assigned/correct takeoff path.
PH.V.E.S5	Maintain powerplant and rotor RPM within normal limits.
PH.V.E.S6	Utilize proper preparatory technique prior to initiating takeoff.
PH.V.E.S7	Initiate forward accelerating movement on the surface.
PH.V.E.S8	Transition to a normal climb airspeed, ±10 knots, and set power setting.
PH.V.E.S9	Maintain proper ground track with crosswind correction, if necessary.
PH.V.E.S10	Demonstrate runway incursion avoidance procedures.

V. Takeoffs, Landings, and Go-Arounds

Task	***F. Confined Area Operation***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a confined area operation.
Knowledge	The applicant demonstrates understanding of:
PH.V.F.K1	Effects of atmospheric conditions, including wind and density altitude on approach, landing, and takeoff performance.
PH.V.F.K2	Situations when a confined area approach and landing is recommended and factors related to landing performance, to include height/velocity diagram information.
PH.V.F.K3	Elements of a proper high and low reconnaissance, including takeoff and departure planning.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.V.F.R1	Selection of approach path, termination point and departure path based on pilot capability, helicopter performance and limitations, wind and availability of alternate sites.
PH.V.F.R2	Effects of:
PH.V.F.R2a	a. Crosswind
PH.V.F.R2b	b. Windshear
PH.V.F.R2c	c. Wake Turbulence
PH.V.F.R3	Planning for:
PH.V.F.R3a	a. Height/velocity diagram information
PH.V.F.R3b	b. Go-around/rejected landing
PH.V.F.R3c	c. Forced landing during approach
PH.V.F.R4	Collision hazard management.
PH.V.F.R5	Vortex Ring State.
PH.V.F.R6	Exceeding helicopter limitations.
PH.V.F.R7	Low altitude maneuvering.
PH.V.F.R8	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.V.F.S1	Complete the appropriate checklist.
PH.V.F.S2	Make radio calls as appropriate.
PH.V.F.S3	Ascertain wind direction with or without visible wind direction indicators.
PH.V.F.S4	Accomplish a proper high and low reconnaissance of the confined landing area.
PH.V.F.S5	Select a suitable approach path, termination point, and departure path.
PH.V.F.S6	Track the selected approach path at an acceptable approach angle and rate of closure to the termination point.
PH.V.F.S7	Continually evaluate the suitability of the confined landing area and/or termination point.
PH.V.F.S8	Maintain rotor RPM within normal limits.
PH.V.F.S9	Terminate in a hover or on the surface, as conditions allow.
PH.V.F.S10	Accomplish a proper ground reconnaissance.
PH.V.F.S11	Select a suitable takeoff point, considers factors affecting takeoff and climb performance under various conditions.
PH.V.F.S12	Demonstrate runway incursion avoidance procedures.

V. Takeoffs, Landings, and Go-Arounds

Task	***G. Pinnacle/Platform Operations***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a pinnacle/platform operation.
Knowledge	The applicant demonstrates understanding of:
PH.V.G.K1	Effects of atmospheric conditions, including wind, on approach, landing, takeoff and climb performance
PH.V.G.K2	Suitable takeoff point and departure flight path during climb
PH.V.G.K3	Situations when a pinnacle/platform approach, landing and takeoff is recommended and factors related to helicopter performance
PH.V.G.K4	Elements of a proper high and low reconnaissance.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.V.G.R1	Selection of approach path, termination point and departure path based on pilot capability, helicopter performance and limitations, and wind.
PH.V.G.R2	Effects of:
PH.V.G.R2a	a. Crosswind
PH.V.G.R2b	b. Windshear
PH.V.G.R2c	c. Wake turbulence
PH.V.G.R3	Planning for:
PH.V.G.R3a	a. Height/velocity diagram information
PH.V.G.R3b	b. Go-around
PH.V.G.R3c	c. Powerplant failure during approach/landing phase of flight
PH.V.G.R4	Collision hazard management.
PH.V.G.R5	Vortex Ring State.
PH.V.G.R6	Landing surface.
PH.V.G.R7	Loss of tail rotor effectiveness.
PH.V.G.R8	Low altitude maneuvering.
PH.V.G.R9	Distractions, loss of situational awareness, and/or improper task management.
PH.V.G.R10	Consider passenger access and tail rotor exposure.
PH.V.G.R11	Consider availability of forced landing area.
Skills	The applicant demonstrates the ability to:
PH.V.G.S1	Complete the appropriate checklist.
PH.V.G.S2	Make radio calls as appropriate.
PH.V.G.S3	Accomplish a proper high and low reconnaissance.
PH.V.G.S4	Ascertain wind direction with or without visible wind direction indicators.
PH.V.G.S5	Select a suitable approach path, termination point, and departure path.
PH.V.G.S6	Select an approach path considering wind direction.
PH.V.G.S7	Track the selected approach path at an acceptable approach angle and rate of closure to the termination point.
PH.V.G.S8	Maintain powerplant and rotor RPM within normal limits.
PH.V.G.S9	Terminate in a hover or on the surface, as conditions allow.
PH.V.G.S10	Select a suitable takeoff point, and consider factors affecting takeoff and climb performance under various conditions.
PH.V.G.S11	Demonstrate runway incursion avoidance procedures.

V. Takeoffs, Landings, and Go-Arounds

Task	***H. Shallow Approach and Running/Roll-On Landing***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a shallow approach and running/roll-on landing operation.
Knowledge	The applicant demonstrates understanding of:
PH.V.H.K1	Effects of atmospheric conditions, including density altitude and wind, on approach and landing performance.
PH.V.H.K2	Elements related to shallow approach and running/roll-on landing, including the purpose of the maneuver, to include height/velocity diagram information, and effect of landing surface texture.
PH.V.H.K3	Aircraft limitations.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.V.H.R1	Selection of approach path and landing based on pilot capability, aircraft performance and limitations, and wind.
PH.V.H.R2	Effects of:
PH.V.H.R2a	a. Crosswind
PH.V.H.R2b	b. Windshear
PH.V.H.R2c	c. Wake turbulence
PH.V.H.R3	Planning for:
PH.V.H.R3a	a. Height/velocity diagram information
PH.V.H.R3b	b. Go-around/rejected landing
PH.V.H.R3c	c. Powerplant failure during approach/landing phase of flight
PH.V.H.R4	Collision hazard management.
PH.V.H.R5	Landing surface and length.
PH.V.H.R6	Dynamic rollover.
PH.V.H.R7	Ground resonance.
PH.V.H.R8	Exceeding manufacturer's limitations.
PH.V.H.R9	Low altitude maneuvering.
PH.V.H.R10	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.V.H.S1	Complete the appropriate checklist.
PH.V.H.S2	Make radio calls as appropriate.
PH.V.H.S3	Ascertain wind direction with or without visible wind direction indicators.
PH.V.H.S4	Maintain powerplant and rotor RPM within normal limits.
PH.V.H.S5	Establish and maintain the recommended approach angle, and proper rate of closure.
PH.V.H.S6	Maintain proper ground track with crosswind correction, if necessary.
PH.V.H.S7	Maintain a speed that will take advantage of effective translational lift during surface contact with landing gear parallel with the ground track.
PH.V.H.S8	Demonstrate runway incursion avoidance procedures.

V. Takeoffs, Landings, and Go-Arounds

Task	***I. Go-Around***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a go-around (or a rejected landing for wheeled helicopters) with emphasis on factors that contribute to landing conditions that may require a go-around.
Knowledge	The applicant demonstrates understanding of:
PH.V.I.K1	A stabilized approach, to include energy management concepts.
PH.V.I.K2	Effects of atmospheric conditions, including wind and density altitude on a go-around.
PH.V.I.K3	Wind correction techniques on go-around.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.V.I.R1	Delayed recognition of the need for a go-around.
PH.V.I.R2	Delayed performance of go-around at low altitude.
PH.V.I.R3	Appropriate application of power.
PH.V.I.R4	Appropriate helicopter control inputs.
PH.V.I.R5	Collision hazard management.
PH.V.I.R6	Low altitude maneuvering.
PH.V.I.R7	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.V.I.S1	Complete the appropriate checklist.
PH.V.I.S2	Make radio calls as appropriate.
PH.V.I.S3	Make a timely decision to discontinue the approach to landing.
PH.V.I.S4	Maintain powerplant and rotor RPM within normal limits while applying proper control input to stop descent and initiate climb.
PH.V.I.S5	Retract the landing gear, if applicable, after a positive rate-of-climb indication.
PH.V.I.S6	Transition to a normal climb airspeed ± 10 knots.
PH.V.I.S7	Maintain directional control, ground track, and proper wind-drift correction throughout the maneuver.
PH.V.I.S8	Demonstrate runway incursion avoidance procedures.

V. Takeoffs, Landings, and Go-Arounds

Task	***A. Rapid Deceleration/Quick Stop***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with rapid decelerations with emphasis on factors that contribute to conditions that may require a rapid deceleration or quick stop. ***Note:*** *On a practical test, the evaluator shall evaluate Task A and at least Task B or Task C.*
Knowledge	The applicant demonstrates understanding of:
PH.VI.A.K1	A rapid deceleration/quick stop to include energy management concepts.
PH.VI.A.K2	Effects of atmospheric conditions, including wind and density altitude on a rapid deceleration/quick stop.
PH.VI.A.K3	Wind correction techniques during rapid deceleration/quick stop.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VI.A.R1	Delayed recognition of the need for a rapid deceleration/quick stop.
PH.VI.A.R2	Power management.
PH.VI.A.R3	Rotor RPM management.
PH.VI.A.R4	Vortex Ring State.
PH.VI.A.R5	Collision hazard management.
PH.VI.A.R6	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.VI.A.S1	Complete the appropriate checklist.
PH.VI.A.S2	Make radio calls as appropriate.
PH.VI.A.S3	Maintain powerplant and rotor RPM within normal limits.
PH.VI.A.S4	Properly coordinate all controls throughout the execution of the maneuver to terminate in a hover at an appropriate hover height.
PH.VI.A.S5	Maintain an altitude that will permit safe clearance between the tail boom and the surface.
PH.VI.A.S6	Maintain heading throughout the maneuver, ±10°.

VI. Performance Maneuvers

Task	***B. Basic Autorotation***
References	FAA-H-8083-2, FAA-H-8083-21; AC 61-140; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a straight in autorotation with a power recovery or to the surface, as briefed prior to the maneuver. ***Note:*** *See Appendix 6: Safety of Flight*
Knowledge	The applicant demonstrates understanding of:
PH.VI.B.K1	The effects of wind, weight, density altitude, and height/velocity diagram information.
PH.VI.B.K2	Rotor RPM/Energy management.
PH.VI.B.K3	Powerplant management.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VI.B.R1	Low entry altitudes.
PH.VI.B.R2	Delayed flight control inputs.
PH.VI.B.R3	Rotor RPM/Energy management.
PH.VI.B.R4	Powerplant management.
PH.VI.B.R5	Excessive rate of descent.
PH.VI.B.R6	Powerplant failure during recovery.
PH.VI.B.R7	Collision hazard management.
PH.VI.B.R8	Delayed decision to terminate autorotation.
PH.VI.B.R9	Power recovery.
PH.VI.B.R10	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.VI.B.S1	Complete the appropriate checklist.
PH.VI.B.S2	Make radio calls as appropriate.
PH.VI.B.S3	Select a suitable touchdown area.
PH.VI.B.S4	Clear the area.
PH.VI.B.S5	Select an appropriate entry altitude.
PH.VI.B.S6	Initiate the maneuver at the proper point.
PH.VI.B.S7	Establish power off glide with the helicopter trimmed and autorotation airspeed, ±5 knots.
PH.VI.B.S8	Maintain rotor RPM within normal limits.
PH.VI.B.S9	Compensate for wind speed and direction as necessary to avoid undershooting or overshooting the selected landing area.
PH.VI.B.S10	Utilize proper deceleration and collective pitch application that permits safe clearance between the tail boom and the surface.
PH.VI.B.S11	Initiate proper power recovery.
PH.VI.B.S12	Terminate autorotation to a stabilized hover at the recommended hovering altitude or to the surface in a safe area, as appropriate.

VI. Performance Maneuvers

Task	***C. Autorotation with Turn***
References	FAA-H-8083-2, FAA-H-8083-21; AC 61-140; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a 90º to 180º autorotation with a power recovery or to the surface, as briefed prior to the maneuver. ***Note:*** *See Appendix 6: Safety of Flight*
Knowledge	The applicant demonstrates understanding of:
PH.VI.C.K1	The effects of wind, weight, density altitude, and height/velocity diagram information.
PH.VI.C.K2	The effect of rotor systems during an autorotation.
PH.VI.C.K3	Rotor RPM/Energy management.
PH.VI.C.K4	Powerplant management.
PH.VI.C.K5	The causes and effects of high descent rates.
PH.VI.C.K6	The effect of varying bank angles, air speeds, and rotor RPM.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VI.C.R1	Entry altitude.
PH.VI.C.R2	Delayed flight control inputs.
PH.VI.C.R3	Rotor RPM/Energy management.
PH.VI.C.R4	Powerplant management.
PH.VI.C.R5	Excessive rate of descent.
PH.VI.C.R6	Powerplant failures during recovery.
PH.VI.C.R7	Collision hazard management.
PH.VI.C.R8	Delayed decision to terminate autorotation.
PH.VI.C.R9	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.VI.C.S1	Complete the appropriate checklist.
PH.VI.C.S2	Make radio calls as appropriate.
PH.VI.C.S3	Select a suitable touchdown area.
PH.VI.C.S4	Clear the area.
PH.VI.C.S5	Select an appropriate entry altitude.
PH.VI.C.S6	Initiate the maneuver at the proper point.
PH.VI.C.S7	Establish power off glide with the aircraft properly trimmed and autorotation airspeed, ±5 knots.
PH.VI.C.S8	Maintain rotor RPM within normal limits.
PH.VI.C.S9	Compensate for wind speed and direction as necessary to avoid undershooting or overshooting the selected landing area.
PH.VI.C.S10	Roll out of the turn to align the helicopter with the selected landing area no lower than 300 feet AGL.
PH.VI.C.S11	Utilize proper deceleration and collective pitch application that permits safe clearance between the tail boom and the surface.
PH.VI.C.S12	Perform appropriate power recovery.
PH.VI.C.S13	Terminate autorotation to a stabilized hover at the recommended hovering altitude or to the surface in a safe area, as appropriate.

VI. Performance Maneuvers

Task	***D. Advanced Autorotation***
References	FAA-H-8083-2, FAA-H-8083-21; AC 61-140; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge and risk management associated with accurately maneuvering the helicopter during an advanced autorotation. ***Note:*** *See Appendix 6: Safety of Flight*
Knowledge	The applicant demonstrates understanding of:
PH.VI.D.K1	Effects of wind, weight, density altitude, and height/velocity diagram information.
PH.VI.D.K2	Minimum rate of descent configuration and its uses.
PH.VI.D.K3	Maximum glide distance configuration and when to use it.
PH.VI.D.K4	Use of low speed configuration at altitude.
PH.VI.D.K5	Rotor RPM/Energy management.
PH.VI.D.K6	Powerplant management.
PH.VI.D.K7	The causes and effects of high descent rates.
PH.VI.D.K8	The effect of varying bank angles, air speeds, and rotor RPM.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VI.D.R1	Entry altitude.
PH.VI.D.R2	Delayed flight control inputs.
PH.VI.D.R3	Rotor RPM/Energy management.
PH.VI.D.R4	Powerplant management.
PH.VI.D.R5	Excessive rate of descent.
PH.VI.D.R6	Powerplant failures during recovery.
PH.VI.D.R7	Collision hazard management.
PH.VI.D.R8	Delayed decision to terminate autorotation.
PH.VI.D.R9	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.VI.D.S1	Tested for knowledge and risk only.

VII. Navigation

Task	***A. Pilotage and Dead Reckoning***
References	14 CFR part 61; FAA-H-8083-2; FAA-H-8083-21; FAA-H-8083-25; Navigation Charts, Digital-Visual Charts (d-VC); POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with pilotage and dead reckoning.
Knowledge	The applicant demonstrates understanding of:
PH.VII.A.K1	Pilotage and dead reckoning.
PH.VII.A.K2	Magnetic compass errors.
PH.VII.A.K3	Topography.
PH.VII.A.K4	Planned versus actual flight plan calculations and required corrections.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VII.A.R1	Collision hazard management.
PH.VII.A.R2	Distractions, loss of situational awareness, and/or improper task management.
PH.VII.A.R3	Unplanned fuel consumption.
Skills	The applicant demonstrates the ability to:
PH.VII.A.S1	Use the planned flight log.
PH.VII.A.S2	Navigate by pilotage.
PH.VII.A.S3	Navigate by means of pre-computed headings, groundspeeds, and elapsed time.
PH.VII.A.S4	Interpret aeronautical charts.
PH.VII.A.S5	Demonstrate use of the magnetic direction indicator in navigation, to include turns to headings.
PH.VII.A.S6	Correct for and record the differences between preflight fuel, groundspeed, and heading calculations and those determined en route.
PH.VII.A.S7	Verify position within three nautical miles of the flight-planned route.
PH.VII.A.S8	Arrive at the en route checkpoints within five minutes of the initial or revised estimated time of arrival and provide a destination estimate.
PH.VII.A.S9	Maintain the selected altitude, ± 200 feet and headings, ± 15°.

VII. Navigation

Task	***B. Navigation Systems and Radar Services***
References	FAA-H-8083-2; FAA-H-8083-6, FAA-H-8083-25; AIM ***Note:*** *The evaluator should reference the manufacturer's equipment supplement(s) as necessary.*
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with navigation systems and radar services.
Knowledge	The applicant demonstrates understanding of:
PH.VII.B.K1	Ground-based navigation (identification, orientation, course determination, equipment, tests and regulations).
PH.VII.B.K2	Satellite-based navigation (e.g., equipment, regulations, authorized use of databases, and Receiver Autonomous Integrity Monitoring (RAIM)).
PH.VII.B.K3	Radar assistance to VFR aircraft (e.g., operations, equipment, available services, traffic advisories).
PH.VII.B.K4	Transponder (Mode(s) A, C, and S).
PH.VII.B.K5	Use of EFB, if applicable.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VII.B.R1	Management of automated navigation and auto flight systems.
PH.VII.B.R2	Distractions, loss of situational awareness, and/or improper task management.
PH.VII.B.R3	Limitations of the navigation system in use.
PH.VII.B.R4	The use of EFB.
Skills	The applicant demonstrates the ability to:
PH.VII.B.S1	Use an airborne electronic navigation system.
PH.VII.B.S2	Determine position using the navigation system.
PH.VII.B.S3	Intercept and track a given course, radial, or bearing, as appropriate.
PH.VII.B.S4	Recognize and describe the indication of station or waypoint passage, if appropriate.
PH.VII.B.S5	Recognize signal loss and take appropriate action.
PH.VII.B.S6	Use proper communication procedures when utilizing radar services.
PH.VII.B.S7	Maintain the appropriate altitude, ±200 feet and heading ±15°.
PH.VII.B.S8	Use EFB, if applicable.

VII. Navigation

Task	***C. Diversion***
References	FAA-H-8083-2, FAA-H-8083-25; AIM; Navigation Charts
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with diversion.
Knowledge	The applicant demonstrates understanding of:
PH.VII.C.K1	Selecting an alternate destination.
PH.VII.C.K2	Situations that require deviations from flight plan and/or ATC instructions.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VII.C.R1	Collision hazard management.
PH.VII.C.R2	Distractions, loss of situational awareness, and/or improper task management.
PH.VII.C.R3	Ability to make a timely decision to divert.
PH.VII.C.R4	Ability to select an appropriate airport or heliport, as applicable.
PH.VII.C.R5	Ability to utilize all available resources (e.g., automation, ATC, and flight deck planning aids).
Skills	The applicant demonstrates the ability to:
PH.VII.C.S1	Select a suitable airport or heliport, as applicable, and route for diversion.
PH.VII.C.S2	Make a reasonable estimate of heading, groundspeed, arrival time, and fuel required to the “divert to” destination.
PH.VII.C.S3	Maintain the appropriate altitude, ±200 feet and heading, ±15°.
PH.VII.C.S4	Update/interpret weather in flight.
PH.VII.C.S5	Explain and use flight deck displays of digital weather and aeronautical information, as applicable.

VII. Navigation

Task	***D. Lost Procedures***
References	FAA-H-8083-2, FAA-H-8083-21; AIM; Navigation Charts
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with lost procedures and taking appropriate steps to achieve a satisfactory outcome if lost.
Knowledge	The applicant demonstrates understanding of:
PH.VII.D.K1	Methods to determine position.
PH.VII.D.K2	Assistance available if lost (e.g. radar services, communication procedures).
PH.VII.D.K3	Action in rapidly deteriorating weather and/or with impending fuel exhaustion
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VII.D.R1	Collision hazard management.
PH.VII.D.R2	Distractions, loss of situational awareness, and/or improper task management.
PH.VII.D.R3	Ability to record times over waypoints.
PH.VII.D.R4	Ability to seek assistance or declare an emergency in a deteriorating situation.
Skills	The applicant demonstrates the ability to:
PH.VII.D.S1	Select an appropriate course of action
PH.VII.D.S2	Use an appropriate method to determine position.
PH.VII.D.S3	Maintain an appropriate heading and climb as necessary.
PH.VII.D.S4	Identify prominent landmarks.
PH.VII.D.S5	Use navigation systems/facilities and/or contact an ATC facility for assistance.

VIII. Emergency Operations

Task	***A. Power Failure in a Hover***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a power failure in a hover.
Knowledge	The applicant demonstrates understanding of:
PH.VIII.A.K1	Elements related to power failure in a hover, to include energy management concepts.
PH.VIII.A.K2	Effects of atmospheric conditions, including wind and density altitude in a hovering autorotation to include height/velocity diagram information.
PH.VIII.A.K3	High and low inertia of rotor systems.
PH.VIII.A.K4	Aerodynamics associated with power failure in a hover.
PH.VIII.A.K5	Proper orientation, division of attention, and proper planning.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VIII.A.R1	Delayed recognition of a powerplant failure in a hover.
PH.VIII.A.R2	Flight control inputs.
PH.VIII.A.R3	Helicopter movement during powerplant failure.
PH.VIII.A.R4	Dynamic rollover.
PH.VIII.A.R5	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
PH.VIII.A.S1	Complete the appropriate checklist.
PH.VIII.A.S2	Make radio calls as appropriate.
PH.VIII.A.S3	Clear the area.
PH.VIII.A.S4	Select a suitable surface for a safe touchdown.
PH.VIII.A.S5	Select a safe hovering altitude of at least 2-3 feet.
PH.VIII.A.S6	Establish a stationary or forward hover into the wind, with powerplant and rotor RPM within normal limits.
PH.VIII.A.S7	Maintain a heading, ±10°, throughout the maneuver.
PH.VIII.A.S8	React appropriately to the simulated powerplant failure.
PH.VIII.A.S9	Smoothly apply proper flight control inputs to touch down with minimum sideward movement, and no rearward movement.
PH.VIII.A.S10	Lower collective to full down position, and center the cyclic and antitorque pedals.

VIII. Emergency Operations

Task	***B. Power Failure at Altitude***
References	FAA-H-8083-2, FAA-H-8083-21; AC 61-140; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a power failure at altitude. ***Note:*** *See Appendix 6: Safety of Flight*
Knowledge	The applicant demonstrates understanding of:
PH.VIII.B.K1	Effects of atmospheric conditions, including wind and density altitude, to include height/velocity diagram information.
PH.VIII.B.K2	Undershooting or overshooting the selected landing area.
PH.VIII.B.K3	Scenario-based emergency operating procedures for a simulated failure.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VIII.B.R1	Flight control input.
PH.VIII.B.R2	Exceedances of main rotor RPM limits.
PH.VIII.B.R3	Helicopter trim and balance.
PH.VIII.B.R4	Selection of landing area.
PH.VIII.B.R5	Energy management.
PH.VIII.B.R6	Collision hazard management.
PH.VIII.B.R7	Distractions, loss of situational awareness, and/or improper task management
PH.VIII.B.R8	Passenger and/or crew brief.
PH.VIII.B.R9	Correct recovery technique and vortex ring state at low speeds.
Skills	The applicant demonstrates the ability to:
PH.VIII.B.S1	Establish an autorotation.
PH.VIII.B.S2	Navigate to a suitable landing area into the wind as much as practical.
PH.VIII.B.S3	Communicate the emergency (simulation) if time permits.
PH.VIII.B.S4	Adjust the autorotative profile, as appropriate.
PH.VIII.B.S5	Carry out crash actions, time and altitude permitting.
PH.VIII.B.S6	Execute the recovery as briefed.

VIII. Emergency Operations

Task	***C. Systems and Equipment Malfunction***
References	FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with the causes, indications, and pilot actions for a system malfunction determined by the evaluator.
Knowledge	The applicant demonstrates understanding of:
PH.VIII.C.K1	A malfunction scenario provided by the evaluator.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VIII.C.R1	The malfunction scenario provided by the evaluator.
Skills	The applicant demonstrates the ability to:
PH.VIII.C.S1	Aviate, navigate, and communicate appropriate to the scenario (simulated by the evaluator) as briefed.

VIII. Emergency Operations

Task	***D. Vortex Ring State***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with main rotor Vortex Ring State.
Knowledge	The applicant demonstrates understanding of:
PH.VIII.D.K1	Effects of atmospheric conditions, including wind and density altitude, to include height/velocity diagram information.
PH.VIII.D.K2	The aerodynamics of Vortex Ring State.
PH.VIII.D.K3	Requirements for the formation of Vortex Ring State.
PH.VIII.D.K4	Flight scenarios under which Vortex Ring State can occur.
PH.VIII.D.K5	Effective recovery techniques.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VIII.D.R1	Delayed recognition of Vortex Ring State conditions and improper recovery.
PH.VIII.D.R2	Entering the maneuver at a lower attitude than planned.
PH.VIII.D.R3	Collision hazard management.
PH.VIII.D.R4	Distractions, loss of situational awareness, and/or improper task management.
PH.VIII.D.R5	Low-altitude maneuvering.
Skills	The applicant demonstrates the ability to:
PH.VIII.D.S1	Complete the appropriate checklist.
PH.VIII.D.S2	Clear the area.
PH.VIII.D.S3	Select an altitude that will allow recovery to be completed no less than 1,000 feet AGL or, if applicable, the manufacturer's recommended altitude, whichever is higher.
PH.VIII.D.S4	Demonstrate Vortex Ring State.
PH.VIII.D.S5	Promptly recognize and recover at the onset of Vortex Ring State.
PH.VIII.D.S6	Utilize an appropriate recovery procedure.

VIII. Emergency Operations

Task	***E. Low Rotor RPM Recognition and Recovery***
References	FAA-H-8083-2, FAA-H-8083-21; Appropriate Manufacturer's Safety Notices; POH/RFM.
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with low rotor RPM recovery. ***Note****: The evaluator may test the applicant orally on this TASK if helicopter used for the practical test has a governor that cannot be disabled.*
Knowledge	The applicant demonstrates understanding of:
PH.VIII.E.K1	Effects of atmospheric conditions, including high temperature and density altitude.
PH.VIII.E.K2	Elements related to low rotor RPM recovery, energy management including the combination of conditions that may lead to this situation.
PH.VIII.E.K3	Aerodynamics that affect low rotor RPM conditions.
PH.VIII.E.K4	Powerplant performance.
PH.VIII.E.K5	Low RPM blade stall.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VIII.E.R1	Main rotor RPM limitations and recovery.
PH.VIII.E.R2	Exceeding powerplant limitations.
PH.VIII.E.R3	Ability to properly enable helicopter powerplant governor.
PH.VIII.E.R4	Collision hazard management.
PH.VIII.E.R5	Distractions, loss of situational awareness, and/or improper task management.
PH.VIII.E.R6	Low inertia rotor systems.
PH.VIII.E.R7	Directional control.
Skills	The applicant demonstrates the ability to:
PH.VIII.E.S1	Complete the appropriate checklist.
PH.VIII.E.S2	Clear the area.
PH.VIII.E.S3	Disable the helicopter powerplant governor, as per the RFM or manufacturer's recommendations.
PH.VIII.E.S4	Detect the development of low rotor RPM and initiate prompt corrective action.
PH.VIII.E.S5	Utilize the appropriate recovery procedure to return rotor RPM to normal limits.
PH.VIII.E.S6	Enable helicopter powerplant governor and confirm operation.

VIII. Emergency Operations

Task	***F. Antitorque System Failure***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM.
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with an antitorque system failure. ***Note:*** *Task F is a knowledge and risk mitigation TASK only*
Knowledge	The applicant demonstrates understanding of:
PH.VIII.F.K1	The elements related to antitorque system failure by describing:
PH.VIII.F.K1a	a. The aerodynamic indications of an antitorque system failure(s)
PH.VIII.F.K1b	b. Differences between complete loss of antitorque and various mechanical control failures
PH.VIII.F.K1c	c. Manufacturers recommended procedures for dealing with the different types of antitorque system(s) failure
PH.VIII.F.K2	Wind condition favorable to landing with an antitorque failure.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VIII.F.R1	Preflight inspection of tail rotor driveshaft, tail rotor gearbox and assembly.
PH.VIII.F.R2	Identification of type antitorque failure for the subject aircraft.
PH.VIII.F.R3	Procedures for dealing with an antitorque failure.
Skills	The applicant demonstrates the ability to:
PH.VIII.F.S1	Intentionally left blank.

VIII. Emergency Operations

Task	***G. Dynamic Rollover***
References	FAA-H-8083-2, FAA-H-8083-21; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with Dynamic Rollover. ***Note:*** *TASK G is a knowledge and risk mitigation TASK only*
Knowledge	The applicant demonstrates understanding of:
PH.VIII.G.K1	Elements related to the aerodynamics of dynamic rollover.
PH.VIII.G.K2	Interactions among the antitorque thrust, crosswind, slope, lateral CG, helicopter weight, cyclic, and collective pitch control in contributing to dynamic rollover.
PH.VIII.G.K3	Preventive flight technique and chain of recovery sequence during takeoffs, landings, and slope operations.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VIII.G.R1	Takeoff surface condition conducive to dynamic rollover.
PH.VIII.G.R2	Ability to ensure landing gear is lifted free of the surface.
PH.VIII.G.R3	Flight control inputs to arrest rolling tendency during liftoff or landing.
PH.VIII.G.R4	Excessive sideward hover speeds.
PH.VIII.G.R5	Awareness of angle of bank and roll rate throughout the maneuver.
Skills	The applicant demonstrates the ability to:
PH.VIII.G.S1	Intentionally left blank.

VIII. Emergency Operations

Task	***H. Ground Resonance***
References	FAA-H-8083-2, FAA-H-8083-21; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with Ground Resonance. ***Note:*** *TASK H is a knowledge and risk mitigation TASK only*
Knowledge	The applicant demonstrates understanding of:
PH.VIII.H.K1	Exhibits knowledge of the elements related to ground resonance by describing:
PH.VIII.H.K1a	a. Conditions that contribute to ground resonance including the susceptibility or immunity of particular rotor system designs
PH.VIII.H.K1b	b. Preventive flight technique during takeoffs and landings
PH.VIII.H.K1c	c. Conditions that contribute to ground resonance including the susceptibility or immunity of particular landing gear
PH.VIII.H.K1d	d. Landing surface
PH.VIII.H.K2	Inspection items that may contribute to ground resonance.
PH.VIII.H.K3	Corrective actions during low and normal rotor RPM speeds.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VIII.H.R1	Inspection of items that may contribute to ground resonance.
PH.VIII.H.R2	Recognition of the onset of ground resonance.
PH.VIII.H.R3	Improper recovery procedure.
Skills	The applicant demonstrates the ability to:
PH.VIII.H.S1	Intentionally left blank.

VIII. Emergency Operations

Task	***I. Low G Recognition and Recovery***
References	FAA-H-8083-2, FAA-H-8083-21, POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with low G conditions. ***Note:*** *TASK I is a knowledge and risk mitigation TASK only*
Knowledge	The applicant demonstrates understanding of:
PH.VIII.I.K1	Exhibits knowledge of the elements related to low G conditions by describing:
PH.VIII.I.K1a	a. Aerodynamic factors related to low G conditions
PH.VIII.I.K1b	b. Situations that contribute to low G conditions
PH.VIII.I.K1c	c. Proper recovery procedures and avoidance of mast bumping
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VIII.I.R1	Control inputs that cause low G conditions.
Skills	The applicant demonstrates the ability to:
PH.VIII.I.S1	Intentionally left blank.

VIII. Emergency Operations

Task	***J. Emergency Equipment and Survival Gear***
References	FAA-H-8083-2, FAA-8083-21A; POH/RFM; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with emergency equipment, and survival gear appropriate to the helicopter and environment encountered during flight and identifying appropriate equipment that should be onboard the helicopter.
Knowledge	The applicant demonstrates understanding of:
PH.VIII.J.K1	ELT operations, limitations, and testing requirements.
PH.VIII.J.K2	Fire extinguisher operations and limitations.
PH.VIII.J.K3	Emergency equipment and survival gear needed for:
PH.VIII.J.K3a	a. Climate extremes (hot/cold)
PH.VIII.J.K3b	b. Mountainous terrain
PH.VIII.J.K3c	c. Overwater operations
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.VIII.J.R1	Planning for basic needs (water, clothing, shelter) for 48 to 72 hours.
Skills	The applicant demonstrates the ability to:
PH.VIII.J.S1	Identify appropriate equipment and personal gear.
PH.VIII.J.S2	Brief passengers on proper use of on-board emergency equipment and survival gear.

IX. Night Operations

Task	***A. Night Flight***
References	FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-25; AIM; POH/RFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with night operations.
Knowledge	The applicant demonstrates understanding of:
PH.IX.A.K1	Physiological aspects of vision related to night flying.
PH.IX.A.K2	Ground based lighting systems applicable to flight in the helicopter supplied by the applicant including those at heliports, airports, runways, taxiways, helipads and on obstructions.
PH.IX.A.K3	Pilot controlled lighting.
PH.IX.A.K4	Helicopter equipment and lighting requirements for night operation including the location of lights, switches, spare fuses, circuit breakers, and personal lighting equipment.
PH.IX.A.K5	Night orientation, navigation, chart reading techniques and methods for maintaining night vision effectiveness.
PH.IX.A.K6	Visual illusions at night.
PH.IX.A.K7	Interpretation of traffic position and direction based solely on position lights.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.IX.A.R1	Collision hazard management.
PH.IX.A.R2	Runway incursion.
PH.IX.A.R3	Distractions, loss of situational awareness, and/or improper task management.
PH.IX.A.R4	The effect of visual Illusions and added risks during all phases of night flying.
Skills	The applicant demonstrates the ability to:
PH.IX.A.S1	**Note:** *Not generally evaluated in flight. If conducting a practical test at night, all ACS Tasks are evaluated in that environment, thus there is no need for explicit skill elements to exist here.*

X. Postflight Procedures

Task	***A. After Landing, Parking and Securing***
References	FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-21; POH/RFM, GFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with after landing, parking, and securing procedures.
Knowledge	The applicant demonstrates understanding of:
PH.X.A.K1	Helicopter shutdown, securing, and postflight inspection.
PH.X.A.K2	Documenting in-flight/postflight discrepancies, if any.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks related to:
PH.X.A.R1	Inappropriate activities and distractions.
PH.X.A.R2	Confirmation or expectation bias as related to taxi instructions.
PH.X.A.R3	Airport specific security procedures.
PH.X.A.R4	Runway incursions and avoidance.
Skills	The applicant demonstrates the ability to:
PH.X.A.S1	Minimize the hazardous effects of rotor downwash during hovering.
PH.X.A.S2	Park in an appropriate area, considering the safety of nearby persons and property.
PH.X.A.S3	Complete the appropriate checklist.
PH.X.A.S4	Disembark passengers safely and monitor passenger movement while on the ramp.
PH.X.A.S5	Conduct a postflight inspection and document discrepancies and servicing requirements, if any.
PH.X.A.S6	Secure the helicopter.

This page intentionally left blank.

Appendix Table of Contents

Appendix 1: The Knowledge Test Eligibility, Prerequisites, and Testing Centers

Knowledge Test Description

The knowledge test is an important part of the airman certification process. Applicants must pass the knowledge test before taking the practical test.

The knowledge test consists of objective, multiple-choice questions. There is a single correct response for each test question. Each test question is independent of other questions. A correct response to one question does not depend upon, or influence, the correct response to another.

Knowledge Test Table

Test Code	Test Name	Number of Questions	Age	Allotted Time	Passing Score
PAR	Private Pilot Airplane	60	15	2.5	70
PAT	Private Pilot Airplane/Recreational Pilot - Transition	30	15	1.5	70
PBG	Private Pilot Balloon - Gas	60	14	2.5	70
PBH	Private Pilot Balloon - Hot Air	60	14	2.5	70
PCH	Private Pilot Helicopter ***Canadian Conversion***	40	16	2.0	70
PCP	Private Pilot – Airplane ***Canadian Conversion***	40	16	2.0	70
PGL	Private Pilot Glider	60	14	2.5	70
PGT	Private Pilot Gyroplane/Recreational Pilot - Transition	30	15	1.5	70
PHT	Private Pilot Helicopter/Recreational Pilot - Transition	30	15	1.5	70
PLA	Private Pilot Airship	60	15	2.5	70
PPP	Private Pilot Powered Parachute	60	15	2.5	70
PRG	Private Pilot Gyroplane	60	15	2.5	70
PRH	Private Pilot Helicopter	60	15	2.5	70
PWS	Private Pilot Weight-Shift-Control	60	15	2.5	70

Knowledge Test Blueprint

PAR Knowledge Areas Required by 14 CFR part 61, section 61.105 to be on the Knowledge Test	Percent of Questions Per Test
Regulations	5 – 15%
Accident Reporting	5 – 10%
Performance Charts	5 – 10%
Radio Communications	5 – 10%
Weather	5 – 10%
Safe and Efficient Operations	5 – 15%
Density Altitude Performance	5 – 10%
Weight and Balance	5 – 10%
Aerodynamics, Powerplants and Aircraft Systems	5 – 10%
Aeronautical Decision-Making (ADM)	5 – 10%
Preflight Actions	5 – 10%
Total Number of Questions	**60**

English Language Standard

In accordance with the requirements of 14 CFR part 61 and the FAA Aviation English Language Proficiency standard, throughout the application and testing process the applicant must demonstrate the ability to read, write, speak, and understand the English language. English language proficiency is required to communicate effectively with Air Traffic Control (ATC), to comply with ATC instructions, and to ensure clear and effective crew communication and coordination. Normal restatement of questions as would be done for a native English speaker is permitted, and does not constitute grounds for disqualification.

Knowledge Test Requirements

In order to take the Private Pilot Knowledge Test, you must provide proper identification. To verify your eligibility to take the test, you must also provide one of the following in accordance with the requirements of 14 CFR part 61:

- 14 CFR part 61, section 61.35 lists the prerequisites for taking the knowledge test, to include the minimum age an applicant must be to sit for the test.
  - — Received an endorsement, if required by this part, from an authorized instructor certifying that the applicant accomplished the appropriate ground-training or a home-study course required by this part for the certificate or rating sought and is prepared for the knowledge test;
  - — Proper identification at the time of application that contains the applicant's—
    - (i) Photograph;
    - (ii) Signature;
    - (iii) Date of birth;
    - (iv) If the permanent mailing address is a post office box number, then the applicant must provide a government-issued residential address
- 14 CFR part 61, section 61.49 acceptable forms of retest authorization for **all** Private Pilot tests:
  - — An applicant retesting **after failure** is required to submit the applicable test report indicating failure, along with an endorsement from an authorized instructor who gave the applicant the required additional training. The endorsement must certify that the applicant is competent to pass the test. The test proctor must retain the original failed test report presented as authorization and attach it to the applicable sign-in/out log.

Note: *If the applicant no longer possesses the original test report, he or she may request a duplicate replacement issued by the Airman Certification Branch (AFB-720).*

- Acceptable forms of authorization for Private Pilot Canadian Conversion (PCP) only:
  - Confirmation of Verification Letter issued by AFB-720 (Knowledge Testing Authorization Requirements Matrix).
  - Requires **no** instructor endorsement or other form of written authorization.

Knowledge Test Centers

The FAA authorizes hundreds of knowledge testing center locations that offer a full range of airman knowledge tests. For information on authorized testing centers and to register for the knowledge test, contact one of the providers listed at www.faa.gov.

Knowledge Test Registration

When you contact a knowledge testing center to register for a test, please be prepared to select a test date, choose a testing center, and make financial arrangements for test payment when you call. You may register for test(s) several weeks in advance, and you may cancel in accordance with the testing center's cancellation policy.

Appendix 2: Knowledge Test Procedures and Tips

Before starting the actual test, the testing center will provide an opportunity to practice navigating through the test. This practice or tutorial session may include sample questions to familiarize the applicant with the look and feel of the software. (e.g., selecting an answer, marking a question for later review, monitoring time remaining for the test, and other features of the testing software.)

Acceptable Materials

The applicant may use the following aids, reference materials, and test materials, as long as the material does not include actual test questions or answers:

Acceptable Materials	Unacceptable Materials	Notes
Supplement book provided by proctor	Written materials that are handwritten, printed, or electronic	Testing centers may provide calculators and/or deny the use of personal calculators
All models of aviation-oriented calculators or small electronic calculators that perform only arithmetic functions	Electronic calculators incorporating permanent or continuous type memory circuits without erasure capability	Unit Member (proctor) may prohibit the use of your calculator if he or she is unable to determine the calculator's erasure capability
Calculators with simple programmable memories, which allow addition to, subtraction from, or retrieval of one number from the memory; or simple functions, such as square root and percentages	Magnetic Cards, magnetic tapes, modules, computer chips, or any other device upon which pre-written programs or information related to the test can be stored and retrieved	Printouts of data must be surrendered at the completion of the test if the calculator incorporates this design feature
Scales, straightedges, protractors, plotters, navigation computers, blank log sheets, holding pattern entry aids, and electronic or mechanical calculators that are directly related to the test	Dictionaries	Before, and upon completion of the test, while in the presence of the Unit Member, actuate the ON/OFF switch or RESET button, and perform any other function that ensures erasure of any data stored in memory circuits
Manufacturer's permanently inscribed instructions on the front and back of such aids, e.g., formulas, conversions, regulations, signals, weather data, holding pattern diagrams, frequencies, weight and balance formulas, and air traffic control procedures	Any booklet or manual containing instructions related to use of test aids	Unit Member makes the final determination regarding aids, reference materials, and test materials

Test Tips

When taking a knowledge test, please keep the following points in mind:

- Carefully read the instructions provided with the test.
- Answer each question in accordance with the latest regulations and guidance publications.
- Read each question carefully before looking at the answer options. You should clearly understand the problem before trying to solve it.
- After formulating a response, determine which answer option corresponds with your answer. The answer you choose should completely solve the problem.
- Remember that only one answer is complete and correct. The other possible answers are either incomplete or erroneous.

- If a certain question is difficult for you, mark it for review and return to it after you have answered the less difficult questions. This procedure will enable you to use the available time to maximum advantage.
- When solving a calculation problem, be sure to read all the associated notes.
- For questions involving use of a graph, you may request a printed copy that you can mark in computing your answer. This copy and all other notes and paperwork must be given to the testing center upon completion of the test.

Cheating or Other Unauthorized Conduct

To avoid test compromise, computer testing centers must follow strict security procedures established by the FAA and described in FAA Order 8080.6 (as amended), Conduct of Airman Knowledge Tests. The FAA has directed testing centers to terminate a test at any time a test unit member suspects that a cheating incident has occurred.

The FAA will investigate and, if the agency determines that cheating or unauthorized conduct has occurred, any airman certificate or rating you hold may be revoked. You will also be prohibited from applying for or taking any test for a certificate or rating under 14 CFR part 61 for a period of 1 year.

Testing Procedures for Applicants Requesting Special Accommodations

An applicant with learning or reading disability may request approval from the Airman Testing Standards Branch (AFS-630) through the local Flight Standards District Office (FSDO) or International Field Office/International Field Unit (IFO/IFU) to take airman knowledge test using one of the three options listed below, in preferential order:

Option 1: Use current testing facilities and procedures whenever possible.

Option 2: Use a self-contained, electronic device which pronounces and displays typed-in words (e.g., the Franklin Speaking Wordmaster®) to facilitate the testing process.

Note: *The device should consist of an electronic thesaurus that audibly pronounces typed-in words and presents them on a display screen. The device should also have a built-in headphone jack in order to avoid disturbing others during testing.*

Option 3: Request the proctor's assistance in reading specific words or terms from the test questions and/or supplement book. To prevent compromising the testing process, the proctor must be an individual with no aviation background or expertise. The proctor may provide reading assistance only (i.e., no explanation of words or terms). When an applicant requests this option, the FSDO or IFO/IFU inspector must contact AFS-630 for assistance in selecting the test site and assisting the proctor. Before approving any option, the FSDO or IFO/IFU inspector must advise the applicant of the regulatory certification requirement to be able to read, write, speak, and understand the English language.

Appendix 3: Airman Knowledge Test Report

Immediately upon completion of the knowledge test, the testing center provides the applicant a printed Airman Knowledge Test Report (AKTR) documenting the score with the testing center's raised, embossed seal. The applicant must retain the original AKTR. The instructor must provide instruction in each area of deficiency and provide a logbook endorsement certifying that the applicant has demonstrated satisfactory knowledge in each area. When taking the practical test, the applicant must present the original AKTR to the evaluator, who is required to assess the noted areas of deficiency during the ground portion of the practical test.

An AKTR expires 24 calendar months after the month the applicant completes the knowledge test. If the AKTR expires before completion of the practical test, the applicant must retake the knowledge test.

To obtain a duplicate AKTR due to loss or destruction of the original, the applicant can send a signed request accompanied by a check or money order for $12.00 (U.S. funds), payable to the FAA to:

Federal Aviation Administration
Airmen Certification Branch, AFB-720
P.O. Box 25082
Oklahoma City, OK 73125

To obtain a copy of the application form or a list of the information required, please see the Airman Certification Branch (AFB-720) web page.

FAA Knowledge Test Question Coding

Each Task in the ACS includes an ACS code. This ACS code will soon be displayed on the AKTR to indicate any Task element proven deficient on the knowledge test. Instructors can then provide remedial training in the deficient areas, and evaluators can re-test this element during the practical test.

The ACS coding consists of four elements. For example, this code is interpreted as follows:

PH.XI.A.K1:

PH = Applicable ACS (Private Pilot – Helicopter)
XI = Area of Operation (Night Operations)
A = Task (Night Preparation)
K1 = Task element Knowledge 1 (Physiological aspects of night flying as it relates to vision.)

Knowledge test questions are linked to the ACS codes, which will soon replace the system of Learning Statement Codes (LSC). After this transition occurs, the Airman Knowledge Test Report (AKTR) will list an ACS code that correlates to a specific Task element for a given Area of Operation and Task. Remedial instruction and re-testing will be specific, targeted, and based on specified learning criteria. Similarly, a Notice of Disapproval for the practical test will use the ACS codes to identify the deficient Task elements.

The current knowledge test management system does not have the capability to print ACS codes. Until a new test management system is in place, the LSC (e.g., “PLT058”) code will continue to be displayed on the AKTR. The LSC codes are linked to references leading to broad subject areas. By contrast, each ACS code is tied to a unique Task element in the ACS itself. Because of this fundamental difference, there is no one-to-one correlation between LSC codes and ACS codes.

While all active knowledge test questions for the Private Pilot Rotorcraft series of Knowledge Tests are being aligned with the corresponding ACS, evaluators can continue to use LSC codes in conjunction with the ACS for the time being. The evaluator should look up the LSC code(s) on the applicant’s AKTR in the Learning Statement Reference Guide available at:
https://www.faa.gov/training_testing/testing/media/LearningStatementReferenceGuide.pdf.

After noting the subject area(s), the evaluator can use the corresponding Area(s) of Operation/Task(s) in the ACS to narrow the scope of material for retesting, and to evaluate the applicant’s understanding of that material in the context of the appropriate ACS Area(s) of Operation and Task(s).

Applicant Name Considerations for the Airman Knowledge Test Report (AKTR) and Practical Test Application Form

The applicant uses his or her full legal name on the Airman Certificate and/or Rating Application, FAA Form 8710-1, using up to 50 characters (including spaces). The applicant may exclude some middle names as necessary to meet the 50-character limit. The AKTR may not reflect the applicant's full legal name and may differ slightly from the name presented for the practical test.

If the 8710-1 shows a middle name, the AKTR may show that middle name, the correct middle initial, or no entry. The application will process correctly using the Integrated Airman Certificate and Rating Application (IACRA) system, and the Airmen Certification Branch will accept it. If an incorrect middle initial, spelling variant or different middle name is on the AKTR, or if the AKTR has a first name variation of any kind, the evaluator must attach an explanation and a scan or copy of the applicant's photo identification and attach it to the IACRA or paper application. If the last name on the AKTR has a different spelling or suffix, an IACRA application is not possible. The applicant must use a paper application, and the evaluator must include an explanation and copy of the applicant's photo identification to avoid a correction notice.

Appendix 4: The Practical Test – Eligibility and Prerequisites

The prerequisite requirements and general eligibility for a practical test and the specific requirements for the original issuance of a Private Pilot Certificate in the rotorcraft category can be found in 14 CFR part 61, sections 61.39(a)(1) through (7) and 61.103, respectively.

Appendix 5: Practical Test Roles, Responsibilities, and Outcomes

Applicant Responsibilities

The applicant is responsible for mastering the established standards for knowledge, skill, and risk management elements in all Tasks appropriate to the certificate and rating sought. The applicant should use this ACS, its references, and the Practical Test Checklist in this Appendix in preparation to take the practical test.

Instructor Responsibilities

The instructor is responsible for training the applicant to meet the established standards for knowledge, skill, and risk management elements in all Tasks appropriate to the certificate and rating sought. The instructor should use this ACS and its references as part of preparing the applicant to take the practical test and, if necessary, in retraining the applicant to proficiency in all subject(s) missed on the knowledge test.

Evaluator Responsibilities

An evaluator is:

- Aviation Safety Inspector (ASI);
- Pilot examiner (other than administrative pilot examiners);
- Training center evaluator (TCE);
- Chief instructor, assistant chief instructor or check instructor of pilot school holding examining authority; or
- Instrument Flight Instructor (CFII) conducting instrument proficiency check (IPC).

The evaluator who conducts the practical test is responsible for determining that the applicant meets the established standards of aeronautical knowledge, skills (flight proficiency), and risk management for the Tasks in the appropriate ACS. This responsibility also includes verifying the experience requirements specified for a certificate or rating.

Prior to beginning the practical test, the evaluator must also determine that the applicant meets FAA Aviation English Language Proficiency Standard by verifying that he or she can understand ATC instructions and communicate in English at a level that is understandable to ATC and other pilots. The evaluator should use the procedures outlined in the AC 60-28, English Language Skill Standards required by 14 CFR parts 61, 63, 65, and 107 (current version) when evaluating the applicant's ability to meet the standard.

The evaluator must develop a Plan of Action (POA), written in English, to conduct the practical test, and it must include all of the required Areas of Operation and Tasks. The POA must include a scenario that evaluates as many of the required Areas of Operation and Tasks as possible. As the scenario unfolds during the test, the evaluator will introduce problems and emergencies that the applicant must manage. The evaluator has the discretion to modify the POA in order to accommodate unexpected situations as they arise. For example, the evaluator may elect to suspend and later resume a scenario in order to assess certain Tasks.

In the integrated ACS framework, the Areas of Operation contain Tasks that include "knowledge" elements (such as K1), "risk management" elements (such as R1), and "skill" elements (such as S1). Knowledge and risk management elements are primarily evaluated during the knowledge testing phase of the airman certification process. The evaluator must assess the applicant on all skill elements for each Task included in each Area of Operation of the ACS, unless otherwise noted. The evaluator administering the practical test has the discretion to combine Tasks/elements as appropriate to testing scenarios.

The required minimum elements to include in the POA, unless otherwise noted, from each applicable Task are as follows:

- at least one knowledge element;
- at least one risk management element;
- all skill elements; and
- any Task elements in which the applicant was shown to be deficient on the knowledge test.

Note: *Task elements added to the POA on the basis of being listed on the AKTR may satisfy the other minimum Task element requirements. The missed items on the AKTR are not required to be added in addition to the minimum Task element requirements.*

There is no expectation for testing every knowledge and risk management element in a Task, but the evaluator has discretion to sample as needed to ensure the applicant's mastery of that Task.

Unless otherwise noted in the Task, the evaluator must test each item in the skills section by asking the applicant to perform each one. As safety of flight conditions permit, the evaluator should use questions during flight to test knowledge and risk management elements not evident in the demonstrated skills. To the greatest extent practicable, evaluators should test the applicant's ability to apply and correlate information, and use rote questions only when they are appropriate for the material being tested. If the Task includes an element with sub-elements, the evaluator may choose the primary element and select at least one sub-element to satisfy the requirement that at least one knowledge element be selected. For example, if the evaluator chooses PH.I.H.K1, he or she must select a sub-element such as PH.I.H.K1e to satisfy the requirement to select one knowledge element.

Possible Outcomes of the Test

There are three possible outcomes of the practical test: (1) Temporary Airman Certificate (satisfactory), (2) Notice of Disapproval (unsatisfactory), or (3) Letter of Discontinuance.

If the evaluator determines that a Task is incomplete, or the outcome is uncertain, the evaluator must require the applicant to repeat that Task, or portions of that Task. This provision does not mean that instruction, practice, or the repetition of an unsatisfactory Task is permitted during the practical test.

If the evaluator determines the applicant's skill and abilities are in doubt, the outcome is unsatisfactory and the evaluator must issue a Notice of Disapproval.

Satisfactory Performance

Satisfactory performance requires that the applicant:

- demonstrate the Tasks specified in the Areas of Operation for the certificate or rating sought within the established standards;
- demonstrate mastery of the aircraft by performing each Task successfully;
- demonstrate proficiency and competency in accordance with the approved standards;
- demonstrate sound judgment and exercise aeronautical decision-making/risk management; and
- demonstrate competence in crew resource management in aircraft certificated for more than one required pilot crew member, or competent single-pilot resource management in an aircraft that is certificated for single-pilot operations.

Satisfactory performance will result in the issuance of a temporary certificate.

Unsatisfactory Performance

If, in the judgment of the evaluator, the applicant does not meet the standards for any Task, the applicant fails the Task and associated Area of Operation. The test is unsatisfactory, and the evaluator issues a Notice of Disapproval.

When the evaluator issues a Notice of Disapproval, he or she must list the Area(s) of Operation in which the applicant did not meet the standard. The Notice of Disapproval must also list the Area(s) of Operation not tested, and the number of practical test failures. Tasks failed should be documented on FAA Form 8060-5, Notice of Disapproval (IACRA or paper) within a failed Area of Operation. If the applicant's inability to meet English language requirements contributed to the failure of a Task, the evaluator should note "English Proficiency" on the Notice of Disapproval.

The evaluator or the applicant may end the test if the applicant fails a Task. The evaluator may continue the test only with the consent of the applicant, and the applicant is entitled to credit only for those Areas of Operation and the associated Tasks satisfactorily performed.

Typical areas of unsatisfactory performance and grounds for disqualification include:

- Any action or lack of action by the applicant that requires corrective intervention by the evaluator to maintain safe flight.
- Failure to use proper and effective visual scanning techniques to clear the area before and while performing maneuvers.
- Consistently exceeding tolerances stated in the skill elements of the Task.
- Failure to take prompt corrective action when tolerances are exceeded.
- Failure to exercise risk management.

Discontinuance

When it is necessary to discontinue a practical test for reasons other than unsatisfactory performance (e.g., equipment failure, weather, illness), the evaluator must return all test paperwork to the applicant. The evaluator must prepare, sign, and issue a Letter of Discontinuance that lists those Areas of Operation the applicant successfully completed and the time period remaining to complete the test. The evaluator should advise the applicant to present the Letter of Discontinuance to the evaluator when the practical test resumes in order to receive credit for the items successfully completed. The Letter of Discontinuance becomes part of the applicant's certification file. The evaluator may also list any Tasks completed within an area of operation.

Testing after Discontinuance or Unsatisfactory Performance

To avoid having to retake the entire practical test, an applicant has 60 days from the date of a first failure or Letter of Discontinuance to pass the practical test. The evaluator’s POA must include any unsatisfactory or untested Area(s) of Operation and Task(s) as indicated on the current Notice of Disapproval or Letter of Discontinuance. While an applicant may receive credit for any Task(s) successfully completed within a failed or partially tested Area of Operation, the evaluator has discretion to reevaluate any Task(s).

Practical Test Checklist (Applicant)
Appointment with Evaluator

Evaluator's Name: _____

Location: _____

Date/Time: _____

Acceptable Aircraft

- ☐ Aircraft Documents:
  - ☐ Airworthiness Certificate
  - ☐ Registration Certificate
  - ☐ Operating Limitations
- ☐ Aircraft Maintenance Records:
  - ☐ Logbook Record of Airworthiness Inspections and AD Compliance
- ☐ Pilot's Operating Handbook, FAA-Approved Aircraft Flight Manual

Personal Equipment

- ☐ View-Limiting Device, if applicable
- ☐ Current Aeronautical Charts (Printed or Electronic)
- ☐ Computer and Plotter
- ☐ Flight Plan Form and Flight Logs (printed or electronic)
- ☐ Digital-Chart Supplement (d-CS), Airport Diagrams and appropriate Publications
- ☐ Current AIM

Personal Records

- ☐ Identification—Photo/Signature ID
- ☐ Pilot Certificate
- ☐ Current Medical Certificate or BasicMed status in lieu of Current Medical Certificate
- ☐ Completed FAA Form 8710-1, Airman Certificate and/or Rating Application with Instructor's Signature or completed IACRA form
- ☐ Original Knowledge Test Report
- ☐ Pilot Logbook with appropriate Instructor Endorsements
- ☐ FAA Form 8060-5, Notice of Disapproval (if applicable)
- ☐ Letter of Discontinuance (if applicable)
- ☐ Approved School Graduation Certificate (if applicable)
- ☐ Evaluator's Fee (if applicable)

Additional Rating Task Table

For an applicant who holds at least a Private Pilot Certificate and seeks an additional airplane category and/or class rating at the private pilot level, the evaluator must evaluate that applicant in the Areas of Operation and Tasks listed in the Additional Rating Task Table. Please note, however, that the evaluator has the discretion to evaluate the applicant's competence in the remaining Areas of Operation and Tasks.

If the applicant holds two or more category or class ratings at least at the private level, and the ratings table indicates differing required Tasks, the "least restrictive" entry applies. For example, if "All" and "None" are indicated for one Area of Operation, the "None" entry applies. If "B" and "B, C" are indicated, the "B" entry applies.

Addition of a Rotorcraft – Helicopter Rating to an existing Private Pilot Certificate

Required Tasks are indicated by either the Task letter(s) that apply(s) or an indication that all or none of the Tasks must be tested based on the notes in each Area of Operation.

Private Pilot Rating(s) Held

Areas of Operation	ASEL	ASES	AMEL	AMES	RG	Glider	Balloon	Airship
I	E,F,G	E,F,G	E,F,G	E,F,G	E,F,G	E,F,G	E,F,G	E,F,G
II	A,B,C D, E,F,G	A,B,C D, E,F,G	A,B,C D, E,F,G	A,B,C D, E,F,G	A,B,C D, E,F,G	A,B,C D, E,F,G	A,B,C D, E,F,G	A,B,C D, E,F,G
III	B,C	B,C	B,C	B,C	All	All	All	B,C
IV	All	All	All	All	All	All	All	All
V	A,B,G,H, I,J,K,L	A,B,G,H, I,J,K,L	A,B,G,H, I,J,K,L	A,B,G,H, I,J,K,L	A,B,G,H, I,J,K,L	A,B,G,H, I,J,K,L	A,B,G,H, I,J,K,L	A,B,G,H, I,J,K,L, M
VI	B,C,D	B,C,D	B,C,D	B,C,D	B,C,D	B,C,D	B,C,D	B,C,D
VII	None	None	None	None	None	None	None	None
VIII	None	None	None	None	B	B,C,D	B,C,D	None
IX	None	None	None	None	None	None	None	None
X	A,B,C,D,E, F,G,H,K,L	A,B,C,D,E, F,G,H,K,L	A,B,C,D,E, F,G,H,K,L	A,B,C,D,E, F,G,H,K,L	A,B,C,D,E, F,G,H,K,L	A,B,C,D,E, F,G,H,K,L	A,B,C,D,E, F,G,H,K,L	A,B,C,D,E, F,G,H,K,L
XI	None	None	None	None	None	All	All	All
XII	All	All	All	All	All	All	All	All

Addition of a Rotorcraft -- Gyroplane Rating to an existing Private Pilot Certificate

Required Tasks are indicated by either the Task letter(s) that apply(s) or an indication that all or none of the Tasks must be tested based on the notes in each Area of Operation.

Private Pilot Rating(s) Held

Areas of Operation	ASEL	ASEL	AMEL	AMES	RH	Glider	Balloon	Airship
I	E,F,G	E,F,G	E,F,G	E,F,G	E,F,G	E,F,G	E,F,G	E,F,G
II	A,B,C,E,H	A,B,C,E,H	A,B,C,E,H	A,B,C,E,H	A,B,C,E,H	A,B,C,E,H	A,B,C,E,H	A,B,C,E,H
III	B	B,C	B	B,C	B	All	All	B
IV	None	None	None	None	None	None	None	None
V	A,B,C,D,E,F,L	A,B,C,D,E,F,L	A,B,C,D,E,F,L	A,B,C,D,E,F,L	A,B,C,D,E,F,L	A,B,C,D,E,F,L	A,B,C,D,E,F,L	A,B,C,D,E,F,L
VI	A	A	A	A	A	A	A	A
VII	All	All	All	All	All	All	All	All
VIII	None	None	None	None	None	B,C,D	B,C,D	None
IX	All	All	All	All	All	All	All	All
X	F,G,H,I,J,K,L	F,G,H,I,J,K,L	F,G,H,I,J,K,L	F,G,H,I,J,K,L	F,G,H,I,J,K,L	F,G,H,I,J,K,L	F,G,H,I,J,K,L	F,G,H,I,J,K,L
XI	None	None	None	None	None	All	All	All
XII	All	All	All	All	All	All	All	All

Appendix 6: Safety of Flight

General

Safety of flight must be the prime consideration at all times. The evaluator, applicant, and crew must be constantly alert for other traffic. If performing aspects of a given maneuver, such as emergency procedures, would jeopardize safety, the evaluator will ask the applicant to simulate that portion of the maneuver. The evaluator will assess the applicant's use of visual scanning and collision avoidance procedures throughout the entire test.

Use of Checklists

Throughout the practical test, the applicant is evaluated on the use of an appropriate checklist.

Assessing proper checklist use depends upon the specific Task. In all cases, the evaluator should determine whether the applicant appropriately divides attention and uses proper visual scanning. In some situations, reading the actual checklist may be impractical or unsafe. In such cases, the evaluator should assess the applicant's performance of published or recommended immediate action "memory" items along with his or her review of the appropriate checklist once conditions permit.

In a single-pilot aircraft, the applicant should demonstrate the crew resource management (CRM) principles described as single-pilot resource management (SRM). Proper use is dependent on the specific Task being evaluated. The situation may be such that the use of the checklist while accomplishing elements of an Objective would be either unsafe or impractical in a single-pilot operation. In this case, a review of the checklist after the elements have been accomplished is appropriate.

Use of Distractions

Numerous studies indicate that many accidents have occurred when the pilot has been distracted during critical phases of flight. The evaluator should incorporate realistic distractions during the flight portion of the practical test to evaluate the pilot's situational awareness and ability to utilize proper control technique while dividing attention both inside and outside the helicopter.

Positive Exchange of Flight Controls

There must always be a clear understanding of who has control of the aircraft. Prior to flight, the pilots involved should conduct a briefing that includes reviewing the procedures for exchanging flight controls.

The FAA recommends a positive three-step process for exchanging flight controls between pilots:

- When one pilot seeks to have the other pilot take control of the aircraft, he or she will say, "You have the flight controls."
- The second pilot acknowledges immediately by saying, "I have the flight controls."
- The first pilot again says, "You have the flight controls," and visually confirms the exchange.

Pilots should follow this procedure during any exchange of flight controls, including any occurrence during the practical test. The FAA also recommends that both pilots use a visual check to verify that the exchange has occurred. There must never be any doubt as to who is flying the aircraft.

Aeronautical Decision-Making, Risk Management, Crew Resource Management and Single-Pilot Resource Management

Throughout the practical test, the evaluator must assess the applicant's ability to use sound aeronautical decision-making procedures in order to identify hazards and mitigate risk. The evaluator must accomplish this requirement by reference to the risk management elements of the given Task(s), and by developing scenarios that incorporate and combine Tasks appropriate to assessing the applicant's risk management in making safe aeronautical decisions. For example, the evaluator may develop a scenario that incorporates weather decisions and performance planning.

In assessing the applicant's performance, the evaluator should take note of the applicant's use of CRM and, if appropriate, SRM. CRM/SRM is the set of competencies that includes situational awareness, communication skills, teamwork, task allocation, and decision-making within a comprehensive framework of standard operating procedures (SOP). SRM specifically refers to the management of all resources onboard the aircraft as well as outside resources available to the single pilot.

Deficiencies in CRM/SRM almost always contribute to the unsatisfactory performance of a Task. While evaluation of CRM/SRM may appear to be somewhat subjective, the evaluator should use the risk management elements of the given Task(s) to determine whether the applicant's performance of the Task(s) demonstrates both understanding and application of the associated risk management elements.

Simulated Powerplant Failure and Autorotation

Autorotations during the practical test have the potential to be the highest risk maneuvers the evaluator may ask the applicant to perform. This is either because actual powerplant failures can occur or because stresses inherent in this maneuver may lead to increased aircraft handling errors. Accordingly, the evaluator must include a thorough discussion of the applicant's autorotation training history and currency during the pre-test briefing and during the actual conduct of autorotations in the pre-flight briefing. Items such as: who/how will the autorotation be initiated, determination of when a go-around will commence and who will manipulate the throttle on the power recovery should be addressed by the evaluator and understood by the applicant. During autorotations, the evaluator must consider winds, density altitude, aircraft loading, type of rotorcraft and be familiar with the area of intended landing or conduct a thorough reconnaissance. Conduct all autorotations in accordance with the RFM and the manufacturer's recommendations for autorotation training, when published.

Power Failure at Altitude: The evaluator is expected to use sound judgement when simulating any emergency. Therefore, the entry location, airspeed and altitude must be chosen such that the aircraft is in a position, should an actual powerplant failure occur, that a safe landing can be achieved. Positive risk management includes choosing a safe altitude above terrain to initiate a power failure at altitude. The recommended minimum altitude to initiate a power failure at altitude is 1000 feet AGL; however, if a lower altitude is required to adhere with airspace regulations or local policies, the evaluator must consider and choose options that mitigate the increased risk to establish safety margins equivalent to higher altitude entries.

Basic Autorotation, Autorotation with Turn, and Advanced Autorotation are normally initiated by the applicant. In accordance with the pre-test briefing, they should begin from a position, airspeed and altitude where it is possible, if necessary, to make a safe autorotative landing at a suitably designated area with evaluator and applicant concurrence. Such areas include but are not limited to, hard surface runways or taxiways, designated hard surface landing areas, large hard surface parking lots, large grass fields, and large dry grass runways in good condition.

All autorotations shall include a decision point between 300 and no less than 200 feet AGL verbally called out to indicate whether to continue the descent ("Continue") or abort the maneuver ("Go-Around") and return to powered flight based on the following parameters:

1) Airspeed/attitude – normal range based on RFM guidance
2) Rotor RPM – normal range
3) Aircraft in trim
4) Turns (if any) completed

If the applicant does not begin initiating go-around procedures either because an unsafe parameter as listed above has not been noticed or corrected by 200 foot AGL, the evaluator shall take the flight controls and should be in a position to recover the aircraft to powered flight by no less than 100 feet AGL.

Practical tests conducted in a flight simulation training device (FSTD) can only be accomplished as part of an approved curriculum or training program. Any limitations or powerplant failure will be noted and followed as part of that program.

Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations

Aircraft Requirements & Limitations

14 CFR part 61, section 61.45 prescribes the required aircraft and equipment for a practical test. The regulation states the minimum aircraft registration and airworthiness requirements as well as the minimum equipment requirements, to include the minimum required controls.

If the aircraft presented for the practical test has inoperative instruments or equipment, it must be addressed in accordance with 14 CFR part 91, section 91.213. If the aircraft can be operated in accordance with 14 CFR part 91, section 91.213, then it must be determined if the inoperative instruments or equipment are required to complete the practical test.

Equipment Requirements & Limitations

The equipment examination should be administered before the flight portion of the practical test, but it must be closely coordinated and related to the flight portion.

This section requires the aircraft must be:

- Of U.S., foreign, or military registry of the same category, class and type, if applicable, for the certificate and/or rating for which the applicant is applying.
- The aircraft must have fully functional dual controls, except as provided for in 14 CFR part 61, section, 61.45 (c) and (e); and
- Capable of performing all Areas of Operation appropriate to the rating sought and have no operating limitations, which prohibit its use in any of the Areas of Operation, required for the practical test.

To assist in management of the aircraft during the practical test, the applicant is expected to demonstrate automation management skills by utilizing installed, available, or airborne equipment such as autopilot, avionics and systems displays, and/or flight management system (FMS). The evaluator is expected to test the applicant's knowledge of the systems that are installed and operative during both the ground and flight portions of the practical test.

If the practical test is conducted in an aircraft, the applicant is required by 14 CFR part 61, section 61.45(d)(2) to provide an appropriate view limiting device acceptable to the evaluator. The applicant and the evaluator should establish a procedure as to when and how this device should be donned and removed, and brief this procedure before the flight. The device must be used during all testing that requires flight "solely by reference to instruments." This device must prevent the applicant from having visual reference outside the aircraft, but it must not restrict the evaluator's ability to see and avoid other traffic.

Appendix 8: Use of Flight Simulation Training Devices (FSTD) and Aviation Training Devices (ATD): Rotorcraft - Helicopter

Use of Flight Simulator Training Devices

14 CFR part 61, section 61.4, *Qualification and approval of flight simulators and flight training devices*, states in paragraph (a) that each full flight simulator (FFS) and flight training device (FTD) used for training, and for which an airman is to receive credit to satisfy any training, testing, or checking requirement under this chapter, must be qualified and approved by the Administrator for—

> *(1) the training, testing, and checking for which it is used;*
>
> *(2) each particular maneuver, procedure, or crewmember function performed; and*
>
> *(3) the representation of the specific category and class of aircraft, type of aircraft, particular variation within the type of aircraft, or set of aircraft for certain flight training devices.*

14 CFR part 60 prescribes the rules governing the initial and continuing qualification and use of all Flight Simulator Training Devices (FSTD) used for meeting training, evaluation, or flight experience requirements for flight crewmember certification or qualification.

An FSTD is defined in 14 CFR part 60 as an FFS or FTD:

> ***Full Flight Simulator (FFS)****—a replica of a specific type, make, model, or series aircraft. It includes the equipment and computer programs necessary to represent aircraft operations in ground and flight conditions, a visual system providing an out-of-the-aircraft view, a system that provides cues at least equivalent to those of a three-degree-of-freedom motion system, and has the full range of capabilities of the systems installed in the device as described in part 60 of this chapter and the qualification performance standard (QPS) for a specific FFS qualification level. (part 1)*
>
> ***Flight Training Device (FTD)****—a replica of aircraft instruments, equipment, panels, and controls in an open flight deck area or an enclosed aircraft flight deck replica. It includes the equipment and computer programs necessary to represent aircraft (or set of aircraft) operations in ground and flight conditions having the full range of capabilities of the systems installed in the device as described in part 60 of this chapter and the QPS for a specific FTD qualification level (part 1).*

The FAA National Simulator Program (NSP) qualifies Level A-D FFSs and Level 4 – 7[1] FTDs. In addition, each operational rule part identifies additional requirements for the approval and use of FSTDs in a training program[2]. Use of an FSTD for the completion of the private pilot aircraft practical test is permitted only when accomplished in accordance with an FAA approved curriculum or training program.

Use of Aviation Training Devices

14 CFR part 61, section 61.4(c) states the Administrator may approve a device other than an FFS or FTD for specific purposes. Under this authority, the FAA's General Aviation and Commercial Division provide approval for aviation training devices (ATD) and the associated pilot time credit allowances.

---

[1]The FSTD qualification standards in effect prior to part 60 defined a Level 7 FTD for airplanes (see Advisory Circular 120-45A, Airplane Flight Training Device Qualification, 1992). This device required high fidelity, airplane specific aerodynamic and flight control models similar to a Level D FFS, but did not require a motion cueing system or visual display system. In accordance with the "grandfather rights" of 14 CFR part 60, section 60.17, these previously qualified devices will retain their qualification basis as long as they continue to meet the standards under which they were originally qualified. There is only one airplane Level 7 FTD with grandfather rights that remains in the U.S. As a result of changes to part 60 that were published in the Federal Register in March 2016, the airplane Level 7 FTD was reinstated with updated evaluation standards. The new Level 7 FTD will require a visual display system for qualification. The minimum qualified Tasks for the Level 7 FTD are described in Table B1B of Appendix B of part 60.

[2] 14 CFR part 121, section 121.407; part 135, section 135.335; part 141, section 141.41; and part 142, section 142.59.

The current revision of Advisory Circular (AC) 61-136, *FAA Approval of Aviation Training Devices and Their Use for Training and Experience,* provides information and guidance for the required function, performance, and effective use of ATDs for pilot training and aeronautical experience (including instrument currency). The FAA issues a letter of authorization (LOA) to an ATD manufacturer approving an ATD as a basic aviation training device (BATD) or an advanced aviation training device (AATD). The LOA is valid for a five-year period with a specific expiration date and includes the amount of credit a pilot may take for training and experience pursuant to a pilot certificate rating or privilege.

> ***Aviation Training Device (ATD)****—a training device, other than an FFS or FTD, that has been evaluated, qualified, and approved by the Administrator. In general, this includes a replica of aircraft instruments, equipment, panels, and controls in an open flight deck area or an enclosed aircraft flight deck. It includes the hardware and software necessary to represent a category and class of aircraft (or set of aircraft) operations in ground and flight conditions having the appropriate range of capabilities and systems installed in the device as described within the AC for the specific basic or advanced qualification level.*
>
> ***Basic Aviation Training Device (BATD)****—provides an adequate training platform for both procedural and operational performance Tasks specific to instrument experience and the ground and flight training requirements for the Private Pilot Certificate and Instrument Rating per 14 CFR parts 61 and 141.*
>
> ***Advanced Aviation Training Device (AATD)****—provides an adequate training platform for both procedural and operational performance Tasks specific to the ground and flight training requirements for the Private Pilot Certificate, Instrument Rating Certificate, Commercial Pilot Certificate, Airline Transport Pilot Certificate, and Flight Instructor Certificate per 14 CFR parts 61 and 141. It also provides an adequate platform for Tasks required for instrument experience and the instrument proficiency check.*

Note: *ATDs cannot be used for practical tests, aircraft type specific training, or for an aircraft type rating; therefore the use of an ATD for the private pilot aircraft practical test is not permitted.*

Credit for Pilot Time in an FSTD

14 CFR part 61, section 61.109 specifies the minimum aeronautical experience requirements for a person applying for a Private Pilot Certificate. Paragraphs (a), (c), and (d) specify the time requirements for a Private Pilot Certificate in a helicopter or gyroplane, respectively[3]. These paragraphs include specific experience requirements that must be completed in a rotorcraft. Paragraph (k) of this section specifies the amount of credit a pilot can take for time in an FFS or FTD. For those that received training in programs outside of 14 CFR part 142, section 61.109(k)(1)[4] applies. For those pilots that received training through a 14 CFR part 142 program, section 61.109(k)(2) applies.

Credit for Pilot Time in an ATD

14 CFR part 61, section 61.109 specifies the minimum aeronautical experience requirements for a person applying for a private pilot certificate Paragraphs (a), (c), and (d) specify the time requirements for a private pilot certificate in a rotorcraft helicopter or gyroplane, respectively[5]. These paragraphs include specific experience requirements that must be completed in a rotorcraft. Paragraph (k) of this section specifies the amount of credit a pilot can take towards the private pilot certificate aeronautical experience requirements.

In order to credit the pilot time, the ATD must be FAA-approved and the time must be provided by an authorized flight instructor. The latest version of AC 61-136, states the LOA for each approved ATD will indicate the credit allowances for pilot training and experience, as provided under 14 CFR parts 61 and 141. Time with an instructor in a BATD and an AATD may be credited towards the aeronautical experience requirements for the private pilot certificate as specified in the LOA for the device used. It is recommended that applicants who intend to take credit for pilot time in a BATD or an AATD towards the aeronautical experience requirements for the private pilot

[3] The minimum aeronautical experience requirements may be further reduced as permitted in 14 CFR part 61, section 61.109(k)(3).

[4] As part of program approval, 14 CFR part 141 training providers must also adhere to the requirements for permitted time in an FFS or FTD per Appendix B to 14 CFR part 141.

[5] The minimum aeronautical experience requirements may be further reduced as permitted in 14 CFR part 61, section 61.109(k)(3).

certificate retain a copy of the LOA for each device used verifying the credit allowances for a certificate or rating. For additional information on the logging of ATD time reference the latest version of AC 61-136.

Use of an FSTD on a Practical Test

14 CFR part 61, section 61.45 specifies the required aircraft and equipment that must be provided for a practical test unless permitted to use an FFS or FTD for the flight portion. 14 CFR part, section 61.64 provides the criteria for using an FSTD for a practical test. Specifically, paragraph (a) states –

> *If an applicant for a certificate or rating uses a flight simulator or flight training device for training or any portion of the practical test, the flight simulator and flight training device—*
>
> *(1) Must represent the category, class, and type (if a type rating is applicable) for the rating sought; and*
>
> *(2) Must be qualified and approved by the Administrator and used in accordance with an approved course of training under 14 CFR part 141 or part 142 of this chapter; or under 14 CFR part 121 or part 135 of this chapter, provided the applicant is a pilot employee of that air carrier operator.*

Therefore, practical tests or portions thereof, when accomplished in an FSTD, may only be conducted by FAA aviation safety inspectors (ASI), aircrew program designees (APD) authorized to conduct such tests in FSTDs in 14 CFR parts 121 or 135, qualified personnel and designees authorized to conduct such tests in FSTDs for 14 CFR part 141 pilot school graduates, or appropriately authorized 14 CFR part 142 Training Center Evaluators (TCE).

In addition, 14 CFR part, 61 section 61.64(d) states if a helicopter is not used during the practical test for a type rating in a helicopter (except for preflight inspection), an applicant must accomplish the entire practical test in a Level C or higher FFS and the applicant must meet the specific experience criteria listed. If the experience criteria cannot be met, the applicant can either—

> *(f)(1) […] complete the following Tasks on the practical test in an aircraft appropriate to category, class, and type for the rating sought: Preflight inspection, normal takeoff, normal instrument landing system approach, missed approach, and normal landing; or*
>
> *(f)(2) The applicant's pilot certificate will be issued with a limitation that states: "The [name of the additional type rating] is subject to pilot-in-command limitations," and the applicant is restricted from serving as pilot-in-command in an aircraft of that type.*

When flight Tasks are accomplished in a helicopter, certain Task elements may be accomplished through "simulated" actions in the interest of safety and practicality. However, when accomplished in an FFS or FTD, these same actions would not be "simulated." For example, when in a helicopter, a simulated powerplant fire may be addressed by retarding the throttle to idle, simulating the shutdown of the powerplant, simulating the discharge of the fire suppression agent, if applicable, and simulating the disconnection of associated electrical, hydraulic, and pneumatics systems. However, when the same emergency condition is addressed in an FSTD, all Task elements must be accomplished as would be expected under actual circumstances.

Similarly, safety of flight precautions taken in the helicopter for the accomplishment of a specific maneuver or procedure (such as limiting altitude at which an autorotation begins need not be taken when an FSTD is used. It is important to understand that, whether accomplished in an airplane or FSTD, all Tasks and elements for each maneuver or procedure must have the same performance standards applied equally for determination of overall satisfactory performance.

Appendix 9: References

This ACS is based on the following 14 CFR parts, FAA guidance documents, manufacturer's publications, and other documents.

Reference	Title
14 CFR part 39	Airworthiness Directives
14 CFR part 43	Maintenance, Preventive Maintenance, Rebuilding and Alteration
14 CFR part 61	Certification: Pilots, Flight Instructors, and Ground Instructors
14 CFR part 67	Medical Standards and Certification
14 CFR part 68	Requirements for Operating Certain Small Aircraft without a Medical Certificate
14 CFR part 71	Designation of Class A, B, C, D and E Airspace Areas; Air Traffic Service Routes; and Reporting Points
14 CFR part 91	General Operating and Flight Rules
14 CFR part 93	Special Air Traffic Rules
AC 00-6	Aviation Weather
AC 60-28	English Language Skill Standards Required by 14 CFR parts 61, 63, 65, and 107
AC 61-140	Autorotation Training
AC 90-95	Unanticipated Right Yaw in Helicopters
AC 91.21-1	Use of Portable Electronic Devices Aboard Aircraft
AC 91-32	Safety in and Around Helicopters
AC 91-42	Hazards of Rotating Propeller and Helicopter Rotor Blades
AC 91-55	Reduction of Electrical System Failures following Aircraft Engine Starting
AC 91-73	Parts 91 and 135 Single Pilot, Flight School Procedures During Taxi Operations
AIM	Aeronautical Information Manual
AC 00-45	Aviation Weather Services
FAA-H-8083-1	Aircraft Weight and Balance Handbook
FAA-H-8083-2	Risk Management Handbook
FAA-H-8083-6	Advanced Avionics Handbook
FAA-H-8083-21	Rotorcraft Flying Handbook for Gyroplane Use Only
FAA-H-8083-21	Helicopter Flying Handbook
FAA-H-8083-25	Pilot's Handbook of Aeronautical Knowledge
POH/RFM	Pilot's Operating Handbook/FAA-Approved Rotorcraft Flight Manual
Other	Digital-Chart Supplement (d-CS)
	Navigation Charts
	Navigation Equipment Manual
	USCG Navigation Rules, International-Inland
	NOTAMs

Note: *Users should reference the current edition of the reference documents listed above. The current edition of all FAA publications can be found at www.faa.gov.*

Appendix 10: Abbreviations and Acronyms

The following abbreviations and acronyms are used in the ACS.

Abb./Acronym	Definition
AATD	Advanced Aviation Training Device
ACS	Airman Certification Standards
ADM	Aeronautical Decision-Making
AFB	Airman Certification Branch
AFS	Flight Standards Service
AGL	Above Ground Level
AIM	Aeronautical Information Manual
AKTR	Airman Knowledge Test Report
ASI	Aviation Safety Inspector
ATC	Air Traffic Control
ATD	Aviation Training Device
ATP	Airline Transport Pilot
BATD	Basic Aviation Training Device
CFII	Instrument Flight Instructor
CFR	Code of Federal Regulations
CG	Center of Gravity
CRM	Crew Resource Management
d-CS	Digital-Chart Supplement
FAA	Federal Aviation Administration
FFS	Full Flight Simulator
FSDO	Flight Standards District Office
FSTD	Flight Simulation Training Device
FTD	Flight Training Device
GFM	Gyroplane Flight Manual
GPS	Global Positioning System
H/V	Height/Velocity
IACRA	Integrated Airman Certification and Rating Application
IFO	International Field Office
IFR	Instrument Flight Rules
IFU	International Field Unit
IGE	In Ground Effect
IPC	Instrument Proficiency Check
KOEL	Kinds of Operation Equipment List
LAHSO	Land and Hold Short Operations
LOA	Letter of Authorization
LSC	Learning Statement Codes
LTE	Loss of Tail Rotor Effectiveness
MEL	Minimum Equipment List

Abb./Acronym	Definition
NAS	National Airspace System
NTSB	National Transportation Safety Board
OGE	Out of Ground Effect
PAR	Private Pilot Airplane
PAT	Private Pilot Airplane/Recreational Pilot – Transition
PBG	Private Pilot Balloon - Gas
PBH	Private Pilot Balloon – Hot Air
P/CG	Pilot/Controller Glossary
PCH	Private Pilot Helicopter Canadian Conversion
PCP	Private Pilot – Airplane *Canadian Conversion*
PGL	Private Pilot Glider
PGT	Private Pilot Gyroplane/Recreational Pilot Transition
PHT	Private Pilot Helicopter/Recreational Pilot Transition
PIC	Pilot-in-Command
PLA	Private Pilot Airship
POA	Plan of Action
POH	Pilot's Operating Handbook
PPP	Private Pilot Powered Parachute
PRG	Private Pilot Gyroplane
PRH	Private Pilot Helicopter
PWS	Private Pilot Weight-Shift-Control
QPS	Qualification Performance Standard
RAIM	Receiver Autonomous Integrity Monitoring
RFM	Rotorcraft Flight Manual
RH	Rotorcraft Helicopter
RPM	Revolutions Per Minute
SFRA	Special Flight Rules Area
SMS	Safety Management System
SOP	Standard Operating Procedures
SRM	Single-Pilot Resource Management
SRM	Safety Risk Management
SUA	Special Use Airspace
TCE	Training Center Evaluator
TFR	Temporary Flight Restrictions
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
VRS	Vortex Ring State

Instrument Rating
Powered-Lift

Airman Certification Standards

FAA-S-ACS-X

U.S. Department
of Transportation

**Federal Aviation
Administration**

FAA-S-ACS-X

Instrument Rating – Powered-Lift

Airman Certification Standards

TBD

**Flight Standards Service
Washington, DC 20591**

Acknowledgments

The U.S. Department of Transportation, Federal Aviation Administration (FAA), Office of Safety Standards, Regulatory Support Division, Airman Testing Branch, P.O. Box 25082, Oklahoma City, OK 73125 developed this Airman Certification Standards (ACS) document with the assistance of the aviation community. The FAA gratefully acknowledges the valuable support from the many individuals and organizations who contributed their time and expertise to assist in this endeavor.

Availability

This ACS is available for download from www.faa.gov. Please send comments regarding this document using the following link to the Airman Testing Branch Mailbox.

Material in FAA-S-ACS-X will be effective XXXX XX, 201X. All previous editions of the Instrument Rating – Practical Test Standards will be obsolete as of this date for powered-lift applicants.

Foreword

The Federal Aviation Administration (FAA) has published the Instrument Rating – Powered-Lift Airman Certification Standards (ACS) document to communicate the aeronautical knowledge, risk management, and flight proficiency standards for the instrument rating in the powered-lift category. This ACS incorporates and supersedes FAA-S-8081-4E, Instrument Rating Practical Test Standards for Airplane, Helicopter and Powered Lift for applicants in the powered-lift category.

The FAA views the ACS as the foundation of its transition to a more integrated and systematic approach to airman certification. The ACS is part of the Safety Management System (SMS) framework that the FAA uses to mitigate risks associated with airman certification training and testing. Specifically, the ACS, associated guidance, and test question components of the airman certification system are constructed around the four functional components of an SMS:

- Safety Policy that defines and describes aeronautical knowledge, flight proficiency, and risk management as integrated components of the airman certification system;
- Safety Risk Management processes through which internal and external stakeholders identify and evaluate regulatory changes, safety recommendations, and other factors that require modification of airman testing and training materials;
- Safety Assurance processes to ensure the prompt and appropriate incorporation of changes arising from new regulations and safety recommendations; and
- Safety Promotion in the form of ongoing engagement with both external stakeholders (e.g., the aviation training industry) and FAA policy divisions.

The FAA has developed this ACS and its associated guidance in collaboration with a diverse group of aviation training experts. The goal is to drive a systematic approach to all components of the airman certification system, including knowledge test question development and conduct of the practical test. The FAA acknowledges and appreciates the many hours that these aviation experts have contributed toward this goal. This level of collaboration, a hallmark of a robust safety culture, strengthens and enhances aviation safety at every level of the airman certification system.

John S. Duncan
Executive Director, Flight Standards Service

Revision History

Document #	Description	Revision Date
FAA-S-8081-4E	Instrument Rating for Airplane, Practical Test Standards (with Changes 1-5)	January 2010
FAA-S-ACS-X	Instrument Rating – Airman Certification Standards for Airplane, Helicopter, & Powered Lift	TBD

Major Enhancements to Version FAA-S-ACS-X

New Document

Table of Contents

Introduction

Airman Certification Standards Concept

The goal of the airman certification process is to ensure the applicant possesses knowledge, ability to manage risks, and skill consistent with the privileges of the certificate or rating being exercised, in order to act as Pilot-in-Command (PIC).

In fulfilling its responsibilities for the airman certification process, the Federal Aviation Administration (FAA) Flight Standards Service (AFS) plans, develops, and maintains materials related to airman certification training and testing. These materials include several components. The FAA knowledge test measures mastery of the aeronautical knowledge areas listed in Title 14 of the Code of Federal Regulations (14 CFR) part 61. Other materials, such as handbooks in the FAA-H-8083 series, provide guidance to applicants on aeronautical knowledge, risk management, and flight proficiency.

Safe operations in today's National Airspace System (NAS) require integration of aeronautical knowledge, risk management, and flight proficiency standards. To accomplish these goals, the FAA draws upon the expertise of organizations and individuals across the aviation and training community to develop the Airman Certification Standards (ACS). The ACS integrates the elements of knowledge, risk management, and skill listed in 14 CFR part 61 for each airman certificate or rating. It thus forms a more comprehensive standard for what an applicant must know, consider, and do for the safe conduct and successful completion of each Task to be tested on both the qualifying FAA knowledge test and the oral and flight portions of the practical test.

During the ground and flight portion of the practical test, the FAA expects evaluators to assess the applicant's mastery of the topic in accordance with the level of learning most appropriate for the specified Task. The oral questioning will continue throughout the entire practical test. For some topics, the evaluator will ask the applicant to describe or explain. For other items, the evaluator will assess the applicant's understanding by providing a scenario that requires the applicant to appropriately apply and/or correlate knowledge, experience, and information to the circumstances of the given scenario. The flight portion of the practical test requires the applicant to demonstrate knowledge, risk management, flight proficiency, and operational skill in accordance with the ACS.

Note: *As used in the ACS, an* evaluator *is any person authorized to conduct airman testing (e.g., an FAA Aviation Safety Inspector (ASI), Designated Pilot Examiner (DPE), or other individual authorized to conduct a test for a certificate or rating.)*

Using the ACS

The ACS consists of ***Areas of Operation*** arranged in a logical sequence, beginning with Preflight Preparation and ending with Postflight Procedures. Each Area of Operation includes ***Tasks*** appropriate to that Area of Operation. Each Task begins with an ***Objective*** stating what the applicant should know, consider, and/or do. The ACS then lists the aeronautical knowledge, risk management, and skill elements relevant to the specific Task, along with the conditions and standards for acceptable performance. The ACS uses ***Notes*** to emphasize special considerations. The ACS uses the terms "will" and "must" to convey directive (mandatory) information. The term "may" denotes items that are recommended but not required. The **References** for each Task indicate the source material for Task elements. For example, in Tasks such as "Current and forecast weather for departure, arrival, and en route phases of flight" (IP.I.B.K1), the applicant should be prepared for questions on any weather product presented in the references for that Task.

Each Task in the ACS is coded according to a scheme that includes four elements. For example:

IP.I.C.K4:

- **IP** = Applicable ACS (Instrument Rating – Powered-Lift)
- **I** = Area of Operation (Preflight Preparation)
- **C** = Task (Cross-Country Flight Planning)
- **K4** = Task Element Knowledge 4 (Elements of an IFR flight plan.)

Knowledge test questions are linked to the ACS codes, which will ultimately replace the system of Learning Statement Codes (LSC). After this transition occurs, the Airman Knowledge Test Report (AKTR) will list an ACS

code that correlates to a specific Task element for a given Area of Operation and Task. Remedial instruction and re-testing will be specific, targeted, and based on specified learning criteria. Similarly, a Notice of Disapproval for the practical test will use the ACS codes to identify the deficient Task elements. Once ACS codes are listed on the AKTR, applicants and evaluators should interpret the codes using the specific ACS revision in effect on the date of the knowledge test.

The current knowledge test management system does not have the capability to print ACS codes. Until a new test management system is in place, the LSC (e.g., “PLT058”) code will continue to be displayed on the AKTR. The LSC codes are linked to references leading to broad subject areas. By contrast, each ACS code is tied to a unique Task element in the ACS itself. Because of this fundamental difference, there is no one-to-one correlation between LSC codes and ACS codes.

Because all active knowledge test questions for the Instrument Rating Powered-lift (IRPL) knowledge test have been aligned with the corresponding ACS, evaluators can continue to use LSC codes in conjunction with the ACS for the time being. The evaluator should look up the LSC code(s) on the applicant’s AKTR in the Learning Statement Reference Guide available using the following link: Learning Statement Reference Guide. After noting the subject area(s), the evaluator can use the corresponding Area(s) of Operation/Task(s) in the ACS to narrow the scope of material for retesting, and to evaluate the applicant’s understanding of that material in the context of the appropriate ACS Area(s) of Operation and Task(s).

Applicants for a combined Private Pilot Certificate with Instrument Rating, in accordance with 14 CFR part 61, section 61.65 (a) and (g), must pass all areas designated in the Private Pilot Powered-Lift (PL) ACS, when published, and the Instrument Rating Powered-Lift (IP) ACS. Examiners need not duplicate Tasks. For example, only one preflight demonstration would be required; however, the Preflight Task from the Instrument Powered-Lift ACS would be more extensive than the Preflight Task from the Private Pilot Powered-Lift ACS to ensure readiness for Instrument Flight Rules (IFR) flight.

A combined certificate and rating evaluation should be treated as one practical test, requiring only one application and resulting in only one temporary certificate, disapproval notice, or letter of discontinuance, as applicable. Failure of any Task will result in a failure of the entire test and application. Therefore, even if the deficient maneuver was instrument related and the performance of all visual flight rules (VFR) Tasks was determined to be satisfactory, the applicant will receive a notice of disapproval.

The applicant must pass the powered–lift IRPL knowledge test before taking the instrument rating practical test. The practical test is conducted in accordance with the ACS and/or PTS that is current as of the date of the practical test cycle. Further, the ground portion of the practical test allows the evaluator to determine whether the applicant is sufficiently prepared to advance to the flight portion of the practical test, and the applicant must pass the ground portion of the practical test before beginning the flight portion. The oral questioning will continue throughout the entire practical test.

The FAA encourages applicants and instructors to use the ACS when preparing for knowledge tests and practical tests. The FAA will revise the ACS as circumstances require.

I. Preflight Preparation

Task	***A. Pilot Qualifications***
References	14 CFR part 61, 68; FAA-H-8083-2, FAA-H-8083-15, AC 68-1
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with the requirements to act as PIC under instrument flight rules.
Knowledge	The applicant demonstrates understanding of:
IP.I.A.K1	Pilot certification requirements, recency of experience, and recordkeeping.
IP.I.A.K2	Pilot certificate privileges and limitations associated with the instrument rating.
IP.I.A.K3	Privileges and limitations of medical certification under part 67 or under part 68, BasicMed.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.I.A.R1	Ability to distinguish proficiency versus currency.
IP.I.A.R2	Ability to set personal minimums.
IP.I.A.R3	Evaluation of fitness for flight and physiological factors that might affect the pilot's ability to fly under instrument conditions (e.g. known and/or untreated medical conditions, the effects of over-the-counter medications, stress and fatigue or sleep deprivation).
IP.I.A.R4	Flying an unfamiliar aircraft, or operating with unfamiliar flight display systems and avionics.
Skills	The applicant demonstrates the ability to:
IP.I.A.S1	Apply requirements to act as PIC under Instrument Flight Rules (IFR) in a scenario given by the evaluator.

I. Preflight Preparation

Task	***B. Weather Information***
References	14 CFR part 91; FAA-H-8083-25, AC 00-6; AC 00-45, AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with obtaining, understanding, and applying weather information for a flight under IFR.
Knowledge	The applicant demonstrates understanding of:
IP.I.B.K1	Acceptable sources of weather data for flight planning purposes.
IP.I.B.K2	Weather products and resources utilized for preflight planning, current and forecast weather for departure, en route operations and arrival phases of flight.
IP.I.B.K3	Meteorology applicable to the departure, en route, alternate, and destination for flights conducted under IFR in Instrument Meteorological Conditions (IMC) to include expected climate and hazardous conditions such as:
IP.I.B.K3a	a. Atmospheric composition and stability
IP.I.B.K3b	b. Wind (e.g., crosswind, tailwind, windshear, mountain wave, etc.)
IP.I.B.K3c	c. Temperature
IP.I.B.K3d	d. Moisture/precipitation
IP.I.B.K3e	e. Weather system formation, including air masses and fronts
IP.I.B.K3f	f. Clouds
IP.I.B.K3g	g. Turbulence
IP.I.B.K3h	h. Thunderstorms and microbursts
IP.I.B.K3i	i. Icing and freezing level information
IP.I.B.K3j	j. Fog
IP.I.B.K3k	k. Frost
IP.I.B.K4	Flight deck displays of digital weather and aeronautical information.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.I.B.R1	Factors involved in making the go/no-go and continue/divert decisions, to include:
IP.I.B.R1a	a. Circumstances that would make diversion prudent
IP.I.B.R1b	b. Personal Weather Minimums
IP.I.B.R1c	c. Hazardous weather conditions to include known or forecast icing or turbulence aloft
IP.I.B.R2	Limitations of:
IP.I.B.R2a	a. Onboard weather equipment
IP.I.B.R2b	b. Aviation weather reports and forecasts
IP.I.B.R2c	c. Inflight weather resources
Skills	The applicant demonstrates the ability to:
IP.I.B.S1	Use available aviation weather resources to obtain an adequate weather briefing.
IP.I.B.S2	Discuss the implications of at least three of the conditions listed in K3a through K3k above, using actual weather or weather conditions in a scenario provided by the evaluator.
IP.I.B.S3	Correlate weather information to make a competent go/no-go decision.
IP.I.B.S4	Determine whether an alternate airport is required, and, if required, whether the selected alternate airport meets regulatory requirements.

I. Preflight Preparation

Task	***C. Cross-Country Flight Planning***
References	14 CFR part 91; FAA-H-8083-2, FAA-H-8083-15, FAA-H-8083-16, FAA-H-8083-25; Navigation Charts, Chart Supplement; AIM; NOTAMs
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with planning an IFR cross-country and filing an IFR flight plan.
Knowledge	The applicant demonstrates understanding of:
IP.I.C.K1	Route planning, including consideration of the available navigational facilities, special use airspace, preferred routes, and alternate airports/heliports/landing sites as applicable to the aircraft supplied by the applicant.
IP.I.C.K2	Altitude selection accounting for terrain and obstacles, glide distance/autorotation of aircraft, IFR cruising altitudes, effect of wind, and oxygen requirements.
IP.I.C.K3	Calculating:
IP.I.C.K3a	a. Time, climb and descent rates, course, distance, heading, true airspeed, and groundspeed
IP.I.C.K3b	b. Estimated time of arrival to include conversion to universal coordinated time (UTC)
IP.I.C.K3c	c. Fuel requirements, to include reserve
IP.I.C.K4	Elements of an IFR flight plan.
IP.I.C.K5	Procedures for activating and closing an IFR flight plan in controlled and uncontrolled airspace.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.I.C.R1	Pilot.
IP.I.C.R2	Aircraft.
IP.I.C.R3	Environment (e.g., weather, icing, turbulence, airports, heliports, landing sites, airspace, terrain, obstacles).
IP.I.C.R4	External pressures.
IP.I.C.R5	Limitations of air traffic control (ATC) services.
IP.I.C.R6	Limitations of electronic planning applications and programs.
IP.I.C.R7	Improper fuel planning.
Skills	The applicant demonstrates the ability to:
IP.I.C.S1	Prepare, present and explain a cross-country flight plan assigned by the evaluator including a risk analysis based on real time weather which includes calculating time en route and fuel considering factors such as power settings, operating altitude, wind, fuel reserve requirements, and weight and balance requirements.
IP.I.C.S2	Recalculate fuel reserves based on a scenario provided by the evaluator.
IP.I.C.S3	Create a navigation plan and simulate filing an IFR flight plan.
IP.I.C.S4	Interpret departure, arrival, en route, and approach procedures with reference to appropriate and current charts.
IP.I.C.S5	Recognize simulated proprotor contamination due to airframe icing and demonstrate knowledge of the adverse effects of airframe icing during pre-takeoff, takeoff, cruise, and landing phases of flight as well as the corrective actions.
IP.I.C.S6	Apply pertinent information from appropriate and current aeronautical charts, Charts Supplement; NOTAMs relative to airport runway and taxiway or heliport closures; and other flight publications.

II. Preflight Procedures

Task	***A. Aircraft Systems Related to IFR Operations***
References	14 CFR parts 61, 91, 97; FAA-H-8083-2, FAA-H-8083-15; POH/AFM; AC 91-74
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with anti-icing and de-icing systems, if applicable.
Knowledge	The applicant demonstrates understanding of:
IP.II.A.K1	The general operational characteristics and limitations of applicable anti-icing and deicing systems, including airframe, proprotor, intake, fuel, and pitot-static systems.
IP.II.A.K2	Automatic Flight Control System (AFCS), if applicable.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.II.A.R1	Pilots with little or no experience with flight in icing conditions.
IP.II.A.R2	Limitations of anti-icing and deicing systems.
IP.II.A.R3	Management and monitoring of automated systems.
Skills	The applicant demonstrates the ability to:
IP.II.A.S1	Demonstrate familiarity with anti- or de-icing procedures and/or information published by the manufacturer that is specific to the aircraft used on the practical test.

II. Preflight Procedures

Task	***B. Aircraft Flight Instruments and Navigation Equipment***
References	14 CFR parts 61, 91; FAA-H-8083-15; AC 90-100, 90-105, 90-107, 91-78; AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with managing instruments appropriate for an IFR flight.
Knowledge	The applicant demonstrates understanding of:
IP.II.B.K1	Operation of the aircraft's applicable flight instrument system(s) including:
IP.II.B.K1a	a. Pitot-static instrument system: altimeter, airspeed indicator, vertical speed indicator
IP.II.B.K1b	b. Gyroscopic/electric/vacuum instrument system: attitude indicator, heading indicator, turn-and-slip indicator/turn coordinator
IP.II.B.K1c	c. Electrical systems, electronic flight instrument displays (PFD, MFD), transponder
IP.II.B.K1d	d. Magnetic compass
IP.II.B.K2	Capabilities and uses of electronic flight bags.
IP.II.B.K3	Operation of the aircraft's applicable navigation system(s) including:
IP.II.B.K3a	a. VOR, DME, ILS, marker beacon receiver/indicators
IP.II.B.K3b	b. RNAV, GPS, Wide Area Augmentation System (WAAS), FMS, autopilot
IP.II.B.K4	Capabilities and uses of ADS-B out and in.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.II.B.R1	Managing and monitoring automated systems.
IP.II.B.R2	The difference between approved and non-approved navigation devices.
IP.II.B.R3	Common failure modes of flight and navigation instruments.
IP.II.B.R4	The limitations of electronic flight bags.
IP.II.B.R5	Ensuring currency and coverage of navigation databases.
Skills	The applicant demonstrates the ability to:
IP.II.B.S1	Operate and manage installed instruments and navigation equipment.
IP.II.B.S2	Operate and manage an applicant supplied EFB, if used.

II. Preflight Procedures

Task	***C. Instrument Flight Deck Check***
References	14 CFR part 91; FAA-8083-2, FAA-H-8083-3, FAA-H-8083-15, FAA-H-8083-25; AC 91.21-1; POH/AFM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with conducting a preflight check on the airplane's instruments necessary for an IFR flight.
Knowledge	The applicant demonstrates understanding of:
IP.II.C.K1	Purpose of performing an instrument flight deck check and how to detect possible defects.
IP.II.C.K2	IFR airworthiness, to include aircraft inspection requirements and required equipment for IFR flight (and use of MEL, if applicable).
IP.II.C.K3	Required procedures, documentation, and limitations of flying with inoperative equipment.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.II.C.R1	Operating with inoperative equipment.
IP.II.C.R2	Operating with outdated navigation publications or databases.
Skills	The applicant demonstrates the ability to:
IP.II.C.S1	Perform preflight inspection by following the checklist appropriate to the aircraft and determine that the aircraft is in a condition for safe instrument flight.

III. Air Traffic Control Clearances and Procedures

Task	***A. Compliance with Air Traffic Control Clearances***
References	14 CFR parts 61, 91; FAA-H-8083-15; AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with ATC clearances and procedures while operating solely by reference to instruments. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
IP.III.A.K1	Elements and procedures related to ATC clearances and pilot/controller responsibilities for departure, en route, and arrival phases of flight including clearance void times.
IP.III.A.K2	PIC emergency authority.
IP.III.A.K3	Lost communication procedures.
IP.III.A.K4	Procedures for flights outside of ATC coverage.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.III.A.R1	Less than full understanding of an ATC clearance.
IP.III.A.R2	Inappropriate, incomplete, or incorrect ATC clearances.
IP.III.A.R3	ATC clearances incompatible with aircraft performance and/or navigation capability.
IP.III.A.R4	Aircraft with similar call signs.
Skills	The applicant demonstrates the ability to:
IP.III.A.S1	Correctly copy, read back, interpret, and comply with simulated and/or actual ATC clearances in a timely manner using standard phraseology as provided in the Aeronautical Information Manual.
IP.III.A.S2	Correctly set communication frequencies, navigation systems (identifying when appropriate), and transponder codes in compliance with the ATC clearance.
IP.III.A.S3	Use the current and appropriate paper or electronic navigation publications.
IP.III.A.S4	Intercept all courses, radials, and bearings appropriate to the procedure, route, or clearance in a timely manner.
IP.III.A.S5	Maintain the applicable airspeed ±10 knots, headings ±10°, altitude ±100 feet; and track a course, radial, or bearing within ¾-scale deflection of the CDI.
IP.III.A.S6	Demonstrate CRM/SRM.
IP.III.A.S7	Perform the appropriate aircraft checklist items relative to the phase of flight.

III. Air Traffic Control Clearances and Procedures

Task	***B. Holding Procedures***
References	14 CFR parts 61, 91; FAA-H-8083-15, FAA-H-8083-16; AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with holding procedures solely by reference to instruments.
Knowledge	The applicant demonstrates understanding of:
IP.III.B.K1	Elements related to holding procedures, including reporting criteria, appropriate speeds, aircraft configuration, and recommended entry procedures for published and non-published holding patterns.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.III.B.R1	Recalculating fuel reserves if assigned an unanticipated expect further clearance (EFC) time.
IP.III.B.R2	Scenarios and circumstances that could result in minimum fuel or the need to declare an emergency.
IP.III.B.R3	Scenarios that could lead to holding, including deteriorating weather at the planned destination.
IP.III.B.R4	Improper holding entry and improper wind correction while holding.
Skills	The applicant demonstrates the ability to:
IP.III.B.S1	Explain and use an entry procedure that ensures the aircraft remains within the holding pattern airspace for a standard, nonstandard, published, or non-published holding pattern.
IP.III.B.S2	Establish the holding airspeed and configuration appropriate for the altitude or aircraft when 3 minutes or less from, but prior to arriving at, the holding fix and set appropriate power as needed for fuel conservation.
IP.III.B.S3	Recognize arrival at the holding fix and promptly initiate entry into the holding pattern.
IP.III.B.S4	Maintain airspeed ±10 knots, altitude ±100 feet, selected headings within ±10°, and track a selected course, radial, or bearing within ¾-scale deflection of the CDI.
IP.III.B.S5	Use proper wind correction procedures to maintain the desired pattern and to arrive over the fix as close as possible to a specified time and maintain pattern leg lengths when specified.
IP.III.B.S6	Use an MFD and other graphical navigation displays, if installed, to monitor position in relation to the desired flightpath during holding.
IP.III.B.S7	Comply with ATC reporting requirements and restrictions associated with the holding pattern.
IP.III.B.S8	Demonstrate CRM/SRM.

IV. Flight by Reference to Instruments

Task	***A. Instrument Flight***
References	14 CFR part 61; FAA-8083-2, FAA-H-8083-15
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing basic flight maneuvers solely by reference to instruments.
Knowledge	The applicant demonstrates understanding of:
IP.IV.A.K1	Elements related to attitude instrument flying during straight-and-level flight, climbs, turns, descents, and configuration changes while conducting various instrument flight procedures.
IP.IV.A.K2	Interpretation, operation, and limitations of pitch, bank, and power instruments.
IP.IV.A.K3	Normal and abnormal instrument indications and operations.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.IV.A.R1	Situations that can affect physiology and degrade instrument cross-check.
IP.IV.A.R2	Spatial disorientation and optical illusions.
IP.IV.A.R3	Flying an unfamiliar aircraft, or operating with unfamiliar flight display systems and avionics.
Skills	The applicant demonstrates the ability to:
IP.IV.A.S1	Maintain altitude ±100 feet during level flight, selected headings ±10°, airspeed ±10 knots, and bank angles ±5° during turns.
IP.IV.A.S2	Use proper instrument cross-check and interpretation, and apply the appropriate pitch, bank, power, and trim corrections when applicable.

IV. Flight by Reference to Instruments

Task	***B. Recovery from Unusual Flight Attitudes***
References	14 CFR part 61; FAA-H-8083-15
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with recovering from unusual flight attitudes solely by reference to instruments.
Knowledge	The applicant demonstrates understanding of:
IP.IV.B.K1	Procedures for recovery from unusual flight attitudes.
IP.IV.B.K2	Upset prevention including unusual flight attitude causal factors, physiological factors, system and equipment failures, and environmental factors.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.IV.B.R1	Situations that could lead to loss of control or unusual flight attitudes (e.g., stress, task saturation, inadequate instrument scan, and distractions).
IP.IV.B.R2	The startle response and following an incorrect or abrupt recovery procedure.
Skills	The applicant demonstrates the ability to:
IP.IV.B.S1	Use proper instrument cross-check and interpretation to identify an unusual attitude (including both nose-high and nose-low), and apply the appropriate pitch, bank, power, and configuration changes, in the correct sequence, to return to a stabilized level flight attitude.

V. Navigation Systems

Task	***A. Intercepting and Tracking Navigational Systems and Arcs***
References	14 CFR parts 61, 91, 97; FAA-H-8083-15, FAA-H-8083-16; POH/AFM; AIM ***Note:*** *The evaluator must reference the manufacturer's equipment supplement(s) as necessary for appropriate limitations, procedures, etc.*
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with intercepting and tracking navigation aids and arcs solely by reference to instruments.
Knowledge	The applicant demonstrates understanding of:
IP.V.A.K1	Ground-based navigation (orientation, course determination, equipment, tests and regulations) including procedures for intercepting and tracking courses and arcs.
IP.V.A.K2	Satellite-based navigation (orientation, course determination, equipment, tests and regulations, interference, appropriate use of databases, Receiver Autonomous Integrity Monitoring (RAIM), and Wide Area Augmentation System (WAAS)) including procedures for intercepting and tracking courses and arcs.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.V.A.R1	Management and monitoring of automated navigation and autoflight systems.
IP.V.A.R2	Distractions, loss of situational awareness, and/or improper task management.
IP.V.A.R3	Limitations of the navigation system in use.
Skills	The applicant demonstrates the ability to:
IP.V.A.S1	Tune and correctly identify the navigation facility/program the navigation system and verify system accuracy as appropriate for the equipment installed in the airplane.
IP.V.A.S2	Determine airplane position relative to the navigational facility or waypoint.
IP.V.A.S3	Set and correctly orient to the course to be intercepted.
IP.V.A.S4	Intercept the specified course at appropriate angle, inbound to or outbound from a navigational facility or waypoint.
IP.V.A.S5	Maintain airspeed ±10 knots, altitude ±100 feet, and selected headings ±10°.
IP.V.A.S6	Apply proper correction to maintain a course, allowing no more than ¾-scale deflection of the CDI. If a DME arc is selected, maintain that arc ±1 nautical mile.
IP.V.A.S7	Recognize navigational system or facility failure, and when required, report the failure to ATC.
IP.V.A.S8	Use an MFD and other graphical navigation displays, if installed, to monitor position, track wind drift, and to maintain situational awareness.
IP.V.A.S9	Properly use the autopilot, if installed, to intercept courses.

V. Navigation Systems

Task	***B. Departure, En Route, and Arrival Operations***
References	14 CFR parts 61, 91, 97; FAA-H-8083-15, FAA-H-8083-16; AC 90-100, 91-74; POH/AFM; AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with IFR departure, en route, and arrival operations solely by reference to instruments. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
IP.V.B.K1	Elements related to ATC routes, including departure procedures (DPs) and associated climb gradients; arrival procedures (STARs) and associated constraints.
IP.V.B.K2	Pilot/controller responsibilities, communication procedures, and ATC services available to pilots.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.V.B.R1	Miscommunication with ATC or deviating from clearances and published procedures.
IP.V.B.R2	Recognition of limitations of traffic avoidance equipment.
IP.V.B.R3	Using see and avoid techniques when and where possible.
Skills	The applicant demonstrates the ability to:
IP.V.B.S1	Select, identify (as necessary) and use the appropriate communication and navigation facilities associated with the proposed flight.
IP.V.B.S2	Configure the aircraft and perform the appropriate airplane checklist items relative to the phase of flight.
IP.V.B.S3	Use the current and appropriate paper or electronic navigation publications.
IP.V.B.S4	Establish two-way communications with the proper controlling agency, use proper phraseology and comply, in a timely manner, with all ATC instructions and airspace restrictions as well as exhibit adequate knowledge of communication failure procedures.
IP.V.B.S5	Intercept all courses, radials, and bearings appropriate to the procedure, route, or clearance in a timely manner.
IP.V.B.S6	Comply with all applicable charted procedures.
IP.V.B.S7	Maintain airspeed ±10 knots, altitude ±100 feet, and selected headings ±10°, and apply proper correction to maintain a course allowing no more than ¾-scale deflection of the CDI.
IP.V.B.S8	Update/interpret weather in flight.
IP.V.B.S9	Explain and use flight deck displays of digital weather and aeronautical information, as applicable.
IP.V.B.S10	Demonstrate CRM/SRM.

VI. Instrument Approach Procedures

Task	***A. Nonprecision Approach***
References	14 CFR parts 61, 91; FAA-H-8083-15, FAA-H-8083-16; IFP, AIM, AC 120-108
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing nonprecision approach procedures solely by reference to instruments. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
IP.VI.A.K1	Procedures and limitations associated with a nonprecision approach.
IP.VI.A.K2	Navigation system indications and annunciations expected during a nonprecision approach.
IP.VI.A.K3	Advisory Vertical Guidance.
IP.VI.A.K4	Copter PinS approaches.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.VI.A.R1	Descending below the minimum descent altitude (MDA) without proper visual references.
IP.VI.A.R2	Deteriorating weather conditions on approach.
IP.VI.A.R3	An unstable approach, including excessive descent rates.
IP.VI.A.R4	Aircraft configuration during an approach and missed approach.
IP.VI.A.R5	Management and monitoring of automated navigation and autoflight systems.
Skills	The applicant demonstrates the ability to:
IP.VI.A.S1	Accomplish the nonprecision instrument approaches selected by the evaluator.
IP.VI.A.S2	Establish two-way communications with ATC appropriate for the phase of flight or approach segment, and use proper communication phraseology.
IP.VI.A.S3	Select, tune, identify, and confirm the operational status of navigation equipment to be used for the approach.
IP.VI.A.S4	Comply with all clearances issued by ATC or the evaluator.
IP.VI.A.S5	Recognize if any flight instrumentation is inaccurate or inoperative, and take appropriate action.
IP.VI.A.S6	Advise ATC or the evaluator if unable to comply with a clearance.
IP.VI.A.S7	Establish the appropriate aircraft configuration and airspeed considering turbulence and windshear, and complete the checklist items appropriate to the phase of the flight.
IP.VI.A.S8	Maintain altitude ±100 feet, selected heading ±10°, airspeed ±10 knots, prior to beginning the final approach segment.
IP.VI.A.S9	Apply adjustments to the published MDA and visibility criteria for the aircraft approach category, as appropriate, for factors that include NOTAMs, inoperative aircraft or navigation equipment, or inoperative visual aids associated with the landing environment, etc.
IP.VI.A.S10	Establish a stabilized descent to the appropriate altitude.
IP.VI.A.S11	For the final approach segment, maintain no more than a ¾-scale deflection of the CDI, maintain airspeed ±10 knots, and altitude, if applicable, above MDA, +100/-0 feet, to the Visual Descent Point (VDP) or Missed Approach Point (MAP).
IP.VI.A.S12	Execute the missed approach procedure if the required visual references for the intended runway are not distinctly visible and identifiable at the appropriate point or altitude for the approach profile.
IP.VI.A.S13	Execute a landing from a straight-in or circling approach as applicable to the aircraft and scenario as instructed by ATC or the evaluator.
IP.VI.A.S14	Use an MFD and other graphical navigation displays, if installed, to monitor position, track wind drift, and to maintain situational awareness.

VI. Instrument Approach Procedures

Task	***B. Precision Approach***
References	14 CFR parts 61, 91; FAA-H-8083-15, FAA-H-8083-16; IFP; AC 90-105, 90-107; AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing precision approach procedures solely by reference to instruments. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
IP.VI.B.K1	Procedures and limitations associated with a precision approach, including determining required descent rates and adjusting minimums in the case of inoperative equipment.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.VI.B.R1	Initiating the missed approach below Decision Altitude (DA)/Decision Height (DH) if the required visual references are not visible.
IP.VI.B.R2	Deteriorating weather conditions on approach.
IP.VI.B.R3	An unstable approach including excessive descent rates.
IP.VI.B.R4	Aircraft configuration during an approach and missed approach.
IP.VI.B.R5	Management and monitoring of automated navigation and autoflight systems.
Skills	The applicant demonstrates the ability to:
IP.VI.B.S1	Accomplish the precision instrument approach(es) selected by the evaluator.
IP.VI.B.S2	Establish two-way communications with ATC appropriate for the phase of flight or approach segment, and use proper communication phraseology.
IP.VI.B.S3	Select, tune, identify, and confirm the operational status of navigation equipment to be used for the approach.
IP.VI.B.S4	Comply with all clearances issued by ATC or the evaluator.
IP.VI.B.S5	Recognize if any flight instrumentation is inaccurate or inoperative, and take appropriate action.
IP.VI.B.S6	Advise ATC or the evaluator if unable to comply with a clearance.
IP.VI.B.S7	Establish the appropriate aircraft configuration and airspeed considering turbulence and windshear, and complete the checklist items appropriate to the phase of the flight.
IP.VI.B.S8	Maintain altitude ±100 feet, selected heading ±10°, airspeed ±10 knots, prior to beginning the final approach segment.
IP.VI.B.S9	Apply adjustments to the published DA/DH and visibility criteria for the aircraft approach category, as appropriate, for factors that include NOTAMs, Inoperative airplane or navigation equipment, or inoperative visual aids associated with the landing environment, etc.
IP.VI.B.S10	Establish a predetermined rate of descent at the point where vertical guidance begins, which approximates that required for the aircraft to follow the vertical guidance.
IP.VI.B.S11	Maintain a stabilized final approach from the Final Approach Fix (FAF) to DA/DH allowing no more than ¾-scale deflection of either the vertical or lateral guidance indications and maintain the desired airspeed ±10 knots.
IP.VI.B.S12	Immediately initiate the missed approach procedure when at the DA/DH, and the required visual references for the runway are not unmistakably visible and identifiable.
IP.VI.B.S13	Transition to a landing approach only when the aircraft is in a position from which a descent to a landing on the runway can be made at a normal rate of descent using normal maneuvers.
IP.VI.B.S14	Maintain a stabilized visual flight path from the DA/DH to the runway aiming point where an appropriate landing may be accomplished within the touchdown zone.
IP.VI.B.S15	Use an MFD and other graphical navigation displays, if installed, to monitor position, track wind drift, and to maintain situational awareness.

VI. Instrument Approach Procedures

Task	***C. Missed Approach***
References	14 CFR parts 61, 91; FAA-H-8083-15; IFP; AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing a missed approach procedure solely by reference to instruments.
Knowledge	The applicant demonstrates understanding of:
IP.VI.C.K1	Elements related to missed approach procedures and limitations associated with standard instrument approaches, including while using a FMS and/or autopilot, if equipped.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.VI.C.R1	Deviating from prescribed procedures.
IP.VI.C.R2	Holding, diverting, or electing to fly the approach again.
IP.VI.C.R3	Aircraft configuration during an approach and missed approach.
IP.VI.C.R4	Factors that might lead to executing a missed approach procedure before the missed approach point or to a go-around below the DA/DH or MDA.
IP.VI.C.R5	Management and monitoring of automated navigation and autoflight systems.
Skills	The applicant demonstrates the ability to:
IP.VI.C.S1	Initiate the missed approach promptly by applying power and configuring the aircraft to establish and maintain a climbing profile in accordance with the manufacturer's recommendations.
IP.VI.C.S2	Report to ATC upon beginning the missed approach procedure.
IP.VI.C.S3	Comply with the published or alternate missed approach procedure.
IP.VI.C.S4	Advise ATC or the evaluator if unable to comply with a clearance, restriction, or climb gradient.
IP.VI.C.S5	Follow the recommended checklist items appropriate to the missed approach/go-around procedure.
IP.VI.C.S6	Request, if appropriate, ATC clearance to the alternate airport, clearance limit, or as directed by the evaluator.
IP.VI.C.S7	Maintain the recommended airspeed ±10 knots; heading, course, or bearing ±10°; and altitude(s) ±100 feet during the missed approach procedure.
IP.VI.C.S8	Use an MFD and other graphical navigation displays, if installed, to monitor position and track to help navigate the missed approach.
IP.VI.C.S9	Demonstrate CRM/SRM.

VI. Instrument Approach Procedures

Task	***D. Circling Approach***
References	14 CFR parts 61, 91; FAA-H-8083-15; IFP; AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing a circling approach procedure.
Knowledge	The applicant demonstrates understanding of:
IP.VI.D.K1	Elements related to circling approach procedures and limitations including approach categories and related airspeed restrictions.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.VI.D.R1	Deviating from prescribed circling approach procedures.
IP.VI.D.R2	Executing a circling approach at night or with marginal visibility.
IP.VI.D.R3	Losing visual contact with an identifiable part of the airport.
IP.VI.D.R4	Management and monitoring of automated navigation and autoflight systems.
IP.VI.D.R5	Airspeed and aircraft configuration while circling.
IP.VI.D.R6	Low altitude maneuvering including stall, spin, or CFIT.
IP.VI.D.R7	Executing a missed approach after the MAP while circling.
Skills	The applicant demonstrates the ability to:
IP.VI.D.S1	Select and comply with the circling approach procedure considering turbulence, windshear, and the maneuvering capabilities of the airplane.
IP.VI.D.S2	Confirm the direction of traffic and adhere to all restrictions and instructions issued by ATC or the evaluator.
IP.VI.D.S3	Maneuver the aircraft, at or above the MDA, 90° or more from the final approach course, on a flightpath permitting a normal landing on a suitable runway.
IP.VI.D.S4	Avoid circling beyond visibility requirements and maintain the appropriate circling altitude until in a position from which a descent to a normal landing can be made.
IP.VI.D.S5	Establish the approach and landing configuration for the situation and maintain altitude +100/-0 feet until a descent to an appropriate landing can be made.
IP.VI.D.S6	Demonstrate CRM/SRM.

VI. Instrument Approach Procedures

Task	***E. Landing from an Instrument Approach***
References	14 CFR parts 61, 91; FAA-H-8083-15; AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing the procedures for a landing from an instrument approach.
Knowledge	The applicant demonstrates understanding of:
IP.VI.E.K1	Elements related to the pilot's responsibilities, and the environmental, operational, and meteorological factors that affect a decision to land from a straight-in or circling approach.
IP.VI.E.K2	Airport signs, markings and lighting, to include approach lighting systems.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.VI.E.R1	Attempting to land from an unstable approach.
IP.VI.E.R2	Flying below the glidepath.
IP.VI.E.R3	Transitioning from instrument to visual references for landing.
IP.VI.E.R4	Aircraft configuration for landing.
Skills	The applicant demonstrates the ability to:
IP.VI.E.S1	Transition at the DA/DH, MDA, or visual descent point VDP to a visual flight condition, allowing for safe visual maneuvering and an appropriate landing.
IP.VI.E.S2	Adhere to all ATC or evaluator advisories, such as NOTAMs, windshear, wake turbulence, runway surface, braking conditions, and other operational considerations.
IP.VI.E.S3	Complete the appropriate checklist.
IP.VI.E.S4	Maintain positive aircraft control throughout the landing maneuver.
IP.VI.E.S5	Demonstrate CRM/SRM.

VII. Emergency Operations

Task	***A. Loss of Communications***
References	14 CFR parts 61, 91; AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with loss of communications while operating solely by reference to instruments.
Knowledge	The applicant demonstrates understanding of:
IP.VII.A.K1	Procedures to follow in the event of lost communication during various phases of flight, including techniques for reestablishing communications, when it is acceptable to deviate from an IFR clearance, and when to begin an approach at the destination.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.VII.A.R1	Possible reasons for loss of communication.
IP.VII.A.R2	Deviation from procedures for lost communications.
Skills	The applicant demonstrates the ability to:
IP.VII.A.S1	Recognize loss of communication.
IP.VII.A.S2	Perform actions to re-establish communication.
IP.VII.A.S3	Determine whether to continue to flight plan destination or deviate.
IP.VII.A.S4	Determine appropriate time to begin an approach.
IP.VII.A.S5	Demonstrate CRM/SRM

VII. Emergency Operations

Task	***B. One Engine Inoperative during Straight-and-Level Flight and Turns (Multiengine Aircraft only)***
References	14 CFR 61; FAA-H-8083-3, FAA-H-8083-15
Objective	To determine the applicant exhibits satisfactory knowledge, risk management and skills associated with flight solely by reference to instruments with one engine inoperative.
Knowledge	The applicant demonstrates understanding of:
IP.VII.B.K1	Procedures used if engine failure occurs during straight-and-level flight and turns while on instruments.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.VII.B.R1	Identification of the inoperative engine.
IP.VII.B.R2	Inability to climb or maintain altitude with an inoperative engine.
IP.VII.B.R3	Low altitude maneuvering including CFIT, and stall/spin.
IP.VII.B.R4	Distractions, loss of situational awareness, and/or improper task management.
IP.VII.B.R5	Fuel management during single-engine operation.
Skills	The applicant demonstrates the ability to:
IP.VII.B.S1	Promptly recognize an engine failure and maintain positive aircraft control.
IP.VII.B.S2	Establish the best engine-inoperative aircraft configuration, speed, and trim.
IP.VII.B.S3	Use flight controls in the proper combination as recommended by the manufacturer, or as required to maintain best performance, and trim as required.
IP.VII.B.S4	Verify the prescribed checklist procedures normally used for securing the inoperative engine.
IP.VII.B.S5	Attempt to determine and resolve the reason for the engine failure.
IP.VII.B.S6	Monitor engine functions and make necessary adjustments.
IP.VII.B.S7	Maintain the specified altitude ±100 feet or minimum sink rate if applicable, airspeed ±10 knots, and the specified heading ±10°.
IP.VII.B.S8	Assess the aircraft's performance capability and decide an appropriate action to ensure a safe landing.
IP.VII.B.S9	Maintain control and fly within the aircraft one engine inoperative (OIE) operating limitations.
IP.VII.B.S10	Demonstrate CRM/SRM.

VII. Emergency Operations

Task	***C. Approach and Landing with an Inoperative Engine (Multi-Engine Aircraft only)*** ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
References	14 CFR parts 61,91; FAA-H-8083-3, FAA-H-8083-15, FAA-H-8083-21; IFP
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with executing a published instrument approach solely by reference to instruments with one engine inoperative.
Knowledge	The applicant demonstrates understanding of:
IP.VII.C.K1	Instrument approach procedures with one engine inoperative.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
IP.VII.C.R1	Plan for engine failure during approach.
IP.VII.C.R2	Distractions, loss of situational awareness, and/or improper task management.
IP.VII.C.R3	Single-engine performance.
Skills	The applicant demonstrates the ability to:
IP.VII.C.S1	Promptly recognize a engine failure and maintain positive aircraft control.
IP.VII.C.S2	Confirm the correct aircraft configuration.
IP.VII.C.S3	Use flight controls in the proper combination as recommended by the manufacturer, or as required to maintain best performance, and trim as required.
IP.VII.C.S4	Follow the manufacturer's recommended emergency procedures.
IP.VII.C.S5	Monitor the operating engine and electrical system and make adjustments as necessary.
IP.VII.C.S6	Request and follow an actual or a simulated ATC clearance for an instrument approach.
IP.VII.C.S7	Maintain altitude ±100 feet, airspeed ±10 knots, and selected heading ±10°.
IP.VII.C.S8	Establish a rate of descent that will ensure arrival at the MDA or DA/DH with the aircraft in a position from which a descent to a landing on the intended runway can be made, either straight in or circling as appropriate.
IP.VII.C.S9	On final approach segment, maintain vertical (as applicable) and lateral guidance within ¾-scale deflection.
IP.VII.C.S10	Maintain aircraft control and fly the aircraft within the OEI operating limitations.
IP.VII.C.S11	Comply with the published criteria for the aircraft approach category if circling.
IP.VII.C.S12	Terminate the approach as directed by the evaluator or ATC.
IP.VII.C.S13	Complete the appropriate checklist.
IP.VII.C.S14	Demonstrate CRM/SRM

VII. Emergency Operations

Task	***D. Approach with Loss of Primary Flight Instrument Indicators***
References	14 CFR parts 61, 91; FAA-H-8083-15; IFP
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing an approach solely by reference to instruments with the loss of primary flight control instruments.
Knowledge	The applicant demonstrates understanding of:
IP.VII.D.K1	Indications that primary flight instruments are inaccurate or inoperative, and then need to advise ATC or the evaluator.
IP.VII.D.K2	Failure modes of primary instruments and how to correct or minimize the effect of their loss.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IP.VII.D.R1	Use of secondary flight displays when primary displays have failed.
IP.VII.D.R2	Failure to maintain aircraft control.
IP.VII.D.R3	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
IP.VII.D.S1	Advise ATC or the evaluator of if unable to comply with a clearance.
IP.VII.D.S2	Complete a nonprecision instrument approach without the use of the primary flight instruments using the skill elements of the nonprecision approach Task (See Area of Operation VI, Task A).
IP.VII.D.S3	Demonstrate CRM/SRM.

VIII. Postflight Procedures

Task	***A. Checking Instruments and Equipment***
References	14 CFR parts 61, 91; POH/AFM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with checking flight instruments and equipment during postflight.
Knowledge	The applicant demonstrates understanding of:
IR.VIII.A.K1	Procedures for checking the functionality of all installed instruments and navigation equipment.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IR.VIII.A.R1	Performing a postflight inspection and documenting aircraft discrepancies.
Skills	The applicant demonstrates the ability to:
IR.VIII.A.S1	Conduct a postflight inspection, and document discrepancies and servicing requirements, if any.

Appendix Table of Contents

Appendix 1: The Knowledge Test Eligibility, Prerequisites, and Testing Centers

Knowledge Test Description

The knowledge test is an important part of the airman certification process. Applicants must pass the knowledge test before taking the practical test.

The knowledge test consists of objective, multiple-choice questions. There is a single correct response for each test question. Each test question is independent of other questions. A correct response to one question does not depend upon, or influence, the correct response to another.

Knowledge Test Tables

Test Code	Test Name	Number of Questions	Age	Allotted Time	Passing Score
FIPL	Flight Instructor Powered-Lift				
IFP	Instrument Rating Foreign Pilot	50	n/a	2.5	70
IGI	Ground Instructor Instrument	50	16	2.5	70
IRPL	Instrument Rating Powered-Lift				

*See Rating Table in Appendix 4: The Practical Test – Eligibility and Prerequisites.

Knowledge Test Blueprint

IRA Knowledge Areas Required by 14 CFR part 61, section 61.65 to be on the Knowledge Test	Percent of Questions Per Test
Regulations	15%
IFR En Route and Approach Procedures	15%
Air Traffic Control and Procedures	15%
IFR Navigation	15%
Weather Reports, Critical Weather, Windshear and Forecasts	15%
Safe and Efficient IFR Operations	15%
Aeronautical Decision-Making	5%
Crew Resource Management (CRM)	5%
Total Number of Questions	60

English Language Standard

In accordance with the requirements of 14 CFR part 61, section 61.65(a)(2) the applicant must demonstrate the ability to read, write, speak, and understand the English language throughout the application and testing process. English language proficiency is required to communicate effectively with Air Traffic Control (ATC), to comply with ATC instructions, and to ensure clear and effective crew communication and coordination. Normal restatement of questions as would be done for a native English speaker is permitted, and does not constitute grounds for disqualification. The FAA Aviation English Language Standard (AELS) is the FAA evaluator's benchmark. It requires the applicant to demonstrate at least the International Civil Aviation Organization (ICAO) level 4 standard.

Knowledge Test Requirements

- 14 CFR part 61, section 61.35 lists the prerequisites for taking the knowledge test, to include the minimum age an applicant must be to take the test—15 years of age.

- In order to take the IRPL Knowledge Test, you must provide proper identification. To verify your eligibility to take the test, you must also provide the following in accordance with the requirements of 14 CFR part 61:
    - An endorsement, if required, from an authorized instructor certifying that you accomplished the appropriate ground-training or a home-study course required for the instrument rating and you are prepared for the knowledge test;
    - Proper identification (current at the time of application) that contains your—
        - (i) Photograph;
        - (ii) Signature;
        - (iii) Date of birth; and
        - (iv) If the permanent mailing address is a post office box number, then your residential address as shown on a proper document.

Refer to the Applicant Identification, Information Verification, & Authorization Requirements Matrix, https://www.faa.gov/training_testing/testing/media/testing_matrix.pdf, for what constitutes a proper identification or address document.

- 14 CFR part 61, section 61.49 acceptable forms of retest authorization for **all** Instrument Rating tests:
    - An applicant retesting **after failure** is required to submit the applicable Airman Knowledge Test Report indicating failure, along with an endorsement from an authorized instructor who gave the applicant the required additional training. The endorsement must certify that the applicant is competent to pass the test. The test proctor must retain the original failed Airman Knowledge Test Report presented as authorization and attach it to the applicable sign-in/out log.

        Note: *If the applicant no longer possesses the original Airman Knowledge Test Report, he or she may request a duplicate replacement issued by the Airmen Certification Branch.*

- Acceptable forms of authorization for an Instrument Rating Canadian Conversion, when available (ICP) only:
    - Confirmation of Verification Letter issued by the Office of Foundational Business, Civil Aviation Division, Airmen Certification Branch (Knowledge Testing Authorization Requirements Matrix).
    - Requires **no** instructor endorsement or other form of written authorization.

Knowledge Test Centers

The FAA authorizes hundreds of knowledge testing center locations that offer a full range of airman knowledge tests. For information on authorized testing centers and to register for the knowledge test, contact one of the providers listed at www.faa.gov.

Knowledge Test Registration

When you contact a knowledge testing center to register for a test, please be prepared to select a test date, choose a testing center, and make financial arrangements for test payment when you call. You may register for test(s) several weeks in advance, and you may cancel in accordance with the testing center's cancellation policy.

Appendix 2: Knowledge Test Procedures and Tips

Before starting the actual test, the testing center will provide an opportunity to practice navigating through the test. This practice or tutorial session may include sample questions to familiarize the applicant with the look and feel of the software. (e.g., selecting an answer, marking a question for later review, monitoring time remaining for the test, and other features of the testing software.)

Acceptable Materials

The applicant may use the following aids, reference materials, and test materials, as long as the material does not include actual test questions or answers:

Acceptable Materials	Unacceptable Materials	Notes
Supplement book provided by proctor	Written materials that are handwritten, printed, or electronic	Testing centers may provide calculators and/or deny the use of personal calculators.
All models of aviation-oriented calculators or small electronic calculators that perform only arithmetic functions	Electronic calculators incorporating permanent or continuous type memory circuits without erasure capability.	Unit Member (proctor) may prohibit the use of your calculator if he or she is unable to determine the calculator's erasure capability
Calculators with simple programmable memories, which allow addition to, subtraction from, or retrieval of one number from the memory; or simple functions, such as square root and percentages	Magnetic Cards, magnetic tapes, modules, computer chips, or any other device upon which pre-written programs or information related to the test can be stored and retrieved	Printouts of data must be surrendered at the completion of the test if the calculator incorporates this design feature.
Scales, straightedges, protractors, plotters, navigation computers, blank log sheets, holding pattern entry aids, and electronic or mechanical calculators that are directly related to the test	Dictionaries	Before, and upon completion of the test, while in the presence of the Unit Member, actuate the ON/OFF switch or RESET button, and perform any other function that ensures erasure of any data stored in memory circuits
Manufacturer's permanently inscribed instructions on the front and back of such aids, e.g., formulas, conversions, regulations, signals, weather data, holding pattern diagrams, frequencies, weight and balance formulas, and air traffic control procedures	Any booklet or manual containing instructions related to use of test aids	Unit Member makes the final determination regarding aids, reference materials, and test materials

Test Tips

When taking a knowledge test, please keep the following points in mind:

- Carefully read the instructions provided with the test.
- Answer each question in accordance with the latest regulations and guidance publications.
- Read each question carefully before looking at the answer options. You should clearly understand the problem before trying to solve it.
- After formulating a response, determine which answer option corresponds with your answer. The answer you choose should completely solve the problem.
- Remember that only one answer is complete and correct. The other possible answers are either incomplete or erroneous.

- If a certain question is difficult for you, mark it for review and return to it after you have answered the less difficult questions. This procedure will enable you to use the available time to maximum advantage.
- When solving a calculation problem, be sure to read all the associated notes.
- For questions involving use of a graph, you may request a printed copy that you can mark in computing your answer. This copy and all other notes and paperwork must be given to the testing center upon completion of the test.

Cheating or Other Unauthorized Conduct

To avoid test compromise, computer testing centers must follow strict security procedures established by the FAA and described in FAA Order 8080.6 (as amended), Conduct of Airman Knowledge Tests. The FAA has directed testing centers to terminate a test at any time a test unit member suspects that a cheating incident has occurred.

The FAA will investigate and, if the agency determines that cheating or unauthorized conduct has occurred, any airman certificate or rating you hold may be revoked. You will also be prohibited from applying for or taking any test for a certificate or rating under 14 CFR part 61 for a period of 1 year.

Testing Procedures for Applicants Requesting Special Accommodations

An applicant with learning or reading disability may request approval from the Airman Testing Branch through the local Flight Standards District Office (FSDO) or International Field Office/International Field Unit (IFO/IFU) to take airman knowledge test using one of the three options listed below, in preferential order:

Option 1: Use current testing facilities and procedures whenever possible.

Option 2: Use a self-contained, electronic device which pronounces and displays typed-in words (e.g., the Franklin Speaking Wordmaster®) to facilitate the testing process.

Note: *The device should consist of an electronic thesaurus that audibly pronounces typed-in words and presents them on a display screen. The device should also have a built-in headphone jack in order to avoid disturbing others during testing.*

Option 3: Request the proctor's assistance in reading specific words or terms from the test questions and/or supplement book. To prevent compromising the testing process, the proctor must be an individual with no aviation background or expertise. The proctor may provide reading assistance only (i.e., no explanation of words or terms). When an applicant requests this option, the FSDO or IFO/IFU inspector must contact the Airman Testing Branch for assistance in selecting the test site and assisting the proctor. Before approving any option, the FSDO or IFO/IFU inspector must advise the applicant of the regulatory certification requirement to be able to read, write, speak, and understand the English language.

Appendix 3: Airman Knowledge Test Report

Immediately upon completion of the knowledge test, the applicant receives a printed Airman Knowledge Test Report (AKTR) documenting the score with the testing center's raised, embossed seal. The applicant must retain the original AKTR. The instructor must provide instruction in each area of deficiency and provide a logbook endorsement certifying that the applicant has demonstrated satisfactory knowledge in each area. When taking the practical test, the applicant must present the original AKTR to the evaluator, who is required to assess the noted areas of deficiency during the oral portion of the practical test.

An AKTR expires 24 calendar months after the month the applicant completes the knowledge test. If the AKTR expires before completion of the practical test, the applicant must retake the knowledge test.

To obtain a duplicate AKTR due to loss or destruction of the original, the applicant can send a signed request accompanied by a check or money order for $12.00, payable to the FAA to the following address:

Federal Aviation Administration
Airmen Certification Branch
P.O. Box 25082
Oklahoma City, OK 73125

To obtain a copy of the application form or a list of the information required, please see the Airmen Certification Branch webpage.

FAA Knowledge Test Question Coding

Each Task in the ACS includes an ACS code. This ACS code will ultimately be displayed on the AKTR to indicate what Task element was proven deficient on the knowledge test. Instructors can then provide remedial training in the deficient areas, and evaluators can re-test this element during the practical test.

The ACS coding consists of four elements. For example, this code is interpreted as follows:

IP.I.C.K4:

IP = Applicable ACS (Instrument Rating – Powered-Lift)
I = Area of Operation (Preflight Preparation)
C = Task (Cross-Country Flight Planning)
K4 = Task Element Knowledge 4 (Elements of an IFR flight plan.)

Knowledge test questions are linked to the ACS codes, which will ultimately replace the system of Learning Statement Codes (LSC). After this transition occurs, the AKTR will list an ACS code that correlates to a specific Task element for a given Area of Operation and Task. Remedial instruction and re-testing will be specific, targeted, and based on specified learning criteria. Similarly, a Notice of Disapproval for the practical test will use the ACS codes to identify the deficient Task elements.

The current knowledge test management system does not have the capability to print ACS codes. Until a new test management system is in place, the LSC (e.g., “PLT058”) code will continue to be displayed on the AKTR. The LSC codes are linked to references leading to broad subject areas. By contrast, each ACS code is tied to a unique Task element in the ACS itself. Because of this fundamental difference, there is no one-to-one correlation between LSC codes and ACS codes.

Because all active knowledge test questions for the Instrument Rating Powered-Lift (IRPL) knowledge test have been aligned with the corresponding ACS, evaluators can continue to use LSC codes in conjunction with the ACS for the time being. The evaluator should look up the LSC code(s) on the applicant’s AKTR in the Learning Statement Reference Guide available at the following link: Learning Statement Reference Guide. After noting the subject area(s), the evaluator can use the corresponding Area(s) of Operation/Task(s) in the ACS to narrow the scope of material for retesting, and to evaluate the applicant’s understanding of that material in the context of the appropriate ACS Area(s) of Operation and Task(s). Applicant’s and evaluators should use the ACS document in effect at the time the knowledge test was administered once ACS codes are listed on the AKTR.

The Applicant Name Considerations for the Airman Knowledge Test Report (AKTR) and the Practical Test Application Form

The applicant uses his or her full legal name on the Airman Certificate and/or Rating Application, FAA Form 8710-1, using up to 50 characters (including spaces). The applicant may exclude some middle names as necessary to meet the 50-character limit. The AKTR may not reflect the applicant's full legal name and may differ slightly from the name presented for the practical test.

If the 8710-1 shows a middle name, the AKTR may show that middle name, the correct middle initial, or no entry. The application will process correctly using the Integrated Airman Certificate and Rating Application (IACRA) system, and the Airmen Certification Branch will accept it. If an incorrect middle initial, spelling variant or different middle name is on the AKTR, or if the AKTR has a first name variation of any kind, the evaluator must attach an explanation and a scan or copy of the applicant's photo identification and attach it to the IACRA or paper application. If the last name on the AKTR has a different spelling or suffix, an IACRA application is not possible. The applicant must use a paper application, and the evaluator must include an explanation and copy of the applicant's photo identification to avoid a correction notice.

Appendix 4: The Practical Test – Eligibility and Prerequisites

The prerequisite requirements and general eligibility for a practical test and the specific requirements for the original issuance of an instrument rating in the airplane can be found in 14 CFR part 61, sections 61.39 and 61.65.

If an applicant holds both single-engine and multiengine class ratings on a pilot certificate and takes the instrument rating practical test in a single-engine airplane, the certificate issued must bear the limitation "Multiengine Limited to VFR Only." If the applicant takes the test in a multiengine airplane, the instrument privileges will be automatically conferred for the airplane single-engine rating.

Additional Instrument Rating Desired

If you hold an instrument rating in another category and seek to add an Instrument – Powered-lift rating, you are required to complete the Task(s) indicated in the following table. Do not duplicate a Task not listed in a column for the category in which the instrument rating is currently held for applicants holding both categories (airplane and rotorcraft-helicopter). For example, an applicant with an instrument airplane and instrument helicopter ratings, would not need to test Area of Operation VII, Task D.

Area of Operation	Required Task(s) for holders of Instrument Airplane	Required Task(s) for holders of Instrument Helicopter
I	None	None
II	A,C	A,C
III	None	None
IV	All	All
V	None	None
VI	A,B,C,E	All
VII	B,C,D	B,C,D
VIII	All	All

Appendix 5: Practical Test Roles, Responsibilities, and Outcomes

Applicant Responsibilities

The applicant is responsible for mastering the established standards for knowledge, risk management, and skill elements in all Tasks appropriate to the certificate and rating sought. The applicant should use this ACS, its references, and the Applicant's Practical Test Checklist in this Appendix in preparation to take the practical test.

Instructor Responsibilities

The instructor is responsible for training the applicant to meet the established standards for knowledge, risk management, and skill elements in all Tasks appropriate to the certificate and rating sought. The instructor should use this ACS and its references as part of preparing the applicant to take the practical test and, if necessary, in retraining the applicant to proficiency in all subject(s) missed on the knowledge test.

Evaluator Responsibilities

An evaluator is:

- Aviation Safety Inspector (ASI);
- Pilot examiner (other than administrative pilot examiners);
- Training center evaluator (TCE);
- Chief instructor, assistant chief instructor or check instructor of pilot school holding examining authority; or
- Instrument Flight Instructor (CFII) conducting an instrument proficiency check (IPC).

The evaluator who conducts the practical test is responsible for determining that the applicant meets the established standards of aeronautical knowledge, risk management, and skills (flight proficiency) for the Tasks in the appropriate ACS. This responsibility also includes verifying the experience requirements specified for a certificate or rating.

Prior to beginning the practical test, the evaluator must also determine that the applicant meets FAA Aviation English Language Proficiency Standards by verifying that he or she can understand ATC instructions and communicate in English at a level that is understandable to ATC and other pilots. The evaluator should use the procedures outlined in the AC 60-28, English Language Skill Standard required by 14 CFR parts 61, 63, 65, and 107, as amended, when evaluating the applicant's ability to meet the standard.

The evaluator must develop a Plan of Action (POA), written in English, to conduct the practical test. It must include all of the required Areas of Operation and Tasks. The POA must include a scenario that evaluates as many of the required Areas of Operation and Tasks as possible. As the scenario unfolds during the test, the evaluator will introduce problems and emergencies that the applicant must manage. The evaluator has the discretion to modify the POA in order to accommodate unexpected situations as they arise. For example, the evaluator may elect to suspend and later resume a scenario in order to assess certain Tasks.

In the integrated ACS framework, the Areas of Operation contain Tasks that include "Knowledge" elements (such as K1), "risk management" elements (such as R1), and "skill" elements (such as S1). Knowledge and risk management elements are primarily evaluated during the knowledge testing phase of the airman certification process. The evaluator must assess the applicant on all skill elements for each Task included in each Area of Operation of the ACS, unless otherwise noted. The evaluator administering the practical test has the discretion to combine Tasks/elements as appropriate to testing scenarios.

The required minimum elements to include in the POA, unless otherwise noted, from each applicable Task are as follows:

- at least one knowledge element;
- at least one risk management element;
- all skill elements; and
- any Task elements in which the applicant was shown to be deficient on the knowledge test.

Note: *Task elements added to the POA on the basis of being listed on the AKTR may satisfy the other minimum Task element requirements. The missed items on the AKTR are not required to be added in addition to the minimum Task element requirements.*

There is no expectation for testing every knowledge element and risk management element in a Task, but the evaluator has discretion to sample as many as needed to ensure the applicant's mastery of that Task.

Unless otherwise noted in the Task, the evaluator must test each item in the skills section by asking the applicant to perform each one. As safety of flight conditions permit, the evaluator may use questions during flight to test knowledge and risk management elements not evident in the demonstrated skills. To the greatest extent practicable, evaluators must test the applicant's ability to apply and correlate information, and use rote questions only when they are appropriate for the material being tested. If the Task includes an element with sub-elements, the evaluator may choose the primary element and select at least one sub-element to satisfy the requirement that at least one knowledge element be selected, For example, if the evaluator chooses IP.I.B.K3, he or she must select a sub-element like IP.I.B.K3d to satisfy the requirement to select one knowledge element.

Possible Outcomes of the Test

There are three possible outcomes of the practical test: (1) Temporary Airman Certificate (satisfactory), (2) Notice of Disapproval (unsatisfactory), or (3) Letter of Discontinuance.

If the evaluator determines that a Task is incomplete, or the outcome is uncertain, the evaluator may require the applicant to repeat that Task, or portions of that Task. This provision does not mean that instruction, practice, or the repetition of an unsatisfactory Task is permitted during the practical test.

If the evaluator determines the applicant's skill and abilities are in doubt, the outcome is unsatisfactory and the evaluator must issue a Notice of Disapproval.

Satisfactory Performance

Satisfactory performance requires that the applicant:

- demonstrate the Tasks specified in the Areas of Operation for the certificate or rating sought within the established standards;
- demonstrate mastery of the aircraft by performing each Task successfully;
- demonstrate proficiency and competency in accordance with the approved standards;
- demonstrate sound judgment and exercise aeronautical decision-making/risk management; and
- demonstrate competence in crew resource management in aircraft certificated for more than one required pilot crewmember, or single-pilot competence in an airplane that is certificated for single-pilot operations.

Satisfactory performance will result in the issuance of a temporary certificate.

Unsatisfactory Performance

Typical areas of unsatisfactory performance and grounds for disqualification include:

- Any action or lack of action by the applicant that requires corrective intervention by the evaluator to maintain safe flight.
- Failure to use proper and effective visual scanning techniques to clear the area before and while performing maneuvers.
- Consistently exceeding tolerances stated in the skill elements of the Task.
- Failure to take prompt corrective action when tolerances are exceeded.
- Failure to exercise risk management.

If, in the judgment of the evaluator, the applicant does not meet the standards for any Task, the applicant fails the Task and associated Area of Operation. The test is unsatisfactory, and the evaluator issues a Notice of Disapproval. The evaluator lists the Area(s) of Operation in which the applicant did not meet the standard, any Area(s) of Operation not tested, and the number of practical test failures. The evaluator should also list the Tasks failed or Tasks not tested within any unsatisfactory or partially completed Area(s) of Operation. If the applicant's

inability to meet English language requirements contributed to the failure of a Task, the evaluator must note “English Proficiency” on the Notice of Disapproval.

The evaluator or the applicant may end the test if the applicant fails a Task. The evaluator may continue the test only with the consent of the applicant, and the applicant is entitled to credit only for those Areas of Operation and the associated Tasks performed satisfactorily.

Discontinuance

When it is necessary to discontinue a practical test for reasons other than unsatisfactory performance (e.g., equipment failure, weather, illness), the evaluator must return all test paperwork to the applicant. The evaluator must prepare, sign, and issue a Letter of Discontinuance that lists those Areas of Operation the applicant successfully completed and the date the test must be completed. The evaluator should advise the applicant to present the Letter of Discontinuance to the evaluator when the practical test resumes in order to receive credit for the items successfully completed. The Letter of Discontinuance becomes part of the applicant's certification file.

Testing after Discontinuance or Unsatisfactory Performance

To avoid having to retake the entire practical test, an applicant has 60 days from the date of a first failure or Letter of Discontinuance to pass the practical test. The evaluator’s POA must include any unsatisfactory or untested Area(s) of Operation and Task(s) as indicated on the current Notice of Disapproval or Letter of Discontinuance. While an applicant may receive credit for any Task(s) successfully completed within a failed or partially tested Area of Operation, the evaluator has discretion to reevaluate any Task(s). In the event an ACS revision is published while an applicant possesses a valid Letter of Discontinuance or Notice if Disapproval showing credit for Areas of Operation previously passed, evaluators and applicants should continue to use the ACS in effect on the start date of the test cycle. When an applicant is tested or retested without previous credit, transition to the current ACS.

Practical Test Checklist (Applicant)
Appointment with Evaluator

Evaluator's Name: _____

Location: _____

Date/Time: _____

Acceptable Aircraft

- ☐ Aircraft Documents:
  - ☐ Airworthiness Certificate
  - ☐ Registration Certificate
  - ☐ Operating Limitations
- ☐ Aircraft Maintenance Records:
  - ☐ Logbook Record of Airworthiness Inspections and AD Compliance
- ☐ Pilot's Operating Handbook, FAA-Approved Aircraft Flight Manual

Personal Equipment

- ☐ View-Limiting Device
- ☐ Current Aeronautical Charts (May be electronic)
- ☐ Computer and Plotter
- ☐ Flight Plan Form
- ☐ Flight Plan Form and Flight Logs (printed or electronic)
- ☐ Chart Supplements, Airport Diagrams and Appropriate Publications (regulations, AIM, etc.)

Personal Records

- ☐ Identification—Photo/Signature ID
- ☐ Pilot Certificate
- ☐ Current Medical Certificate or BasicMed qualification
- ☐ Completed FAA Form 8710-1, Airman Certificate and/or Rating Application with Instructor's Signature or completed IACRA form
- ☐ Original Airman Knowledge Test Report
- ☐ Pilot Logbook with appropriate Instructor Endorsements
- ☐ FAA Form 8060-5, Notice of Disapproval (if applicable)
- ☐ Letter of Discontinuance (if applicable)
- ☐ Approved School Graduation Certificate (if applicable)
- ☐ Evaluator's Fee (if applicable)

Instrument Proficiency Check

14 CFR part 61, section 61.57(d) sets forth the requirements for an instrument proficiency check (IPC). Instructors and evaluators conducting an IPC must ensure the pilot meets the standards established in this ACS. A representative number of Tasks must be selected to assure the competence of the applicant to operate in the IFR environment. As a minimum, the applicant must demonstrate the ability to perform the Tasks listed in the table below. The person giving the check should develop a scenario that incorporates as many required Tasks as practical to assess the pilot's ADM and risk management skills.

Guidance on how to conduct an IPC is found in Advisory Circular 61-98, *Currency Requirements and Guidance for the Flight Review and Instrument Proficiency Check*. You may obtain a copy at www.faa.gov.

Area of Operation	IPC (Proficiency Check)[1]
I	None
II	None
III	B
IV	B
V	A
VI	All
VII[1,2]	B, C, D
VIII	All

[1] AATDs can be utilized for the majority of the IPC as specified in the Letter of Authorization issued for the device. However, the circling approach, and the landing Tasks must be accomplished in an aircraft or FFS (Level B, C, or D). A BATD cannot be used for any part of the IPC.

[2] Tasks B and C are applicable only to multiengine powered-lifts.

Appendix 6: Safety of Flight

General

Safety of flight must be the prime consideration at all times. The evaluator, applicant, and crew must be constantly alert for other traffic. The evaluator will assess the applicant's use of visual scanning and collision avoidance procedures throughout the entire test.

If performing aspects of a given maneuver, would jeopardize safety, the evaluator will ask the applicant to simulate that portion of the maneuver. Emergency Operations involving engine failure in Area of Operation VII in an aircraft do not require the actual shutdown of an engine. In the event of an actual loss of communication, engine failure, or instrument failure in the aircraft, an actual emergency exists, and the check must be suspended while the applicant and evaluator deal with the emergency to terminate the flight appropriately and safely. conclusion.

Stall and Spin Awareness

During flight training and testing, the applicant and the instructor or evaluator must always recognize and avoid operations that could lead to an inadvertent stall or spin.

Use of Checklists

Throughout the practical test, the applicant is evaluated on the use of an appropriate checklist.

Assessing proper checklist use depends upon the specific Task. In all cases, the evaluator should determine whether the applicant appropriately divides attention and uses proper visual scanning. In some situations, reading the actual checklist may be impractical or unsafe. In such cases, the evaluator should assess the applicant's performance of published or recommended immediate action "memory" items along with his or her review of the appropriate checklist once conditions permit.

When piloting a powered-lift as a single-pilot, the applicant should demonstrate the crew resource management (CRM) principles described as single-pilot resource management (SRM). Proper use is dependent on the specific Task being evaluated. The situation may be such that the use of the checklist while accomplishing elements of an Objective would be either unsafe or impractical in a single-pilot operation. In this case, a review of the checklist after the elements have been accomplished is appropriate. Use of a checklist should also consider visual scanning and division of attention at all times.

Use of Distractions

Numerous studies indicate that many accidents have occurred when the pilot has been distracted during critical phases of flight. The evaluator should incorporate realistic distractions during the flight portion of the practical test to evaluate the pilot's situational awareness and ability to utilize proper control technique while dividing attention both inside and outside the flight deck.

Positive Exchange of Flight Controls

There must always be a clear understanding of who has control of the aircraft. Prior to flight, the pilots involved should conduct a briefing that includes reviewing the procedures for exchanging flight controls.

The FAA recommends a positive three-step process for exchanging flight controls between pilots:

- When one pilot seeks to have the other pilot take control of the aircraft, he or she will say, "You have the flight controls."
- The second pilot acknowledges immediately by saying, "I have the flight controls."
- The first pilot again says, "You have the flight controls," and visually confirms the exchange.

Pilots should follow this procedure during any exchange of flight controls, including any occurrence during the practical test. The FAA also recommends that both pilots use a visual check to verify that the exchange has occurred. There must never be any doubt as to who is flying the aircraft.

Aeronautical Decision-Making, Risk Management, Crew Resource Management and Single-Pilot Resource Management

Throughout the practical test, the evaluator must assess the applicant's ability to use sound aeronautical decision-making procedures in order to identify hazards and mitigate risk. The evaluator must accomplish this requirement by reference to the risk management elements of the given Task(s), and by developing scenarios that incorporate and combine Tasks appropriate to assessing the applicant's risk management in making safe aeronautical decisions. For example, the evaluator may develop a scenario that incorporates weather decisions and performance planning.

In assessing the applicant's performance, the evaluator should take note of the applicant's use of CRM and, if appropriate, SRM. CRM/SRM is the set of competencies that includes situational awareness, communication skills, teamwork, task allocation, and decision-making within a comprehensive framework of standard operating procedures (SOP). SRM specifically refers to the management of all resources onboard the aircraft as well as outside resources available to the single pilot.

Deficiencies in CRM/SRM almost always contribute to the unsatisfactory performance of a Task. While evaluation of CRM/SRM may appear to be somewhat subjective, the evaluator should use the risk management elements of the given Task(s) to determine whether the applicant's performance of the Task(s) demonstrates both understanding and application of the associated risk management elements.

Multiengine Considerations

There is no deliberate engine shutdown in the instrument rating practical test. For tests conducted in a multiengine powered-lift, the evaluator must discuss with the applicant during the required preflight briefing the methods for simulating an engine failure in accordance with the aircraft manufacturer's recommended procedures.

Practical tests conducted in an FSTD can only be accomplished as part of an approved curriculum or training program. Any limitations for engine failure will be noted in that program.

Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations

Aircraft Requirements & Limitations

14 CFR part 61, section 61.45 prescribes the required aircraft and equipment for a practical test. The regulation states the minimum aircraft registration and airworthiness requirements as well as the minimum equipment requirements, to include the minimum required controls.

If the aircraft presented for the practical test has inoperative instruments or equipment, it must be addressed in accordance with 14 CFR part 91, section 91.213. If the aircraft can be operated in accordance with 14 CFR part 91, section 91.213, then it must be determined if the inoperative instruments or equipment are required to complete the practical test.

Equipment Requirements & Limitations

The equipment examination should be administered before the flight portion of the practical test, but it must be closely coordinated and related to the flight portion. In a training core curriculum that has been approved under 14 CFR part 142, the evaluator may accept written evidence of the equipment exam, provided that the Administrator has approved the exam and authorized the individual who administers it. 14 CFR Part 61 requires the aircraft must:

- Be of U.S., foreign, or military registry of the same category, class and type, if applicable, for the certificate and/or rating for which the applicant is applying.
- Have fully functional dual controls, except as provided for in 14 CFR part 61, section, 61.45 (c) and (e); and
- Be capable of performing all Areas of Operation appropriate to the rating sought and have no operating limitations, which prohibit its use in any of the Area of Operation, required for the practical test.

Consistent with 14 CFR part 61, section 61.45 (b) and (d), the aircraft must have:

- the flight instruments necessary for controlling the aircraft without outside references,
- the radio equipment required for ATC communications, and
- the ability to perform instrument approach procedures
- GPS equipment must be instrument certified and contain the current database.

To assist in management of the aircraft during the practical test, the applicant is expected to demonstrate automation management skills by utilizing installed equipment such as autopilot, avionics and systems displays, and/or a flight management system (FMS). The evaluator is expected to test the applicant's knowledge of the systems that are installed and operative during both the oral and flight portions of the practical test. If the applicant has trained using a class 1 or class 2 EFB to display charts and data, and wishes to use the EFB during the practical test, the applicant is expected to demonstrate appropriate knowledge, risk management, and skill.

If the practical test is conducted in an aircraft, the applicant is required by 14 CFR part 61, section 61.45(d)(2) to provide an appropriate view limiting device acceptable to the evaluator. The applicant and the evaluator should establish a procedure as to when and how this device should be donned and removed, and brief this procedure before the flight. The device must be used during all testing that has flight "solely by reference to instruments" included as part of the Task objective. This device must prevent the applicant from having visual reference outside the aircraft, but it must not restrict the evaluator's ability to see and avoid other traffic. The use of the device does not apply to specific elements within a Task when there is a requirement for visual references.

Operational Requirements, Limitations, & Task Information

V. Navigation Systems

While the applicant is expected to be able to fly DME Arcs, they may be selected for testing only if they are charted and available.

VI. Instrument Approach Procedures

Stabilized Approach Criteria

A stabilized approach is characterized by a constant angle, constant rate of descent approach profile ending near the touchdown point, where the landing maneuver begins.

Use of RNAV or GPS System

If the practical test is conducted in an airplane equipped with an approach-approved RNAV or GPS system or FSTD that is equipped to replicate an approved RNAV or GPS system, the applicant must demonstrate approach proficiency using that system. If the applicant has contracted for training in an approved course that includes GPS training, and the powered-lift/FSTD has a properly installed and operable GPS, the applicant must demonstrate GPS approach proficiency.

Localizer Performance with Vertical Guidance (LPV Minimums)

Localizer performance with vertical guidance (LPV) minimums with a decision altitude (DA) greater than 300 feet height above touchdown (HAT) may be used as a nonprecision approach; however, due to the precision of its glidepath and localizer-like lateral navigation characteristics, an LPV minimums approach can be used to demonstrate precision approach proficiency if the DA is equal to or less than 300 feet HAT.

Vertical or Lateral Deviation Standard

The standard is to allow no more than a ¾ scale deflection of either the vertical or lateral deviation indications during the final approach. As markings on flight instruments vary, a ¾ scale deflection of either vertical or lateral guidance is deemed to occur when it is displaced three-fourths of the distance that it may be deflected from the indication representing that the aircraft is on the correct flight path.

Task A. Nonprecision Approach

The evaluator will select nonprecision approaches representative of the type that the applicant is likely to use. The choices must use at least two different types of navigational aids.

Examples of acceptable nonprecision approaches include: VOR, VOR/DME, LOC procedures on an ILS, LDA, RNAV (RNP) or RNAV (GPS) to LNAV, LNAV/VNAV or LPV line of minima as long as the LPV DA is greater than 300 feet HAT. The equipment must be installed and the database must be current and qualified to fly GPS-based approaches.

The applicant must accomplish at least two nonprecision approaches in simulated or actual weather conditions.

- One must include a procedure turn or, in the case of a GPS-based approach, a Terminal Arrival Area (TAA) procedure.
- At least one must be flown without the use of autopilot and without the assistance of radar vectors. The yaw damper and flight director are not considered parts of the autopilot for purposes of this Task.
- One is expected to be flown with reference to backup or partial panel instrumentation or navigation display, depending on the aircraft's instrument avionics configuration, representing the failure mode(s) most realistic for the equipment used.

The evaluator has discretion to have the applicant perform a landing or a missed approach at the completion of each nonprecision approach.

Task B. Precision Approach

The applicant must accomplish a precision approach to the decision altitude (DA) using aircraft navigational equipment for centerline and vertical guidance in simulated or actual instrument conditions. Acceptable instrument approaches for this part of the practical test are the ILS and GLS. In addition, if the installed equipment and database is current and qualified for IFR flight and approaches to LPV minima, an LPV minima approach can be flown to demonstrate precision approach proficiency if the LPV DA is equal to or less than 300 feet HAT.

The evaluator has discretion to have the applicant perform a landing or a missed approach at the completion of the precision approach.

VII. Emergency Operations

An actual emergency in flight requires suspension of a test in progress. In an actual emergency, the applicant and the evaluator work together to bring the flight to a safe conclusion.

Tasks B & C: One Engine Inoperative during Straight-and-Level Flight and Turns and the Instrument Approach with an Inoperative Engine are not tested if in a single engine powered-lift.

Appendix 8: Use of Flight Simulation Training Devices (FSTD) and Aviation Training Devices (ATD): Airplane Single-Engine, Multiengine Land and Sea

Use of Flight Simulator Training Devices

14 CFR part 61, section 61.4, *Qualification and approval of flight simulators and flight training devices*, states in paragraph (a) that each full flight simulator (FFS) and flight training device (FTD) used for training, and for which an airman is to receive credit to satisfy any training, testing, or checking requirement under this chapter, must be qualified and approved by the Administrator for—

> *(1) the training, testing, and checking for which it is used;*
>
> *(2) each particular maneuver, procedure, or crewmember function performed; and*
>
> *(3) the representation of the specific category and class of aircraft, type of aircraft, particular variation within the type of aircraft, or set of aircraft for certain flight training devices.*

14 CFR part 60 prescribes the rules governing the initial and continuing qualification and use of all Flight Simulator Training Devices (FSTD) used for meeting training, evaluation, or flight experience requirements for flight crewmember certification or qualification.

An FSTD is defined in 14 CFR part 60 as an FFS or FTD:

> ***Full Flight Simulator (FFS)****—a replica of a specific type, make, model, or series aircraft. It includes the equipment and computer programs necessary to represent aircraft operations in ground and flight conditions, a visual system providing an out-of-the-flight deck view, a system that provides cues at least equivalent to those of a three-degree-of-freedom motion system, and has the full range of capabilities of the systems installed in the device as described in part 60 of this chapter and the qualification performance standard (QPS) for a specific FFS qualification level. (part 1)*
>
> ***Flight Training Device (FTD)****—a replica of aircraft instruments, equipment, panels, and controls in an open flight deck area or an enclosed aircraft flight deck replica. It includes the equipment and computer programs necessary to represent aircraft (or set of aircraft) operations in ground and flight conditions having the full range of capabilities of the systems installed in the device as described in part 60 of this chapter and the QPS for a specific FTD qualification level. (part 1)*

The FAA National Simulator Program (NSP) qualifies Level A-D FFSs and Level 4 – 7[3] FTDs. In addition, each operational rule part identifies additional requirements for the approval and use of FSTDs in a training program[4]. Use of an FSTD for the completion of the instrument-airplane rating practical test is permitted only when accomplished in accordance with an FAA approved curriculum or training program. Use of an FSTD for the completion of an instrument proficiency check is also permitted when accomplished in accordance with an FAA approved curriculum or training program.

[3] The FSTD qualification standards in effect prior to part 60 defined a Level 7 FTD for airplanes (see Advisory Circular 120-45A, Airplane Flight Training Device Qualification, 1992). This device required high fidelity, airplane specific aerodynamic and flight control models similar to a Level D FFS, but did not require a motion cueing system or visual display system. In accordance with the "grandfather rights" of 14 CFR part 60, section 60.17, these previously qualified devices will retain their qualification basis as long as they continue to meet the standards under which they were originally qualified. There is only one airplane Level 7 FTD with grandfather rights that remains in the U.S. As a result of changes to part 60 that were published in the Federal Register in March 2016, the airplane Level 7 FTD was reinstated with updated evaluation standards. The new Level 7 FTD will require a visual display system for qualification. The minimum qualified Tasks for the Level 7 FTD are described in Table B1B of Appendix B of part 60.

[4] 14 CFR part 121, section 121.407; part 135, section 135.335; part 141, section 141.41; and part 142, section 142.59.

Use of Aviation Training Devices

14 CFR part 61, section 61.4(c) states the Administrator may approve a device other than an FFS or FTD for specific purposes. Under this authority, the FAA's General Aviation and Commercial Division provides approvals for aviation training devices (ATD).

Advisory Circular (AC) 61-136A, *FAA Approval of Aviation Training Devices and Their Use for Training and Experience,* provides information and guidance for the required function, performance, and effective use of ATDs for pilot training and aeronautical experience (including instrument currency). FAA issues a letter of authorization (LOA) to an ATD manufacturer approving an ATD as a basic aviation training device (BATD) or an advanced aviation training device (AATD). LOAs are valid for a five year period with a specific expiration date and include the amount of credit a pilot may take for training and experience requirements.

> ***Aviation Training Device (ATD)****—a training device, other than an FFS or FTD, that has been evaluated, qualified, and approved by the Administrator. In general, this includes a replica of aircraft instruments, equipment, panels, and controls in an open flight deck area or an enclosed aircraft cockpit. It includes the hardware and software necessary to represent a category and class of aircraft (or set of aircraft) operations in ground and flight conditions having the appropriate range of capabilities and systems installed in the device as described within the AC 61-136 for the specific basic or advanced qualification level.*
>
> ***Basic Aviation Training Device (BATD)****—provides an adequate training platform for both procedural and operational performance Tasks specific to instrument experience and the ground and flight training requirements for the Private Pilot Certificate and instrument rating per 14 CFR parts 61 and 141.*
>
> ***Advanced Aviation Training Device (AATD)****—provides an adequate training platform for both procedural and operational performance Tasks specific to the ground and flight training requirements for the Private Pilot Certificate, Instrument Rating, Commercial Pilot Certificate, Airline Transport Pilot (ATP) Certificate, and Flight Instructor Certificate per 14 CFR parts 61 and 141. It also provides an adequate platform for Tasks required for instrument experience and the instrument proficiency check.*

Note: *ATDs cannot be used for practical tests, aircraft type specific training, or for an aircraft type rating; therefore the use of an ATD for the instrument – airplane rating practical test is not permitted. An AATD, however, may be used for some of the required Tasks of an instrument proficiency check as further explained in this appendix.*

Credit for Time in an FSTD

14 CFR part 61, section 61.65 specifies the minimum aeronautical experience requirements for a person applying for an instrument rating. Paragraph (f) specifies the time requirements for an instrument powered-lift rating, which includes specific experience requirements that must be completed in a powered-lift. Paragraph (h) of this section specifies the amount of credit a pilot can take for time in an FFS or FTD. For those that received training in programs outside of 14 CFR part 142, section 61.65(h)(2)[5] applies. For those pilots that received training through a 14 CFR part 142 program, section 61.65(h)(1) applies.

Credit for Time in an ATD

14 CFR part 61, section 61.65 specifies the minimum aeronautical experience requirements for a person applying for an instrument rating. Paragraph (f) specifies the time requirements for an instrument powered lift rating, which includes specific experience requirements that must be completed in a powered-lift. Paragraph (i) specifies the maximum instrument time in an ATD a pilot may credit towards the instrument rating aeronautical experience requirements. Paragraph (j) specifies the maximum instrument time a pilot may credit in any combination of an FFS, FTD, and ATD.

In order to credit pilot time, the ATD must be FAA-approved and the instrument time must be provided by an authorized instructor. AC 61-136A, states the LOA for each approved ATD will indicate the credit allowances for pilot training and experience, as provided under 14 CFR parts 61 and 141. Time with an instructor in a BATD and an AATD may be credited towards the aeronautical experience requirements for the instrument-powered-lift rating as specified in the LOA for the device used. It is recommended that applicants who intend to take credit for time in

[5] As part of program approval, 14 CFR part 141 training providers must also adhere to the requirements for permitted time in an FFS, FTD, or ATD per Appendix C to 14 CFR part 141.

a BATD or an AATD towards the aeronautical experience requirements for the instrument-powered-lift rating obtain a copy of the LOA for each device used so they have a record for how much credit may be taken. For additional information on the logging of ATD time, reference Appendix 4 of AC 61-136.

Instrument Experience

14 CFR part 61, section 61.57 provides the recent flight experience requirements to serve as a PIC. Paragraph (c) specifies the necessary instrument experience required to serve as a PIC under IFR. The experience may be gained in a powered-lift, an FSTD, or an ATD. Refer to the subparagraphs of 14 CFR part 61, section 61.57(c) to determine the experience needed.

Instrument Proficiency Check

If a person fails to meet the experience requirements of 14 CFR part 61, section 61.57(c), a pilot may only establish instrument currency through an instrument proficiency check as described in 14 CFR section 61.57(d). An FSTD may be used as part of an approved curriculum to accomplish all or portions of this check. If specified in its LOA, an AATD may be used to complete most of the required Tasks. However, the circling approach, the landing Task, and the multiengine airplane Tasks must be accomplished in an aircraft or FFS (Level B, C, or D). A BATD cannot be used for an instrument proficiency check. See the Instrument Proficiency Check table in Appendix 5: Practical Test Roles, Responsibilities, and Outcomes for additional information.

Use of an FSTD on a Practical Test

14 CFR part 61, section 61.45 specifies the required aircraft and equipment that must be provided for a practical test unless permitted to use an FFS or FTD for the flight portion. 14 CFR part 61, section 61 64 provides the criteria for using an FSTD for a practical test. Specifically, paragraph (a) states –

> *If an applicant for a certificate or rating uses a flight simulator or flight training device for training or any portion of the practical test, the flight simulator and flight training device—*
>
> *(1) Must represent the category, class, and type (if a type rating is applicable) for the rating sought; and*
>
> *(2) Must be qualified and approved by the Administrator and used in accordance with an approved course of training under 14 CFR part 141 or 142 of this chapter; or under 14 CFR part 121 or part 135 of this chapter, provided the applicant is a pilot employee of that air carrier operator.*

Therefore, practical tests or portions thereof, when accomplished in an FSTD, may only be conducted by FAA aviation safety inspectors (ASI), aircrew program designees (APD) authorized to conduct such tests in FSTDs in 14 CFR parts 121 or 135, qualified personnel and designees authorized to conduct such tests in FSTDs for 14 CFR part 141 pilot school graduates, or appropriately authorized 14 CFR part 142 Training Center Evaluators (TCE).

When flight Tasks are accomplished in a powered-lift, certain Task elements may be accomplished through “simulated” actions in the interest of safety and practicality. However, when accomplished in an FFS or FTD, these same actions would not be “simulated.” For example, when in a powered-lift, a simulated engine fire may be addressed by retarding the throttle to idle, simulating the shutdown of the engine, simulating the discharge of the fire suppression agent, if applicable, and simulating the disconnection of associated electrical, hydraulic, and pneumatic systems. However, when the same emergency condition is addressed in an FSTD, all Task elements must be accomplished as would be expected under actual circumstances.

Similarly, safety of flight precautions taken in the powered-lift for the accomplishment of a specific maneuver or procedure need not be taken when an FSTD is used. It is important to understand that, whether accomplished in an powered-lift or FSTD, all Tasks and elements for each maneuver or procedure must have the same performance standards applied equally for determination of overall satisfactory performance.

Appendix 9: References

This ACS is based on the following 14 CFR parts, FAA guidance documents, manufacturer's publications, and other documents.

Reference	Title
14 CFR part 61	Certification: Pilots, Flight Instructors, and Ground Instructors
14 CFR part 68	Requirements for Operating Certain Small Aircraft Without a Medical Certificate
14 CFR part 91	General Operating and Flight Rules
14 CFR part 97	Standard Instrument Procedures
AC 00-6	Aviation Weather
AC 00-45	Aviation Weather Services
AC 60-28	English Language Skill Standards Required by 14 CFR parts 61, 63, 65, and 107
AC 61-136	FAA Approval of Aviation Training Devices and Their Use for Training and Experience
AC 68-1	Alternative Pilot Physical Examination and Education Requirements
AC 90-100	U.S. Teminal and En Route Area Navigation (RNAV) Operations
AC 90-105	Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System and in Oceanic and Remote Continental Airspace
AC 90-107	Guidance for localizer performance with Vertical Guidance and Localizer
AC 91.21-1	Use of Portable Electronic Devices Aboard Aircraft
AC 91-74	Pilot Guide: Flight in Icing Conditions
AC 91-78	Use of Class 1 or Class 2 Electronic Flight Bag (EFB)
AC 120-108	Continuous Descent Final Approach
AIM	Aeronautical Information Manual
FAA-H-8083-2	Risk Management Handbook
FAA-H-8083-3	Aircraft Flying Handbook
FAA-H-8083-15	Instrument Flying Handbook
FAA-H-8083-16	Instrument Procedures Handbook
FAA-H-8083-25	Pilot's Handbook of Aeronautical Knowledge
IFP	Instrument Flight Procedures
POH	Pilot's Operating Handbook
Other	Chart Supplements
	Navigation Charts
	NOTAMs

Note: *Users should reference the current edition of the reference documents listed above. The current edition of all FAA publications can be found at www.faa.gov.*

Appendix 10: Abbreviations and Acronyms

The following abbreviations and acronyms are used in the ACS.

Abb./Acronym	Definition
14 CFR	Title 14 of the Code of Federal Regulations
AATD	Advanced Aviation Training Device
AC	Advisory Circular
ACS	Airman Certification Standards
ADM	Aeronautical Decision-Making
AELS	Aviation English Language Standard
AFM	Aircraft Flight Manual
AFS	Flight Standards Service
AIM	Aeronautical Information Manual
AKTR	Airman Knowledge Test Report
AOO	Area of Operation
ASI	Aviation Safety Inspector
ATC	Air Traffic Control
ATD	Aviation Training Device
ATP	Airline Transport Pilot
BATD	Basic Aviation Training Device
CDFA	Constant Descent Final Approach
CDI	Course Deviation Indicator
CFIT	Controlled Flight Into Terrain
CFR	Code of Federal Regulations
CRM	Crew Resource Management
DA	Decision Altitude
DH	Decision Height
DME	Distance Measuring Equipment
DP	Departure Procedures
DPE	Designated Pilot Examiner
FAA	Federal Aviation Administration
FFS	Full Flight Simulator
FMS	Flight Management System
FSDO	Flight Standards District Office
FSTD	Flight Simulation Training Device
FTD	Flight Training Device
GPS	Global Positioning System
HAT	Height Above Threshold (Touchdown)
IACRA	Integrated Airman Certificate and Rating Application
ICAO	International Civil Aviation Organization
IFO	International Field Office
IFP	Instrument Flight Procedures
IFR	Instrument Flight Rules
IFU	International Field Unit
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
ICP	Instrument Rating Airplane *Canadian Conversion*

Abb./Acronym	Definition
IPC	Instrument Proficiency Check
IR	Instrument Rating
IRPL	Instrument Rating Powered-Lift
LDA	Localizer-Type Directional Aid
LOA	Letter of Authorization
LOC	ILS Localizer
LPV	Localizer Performance with Vertical Guidance
LSC	Learning Statement Codes
MAP	Missed Approach Point
MDA	Minimum Descent Altitude
MFD	Multi-function Display
NAS	National Airspace System
NOTAMs	Notices to Airmen
NSP	National Simulator Program
PFD	Primary Flight Display
PIC	Pilot-in-Command
POA	Plan of Action
POH	Pilot's Operating Handbook
QPS	Qualification Performance Standard
RAIM	Receiver Autonomous Integrity Monitoring
RNAV	Area Navigation
RNP	Required Navigation Performance
SMS	Safety Management System
SOP	Standard Operating Procedures
SRM	Single-Pilot Resource Management
STAR	Standard Terminal Arrival
UTC	Coordinated Universal Time
VDP	Visual Descent Point
VFR	Visual Flight Rules
VOR	Very High Frequency Omnidirectional Range
WAAS	Wide Area Augmentation System

Aviation Instructor Handbook

Recommendations

FAA-H-8083-9B

Comments and Requested Changes to Aviation Instructor Handbook FAA-H-8083-9B

Page #	Location	Issue Type	Issue Description
V	Preface	Typo	2nd para, change "FAA-H-8083-9B" to "FAA-H-8083-9A"
VII	Acknowledgements	Addition	Add "and members of the ARAC Airman Certification Standards Work Group" ?
1-18	1st full ¶ on 1st column		"SBT" should be defined. Also, SBT "has been discussed" should be changed to "will be discussed". . . The relocation of this chapter to the first chapter requires this change
1-18	2nd full ¶ on 2nd column		PTS should be changed to ACS CFI ACS to replace PTS
4-2	Column 1 Paragraph 1		Add a sentence to explicitly state that, "Communicating effectively is based on similarity of the idea transmitted by the source and received by the receiver." Could also add or write, "Similarly, as the source, instructors have communicated effectively if the learner has understood the idea/concept/action transmitted in the manner in which it was intended to be understood."
5-14 **6-10**	Figure 5-10 Column 2 Paragraph 3		Characteristics of an effective question should be consistent in both locations.
136	6-10		Keep ABCD of question choices on the same page
	Ch 9		General feedback from our team regarding chapter 9 reference the FSTD material is that the entire chapter could use some work. It may not be appropriate for this revision but we were hoping that at some point the FSTD material could be integrated into chapter 5. Also, there could be deeper connection to existing material and current guidance with reference to different Learning strategies and equipment based on the objective (harmonize the language and use updated references).
164	9-2		change word 'period' to 'lesson'. Figure 7-2 specifically says a lesson and can cover multiple periods
164	9-2		Term 'all platform' is unclear. Slang? Use a clearly defined term.
165	9-3		Add words 'the airline'. Makes statement accurate.
175	9-13		This section on ADM is now largely redundant with what is now in Chapter 1. Keep this chapter on teaching techniques, delete the theory.
177	9-15		Figures belongs in Chapter 1
178	9-16		Section on Factors Affection Decision-Making belongs in Chapter 1

Page #	Location	Issue Type	Issue Description
180	9-18		Change AFD to chart supplement/CS
182	9-20		add simulators and training devices to summary paragraph. This is new material in this chapter
182	9-20		Obstacles to learning was deleted from this chapter. Either add the material back in or delete this reference from the summary paragraph. Would prefer to see it added back in.
C-1	Column 2 Paragraph 3 Line 9		Only references appropriate PTS, needs to also include ACS
C-5	Column 2 Paragraph 4 Line 5		"Instrument Rating PTS" should be "Instrument Rating Airman Certification Standards (ACS)"
	Line 8-9		"Instrument Rating Airman Certification Standards (ACS)" should be "Instrument Rating ACS"

Chapter 7 Designated Pilot Examiner (DPE) Program
Section 2 Conduct Practical Test/Certification Functions
Paragraph 6 General

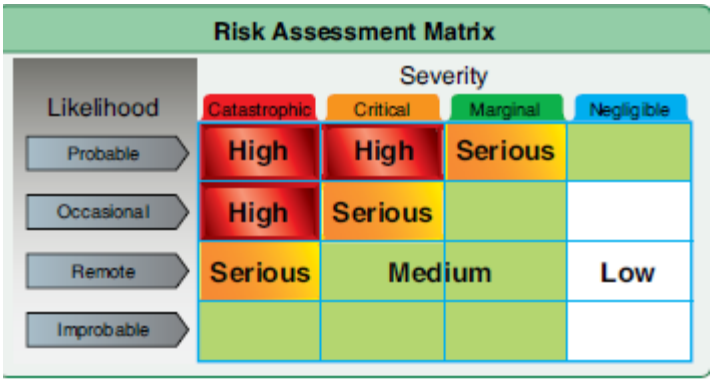
ADD: New paragraph "f. Evaluating Risk Management Skills" (2 pages follow)

f. Evaluating Risk Management Skills. As required by the Airman Certification Standards (ACS), applicants must demonstrate the ability to identify, assess, and mitigate risks on all tasks and objectives in the ACS. These skills are critical not only as a component of specific practical test tasks and objectives but also for the applicant's ability to operate safely in the National Airspace System following the practical test. Accordingly, examiners must comply with the following procedures to evaluate the applicant's ability to conduct effective risk management.

(1) Risk management proficiency is best evaluated in the context of a scenario that replicates elements of an actual operational flight typical of what the applicant may conduct following certification. Accordingly, examiners must use the procedures in paragraph 6e of this section, Evaluating Single-Pilot Resource Management (SRM) Skills, to construct such a scenario for evaluating risk management proficiency.

(2) Applicants may use an accepted procedure, such as the ***PAVE*** (pilot, aircraft, environment, external pressures) checklist to identify risks in the test scenario(s) and for individual tasks and objectives of the practical test. Applicants may use other procedures if they effectively identify scenario and practical test risks.

(3) Applicants may use a risk assessment matrix such as the one below to assess identified risks in the test scenarios and for individual tasks and objectives of the practical test. Applicants may use other procedures if they effectively classify the overall risk of each hazard in terms of its joint likelihood and severity and resulting overall level of risk.



(4) Applicants may use any method or action for mitigating risk in the scenario and on individual practical test tasks and objectives if that action lowers risk likelihood and/or severity to at least a medium ("green") level. One acceptable such method is to use the ***TEAM*** (or ***TEMA***) checklist (transfer, eliminate, mitigate, accept).

(5) Applicants may use a flight risk assessment tool (FRAT) to consolidate and document their identification, assessment, and mitigation process for the risks in the scenario and individual practical test tasks and objectives. The successful use of a FRAT by an applicant indicates better overall understanding of operational risk management than solely responding correctly to individual risk management elements in the ACS. If the FRAT is a numerical example with a "score," the examiner should ensure that the applicant identifies, assesses, and mitigates the hazards and risks that are identified to acceptable levels, rather than just concluding that the score is below the stated threshold and no further action is needed. A non-numerical FRAT is preferable, since it requires the applicant to fully assess and mitigate all identified risks to acceptable levels. One such non-numerical FRAT identified in the Aviation Instructors Handbook is available from the National Business Aviation Association on their web site at https://www.nbaa.org/ops/safety/in-flight-safety/flight-risk-assessment-tool.pdf

(6) Successful applicant use of a FRAT does not relieve the examiner's responsibility to ensure that the applicant meets the risk management standards for each practical test task and objective. If an applicant successfully uses a FRAT to identify, assess, and mitigate risks in the test scenario(s) and tasks and objectives, the examiner may still test the applicant on risk management ACS elements as required to ensure that all objectives and tasks are completed as required by guidance in applicable FAA directives.

END (page 2 of 2)

Chapter 10 – Teaching Practical Risk Management during Flight Instruction

Introduction

Effective risk management is one of the most important skills that a pilot must master to operate safely and avoid accidents. This is also true for flight instructors giving flight instruction. When examining accident data to determine root causes, poor risk management is seen as a root cause of many fatal accidents.

Chapter 1 discussed the foundations of effective risk management, as well as other critical skills that are a part of single-pilot resource management (SRM). Flight instructors, however, may need more practical guidance on teaching risk management to pilots of various experience levels and applying risk management to instructional flights. This chapter provides such practical guidance and will enable instructors to provide learners with the necessary knowledge and skill to perform effective risk management in all phases of their flying activity while maintaining the requisite risk management requirements of flight.

Although it is critical for pilots to be able to practice effective risk management during all their flight operations, it is also critical that instructors and learners do so during the instruction process itself. For the most part, the techniques for conducting risk management during flight instruction are the same as for any other flight. However, risk management for flight instruction must account for unique risks including, for example, maneuvers performed incorrectly by the student close to the ground, in a high workload environment where the instructor must monitor and teach the student in addition to conducting the risk management consistent with any other flight.

Poor risk management and accident causality

Traditional accident investigation taxonomy

Aviation accidents are investigated by both the National Transportation Safety Board (NTSB) and the Federal Aviation Administration (FAA). The role of the NTSB is to determine the probable cause(s) of accidents and make recommendations, while the FAA seeks to determine if the accident revealed deficiencies in pilot training, aircraft certification, air traffic control or another area of FAA responsibility. The two government entities are usually assisted by other interested parties, such as aircraft and/or engine manufacturers, to determine the facts surrounding the accident and assign a probable cause.

The NTSB role can be illustrated by looking at a typical accident report. The sidebar in Figure 10-1 is an excerpt from an NTSB final report of a fatal accident involving a Mooney MO-20J that occurred in 1993.

Figure 10-1
National Transportation Safety Board
Aviation Accident Final Report

Location:	SEEKONK, MA	**Accident Number:**	BFO94FA008
Date & Time:	11/14/1993, 0026 EST	**Registration:**	N4224H
Aircraft:	MOONEY MO-20J	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

DURING A FOUR HOUR IFR CROSS COUNTRY FLIGHT, IN CRUISE, THE ENGINE'S DRY AIR VACUUM PUMP FAILED. THE PILOT ELECTED TO CONTINUE TO HIS FINAL DESTINATION, ABOUT 180 MILES AWAY, NAVIGATING BY HIS LORAN. THE PILOT WAS NOTIFIED BY AIR TRAFFIC CONTROL PERSONNEL THAT IN ORDER TO CONTINUE TO HIS DESTINATION, IMC COULD NOT BE AVOIDED. THE PILOT STATED THAT IMC WAS NOT A PROBLEM AND HE CONTINUED THE FLIGHT. DURING A NO GYRO VECTOR APPROACH TO THE LOCALIZER IN IMC, AT AN ALTITUDE OF ABOUT 1,900 FEET MSL, THE PILOT BECAME SPATIALLY DISORIENTED AND LOST CONTROL OF THE AIRPLANE. THE AIRPLANE IMPACTED THE TERRAIN AND THE PILOT AND PASSENGER WERE FATALLY INJURED. THE DRY AIR VACUUM PUMP WAS EXAMINED. THE EXAMINATION REVEALED THAT THE INPUT SHAFT OF THE PUMP WAS FACTURED PRIOR TO IMPACT.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:
THE PILOT'S INADEQUATE IN FLIGHT PLANNING/DECISION TO CONTINUE FLIGHT INTO KNOWN ADVERSE WEATHER CONDITIONS AFTER THE ENGINE'S DRY AIR VACUUM PUMP FAILED AND THE PILOT'S FAILURE TO MAINTAIN AIRPLANE CONTROL DURING APPROACH. A FACTOR IN THE ACCIDENT WAS THE DRY AIR VACUUM PUMP FAILURE.

Key findings of the NTSB final report of the Mooney accident, highlighted here in yellow for emphasis, emphasized the pilots' loss of control of the aircraft and inadequate in-flight planning. These facts accurately described the final events of the flight leading to the loss of control. In fact, conventional accident analysis classifies accidents such as this one as pilot error due to loss of control.

Root cause analysis and poor risk management

The NTSB report on the Mooney accident accurately decomposes the accident facts to arrive at its probable-cause finding. Yet, there is more to learn about the root causality of the accident by examining the pilot's reaction to events during the flight using the familiar ***PAVE*** acronym from Chapter 1.

The pilot was clearly aware of the vacuum pump failure and the instrument weather conditions (IMC) ahead of him. This generated an aircraft, or ***"A,"*** hazard because of the failed vacuum pump and a weather, or environment ***"V,"*** hazard because of the IMC conditions. The combination of those two hazards became unacceptable risks once the pilot decided to penetrate IMC weather. In addition, it is possible that the pilot's desire to get to his destination created an external pressure, or ***"E,"*** hazard. Finally, the pilot's unwarranted assumption that he could control the aircraft using only a partial panel created a pilot, or ***"P,"*** hazard. Using the risk assessment matrix described in Chapter 1, it is possible to see that "catastrophic" consequences were possible from loss of control in IMC, and the likelihood of

loss of control after a vacuum pump failure, was at least “occasional” or even “probable.” Thus, the overall risk presented was “high” or “red” and thus demanded immediate mitigation of some kind.

The pilot’s most effective mitigation would have been to divert and land while still in visual weather conditions (VMC), yet he did not do so. Why was the pilot unable to practice effective risk management on this flight? There are several reasons why pilots do not effectively conduct risk management. Some of these relate to training and procedures, such as not having received risk management training, failing to continuously apply risk management, or inaccurately assessing the level of risk. It is also possible that cultural issues, such as a higher risk tolerance or even intentional disregard of risk, may be a factor for a few pilots. Finally, it is understandable that pilots often have a desire to get as much utility as possible from their aircraft and thus may intentionally or unintentionally expose themselves to high levels of risk.

Instructors must have a role and a responsibility to help pilots obtain the necessary risk management training and to adopt a safety culture that embraces risk management and mitigation of risk. The instructor’s role in risk management should be incorporated at all levels of training, from a new pilot with little experience to a multi-thousand-hour pilot taking recurrent training.

Best practices for teaching risk management

Risk management training, like any other aspect of flight training, can be made more effective by following some consistent guidelines and using effective tools and techniques. The following guidelines, tools, and techniques can be used for learners of all levels and experience.

As a flight instructor, best practices for risk management include not only teaching risk management, they include applying these guidelines tools and techniques to manage the risk inherent in an instructional flight.

When to teach risk management

The importance of risk management suggests that it should begin being taught at the very start of flight training and should be integrated into actual flight training, rather than taught only as a separate subject. However, it will be more effective if some introductory ground instruction is conducted prior to the first flight lesson. This preliminary instruction should also be part of a formal ground school, but this should not preclude conducting a separate session before the first flight to emphasize the practical nature of the risk management activity.

Risk management activity and discussion should be included in all pre-flight and post-flight briefings. Learners should be encouraged to participate and even lead such discussions as their experience increases.

Risk management training should not be confined only to initial training. Recurrent, transition, flight reviews, instrument proficiency checks, and other training and currency events should also include risk management.

Identifying risk

As described in Chapter 1, the ***PAVE*** checklist is an effective and accepted means for identifying risk. Its four categories capture all the broad areas of risk and provide the learner with convenient "buckets" for risk identification.

Instructors should coach learners, as required, to ensure they use the ***PAVE*** checklist methodically and consider all the sub-elements in each "bucket." For example, the pilot category, or ***"P,"*** applies to both the learner pilot and the instructor pilot, and has two major sub-elements. The first includes pilot qualification, currency and proficiency. The second sub-element covers aeromedical hazards and risks and, as described in Chapter 1, the acronym ***IMSAFE*** can be used to identify those hazards and risks.

Early during flight training, instructors should also identify hazards that almost always generate unacceptable risks unless they are fully mitigated. The ***PAVE*** checklist can also be used for this purpose. For example, several weather hazards are almost always "red" and require immediate mitigation. Examples include a solid line of thunderstorms ahead, requiring a divert to mitigate, or IMC conditions before takeoff, requiring a flight delay or cancellation if the pilot is not instrument rated or the aircraft is not suitably IFR equipped. During ground instruction, instructors may also want to present accident data that illustrates situations which resulted in loss of control, as may happen when penetrating a thunderstorm, or controlled flight into terrain, as could happen when a pilot continues under VFR into IMC conditions.

Throughout the risk management process, the instructor should be empowering in discussing hazards and risk. The instructor should emphasize that risk can be effectively managed, and learners must acquire the necessary skills to accomplish this. In many cases, learners will be professionals who are used to managing risk in their workplace, although the outcomes may be very different. Instructors should acknowledge the learner's expertise in those areas and emphasize that aviation risk management training can be used to apply his or her existing skills within the aviation environment.

Assessing risk

In some ways, risk assessment is the most difficult part of the risk management process. Assessing risk severity (consequences) and likelihood (probability) can be subjective during flight operations. In other aviation applications, such as aircraft certification, the likelihood of an event is calculated mathematically, and consequences are also precisely defined. Nevertheless, risk assessment accuracy can improve with practice and experience.

Instructors should initially lead learners through the assessment phase of each risk identified and provide examples that will help the learner gain confidence in risk assessment. For example, the instructor could hypothesize an event with a low but generally fixed probability, such as an engine failure following takeoff while in the traffic pattern, and then ask the learner to speculate on how to manage the potential severity (consequences) of that event. Coaching the learner, as required, could encourage responses such as using the entire runway length rather than an intersection takeoff, climbing at the best rate of climb speed, and maintaining a tight traffic pattern, all of which could provide the pilot with more landing site choices in the event of an actual engine failure.

Mitigating risk

As explained in Chapter 1, risk mitigation is the "payoff" for the risk management process. When performed effectively, most risks can be mitigated to lower levels of likelihood and/or severity and potentially allow a proposed flight to begin or an ongoing flight to continue.

Like risk identification and assessment, there is a helpful acronym that can be used to guide the mitigation process. ***TEAM*** represents *transfer, eliminate, accept,* and *mitigate.* In flight instruction, it is more useful to order these in the sequential steps of ***TEMA for*** *transfer, eliminate, mitigate*, and *accept* .

Instructors should emphasize to learners that the risk management process can begin days or even weeks before a specific flight. Early in the process, if a pilot identifies a risk that cannot be easily mitigated, such as a weather system with widespread icing conditions forecast to occur several days before and after the projected flight, then the pilot can *transfer* the risk by getting an airline ticket if the pilot must be at an event at a fixed time. Alternatively, if the flight's purpose is just recreational or the event is optional, then the pilot can *eliminate* the risk by cancelling the flight and/or the event During flight instruction, examples of eliminating risk may be by not flying if the crosswind exceeds a limit or by not practicing stalls if the ceiling is below a set value.

Once it is determined that a flight is feasible from a risk management perspective, the actual process to *mitigate* each identified risk assessed as high (red) or serious (yellow) can begin. Instructors should emphasize to learners that even medium (green) risks should be mitigated if possible, following the principle of not accepting unnecessary risk.

Instructors should emphasize that the risk management process is continuous and can begin days before a flight, be integrated into the immediate pre-flight planning, and continue throughout the flight itself. Instructors should create scenarios in-flight that introduce new hazards and risks that require the learner to identify, assess, and mitigate.

The final step in the ***TEMA*** risk mitigation is to *accept* the remaining risk that cannot be mitigated. The instructor should emphasize that a pilot must accomplish this step consciously and on behalf of not only himself, but his passengers and possibly innocent bystanders on the ground. In flight instruction, the final step in the ***TEMA*** risk mitigation is when the instructor consciously accepts the risk of the learner performing a maneuver incorrectly or not to accepted ACS standards and consciously plans enough time and space to keep the flight safe through mitigation.

Risk management tools

The risk management process is largely intuitive, but as with many new concepts, it can be daunting to the learner, especially at the beginning of training. Accordingly, the instructor should use available tools to simplify or make the process more orderly and effective.

The acronyms and assessment matrix discussed previously should be considered as primary tools in teaching risk management. Learners should be encouraged to use these simple tools as a basis for conducting risk management during and after their flight training.

On many flights, the risk management process can be more complex, and a more sophisticated risk management tool is needed. As discussed in Chapter 1, a *flight risk assessment tool* (FRAT) can serve this purpose.

There are a variety of FRATs available from various sources. Many of these FRATs have numerical scoring systems. A fixed list of hazards and associated risks are presented and assigned "scores" based on the severity of the hazard. Typically, if the total score is below a certain number, the pilot can begin the flight. If the score is above a certain number then some sort of mitigating action is required.

These numerical FRATs can be useful but should be used with caution. A low score can still have one or more hazards and associated risks that, if not properly mitigated, can create unacceptable levels of risk. This can happen because a risk on a particular flight is not included in the FRAT's list, or there is only one risk, but it is extreme As an example, a line of embedded thunderstorms may block your route. If that is the only item identified as a risk then the "score" may suggest a "go" decision without requiring mitigation but would be totally unacceptable.

Risk management teaching techniques by phase of instruction

Instructors should teach risk management using a building block approach. This will be effective with both new pilots as well as existing pilots who have not previously been exposed to formal risk management training.

Risk management training through the private pilot level

A new learner's exposure to risk management should begin before the first flight and should be continued throughout initial training. Instructors should emphasize both practical risk management techniques as well as the skills needed to comply with the Airman Certification Standards (ACS).

Pre-solo

Instructor-led and guided risk management training will be required during pre-solo instruction, as with other aspects of pre-solo training. Initial risk management training should be given before the learner's first flight, to familiarize the learner with basic concepts and techniques. Risk management should be part of every pre-flight and post-flight brief. To assist in structuring the risk management process, the learner should be introduced to a non-numerical FRAT, and its use should be demonstrated by the instructor during the first few flights. By the first solo, the learner should be able to conduct a basic risk management analysis.

Post-solo prior to cross-country training

During the initial solo and dual flights following the first solo, the learner should be able to perform a risk analysis of the planned flight, with occasional coaching from the instructor. The instructor should review the learner's risk analysis for all solo flights and provide any required feedback. At the completion of solo flights, the learner should de-brief the instructor on the risk management aspects of the flight.

Cross-country training

During the cross-country phase of training, learners must master risk management techniques commensurate with the complexity of flights under all conceivable aspects of the privileges of the certificate they are seeking. This could include, for a private certificate, flights anywhere under VFR, including night operations, flights in complex airspace, or to unfamiliar airports. Instructors should require the learner to accomplish a full risk analysis for every dual and solo cross-country flight. This should include use of a FRAT or other method of accomplishing this analysis. The instructor should review and approve the risk analysis, just as must be done for other aspects of the learner's preflight preparation and calculations.

Risk management training for experienced pilots

Risk management is not a task confined solely to the initial training environment. Instructors should ensure that risk management is part of all training events, even for already certificated pilots. This is especially true for some pilots who have not been exposed to risk management standards now contained in the ACS.

Instrument training

Risk management training is vital during instruction for the instrument rating because of the added hazards inherent in flight in IMC. Instructors should emphasize broad risk management techniques and strategies that will allow a pilot to analyze and evaluate complex weather and other elements that generate risk. For example, an instructor might suggest that a pilot consider the risk management aspects of a flight in a single-engine aircraft with one radio, one alternator, and one vacuum pump conducted at night over rough terrain with low ceilings. Such a flight may be perfectly "legal" but is fraught with potential risk because of aircraft and environmental hazards.

Transition training

Pilots transitioning to more advanced aircraft will encounter additional types of risk associated with such aircraft. These include more complex systems and avionics, enhanced performance, and expanded abnormal and emergency procedures. Pilots transitioning to lighter, slower aircraft will also encounter additional risk due to less performance capability than the pilot has come to expect.

Instructors who conduct instruction in advanced aircraft should ensure that they have appropriate experience and familiarity with the aircraft and equipment they will instruct in. Instructors should employ scenarios that emphasize risk management aspects of operating advanced aircraft in the National Airspace System. In addition to risk management, other SRM skills such as automation management, task and workload management, and maintaining situational awareness should be emphasized. In most instances, the pilot seeking training will be instrument rated and the instructor should evaluate the pilot's risk management and other SRM proficiency under an IFR scenario.

Recurrent training, flight reviews, and instrument proficiency checks

Instructors should particularly emphasize risk management during any kind of recurrent training or proficiency event. Many pilots who held certificates prior to the introduction of the Airman Certification Standards (ACS) may not have been exposed to formal risk management training or evaluation.

Instructors should consider using scenarios to evaluate pilot risk management proficiency during recurrent training or currency events. The scenario should be constructed in a way that mirrors the pilot's typical operating profile. However, if the pilot plans to change that operating profile, the instructor should discuss or evaluate the pilot's ability to address any risk management issues associated with the new profile. For example, a pilot may usually operate on flights between rural airports in mostly Class E airspace but is soon planning to begin flying regularly to a location in Class B airspace. In this case, the instructor should address the aircraft requirements, such as Mode "C" and ADS-B, and the environmental risk factors associated with Class B operation.

Risk management during operational flights

Pilots who are already certificated conduct most of their flights without an instructor present. As an instructor, you should encourage them to practice effective risk management on all their flights.

Realistically, pilots will not always follow the risk management procedures discussed in this chapter. Instructors should encourage pilots to scale their risk management procedures to match the complexity of the flight. For example, for a local flight, it is acceptable to use an abbreviated risk management protocol using the ***PAVE*** acronym to briefly review the major elements of potential risk. However, for longer or more complex flights it may be desirable to complete a ***FRAT***. A key objective for instructors is to provide risk management guidance that will allow pilots to think of risk management intuitively, as a part of the preparation for every flight and continuously while the flight progresses.

Risk management training for professional pilots

As an instructor, you may encounter pilots who fly professionally. Many professional pilots operate as a crew and receive ongoing and recurrent training at a Part 142 training center. If you instruct in classrooms or simulators at such a facility, you will likely be proficient in subjects such as crew resource management (CRM). You may also be exposed to other training and operating concepts, such as threat and error management (TEM), which has similar elements to risk management.

You may also encounter professional pilots who own their own aircraft and fly them outside of their professional environment. If such pilots seek transition and other flight instruction services from you, you should emphasize risk management as part of the training you provide. Pilots who operate professionally as a crew may not be used to operating single-pilot, without the support infrastructure of their professional employer. Their risk management responsibilities may therefore be different while flying their own aircraft.

Managing risk during flight instruction

Instructors should be conscious of the need to manage risk during the actual flight instruction process. The risk management techniques are the same as those you are teaching learners to use during all flight operations. Although there are a few risks that are unique to flight instruction, these can be identified, assessed, and mitigated as you would for risks that occur in non-instructional flights.

During instruction flight, the instructor can mitigate risk in numerous ways. For example, by choosing practice locations that provide safe options, by performing maneuvers with sufficient altitude, and/or by

staying alert for the unexpected either from the learner or external elements and always being poised to take over the control of the aircraft if needed.

In flight, instructors can manage risk by constantly being aware of potential risk elements and managing them in real time. To do this, the instructor needs to maintain situational awareness of pertinent information, not only of the state of the aircraft, the surrounding traffic, the weather, the airspace, and the surrounding area but also of the learner and what he or she is doing, and planning to do.

Common flight instruction risks

The best process for analyzing flight instruction risks is to identify them as you would on any other flight, using the ***PAVE*** acronym. There may be many potential risks to conducting flight instruction. The examples below are only meant to be representative. Instructors should always conduct a risk analysis prior to providing instruction.

Pilot risks

This category involves both qualification and aeromedical risks. From a qualification perspective, you will be constantly aware that the learner will generally be less proficient than the instructor. Instructors may also have qualification, currency, and proficiency issues if they are not familiar with aircraft, avionics, and procedures. This can create hazards and resulting risks unless the instructor remains vigilant. The aeromedical risks require the instructor to be tuned in to not only his own aeromedical state, but that of the learner.

In flight instruction, Pilot Risk includes both the learner pilot and the instructor pilot. The instructor needs to be prepared for the learner to make mistakes such as those listed in the Airplane Flying Handbook. The risks of these mistakes can be mitigated by being proactive in planning activities based on current conditions, and by allowing enough time and space both to allow the learner to practice and to allow the instructor to take over control of the aircraft before the situation deteriorates beyond the instructor's ability to fly the aircraft.

Aircraft risks

Aircraft used in flight instruction may not always be under the direct control and maintenance supervision of the instructor, resulting in the instructor not being aware of inoperative systems and equipment or overdue inspections. For two-place trainer aircraft, payload is often limited, requiring a reduction in the amount of fuel carried. Performance may also be marginal in high density-altitude situations.

Environmental risks

The airspace used for flight training and practice may be crowded, creating a potential collision hazard. Many areas of the country where flight instruction is conducted often have restricted visibility due to haze, pollution, and other factor, furthering the potential collision hazard. Airspace in these areas may also be complex and subject to restrictions. Conducting certain maneuvers can also create hazards and potential risks. For example, practicing full stalls can result in inadvertent spins. Simulated engine failures, if performed incorrectly, can and have created real emergencies and caused accidents.

External pressure risks

Learners often experience scheduling problems, and this can be aggravated by aircraft problems, weather issues, and other unpredictable events. Learners are also subject to other external pressures involving work, family, finance, and other issues. All of these can create distractions, anxiety, and other responses that can degrade learner performance.

Best practices for managing risk during flight instruction

Instructors can best assess and mitigate identified risks by following the risk management procedures outlined in this chapter. In all cases, the instructor should instruct the learner on sharing responsibilities for risk management during dual instruction. For example, the instructor should emphasize that they are both responsible for maintaining a lookout to see and avoid other air traffic. The learner should also be instructed on how to assist the instructor in resolving items such as aircraft airworthiness status and issues involving the training environment, such as airspace NOTAMs or TFRs.

Specific mitigations for the instructional hazards and risks identified in previous paragraphs include, but are not limited to, the following procedures.

Pilot risks

The instructor's qualifications are paramount in mitigating currency and proficiency issues. Instructors should take actions to familiarize themselves with aircraft models and avionics that they are about to instruct in, if they are not already so qualified. This could be as simple as reviewing the pilot operating handbook (POH) or avionics manuals or as extensive as acquiring flight time in such equipment before giving instruction.

Instructor aeromedical risks should be constantly monitored using the ***IMSAFE*** model. Similarly, the instructor must communicate with the learner to establish a confidence level that will encourage learners to come forward to disclose their own aeromedical issues well in advance of scheduled flights, so that they may be rescheduled if necessary.

Aircraft risks

The instructor should determine the aircraft's official airworthiness status before scheduled flights and before conducting the actual preflight. Unless instructing in their own aircraft, instructors should be familiar with the aircraft operator's procedures for reporting and correcting discrepancies and review the current discrepancy report. Any questions regarding airworthiness status should be resolved with maintenance personnel before conducting the preflight inspection. The instructor should consider involving the learner in this process and should emphasize that it is intended to manage risk by reducing the likelihood and/or severity of potential hazards and risks arising from failed equipment.

Environmental risks

Environmental risks are one of the most frequent causes of accidents. These notably include risks generated by weather, terrain, and night operation hazards and additionally include airports, airspace, and other environmental factors. All these hazards and risks will likely come into play at some point

during the instruction process. Accordingly, instructors should emphasize accurate assessment and mitigation of such risks when providing instruction.

The instructor should involve the learner in every step of the assessment and mitigation process. For example, the weather may be marginal VFR and the scheduled dual instruction lesson called for practicing stalls and slow flight. The instructor should coach the learner to identify the risks involved in conducting stall practice under such conditions, such as inadvertently entering IMC or practicing stalls at too low an altitude, and then suggest ways to mitigate the risk, such as changing the lesson plan to stay in the traffic pattern, conducting a lesson in a training device or ground school, or rescheduling the lesson altogether.

External pressure risks

External pressures can create the most insidious of hazards and risks. Instructors should emphasize the utmost flexibility policies about schedules to ease learner concerns about schedule conflicts with events in their professional and personal lives. Instructors should be conscious of each learner's schedule limitations and other external factors that could affect their performance. Instructors should also emphasize the ability to make schedule changes as needed, change training from an airplane to classroom instruction, or terminate a lesson early if the learner appears apprehensive about time pressures or other external concerns.

Notes on Instructional Risk Management in the Cockpit

The instructor is involved with risk management on multiple levels, which include not only managing the risk of a particular phase of flight or maneuver, but also teaching risk management and managing the risks of providing in-flight instruction. Some concepts an instructor should bear in mind while teaching most maneuvers include:

- Systematically identify all hazards presented and then monitor them during execution of the maneuver—the instructor must keep track of all potential hazards while prompting the learner in the elements of the task and simultaneously monitoring performance.
- Avoid creating a hazard by attempting to teach something at an inappropriate time (e.g., discussing takeoff technique while entering the runway, when attention should be devoted to aircraft control and ensuring that the runway is clear) or at an inappropriate altitude (e.g., teaching stalls below a cloud layer which does not allow an adequate amount of altitude to recover.)
- Discuss hazards and mitigations in detail during briefings on the ground, both pre and post flight.
- While in flight, prompt the learner to identify hazards on their own and verbalize thought processes and risk mitigations as they apply them (e.g., while preparing to execute a ground reference maneuver, ask the learner to identify potential collision hazards and a safe place to make an emergency landing).

The discussion below contains examples of factors an instructor may consider while providing in-flight instruction on various maneuvers. Among other things, they demonstrate the extent to which instructional techniques and instructional risk management are interconnected, and should be approached in a systematic, integrated fashion.

Managing Risk While Teaching Takeoffs

The time it takes for an aircraft to begin its takeoff roll and initiate a climb is only a matter of seconds. There is not enough time to teach effectively during the takeoff roll. Apart from introducing unnecessary hazards (e.g. missing a radio transmission from tower to abort the takeoff), the learner's attention is placed almost entirely on trying to safely maneuver the aircraft. Any information an instructor is trying to convey during the takeoff roll may not be heard or processed by the learner. The instructor should conduct the majority of their teaching (e.g. airspeeds, pitch attitudes, visual references, flight control inputs, engine parameters) prior to contacting tower or announcing their intentions on the CTAF at a non-towered airport. This will avoid over-stimulating the learner's senses, help maintain a sterile cockpit, and support situational awareness and collision avoidance.

When teaching a learner to takeoff, it is imperative that the instructor create realistic scenarios of takeoff types. The scenario must not create hazards such as resulting in the learner attempting to maintain an unsafe climb rate that requires an excessive pitch attitude. An effective scenario should mimic what a learner will encounter outside of flight training. For example, if the instructor wants to prompt the learner to conduct a short-field takeoff, the instructor could specify where the takeoff runway ends or where an (imaginary) obstacle exists. The point where the runway ends or obstacle exists should be realistic. During soft-field takeoffs, the instructor should monitor aircraft drift while the learner is trying to remain in ground effect. The instructor should not let the drift escalate beyond the learner's control and should pay close attention to pitch attitude and airspeed throughout the maneuver.

Insufficient spacing from preceding aircraft during takeoffs also creates various hazards. Some hazards include wake turbulence, insufficient in-trail spacing, and insufficient separation from an aircraft approaching to land. The instructor must ensure that there is sufficient spacing from landing and departing aircraft prior to entering the runway and initiating a takeoff. This will also help teach the learner sound decision making and risk management skills.

Managing Risk While Teaching Landings

Many complex decisions are made during the landing phase. The decisions are based largely on previous experience, of which novice learner pilots have almost none. Instructors sometimes fall prey to teaching landings mechanically. Instead, it is necessary to convey problems and solutions (e.g. use of flaps) based on what is actually happening on that specific approach. When an instructor teaches mechanically, they cause the learner to be ill-equipped to identify or manage constantly changing conditions. This may result in unstable approaches and faulty landings. The instructor should prompt the learner on the current conditions and how to correct the situation to maintain a stabilized approach. The decision on choosing aiming points and touchdown points should not be made mechanically either. The runway number is not always an appropriate aiming point. It is the instructor's responsibility to teach the learner how to pick appropriate aiming and touchdown points based on the type of landing being attempted, the environment and conditions present, and the expected landing performance calculated during pre-flight planning.

Some of the same hazards associated while teaching takeoffs are also present while teaching landings. The instructor is trying to convey a lot of information while simultaneously verifying that the aircraft is being flown safely. This may cause a decrease in attention to collision avoidance or loss of situational awareness. Excessive teaching and coaching on final approach may cause missed radio transmissions

from air traffic control or aircraft in the pattern. To avoid this, it is recommended that the instructor do most teaching on the ground prior to takeoff or during taxi back on lessons consisting of multiple take offs and landings. The instructor should only use concise prompting on approach to landings with the learner.

Certain landings present unique risks. During crosswind landings, it is imperative that the instructor determine whether his or her skills are sufficient to deal with the wind conditions. During a short-field landing, the aircraft is normally flown at a slower approach speed. The instructor must be constantly aware of the risk associated with flight at slow speeds and reduced margins from a stall and loss of control. The instructor and learner must both avoid focusing on the accuracy of the touchdown or "hitting the point." Instead, the entire approach and landing should be accomplished by focusing on the quality of a stable approach, appropriate pitch attitude, speed, and crosswind control. During short-field and power-off 180 accuracy approach and landings, the instructor must be aware of the increased possibility of flat and bounced landings and initiate a go-around when appropriate. During all types of approaches to landing, instructors must remain aware of risks associated with ballooning, excessive floating, and poor crosswind correction and always be prepared to initiate a go-around.

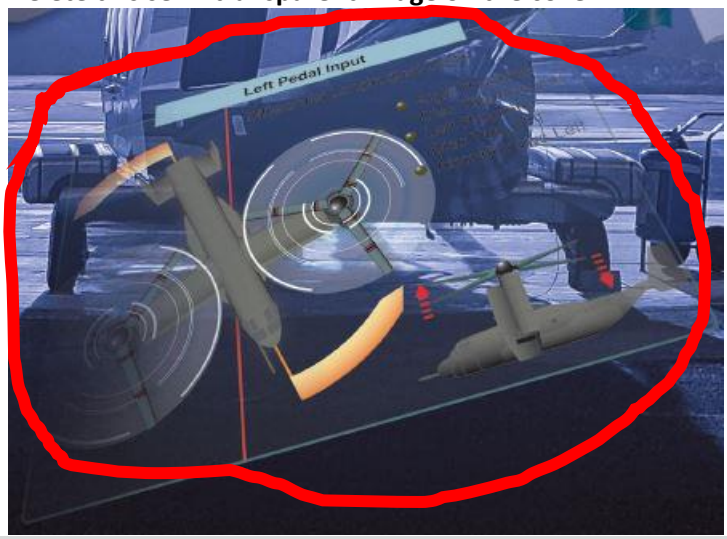
Chapter Summary

Poor risk management may be a leading root cause of fatal accidents. Accordingly, instructors should emphasize and practice risk management in all types of instruction, from primary to advanced training. Instructors should use accepted risk management tools to make training more effective and consistent. Instructors should also use a building block approach to teaching risk management. Risks encountered while giving instruction are similar to those that learners will encounter on operational flights and instructors should use the same risk management tools that learners should use throughout their flying career.

Helicopter Flying Handbook

Recommendations

FAA-H-8083-21B

Page #	Location	Issue Type	Issue Description
i	Graphic on bottom center/right	Incorrect	**Delete this semi-transparent image on the cover:** 
1-2	Left col, 2nd para	Vague	*Piloting a helicopter requires a great deal of training and skill, as well as continuous attention to the machine. The pilot must think in three dimensions and must use both arms and both legs constantly to keep the helicopter in the air. Coordination, control touch, and timing are all used simultaneously when flying a helicopter.* **Replace with:** Piloting a helicopter requires adequate, focused and safety-orientated training often well above the designated minimums to develop the required skill. It also requires continuous attention to the machine and the operating environment. The pilot must work in three dimensions and use both arms and both legs constantly to keep the helicopter in a desired state. Coordination, timing and control touch are all used simultaneously when flying a helicopter.
1-4	Left col, 1st para	Incorrect	*…When viewed from above, designs from Germany, United Kingdom, and the United States are said to rotate counter-clockwise, all others are said to rotate clockwise. This can make it difficult when discussing aerodynamic effects on the main rotor between different designs, since the effects may manifest on opposite sides of each aircraft. Throughout this handbook, all examples are based on a counter-clockwise rotating main rotor system.* **Replace with:** …Helicopter main rotor designs from different manufacturers rotate in one of two different directions

Page #	Location	Issue Type	Issue Description
			(clockwise or counter-clockwise when viewed from above). This can make it confusing when discussing aerodynamic effects on the main rotor between different designs, since the effects may manifest on opposite sides of each aircraft. For clarity, throughout this handbook, all examples use a counter-clockwise rotating main rotor system when viewed from above.
1-5	Right col	Terminology	*A helicopter has four flight control inputs:* **Replace with:** A helicopter has four primary flight controls:
1-5	Right col, under Cyclic heading	Too specific	*…however, the Robinson R-22 and R-44 have unique teetering bar cyclic control systems additionally, a few helicopters have cyclic controls that descend into the cockpit from overhead.* **Replace with:** …however, Robinson helicopters have unique T-bar cyclic control systems. A few helicopters have cyclic controls that descend into the cockpit from overhead while others use side cyclic controls.
1-6	Left col, under Throttle heading	Incorrect	*…In single-engine helicopters, the throttle control is a motorcycle-style twist grip mounted on the collective control while dual-engine helicopters have a power lever for each engine.…* **Replace with:** …In single-engine helicopters, if so equipped, the throttle control is typically a twist grip mounted on the collective control, but it can also be a lever mechanism in fully governed systems. Multi-engine helicopters generally have a power lever or mode switch for each engine.…
2-2	Right col, 2nd para	Typo	*Accordingly, by moving the air over an airfoil we can change the static pressures on the top and bottom thereby generating a useful force (an aerodynamic force.* **Fix as follows:** Accordingly, by moving the air over an airfoil we can change the static pressures on the top and bottom thereby generating a useful force (an aerodynamic force).
2-12	Right col, top para	Terminology	*…This effect is called settling with power and is discussed at length in a later chapter.…* **Replace with:** …This effect is called vortex ring state (formerly referenced as settling-with-power) and is discussed at length in Chapter 11, Helicopter Emergencies and Hazards.….
2-13	Bottom of left col, top of right col	Clarification	*…Any increase in the AOA beyond this point produces a stall and a rapid decrease in lift.* **Replace with:**

Page #	Location	Issue Type	Issue Description
			…Any increase in the AOA beyond this point produces a stall and a rapid decrease in lift (refer to the Low Rotor RPM and Rotor Stall section of Chapter 11, Helicopter Emergencies and Hazards).
2-25	Hovering Autorotation heading	Incorrect	*Hovering Autorotation* **Replace with:** Vertical Autorotation
3-2	Right col, 1st para	Incorrect	*…The throttle control is much like a motorcycle throttle and works in virtually the same way. Twisting the throttle to the left increases rpm; twisting the throttle to the right decreases rpm.…* **Replace with:** …The throttle control is a twist-grip throttle. In most helicopters, manually applying counter-clockwise pressure on the throttle increases engine rpm; manually applying clockwise pressure on the throttle decreases engine rpm.…
4-2	Right col, 1st para	Terminology	*…The main rotor hub is free to tilt with respect to the main rotor shaft on what is known as a teetering hinge.…* **Replace with:** …The main rotor hub is free to tilt with respect to the main rotor shaft on what is known as a teetering or flapping hinge.…
4-4	Left col, 2nd para	Incorrect	*The rigid rotor system is very responsive and is usually not susceptible to mast bumping like the semirigid or articulated systems because the rotor hubs are mounted solid to the main rotor mast.…* **Replace with:** The rigid rotor system is very responsive and is usually not susceptible to mast bumping like the semirigid systems because the rotor hubs are mounted solid to the main rotor mast.…
4-6	After Tandem Rotor section, before Swash Plate Assembly section	Missing information	**Add 2 new sections:** **Coaxial Rotors** A coaxial rotor system is a pair of rotors mounted on the same shaft but turning in opposite directions. This design eliminates the need for a tail rotor or other antitorque mechanisms, and since the blades turn in opposite directions, the effects of dissymmetry of lift are avoided. The main disadvantage of coaxial rotors is the increased mechanical complexity of the rotor system. Numerous Russian helicopters, such as the Kaman Ka-31 and Ka-50, along with the Sikorsky experimental X2 use a coaxial rotor design **Intermeshing Rotors**

Page #	Location	Issue Type	Issue Description
			An intermeshing rotor system is a set of two rotors turning in the opposite directions with each rotor mast mounted on the helicopter with a slight angle, so the blades intermesh without colliding. This design also eliminates the need for an antitorque system, which provides more engine power for lift. However, neither rotor lifts directly vertical which reduces each rotor's efficiency. The Kaman HH-43, which was used by the USAF in a firefighting role and the Kaman K-MAX are examples of an intermeshing rotor systems.
4-8	Right col, last para	Terminology	*…Some common terms are: inter-turbine temperature (ITT), exhaust gas temperature (EGT), or turbine outlet temperature (TOT)….* **Replace with:** …Some common terms are inter-turbine temperature (ITT), exhaust gas temperature (EGT), measured gas temperature (MGT), or turbine outlet temperature (TOT)….
4-14	Left col, 3rd para	Incorrect	*The effect of fuel vaporization and decreasing air pressure in the venturi causes a sharp drop in temperature in the carburetor….* **Replace with:** The effect of fuel vaporization and/or a decrease of air pressure in the venturi causes a rapid decrease in air temperature in the carburetor….
4-18	Right col, last para	Clarification	**Insert new sentence:** *…Indications of carburetor icing are a decrease in engine rpm or manifold pressure, the carburetor air temperature gauge indicating a temperature outside the safe operating range, and engine roughness.* However, reciprocating engines with a governor may mask the formation of carburetor ice since it will maintain a constant manifold pressure and RPM. *Since changes in rpm or manifold pressure can occur for a number of reasons, closely check the carburetor air temperature gauge when in possible carburetor icing conditions….*
5-2	Right col, 5th para	Incorrect	*…A blue line is sometimes added to show the maximum safe autorotation speed….* **Replace with:** …A blue or a red cross-hatched line is sometimes added to show the maximum autorotation speed….
5-2	Left col, 4th para	Clarification	**Insert new sentence:** *Most manufacturers include a table of contents, which identifies the order of the entire manual by section number and title.* In addition, some helicopters may include a log of changes or a revision page to track changes to the

Page #	Location	Issue Type	Issue Description
			manual. *Usually, each section also contains its own table of contents….*
5-2	Right col, last para	Incorrect	*Another restriction on maximum airspeed for level flight with maximum continuous power (V_H) may be the availability of power. An increase in power required due to an increase in weight, or by G producing maneuvers, may decrease V_H. A decrease in power available caused by increased density altitude or by weak or faulty engines also decreases V_H.* **Replace with:** Other airspeed limitations may be included in this section of the RFM. Examples include reduced VNE when doors are removed, maximum airspeed for level flight with maximum continuous power (VH), or restrictions when carrying an external load. Pilots need to understand and adhere to all airspeed limitations appropriate to the make, model, and configuration of the helicopter being flown.
5-6	Para 3	Clarification	**Insert new sentence between 1st and 2nd sentences and edit 3rd sentence:** *The safety and operational tips section is optional and contains a review of information that could enhance the safety of the operation.* Manufacturers may include best operating practices and other recommended procedures for the enhancement of safety and reducing accidents. Some examples of the information that might be covered include physiological factors, general weather information, fuel conservation procedures, external load warnings, low rotor rpm considerations, and recommendations that if not adhered to could lead to an emergency.
6-2	Para under Weight Limitations section	Clarification	*Weight limitations are necessary to guarantee the structural integrity of the helicopter and enable pilots to predict helicopter performance accurately.…* **Replace with:** Weight limits are necessary to guarantee the structural integrity of the helicopter, enable pilots to predict helicopter performance and insure aircraft controllability.…
6-2	Para under Balance section	Clarification	**Add sentence to end of para:** *…It is essential to load the aircraft within the allowable CG range specified in the rotorcraft flight manual's (RFM) weight and balance limitations.* Loading outside approved limits can result in insufficient control travel for safe operation.
6-4	Left col, 3rd para	Incomplete	**Delete:** *Then using one of the methods described below, calculate the loaded moment and/or loaded CG and verify that it falls within the allowable CG range shown in the RFM.*
7-2	Para under Weight section	Clarification	**Add sentence to beginning of para:** Weight is one of the most important factors because the pilot can control it. *Most performance charts include…*

Page #	Location	Issue Type	Issue Description
7-2	Para under Winds section	Clarification	*…As wind speed increases, translational lift increases, resulting in less power required to hover.* **Replace with:** …Assuming a headwind, as wind speed increases, translational lift increases, resulting in less power required to hover.
7-2	Para under Performance Charts section	Incomplete	*…It is assumed that the helicopter is in good operating condition and the engine is developing its rated power….* **Replace with:** …It is assumed that the helicopter is in good operating condition, calm wind, and the engine is developing its rated power….
7-3 & 7-4	7-3: Right col, paras 4 & 5 7-4: Left col, paras 1 thru 6	Improper placement	**On page 7-3 delete:** Paragraphs 4 (starting with "*It is possible…*") and 5 (starting with "*The airspeed is…*") **On page 7-4 delete:** Paragraphs 1 through 6 (starting with "*In the final stage…*" ending with "*…Aerodynamics of Flight.*")
8-4	Para under Passengers section	Incomplete	**Add new 1st para (make old 1st para new 2nd para) and revise 2nd para:** Passengers increase the responsibility, workload, and risk for the pilot. The workload and distractions seem magnified to inexperienced pilots while they are developing confidence and ability to operate in the aviation environment. Inexperienced pilots should consider building up their passenger carrying experience while remaining in good flying conditions and in a familiar area. *All persons boarding a helicopter while its rotors are turning should be* briefed on *the safest means of doing so. The pilot in command (PIC) should always brief the passengers prior to engine start to ensure complete understanding of all procedures. The exact procedures may vary slightly from one helicopter model to another, but the following should suffice as a generic guide.*
8-4	Right col, no. 3	Incorrect	*3. …For that reason, it is uniformly accepted for personnel to approach from the sides of the helicopter. Personnel should always be cautioned about approaching from the rear due to the tail rotor hazard, even for helicopters such as the BO-105 and BK-117.* **Replace with:** 3. …For that reason, it is generally accepted for personnel to approach from the sides of the helicopter. Helicopters designed to be loaded from the rear require personnel to exercise extreme caution.
8-6	Left col, no. 1	Incomplete	*1. The use and operation of seatbelts for takeoff, en route, and landing.*

Page #	Location	Issue Type	Issue Description
			Replace with: 1. Passengers should be briefed and understand the proper use of seatbelts, doors, and headsets/intercom system.
8-6	Left col	Incorrect	**Add new no. 2 and 3 and revise 4 thru 6:** 2. The safe entry and exit paths (away from the tail rotor and within the pilot's view). 3. If possible, remove front passenger flight controls and ensure all passenger personal items, such as cameras and mobile phones are secure. 4. For over water flights, the location and use of flotation gear and other survival equipment that are onboard. Pilot instructions should include how and when to exit the helicopter should ditching or a water landing occur. 5. For flights over rough or isolated terrain, the pilot should brief all occupants regarding the location of maps and survival equipment. 6. Passengers should be informed as to what actions and precautions to take in the event of an emergency, such as the body position for best spinal protection against a high vertical impact (erect with back firmly against the seat back); and when and how to exit. Ensure that passengers are aware of the location of the fire extinguisher, survival equipment and, if equipped, how to use and locate the Emergency Position Indicator Radio Beacon (EPIRB).…
9-2	Right col, no. 3	Incorrect	*3. Anticipate the following characteristics during aggressive maneuvering flight, and adjust or lead with collective as necessary to maintain trim and torque:* **Replace with:** 3. The following flight characteristics may be expected during maneuvering flight and will be discussed and demonstrated by your Flight Instructor:
9-2	Right col, 2nd to last bullet	Incorrect	**Delete the following bullet:** *Many overtorques during flight occur as the aircraft unloads from high G maneuvers. This is due to insufficient collective reduction following the increase to maintain consistent torque and rotor rpm as G-loading increased (dive recovery or recovery from high G-turn to the right).*
9-3	Left col, last para, 3rd sentence	Incorrect description	*…At the same time apply pressure and counter pressure on the pedals to ensure heading remains constant.…* **Replace with:** …As collective and torque increases, antitorque must be adjusted as well. Therefore, as the aircraft begins to get light on the landing gear, apply appropriate antitorque pedal to maintain aircraft heading.…
9-10	Ch 9	Clarification	**Reorder Chapter 9 sections as follows:** Introduction

Page #	Location	Issue Type	Issue Description
			The Four Fundamentals Straight and Level Flight Turns Normal Climb Normal Descent Vertical Takeoff to a Hover Hovering Hovering Turn Hovering – Forward Flight Hovering – Sideward Flight Hovering – Rearward Flight Taxiing Normal Takeoff from a Hover Normal Takeoff from the Surface Crosswind Considerations During Takeoffs Ground Reference Maneuvers Traffic Patterns Approaches Go-Around Chapter Summary
2-14, 9-4, 9-6 (4x), 9-7 (3x), 9-20, 10-5 (3x), 10-6, 11-8	Chapters 2, 9, 10, and 11	Terminology	**Replace all references to *hovering altitude* with hovering height.**
9-8	Para under Surface Taxi section	Incorrect	*A surface taxi is used to minimize the effects of rotor downwash. [Figure 9-6] Avoid excessive cyclic displacement while surface taxiing or on the ground which can lead to main rotor blades contacting the helicopter or rotor mast. This technique may be used with wheeled aircraft, or with those that have floats, skids or skis.* **Replace with:** A surface taxi is used to minimize the effects of rotor downwash in wheel-type helicopters *[Figure 9-6]*. Surface taxiing in skid type helicopters is generally not recommended due to the high risk of dynamic rollover; for more information, refer to Chapter 11, Helicopter Emergencies and Hazards. **Also replace Figure 9-6 with an accurate image:** The image used to show a wheel type aircraft is wrong. There is no such aircraft in production (it appears to be a 206L model with wheels drawn on it). Replace the image with a wheel type

Page #	Location	Issue Type	Issue Description
			aircraft currently in production (Leonardo 109, 139 or Sikorsky S-92 or equivalent).
9-14	Para under Technique section	Clarification	*…Fly the maneuver approximately 500 to 800 feet above the ground, which is the altitude usually required for an airport traffic pattern.…Altitude can be raised up to 800 feet as proficiency improves.* **Replace with:** …Fly the maneuver approximately 500 to 1000 feet above the ground as appropriate.…Altitude can be raised up to 1000 feet as proficiency improves.
9-17	Left col, 2nd para	Incorrect	*…Since the maneuver is performed between 500 and 800 feet AGL, the area selected should also afford an opportunity for a safe emergency autorotation in the event it becomes necessary.* **Replace with:** …Additionally, the area should be clear and suitable for any emergency landings should they be required.
9-17	Para under Traffic Patterns section	Clarification	**Add new sentences to end of para:** *…In addition, learn how to fly these patterns in case air traffic control (ATC) requests a fixed-wing traffic pattern be flown.* Traffic patterns are initially taught during the day. Traffic patterns at night may need to be adjusted; for more information, refer to Chapter 12, Night Operations.
9-18	Right col, 3rd para	Incorrect	*An accepted helicopter traffic pattern is flown at 500 feet AGL and consists of right turns.…* **Replace with:** A helicopter traffic pattern is flown at 500-1000 feet AGL depending on considerations such as terrain, obstacles, and other aircraft traffic.…
9-19	Para under Normal Approach to a Hover section	Incorrect	*A normal approach uses a descent profile of between 7° and 12° starting at approximately 300–500 feet AGL.* **Replace with:** A normal approach uses a descent angle of between 7° and 12°.
10-4	Right col, para under Technique section	Terminology	**Replace altitude with height:** *…It is practiced at* a height *that permits a safe clearance between the tail rotor and the surface throughout the maneuver, especially at the point where the pitch attitude is highest. The* height *at completion should be no higher than the maximum safe hovering* height *prescribed by that particular helicopter's manufacturer. In selecting* a height *at which to begin the maneuver, take into account the overall length of the helicopter and its height-velocity diagram.…*
10-5	Para under Steep Approach section	Terminology	*…Caution must be exercised to avoid the parameters for settling with power (20–100 percent of available power applied, airspeed of less than 10 knots, and a rate of descent greater than 300 feet per minute (fpm)). For additional information on*

Page #	Location	Issue Type	Issue Description
			settling with power, refer to Chapter 11, Helicopter Emergencies and Hazards. **Replace with:** …Caution must be exercised to avoid the parameters for vortex ring state (20–100 percent of available power applied, airspeed of less than 10 knots, and a rate of descent greater than 300 feet per minute (fpm)). For additional information on vortex ring state (formerly referenced as settling-with-power), refer to Chapter 11, Helicopter Emergencies and Hazards.
10-7	Para under Slope Operations section	Incorrect	*Prior to conducting any slope operations, be thoroughly familiar with the characteristics of dynamic rollover and mast bumping, which are discussed in Chapter 12, Helicopter Emergencies.…* **Replace with:** Prior to conducting any slope operations, be thoroughly familiar with the characteristics of dynamic rollover and mast bumping, which are discussed in Chapter 11, Helicopter Emergencies and Hazards.…
10-8	Left col, 2nd to last para	Incorrect and Bad Formatting	*…A slope of 5° is considered maximum for normal operation of most helicopters. Consult the Rotorcraft Flight Manual (RFM) or Pilot's Operating Handbook (POH) for the specific limitations of the helicopter being flown.* **Replace with:** …A slope of 5° is recommended maximum for training in most helicopters. However, additional training to the manufacturer's limitations may be required. Consult the Rotorcraft Flight Manual (RFM) or Pilot's Operating Handbook (POH) for the specific limitations of the helicopter being flown. **Also, delete the gap in middle of this paragraph**.
10-8	Left col, last para	Incorrect	*…If this occurs, abandon the landing because the slope is too steep.…* **Replace with:** …If helicopter mast moment or slope limits are reached before the helicopter is firmly on the ground, return the helicopter to a hover. Select a new area with a lesser degree of slope.…
10-12	Para under Summary section	Clarification	*…The correlation between helicopter power requirements, the environment, and safety were also explained to familiarize the pilot with how the helicopter reacts during different maneuvers.…* **Replace with:** …The correlation between helicopter performance requirements, the environmental factors associated with different flight techniques, and safety considerations were also explained to familiarize the pilot with the measures that can be taken when performing these maneuvers to mitigate risks.…

Page #	Location	Issue Type	Issue Description
11-2	Right col, 1st para	Clarification	*Several factors affect the rate of descent in autorotation: density altitude, gross weight, rotor rpm, and airspeed. The primary way to control the rate of descent is with airspeed.…* **Replace with:** Several factors affect the rate of descent in autorotation: bank angle, density altitude, gross weight, rotor rpm, trim condition, and airspeed. The primary ways to control the rate of descent are with airspeed and rotor rpm.…
11-2	Right col, 3rd para	Terminology	*…Higher rotor weights may require more collective to control rotor rpm.…* **Replace with:** …Heavier helicopter weights may require more collective to control rotor rpm.…
11-2	Right col, 2nd para	Clarification	**Add sentence to end of para:** *…Therefore, autorotative descents at very low or very high airspeeds are more critical than those performed at the minimum rate of descent airspeed.* Refer to the height-velocity diagram discussion in Chapter 7, Helicopter Performance.
11-3	Left col, Para 1	Terminology	*…specific airspeed and rotor rpm for autorotation is established for each type of helicopter on the basis of average weather, wind conditions, and normal loading.…* **Replace with:** …specific airspeed and rotor rpm for autorotation is established for each type of helicopter based on average weather, calm wind conditions, and normal loading.…
11-3	Right col, Para 1	Clarification	*…associated with airspeed control in powered flight but may not be given the credit appropriate for rotor rpm control during practice and emergency power off autorotations.…* **Replace with:** …associated with attitude/airspeed control in powered flight but may not be given the credit appropriate for rotor rpm control during practice and emergency power off autorotations.…
11-4	Para under Technique (How to Practice) section	Incorrect	*…From level flight at the appropriate airspeed (cruise or the manufacturer's* *recommended airspeed), 500–700 feet above ground level (AGL), and heading into the wind, smoothly but firmly lower the collective to the full down position, while maintaining rotor rpm in the green arc with collective.…* **Replace with:** …From level flight at the appropriate airspeed (cruise or the manufacturer's recommended airspeed), 500–700 feet above ground level (AGL), and heading into the wind, smoothly but firmly lower the collective to the full down position. Use aft cyclic to prevent a nose low attitude while maintaining rotor rpm in the green arc with collective.…

Page #	Location	Issue Type	Issue Description
11-5	Left col, 2nd para	Incorrect	**Delete:** *In many light helicopters, the student pilot can sit in the pilot seat with the engine turned off while the instructor pulls down on the helicopter's tail until the tail rotor guard or "stinger" touches the surface.*
11-5	Left col, 4th para	Clarification	*At this point, if a full touchdown landing is to be made, allow the helicopter to descend vertically (position 5)….This collective application uses some of the potential energy in the rotor disk to help slow the descent rate of the helicopter. Additional antitorque pedal is required to maintain heading as collective pitch is raised due to the reduction in rotor rpm and the resulting reduced effect of the tail rotor.…* **Replace with:** At this point, if a full touchdown landing is to be performed, allow the helicopter to descend vertically (position 5)….This collective application uses some of the kinetic energy in the rotor disk to help slow the descent rate of the helicopter. When the collective is raised, the opposite antitorque pedal used in powered flight will be needed due to the friction within the transmission/drive train.…
11-5	Right col, 3rd para	Incorrect	**Replace potential with kinetic:** *…Holding the helicopter in the air by using all of the rotor rpm* kinetic *energy usually causes the helicopter to have a hard landing, which results in the blades flexing down and contacting the tail boom.…*
11-5	Right col, 2nd para	Clarification	*…Rather, by lowering the collective slightly during the ground run, more weight is placed on the undercarriage, slowing the helicopter.* **Replace with:** …By lowering the collective slightly during the ground run, an increase in weight is placed on the landing carriage, slowing the helicopter; however, this is dependent on the condition of the landing surface.
11-7	Right col, 2nd to last para	Incorrect	*…When a landing is to be made following the power recovery, bring the helicopter to a hover at hovering altitude and then descend to a landing.* **Replace with:** …When a landing is to be made following the power recovery, bring the helicopter to a hover and then descend to a landing.
11-9	Height-Velocity Diagram section	Clarification	**Move entire H-V Diagram section to:** page 7-2, right column, after Performance Charts section, before Autorotational Performance section**.**
11-9	Right col, 1st para	Terminology	*The height-velocity diagram or H/V curve is a graph charting the safe/unsafe flight profiles relevant to a specific helicopter.…* **Replace with:**

Page #	Location	Issue Type	Issue Description
			The height-velocity diagram shows the combinations of airspeed and height above the ground, which will allow an average pilot to successfully complete a landing after an engine failure.…
11-9	Right col, 1st para	Incorrect	**Delete:** *As operation outside the safe area of the chart can be fatal in the event of a power or driveline failure, it is sometimes referred to as the dead man's curve by helicopter pilots.*
11-9	Right col, last para	Terminology	**Replace potential with kinetic:** *At low heights with low airspeed, such as a hover taxi, the pilot can simply use the* kinetic *energy from the rotor disk to cushion the landing with collective, converting rotational inertia to lift.…*
11-11	Left col, 2nd para	Clarification	*Charts and diagrams for helicopters set out in Title 14 of the Code of Federal Regulations (14 CFR) Part 27, Airworthiness Standards: Normal Category Rotorcraft, are advisory in nature and not regulatory. However, these charts do establish the safe parameters for operation. It is important to remember that these guidelines establish the tested capabilities of the helicopter. Unless the pilot in command (PIC) is a certificated test pilot, operating a helicopter beyond its established capabilities can be considered careless and reckless operation, especially if this action results in death or injury.* **Replace with:** The production of performance charts and diagrams for helicopters are regulatory as set out in Title 14 of the Code of Federal Regulations (14 CFR) Part 27, Airworthiness Standards. These charts establish safer parameters for operation. Although not regulatory, the pilot should carry out a full risk assessment to carefully consider the higher risk before operating within the shaded areas of the height-velocity diagram.
11-11	Left col, Common Errors section	Incorrect	**Delete:** *Common Errors* *1. Performing hovers higher than performed during training for hovering autorotations and practiced proficiency.* *2. Excessively nose-low takeoffs. The forward landing gear would impact before the pilot could assume a landing attitude.* *3. Adding too much power for takeoff.* *4. Not maintaining landing gear aligned with takeoff path until transitioning to a crab heading to account for winds.*
11-11	Settling-With-Power (Vortex Ring State) header	Terminology	*Settling-With-Power (Vortex Ring State)* *Vortex ring state describes an aerodynamic condition in which a helicopter may be in a vertical descent with 20 percent up to maximum power applied, and little or no climb performance. The term "settling-with-power" comes from the fact that the helicopter keeps settling even though full engine power is applied.* **Replace with:**

Page #	Location	Issue Type	Issue Description
			Vortex Ring State Vortex ring state (formerly referenced as settling-with-power) describes an aerodynamic condition in which a helicopter may be in a vertical descent with 20 percent up to maximum power applied, and little or no climb performance. The previously used term settling-with-power came from the fact that the helicopter keeps settling even though full engine power is applied.
11-11	Fig 11-5	Incorrect	**Replace Figure 11-5 with correct depiction:** The current Figure is an incorrect depiction. There is an interior vortex, but it is very small and almost inconsequential. The outboard vortex is quite large and of more importance to this condition. Figure 11-5 is incorrect in showing the vortices all the same size.
11-11	Right col, 2nd to last para	Terminology	*…Airspeeds that are below translational lift airspeeds are within this region of susceptibility to settling-with-power aerodynamics.…* **Replace with:** …Airspeeds that are below translational lift airspeeds are within this region of susceptibility to vortex ring state aerodynamics.…
11-12	Left col, 2nd para	Terminology	*…Recovery is accomplished by increasing airspeed, and/or partially lowering collective. In many helicopters, lateral cyclic combined with lateral tailrotor thrust will produce the quickest exit from the hazard assuming that there are no barriers in that direction.…* **Replace with:** …The traditional recovery is accomplished by increasing airspeed, and/or partially lowering collective to exit the vortex. In most helicopters, lateral cyclic thrust combined with an increase in power and lateral antitorque thrust will produce the quickest exit from the hazard. This technique, known as the Vuichard Recovery (named after the Swiss examiner from the Federal Office of Civil Aviation who developed it) recovers by eliminating the descent rate as opposed to exiting the vortex.…
11-12	Left col, 2nd para	Incorrect	*…In a fully developed vortex ring state, the only recovery may be to enter autorotation to break the vortex ring state.* **Replace with:** …If the vortex ring state and the corresponding descent rate is allowed to progress to what is called the windmill brake state, the point where the airflow is completely up through the rotor, the only recovery may be an autorotation.
11-12	Left col, 1st para	Terminology	*Some of the situations that are conducive to a settling-with-power condition are: any hover above ground effect altitude, specifically attempting to hover OGE at altitudes above the hovering ceiling of the helicopter, attempting to hover OGE without maintaining precise altitude control, pinnacle or rooftop helipads when the wind is not aligned with the landing*

Page #	Location	Issue Type	Issue Description
			direction, and downwind and steep power approaches in which airspeed is permitted to drop below 10 knots, depending on the type of helicopter. **Replace with:** Situations that are conducive to a vortex ring state condition are attempting to hover OGE without maintaining precise altitude control, and approaches, especially steep approaches, with a tailwind component.
11-12	Left col, 2nd para	Terminology	*When recovering from a settling-with-power condition, the pilot tends first to try to stop the descent by increasing collective pitch.…* **Replace with:** When recovering from a vortex ring state condition, the pilot tends first to try to stop the descent by increasing collective pitch.…
11-12	Left col, 4th para	Incorrect	*For settling-with-power demonstrations and training in recognition of vortex ring state conditions, all maneuvers should be performed at an altitude of 2000–3000 feet AGL to allow sufficient altitude for entry and recovery.* **Replace with:** For vortex ring state demonstrations and training in recognition and recovery should be performed from a safe altitude to allow recovery no less than 1000 feet AGL or the manufacturer's recommended altitude, whichever is higher.
11-12	Left col, last para	Terminology	*However, helicopter pilots would normally initiate recovery at the first indication of settling-with-power.* **Replace with:** However, helicopter pilots would normally initiate recovery at the first indication of vortex ring state.
11-12	Right col	Terminology	*Common Errors* 1. *Too much lateral speed for entry into settling-with-power.* 2. *Excessive decrease of collective.* **Replace with:** Common Errors – Traditional Recovery 1. Too much lateral speed for entry into vortex ring state. 2. Excessive decrease of collective.
11-12	Right col	Terminology	**After Common Errors – Traditional Recovery section add:** Common Errors – Vuichard Recovery 1. Excessive lateral cyclic 2. Failure to maintain heading
11-12	Right col, 3rd para	Clarification	*Retreating blade stall is a major factor in limiting a helicopter's never-exceed speed (V_{NE})…* **Replace with:**

Page #	Location	Issue Type	Issue Description
			Retreating blade stall is a factor in limiting a helicopter's never-exceed speed (V_{NE})…
11-12	Right col, 4th para	Clarification	**Replace with:** *When recovering from a retreating blade stall condition* caused by high airspeed*, moving the cyclic aft only worsens the stall as aft cyclic produces a flare effect, thus increasing the AOA. Pushing forward on the cyclic also deepens the stall as the AOA on the retreating blade is increased.* While the first step in a proper recovery is usually to reduce collective, RBS should be evaluated in light of the relevant factors discussed in the previous paragraph and addressed accordingly. For example, if a pilot at high weight and high DA is about to conduct a high reconnaissance prior to a confined area operation where rolling into a steep turn causes onset of RBS, the recovery is to roll out of the turn. If the cause is low rotor RPM, then increase the RPM.
11-13	Para under Dynamic Rollover section	Incorrect	*…(5–8° depending on helicopter, winds, and loading)…* **Replace with:** …The angle at which dynamic rollover occurs will vary based on helicopter type….
11-13	Under Dynamic Rollover section, 2nd para	Clarification	**Replace 2nd para with:** *Dynamic rollover begins when the helicopter starts to pivot laterally around its skid or wheel.* For dynamic rollover to occur the following three factors must be present: 1. A rolling moment 2. A pivot point other than the helicopter's normal CG 3. Thrust greater than weight *This can occur for a variety of reasons, including the failure to remove a tie down or skid-securing device, or if the skid or wheel contacts a fixed object while hovering sideward, or if the gear is stuck in ice, soft asphalt, or mud. Dynamic rollover may also occur if you use an improper landing or takeoff technique or while performing slope operations.* Whatever the cause, dynamic rollover is possible if not using the proper corrective technique.
11-14	Fig 11-7	Formatting	**Move:** Figure 11-7 directly under the paragraph where it is mentioned (instead of under Cyclic Trim section).
11-16	Low-G Conditions and Mast Bumping section	Incomplete / Incorrect	**Replace current 3 paras in section with:** "G" is an abbreviation for acceleration due to the earth's gravity. A person standing on the ground or sitting in an aircraft in level flight is experiencing one G. An aircraft in a tight, banked turn with the pilot being pressed into the seat is experiencing more than one G or high-G conditions. A person beginning a downward ride in an elevator or riding down a

Page #	Location	Issue Type	Issue Description
			steep track on a roller coaster is experiencing less than one G or low-G conditions. The best way for a pilot to recognize low G is a weightless feeling similar to the start of a downward elevator ride. Helicopters rely on positive G to provide much or all of their response to pilot control inputs. The pilot uses the cyclic to tilt the rotor disk, and, at one G, the rotor is producing thrust equal to aircraft weight. The tilting of the thrust vector provides a moment about the center of gravity to pitch or roll the fuselage. In a low-G condition, the thrust and consequently the control authority are greatly reduced. Although their control ability is reduced, multi-bladed (three or more blades) helicopters can generate some moment about the fuselage independent of thrust due to the rotor hub design with the blade attachment offset from the center of rotation. However, helicopters with two-bladed teetering rotors rely entirely on the tilt of the thrust vector for control. Therefore, low-G conditions can be catastrophic for two-bladed helicopters. At lower speeds, such as initiation of a takeoff from hover or the traditional recovery from vortex ring state, forward cyclic maneuvers do not cause low G and are safe to perform. However, an abrupt forward cyclic input or pushover in a two-bladed helicopter can be dangerous and must be avoided, particularly at higher speeds. During a pushover from moderate or high airspeed, as the helicopter noses over, it enters a low-G condition. Thrust is reduced, and the pilot has lost control of fuselage attitude but may not immediately realize it. Tail rotor thrust or other aerodynamic factors will often induce a roll. The pilot still has control of the rotor disk, and may instinctively try to correct the roll, but the fuselage does not respond due to the lack of thrust. If the fuselage is rolling right, and the pilot puts in left cyclic to correct, the combination of fuselage angle to the right and rotor disk angle to the left becomes quite large and may exceed the clearances built into the rotor hub. This results in the hub contacting the rotor mast, which is known as mast bumping. *[Figure 11-10]* Low-G mast bumping has been the cause of numerous military and civilian fatal accidents. It was initially encountered during nap-of-the-earth flying, a very low-altitude tactical flight technique used by the military where the aircraft flies following the contours of the geographical terrain. The accident sequence may be extremely rapid, and the energy and inertia in the rotor system can sever the mast or allow

Page #	Location	Issue Type	Issue Description
			rotor blades to strike the tail or other portions of the helicopter. Turbulence, especially severe downdrafts, can also cause a low-G condition and, when combined with high airspeed, may lead to mast bumping. Typically, helicopters handle turbulence better than a light airplane due to smaller surface area of the rotor blades. During flight in turbulence, momentary excursions in airspeed, altitude, and attitude are to be expected. Pilots should respond with smooth, gentle control inputs and avoid overcontrolling. Most importantly, pilots should slow down; mast bumping is less likely at lower airspeeds Pilots can avoid mast bumping accidents as follows: • Avoid abrupt forward cyclic inputs in two-bladed helicopters. Airplane pilots may find this a difficult habit to break because pushing the nose down is an accepted collision avoidance maneuver in an airplane. Helicopter pilots would accomplish the same rapid descent by lowering the collective, and airplane pilots should train to make this instinctual. • Recognize the weightless feeling associated with the onset of low G and quickly take corrective action before the situation becomes critical. • Recognize that uncommanded right roll for helicopters with main rotors which rotate counter-clockwise when viewed from above indicates that loss of control is imminent, and immediate corrective action must be taken. • Recover from a low-G situation by first gently applying aft cyclic to restore normal G before attempting to correct any roll. • If turbulence is expected or encountered, reduce power and use a slower than normal cruise speed. Turbulence (where high rotor flapping angles are already present), and higher airspeeds (where the controls are more sensitive) both increase susceptibility to low-G conditions. • Use a flight simulator to learn to recognize and experience low G conditions that result in mast bumping, its correct recovery technique, and the consequences of using incorrect recovery actions. Refer to Chapter 14, Simulation.

Page #	Location	Issue Type	Issue Description
			Multi-bladed rotors may experience a phenomenon similar to mast bumping known as droop stop pounding if flapping clearances are exceeded, but because they retain some control authority at low G, occurrences are less common than for teetering rotors.
11-16 and 11-17	Low Rotor RPM and Blade Stall and Recovery from Low Rotor RPM sections	Incomplete / Incorrect	**Delete the Recovery from Low Rotor RPM section and its 4 paras. Replace Low Rotor RPM and Blade Stall section with: Low Rotor RPM and Rotor Stall** Rotor RPM is a critically important parameter for all helicopter operations. Just as airplanes will not fly below a certain airspeed, helicopters will not fly below a certain rotor RPM. Safe rotor RPM ranges are marked on the helicopter's tachometer and specified in the RFM. If the pilot allows the rotor RPM to fall below the safe operating range, the helicopter is in a Low RPM situation. If the rotor RPM continues to fall, the rotor will eventually stall. Rotor stall should not be confused with retreating blade stall, which occurs at high forward speeds and over a small portion of the retreating blade tip. Retreating blade stall causes vibration and control problems, but the rotor is still very capable of providing sufficient lift to support the weight of the helicopter. Rotor stall, however, can occur at any airspeed, and the rotor quickly stops producing enough lift to support the helicopter, causing it to lose lift and descend rapidly. Rotor stall is very similar to the stall of an airplane wing at low airspeeds. The airplane wing relies on airspeed to produce the required airflow over the wing, whereas the helicopter relies on rotor RPM. As the airspeed of the airplane decreases or the speed of the helicopter rotor slows down, the AOA of the wing/rotor blade must be increased to support the weight of the aircraft. At a critical angle (about 15°), the airflow over the wing or the rotor blade will separate and stall, causing a sudden loss of lift and increase in drag (refer to Chapter 2, Aerodynamics of Flight). An airplane pilot recovers from a stall by lowering the nose to reduce the AOA and adding power to restore normal airflow over the wing. However, the falling helicopter is experiencing upward airflow through the rotor disk, and the resulting AOA is so high that even full down collective will not restore normal airflow. In the helicopter when the rotor stalls, it does not do so symmetrically because any forward airspeed will produce a higher airflow on the advancing side than on the retreating side. This causes the retreating blade to stall first, and its weight makes it descend as it moves aft while the advancing blade is climbing as it goes

Page #	Location	Issue Type	Issue Description
			forward. The resulting low aft blade and high forward blade become a rapid aft tilting of the rotor disc sometimes referred to as rotor “blow back” or “flap back.” As the helicopter begins to descend, the upward flow of air acting on the bottom surfaces of the tail boom and any horizontal stabilizers tend to pitch the aircraft nose down. These two effects, combined with any aft cyclic by the pilot attempting to keep the aircraft level, allow the rotor blades to blow back and contact the tail boom, in some cases actually severing the tail boom. Since the tail rotor is geared to the main rotor, in many helicopters the loss of main rotor RPM also causes a significant loss of tail rotor thrust and a corresponding loss of directional control. Rotor stalls in helicopters are not recoverable. At low altitude, rotor stall will result in an accident with significant damage to the helicopter, and at altitudes above approximately 50 feet the accident will likely be fatal. Consequently, early recognition of the low rotor RPM condition and proper recovery technique is imperative. Low rotor RPM can occur during power-off and power-on operations. During power-off flight, a low RPM situation can be caused by the failure to quickly lower the collective after an engine failure or by raising the collective at too great a height above ground at the bottom of an autorotation. However, more common are power-on rotor stall accidents. These occur when the engine is operating normally but the pilot demands more power than is available by pulling up too much on the collective. Known as “overpitching,” this can easily occur at higher density altitudes where the engine is already producing its maximum horsepower and the pilot raises the collective. The corresponding increased AOA of the blades requires more engine horsepower to maintain the speed of the blades; however, the engine cannot produce any additional horsepower, so the speed of the blades decreases. A similar situation can occur with a heavily loaded helicopter taking off from a confined area. Other causes of a power-on low rotor RPM condition include the pilot rolling the throttle the wrong way in helicopters not equipped with a governor or a governor failure in helicopters so equipped. As the RPM decreases, the amount of horsepower the engine can produce also decreases. Engine horsepower is directly proportional to its RPM, so a 10% loss in RPM due to overpitching, or one of the other scenarios above, will result in a 10% loss in the engine’s ability to produce horsepower,

Page #	Location	Issue Type	Issue Description
			making recovery even slower and more difficult than it would otherwise be. With less power from the engine and less lift from the decaying rotor RPM, the helicopter will start to settle. If the pilot raises the collective to stop the settling, the situation will feed upon itself rapidly leading to rotor stall. There are a number of ways the pilot can recognize the low rotor RPM situation. Visually, the pilot can not only see the rotor RPM indicator decrease but also the change in torque will produce a yaw; there will also be a noticeable decrease in engine noise, and at higher airspeeds or in turns, an increase in vibration. Many helicopters have a low RPM warning system that alerts the pilot to the low rotor RPM condition. To recover from the low rotor RPM condition the pilot must simultaneously lower the collective, increase throttle if available and apply aft cyclic to maintain a level attitude. At higher airspeeds, additional aft cyclic may be used to help recover lost RPM. Recovery should be accomplished immediately before investigating the problem and must be practiced to become a conditioned reflex.
11-17	Para under System Malfunctions	Incorrect	*The reliability and dependability record of modern helicopters is very impressive. By following the manufacturer's recommendations regarding operating limits and procedures and periodic maintenance and inspections, most system and equipment failures can be eliminated. Most malfunctions or failures can be traced to some error on the part of the pilot; therefore, most emergencies can be averted before they happen. An actual emergency should be a rare occurrence.* **Replace with:** By following the manufacturer's recommendations regarding operating limits and procedures and periodic maintenance and inspections, many system and equipment failures can be eliminated. Certain malfunctions or failures can be traced to some error on the part of the pilot; therefore, appropriate flying techniques and use of threat and error management may help to prevent an emergency.
11-25	Under Lost Procedures section, Before Emergency Equipment Survival Gear section	Clarification	**Add new section:** **Inadvertent Instrument Meteorological Conditions Entry (IIMC)** Inadvertent entry into Instrument Meteorological Conditions (IMC) is a scary, stressful, and life-threatening event for any pilot. An IIMC entry may occur suddenly, has no simple procedural exit, and is not like training by reference to instruments in VMC conditions with a flight instructor or safety pilot onboard. Because most training helicopters are not

Page #	Location	Issue Type	Issue Description
			equipped with instruments to fly in IMC or are not certified for IFR flight, most General Aviation helicopter pilots will experience actual instrument conditions and the associated bodily perceptions and disorientations that may occur. An IIMC entry could be a pilot's first experience with IMC, and most available and accessible helicopters are not equipped with augmented safety systems or autopilots, which would significantly aid in the event of an IIMC entry. While commercial operators often require helicopter pilots with Commercial Certificates to be instrument rated, both Commercial and General Aviation helicopter fatal accidents still occur as a result of IIMC encounters. Many aircraft mishaps can be traced back to either the pilot's inability to recover an aircraft after inadvertently entering IMC or the aircraft's lack of equipment to provide sufficient instrument references. Therefore, it is essential, whether instrument rated or not, that all pilots understand the risks of and know how to avoid IIMC. The desire and need to use outside visual references is natural for most pilots because much of initial flight training is based upon visual cues, not on instruments. This primacy can only be overcome through significant additional instrument training. Additionally, Instrument Flight may be intimidating to some and too costly for others. As a result, many helicopter pilots choose not to seek an instrument rating. It is noteworthy that if IIMC is encountered and the pilot is not Instrument rated, not current or not proficient, or if the aircraft is only equipped for basic VMC flight, the risk of a fatal crash increases exponentially in any IMC penetration regardless of altitude. Although knowing how to recover from IIMC can be a lifesaving skill, preventing entry into IIMC is an even more critical skill. A good rule is to use personal minimums prior to flight and avoid the risk of IMC weather entirely. A trend of deteriorating weather conditions enroute should also be recognized early on and acted upon so that the flight route can be changed to land before actual Instrument Conditions are encountered. If weather conditions deteriorate below the pilot's personal minimums during flight, a pilot who understands the risks of IIMC knows that he or she is at an enroute decision point, where it is necessary to either turn back to the origin airport or land somewhere safe to wait until the weather has cleared. Pilots should recognize that descent below to a pre-determined

Page #	Location	Issue Type	Issue Description
			minimum altitude above ground level (for example, 500 feet AGL) to avoid clouds or slowing to a pre-determined minimum airspeed (for example, slowing to 50 KIAS) to reduce rate of closure into deteriorating weather indicates the decision point had been reached. Either a deteriorating ceiling or deteriorating visibility should trigger the decision to discontinue the current flight path to avoid the risk of IIMC. If the pilot is instrument rated, instrument currency, and proficiency should all be maintained. If IIMC is encountered despite appropriate preflight planning and weather assumptions made, the instrument rated pilot should climb to a safe altitude free of obstacles (such as an MSA or MOCA) and obtain an instrument clearance from ATC once stable flight is achieved. It is imperative to remember the primary rule in any aeronautical decision making is always to AVIATE first (fly the aircraft), then NAVIGATE, and finally COMMUNICATE. Often communication is made first, as it is natural to look for help in strenuous and difficult situations. As pilots, however, we must always fly the aircraft first. If the pilot is not instrument rated, not proficient, not current, or is flying a non-IFR equipped helicopter, remaining in VMC conditions is paramount. Pilots who are not trained or proficient in flight solely by reference to instruments have a tendency to try to chase favorable weather by flying just above the trees or by following roads. The thought process is that as long as I can see what is below me, I can fly to my intended destination. Experience and statistical data shows that continuing VFR flight in IMC often leads to a fatal outcome. Pilots often get fixated on what they see below them and fail to see what is ahead of them—power lines, towers, and taller trees. By the time the pilot sees the obstacle, it is either too close to avoid a collision, or while successfully avoiding the obstacle, the pilot nevertheless ends up in IIMC at an unusual attitude. When planning for a night flight, pilots should carefully plan the flight over navigable routes with sufficient check points to ensure clearance from obstructions. Descents should be planned over known and easily identifiable areas. Deteriorating weather is even harder to detect at night; therefore, pilots should constantly evaluate the weather throughout the flight and use more conservative personal minimums. Night flight experience and proficiency improves a pilot’s ability to assess deteriorating weather conditions at night.

Page #	Location	Issue Type	Issue Description
			Below are some basic rules to help a pilot remain in VMC throughout any flight: 1. Slowly turn around if threatened by deteriorating visual cues and proceed back to VMC weather or the first safe landing area if the weather ahead becomes questionable. Remember prevention is paramount. 2. Do not proceed further on a course when the terrain ahead is not clearly discernable. 3. Delay the flight and not take off if weather conditions are already questionable, could deteriorate significantly based on available forecasts or if uncertain whether the flight will be concluded safely. Often, a gut feeling can provide a warning that unreasonable risks are involved. 4. Always have a safe landing area (such as airports or large open spaces) in mind for every flight and always be aware of the safe landing area's location relative to your intended route of flight. There are five basic steps that every pilot should be familiar with, and which should be executed immediately after inadvertently entering IMC. However, remember that if you are not trained to execute the following maneuvers solely based on reference to instruments (or your aircraft is not equipped with the required instruments), this guidance is useless and a fatal crash is likely: 1. Level your "wings"—level the attitude indicator in pitch and bank. 2. Attitude—set a climb attitude that achieves a safe climb out speed appropriate to your type of helicopter. This is often no more than 10° of pitch up on the attitude indicator. 3. Speed—verify the attitude selected has achieved the desired speed. It is critical to recognize that control inputs at slower speeds closer to a hover or below effective translational lift speeds may cause larger control inputs and increased dynamic instability, which may be impossible to recover from in IMC. 4. Power—adjust to a climb power setting relative to the desired airspeed. This should be executed concurrent with 2 and 3. 5. Heading and Trim—pick a heading known to be free of obstacles and maintain it, most often the heading you were already on. That was your planned and briefed route of flight. Set the heading bug to avoid over-controlling in bank. Maintain coordinated flight so that

Page #	Location	Issue Type	Issue Description
			an unusual attitude will not develop. Try to avoid immediately turning 180°. Turning around is not often the safest route and executing a turn immediately after IIMC entry may lead to spatial disorientation. If a 180° turn is the safest option, commence that turn only after balanced flight is achieved (items 1 through 5 above) and maintain a constant rate of turn appropriate to the selected airspeed. There are exciting developments occurring in regards to aircraft design, new enhanced and lower-cost technologies, and aircraft certification. Because of this promising future, much of the discussion and guidance in this chapter may soon become irrelevant. As helicopters integrate more into the NAS IFR infrastructure and Instrument training becomes normalized, IMC flight in helicopters will also become "the norm." IIMC will no longer be the emergency it is described to be with its associated prevention and recovery techniques. As is the case in fixed wing flying, IMC is as expected and trained for as is VMC flying and is, truly, a very enjoyable and efficient way to travel to your destination. Until such time, however, an instrument rating may be a life-saving addition to any helicopter pilot's level of certification. Please refer to the Instrument Flying Handbook (FAA-H-8083-15, as revised); Advanced Avionics Handbook (FAA-H-8083-6, as revised); and the Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25, as revised) for further exploration of IMC flight and how to obtain an instrument rating. When evaluating the skill required to safely execute flights into known IMC or more importantly into IIMC. Planning and prevention, not recovery, are the best strategies to eliminate IIMC related fatalities.
12-1 thru 12-6	Ch 12	Incorrect	**Delete Chapter 12 entirely.**
13-1	Ch 13	Incorrect	**Current *Chapter 13: Night Operations* will become Chapter 12: Night Operations.**
13-6	Left col, 2nd full para	Incorrect	*…In addition, flashing aviation red or white anitcollision lights are required for night flights.…* **Replace with:** …In addition, flashing aviation red or white anticollision lights are required for all flights, if equipped on the aircraft and in an operable condition (in accordance with 14 CFR §91.209(b), which aids in the identification during night conditions).…
13-8	After Taxi Technique section,	Clarification	**Add new section:** **Night Traffic Patterns**

Page #	Location	Issue Type	Issue Description
	before Takeoff section		Traffic patterns are covered in Chapter 9, Basic Flight Maneuvers, but the following additional considerations should be taken into account when flying a helicopter in a night traffic pattern: 1. The minimum recommended pattern height at night is 1,000 feet when able. 2. If possible, consider taking the right hand night pattern with fixed wing in the left hand pattern for extra separation, but if needed, conform and integrate with the fixed wing using the same pattern height. 3. Be extra vigilant on abiding with noise abatement procedures at night. 4. Always plan to use the lit runway at night for unaided (no night vision equipment) approaches and departures. 5. Avoid downwind and crosswind approaches at night when able.
13-9	Right col, 1st para	Terminology	*…If too much airspeed is lost, a settling-with-power condition may result.…* **Replace with:** …If too much airspeed is lost, a vortex ring state condition may result.…
13-9	Right col, 2nd para	Terminology	*…This effect can cause a pilot to terminate the approach at an altitude that is too high, which may result in a settling-with-power condition and a hard landing.* **Replace with:** …This effect can cause a pilot to terminate the approach at an altitude that is too high, which may result in a vortex ring state condition and a hard landing.
13-10	Right col, 2nd to last para	Clarification	**Add 2 sentences to end of para:** *…Without that pilot experience, low lighting considerations should be applied by pilots for both preflight planning and operations until high lighting conditions are observed or determined to be regularly available.* Even if the aircraft is certified for day and night VFR conditions, night flight should only be conducted if adequate celestial illumination is assured during the entirety of the flight.
14-1	Ch 14	Incorrect	**Current *Chapter 14: Effective Aeronautical Decision-Making* will become Chapter 13: Effective Aeronautical Decision-Making.**
14-5	Left col, 1st line	Terminology	*…in a potential settling-with-power situation if she tried to trade airspeed for altitude and lost effective translational lift (ETL).…* **Replace with:** …in a potential vortex ring state situation if she tried to trade airspeed for altitude and lost effective translational lift (ETL).…

Page #	Location	Issue Type	Issue Description
Will be the new 14-1	After (new) Chapter 13, before Glossary	Incomplete	**Add a new Ch 14 (generate/acquire suitable graphics and images if possible):** **Chapter 14: Simulation** **Introduction** Aviation Training Devices (ATDs), Flight Training Devices (FTDs) and Full Flight Simulators (FFSs) are tools to significantly improve the training benefits and efficiencies of flight training alone. The various capabilities and specific opportunities they afford including: • Safety • Repeatable scenario and high risk situations to demonstrate the effects of Aeronautical Decision Making (ADM) and Threat and Error Management (TEM) • Extended scope of training • Special maneuver training capability • 24 hour availability to simulate in all weather conditions • Progressive and structured learning • High availability • Cost effectiveness • Environmental considerations **Benefits of Synthetic Training** **Safety** The first and most obvious benefit of using an ATD/FTD/FFS for training is the safety of the training operation itself. In the device, the training environment is designed and controlled to avoid any real hazards for the trainees and instructors. A trainee can make mistakes and errors, learn from them, and can perform and repeat procedures that may not be appropriate or safe when performed in a helicopter. **Repeatable Scenario and High Risk Situations to Demonstrate the Effects of ADM and TEM** For safety reasons, when performing an abnormal procedure or a failure in the helicopter, the malfunction is simulated either by pretending or by reproducing the effect of the malfunction in an at risk situation. For some critical scenarios trained in the helicopter such as engine failure during take-off, the element of surprise is often missing because of safety considerations or delays and allowances to accommodate local air traffic. This denies the pilot the opportunity to experience failures as they

Page #	Location	Issue Type	Issue Description
			would actually happen thereby diminishing the value of the training exercise. These considerations do not apply when performing this training in a simulator. Freedom from such considerations allows the pilot to experience more realistic training, which includes the surprise element, any startle response that results, the pilot's diagnostic process and appropriate response, and the ability to learn from errors made in a safe environment. **Extended Scope of Training and Special Maneuver Training Capability** The following initial and recurrent emergency training tasks are considered safer to complete in an ATD/FTD/FFS: • Vortex Ring State (VRS) • Loss of Tail Rotor Effectiveness (LTE) • Low Rotor RPM Recognition and Recovery • Anti-Torque System Failure • Static and Dynamic Rollover • Low G Recognition and Recovery • Ground Resonance • Flight in Degraded Visual Environment (DVE) • Unintended or Unexpected Flight into IMC (UIMC) • Various system and equipment malfunctions appropriate to a specific make and model **24 Hour Availability to Simulate in All Weather Conditions** In flight conditions: VMC/IMC and day/night, icing conditions, the training required takes place regardless of the prevailing conditions in the environment. **Progressive and Structured Learning** Progressive learning is an accepted approach to education, and flight simulation is well suited to this type of learning. It places emphasis on building on previous training by "doing," with hands-on experience designed to promote learning that is aligned with the lesson objective. Training Centers, Pilot Schools with FAA approved curricula, and individual flight instructors can create building blocks for learning that have a high likelihood of producing desired results. This allows for a productive use of the applicant's and instructor's time as the lesson objectives for learning are targeted and addressed as efficiently as possible. **High Availability**

Page #	Location	Issue Type	Issue Description
			Recognized high average ATD/FTD/FFS serviceability (typically around 96-98%). **Cost Effectiveness** There are economic benefits when using simulators in training. The savings made when compared with actual flight time can be quite significant for complex helicopter types in a multi-crew environment. Thus, training in an ATD/FTD/FFS is more cost effective. Additionally, while training in a simulator, the helicopter becomes available for training that requires its use or for revenue-generating flights. **Environmental Considerations** The environmental benefits of using a synthetic device in place of a helicopter include lower emissions, a lower carbon footprint, zero noise pollution and minimal impact on the local area, particularly at night. **Simulation Considerations** **Motion Sickness** Simulation sickness is slightly different from the usual airsickness. The most often reported symptoms are eyestrain, blurred vision, difficulty focusing, queasiness, and visual flashbacks, with occasional headaches and difficulty concentrating. Some pilots, even those who never have any problems during flight, experience undesirable effects and may need to avoid operating a vehicle until the symptoms subside after a session in an ATD/FTD/FFS. Tips to minimize motion sickness: • Avoid simulation training if you are fatigued or have an upset stomach. • Consume light refreshments only and keep hydrated. • Ensure adequate ventilation and temperature control. • Avoid abrupt attitude changes. • Maintain balanced flight. • Minimize head movement. • Maintain regular exposure to the synthetic environment. **Good Training Practices** In order to maximize the value of an ATD/FTD/FFS training session, full and mission oriented pre- and post-flight briefings are essential and should include at least:

Page #	Location	Issue Type	Issue Description

- ATD/FTD/FFS/Helicopter differences, capabilities, and limitations.
- Scenario/Lesson preparation taking into account a progressive approach.
- Training objectives.
- A thorough debrief utilizing CRM facilitative techniques.
- TEM techniques throughout.

Types of Synthetic Training Devices

The FAA divides its simulation trainer approvals into three specific and independent categories:

- Full Flight Simulator (FFS)
- Flight Training Device (FTD)
- Aviation Training Device (ATD)

Applicants for a pilot certificate or rating will see on the current FAA Form 8710-1, Airman Certificate and/or Rating Application three separate categories for entering this type of pilot time as FFS, FTD, or ATD time.

FAA operations inspectors have the authority to inspect any training device that is being used to satisfy 14 CFR part 61 or 141 regulatory requirements to verify compliance for its allowed use. Any concerns or discrepancies should be forwarded to the National Simulator Program (NSP) Branch of the Air Transportation Division or the Airmen Training and Certification Branch of the General Aviation and Commercial Division, as appropriate.

FFS and FTD

14 CFR part 60 provides the criteria for FFS and FTD approvals and further divides the approvals as follows:

- Full Flight Simulators (levels A-D)
- Flight Training Devices (levels 4-7)

These typically more complex type of trainers are described comprehensively in Part 60 as FSTDs and each device requires sponsorship by a Part 119 certificate holder (Part 121/135 operators), a Part 141 pilot school, or a Part 142 training center and are most often used by the airlines and aviation colleges/universities.

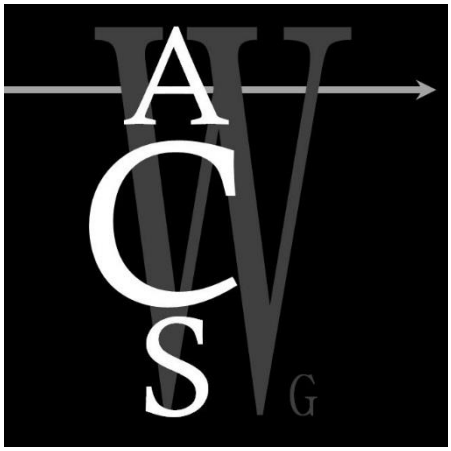
The term “Simulator” or “Flight Simulator” referenced in the regulation for training or experience allowances corresponds to FFS (A-D) approvals.

Page #	Location	Issue Type	Issue Description
			The term “Flight Training Device” referenced in the regulation corresponds to FTD (4-7) approvals. Only FTDs levels 4-7 can be used for FTD allowances. (The FAA no longer provides FTD levels 1-3 approvals, and they are not permitted for use on an airman practical test.) FFS and FTD authorizations are provided by the NSP Branch located in Atlanta, GA. These device approvals must be renewed annually. **ATD** AC 61-136, *FAA Approval of Aviation Training Devices and Their Use for Training and Experience* (as amended) provides the criteria for ATD approvals and use, and then divides them into two categories: Basic or Advanced ATD approvals. These training devices are more likely to be used by a local flight school providing training to the general public under Part 61 or 141 regulations. The term ATD referenced in the regulation provides for both the Basic Aviation Training Device (BATD) and Advanced Aviation Training Device (AATD) allowances. A FAA Letter of Authorization (LOA) provides the time allowances for each approval. Additional ATD guidance for their definition, evaluation, approval, and use is provided in the recently revised AC 61-136. This also addresses previously approved training devices (FTD levels 1-3, PCATDs, and other older approvals). ATDs cannot be used for airman practical tests. The FAA LOA for a manufacturer’s specific model provides the applicable training and experience allowances for that BATD or AATD approval. This includes Part 61 and 141 allowances for the Private Pilot and Instrument Rating for BATDs. Additional allowances are provided for an AATD for Commercial Pilot, Flight Instructor, and ATP certificates. Instrument pilot experience (currency) allowances are provided within both types of approvals. Only the AATD can be used to facilitate the Instrument Proficiency Check (IPC) requirements as described in the Instrument Practical Test Standards (PTS). A valid FAA LOA from the FAA Airmen Training and Certification Branch for ATDs must accompany the trainer to be used for the minimum pilot experience requirements specified in the regulation. LOAs are valid for a five-year period. A copy of the LOA must be provided to the pilot who wishes to use this credit for pilot certification or ratings. As of January 1, 2015, LOAs that

Page #	Location	Issue Type	Issue Description
			lack an expiration date are no longer valid, and that device cannot be used to meet minimum "regulatory" pilot experience requirements. However, older legacy trainers can still be used as procedural trainers, but their use can only be documented as ground or classroom instruction. Some flight schools use these trainers to help students memorize procedures in advance of the flight training and have experienced reductions in the overall flight time totals when preparing and recommending students for a practical test. Manufacturers can apply for a new FAA ATD authorization for their previously approved devices if they qualify, in accordance with the guidance in AC 61-136. Flight schools with these older devices should contact the manufacturer to determine if a new LOA is available. All aviation trainers used for credit on an airman application must have a valid LOA that includes a five-year expiration date. (The FAA no longer provides device approvals as levels 1-3 FTDs or PCATDs.) ATD authorizations can only be provided by the General Aviation and Commercial Division in Washington, DC. LOAs cannot be provided by the local Flight Standards District Office (FSDO). However, the Principle Operations Inspector (POI) providing oversight for a Part 141 pilot school will need to approve the use of a previously FAA-approved training device (with a valid LOA) within an approved pilot school course curriculum and Training Course Outline (TCO). **Logging Training Time and Experience** Authorized instructors or pilots logging time in a FFS or FTD should log that time as such and record the aircraft simulator type with the FAA ID number or serial number of the device being used for training. These FSTDs must be re-authorized on an annual basis, and individuals should verify this renewal if using this pilot time for regulatory experience or currency requirements. Authorized instructors or pilots logging time in an ATD for airman training, pilot time, or experience requirements are required to log the time as BATD or AATD time appropriately. Any columns that reference flight time should remain blank when logging ATD time. ATD pilot time can be logged as Total/Instruction Received/Instrument (these same blocks are provided on FAA Form 8710-1 to enter ATD time appropriately). Simulated "instrument" time can be logged in an ATD, but only during the time when the visual component of

Page #	Location	Issue Type	Issue Description
			the training session is configured for Instrument Meteorological Conditions (IMC) and the pilot is maintaining control solely by reference to the flight instruments. Logging time in this fashion will allow a pilot to credit this time towards the aeronautical experience and recent experience requirements as specified in 14 CFR part 61 or 141. Under Part 61, subpart 61.51(b)(1)(iv) that the type and identification of the ATD be included in the logging of pilot time as described in the LOA must be recorded. It is the responsibility of the flight instructor, student, or certificated pilot to verify the device is qualified and approved for training or experience requirements. The person logging time in an ATD should ask for and retain a copy of the manufacturer's LOA. Time logged in training devices can be cumulative. For example, under Part 61 the LOA for AATDs currently provide for 2.5 hours for the private pilot, 10 hours for instrument, 50 hours for commercial, and 25 hours for ATP. As an individual acquires these additional certificates, the total allowance would be 87.5 hours. NOTE: There are no restrictions on the amount of training accomplished and logged in training devices. However, the regulatory limitations on maximum credit allowed for the minimum pilot certification requirements for each certificate or rating is specified in Parts 61 and 141 or in the LOA. No approvals or authorizations are provided for aircraft type ratings using ATDs. Additionally, airman testing cannot be done in ATDs. **Summary** ATDs, FTDs and FFSs are great tools to significantly improve training benefits and efficiency, while avoiding training accidents and the risks involved in helicopter operations. These devices present other advantages such as extended training scope and special maneuvers training capability, 24 hour availability, and all weather conditions availability, and progressive learning. They are also cost effective and environmentally friendly. There are also the benefits of using realistic training scenarios where operational aspects can be introduced as a genuine surprise. However, it should be noted that helicopter regulation today does not allow zero flight time training as the fixed wing regulation does, therefore a minimum number of helicopter flight hours is required for any initial type rating.

Page #	Location	Issue Type	Issue Description
			Remember that there is huge safety benefit when taking advantage of the well-known fact that most people learn from their mistakes, even if emergency situations and scenarios are never the same twice. Learning from mistakes in a safe synthetic environment and developing good ADM and TEM before testing them in the air is extremely valuable.
G-2	Between Cyclic pitch control and Delta hinge	Terminology	**Add:** Degraded Visual Environment (DVE). Any flight environment of reduced visibility in which situational awareness of the aircrew or control of the aircraft may be severely diminished, completely lost, or may not be maintained as comprehensively as they are during flight operations within clear or undiminished visibility. DVE conditions are further categorized into eleven different types: smoke, smog, clouds, rain, fog, snow, whiteout, night, flat light, sand, and brownout.
G-3	Between Dynamic rollover and Feathering	Terminology	**Add:** Emergency Position Indicator Radio Beacon **(**ERIPB). A device used to alert search and rescue services in the event of an emergency by transmitting a coded message on the 406 MHz distress frequency, which is relayed by the Cospas-Sarsat global satellite system.
G-4	Settling with power	Incorrect	**Delete:** *Settling with power. See vortex ring state.*
ix thru xiv	Table of Contents	Incorrect	**Fix Table of Contents to reflect new chapter/sections/pagination throughout.**


A
C
S
V
G