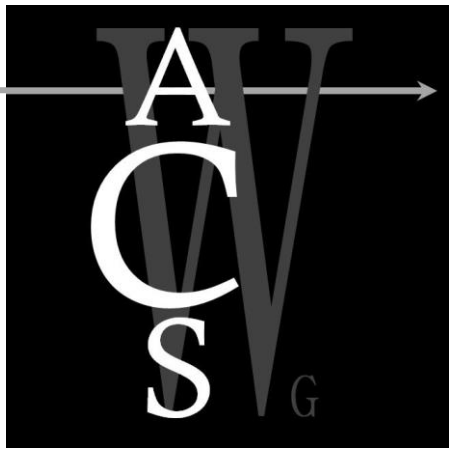

Aviation Rulemaking Advisory Committee

Airman Certification System Working Group

Interim Recommendation Report

May 21, 2018

May 21, 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 has provided feedback on draft standards for the Airline Transport Pilot (ATP) and Type Rating for Airplane, Commercial Pilot – Military Competence, the Aviation Maintenance Technician (AMT), and Instructor. Additionally, we have included recommendations on Instructor ACS development, prototype, and guidance as well as a recommendation to align AMT training regulations and guidance with the ACS.

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,

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ARAC Vice-Chair
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FAA-S-ACS-11

U.S. Department
of Transportation

**Federal Aviation
Administration**

FAA-S-ACS-11

Airline Transport Pilot and Type Rating for Airplane

Airman Certification Standards

Date 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: afs630comments@faa.gov .

Material in FAA-S-ACS-11 will be effective XXXX 2019. All previous editions of the Airline Transport Pilot and Aircraft Type Rating -Practical Test Standards for Airplane will be obsolete as of this date for Airplane applicants.

Foreword

The Federal Aviation Administration (FAA) has published the Airline Transport Pilot—Airplane Airman Certification Standards (ACS) document to communicate the aeronautical knowledge, risk management, and flight proficiency standards for airline transport pilot certification (ATP) and type rating in the airplane category, single-engine land and sea; and multiengine land and sea classes. This ACS incorporates and supersedes the previous Airline Transport Pilot and Aircraft Type Rating Practical Test Standards (PTS) for Airplane, FAA-S-8081-5.

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, or 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-8081-5F	Airline Transport Pilot and Aircraft Type Rating Practical Test Standards for Airplane	July 2008
FAA-S-ACS-11	Airline Transport Pilot and Type Rating for Airplane Airman Certification Standards	XXXX, XXXX

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Introduction

Airman Certification Standards Concept

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

In fulfilling its responsibilities for the airman certification process, the 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.

The FAA recognizes that safe operations in today's complex National Airspace System (NAS) require a more systematic integration of aeronautical knowledge, risk management, and flight proficiency standards than those prescribed in the PTS. The FAA further recognizes the need to more clearly calibrate knowledge, risk management, and skills to the level of the certificate or rating, and to align standards with guidance and test questions.

To accomplish these goals, the FAA drew upon the expertise of organizations and individuals across the aviation and training community to develop the 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 either the knowledge exam or the practical test.

The ACS significantly improves the knowledge test part of the certification process by enabling the development of test questions, from FAA reference documents, that are meaningful and relevant to safe operation in the NAS. It is important for applicants, instructors, and evaluators to understand that the addition of knowledge and risk management elements is not intended to lengthen or expand the scope of the practical test. Rather, the integration of knowledge and risk management elements associated with each Task is intended to enable a more holistic approach to learning, training, and testing. During the ground portion of the practical test, for example, the ACS provides greater context and structure both for retesting items missed on the knowledge test, if applicable, and for sampling the applicant’s mastery of knowledge and risk management elements associated with a given skill Task.

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. Knowledge elements not evident in the demonstrated skills may be tested by questioning, at any time, during the flight portion of the test. Questioning in-flight should be used judiciously so that safety is not jeopardized. Questions may be deferred until after the flight portion of the test is completed.

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 "Airport markings, signs, and lights." (AA.II.C.K3), the applicant must be prepared for questions on any airport markings, signs, and lights presented in the references for that Task.

The abbreviation(s) within parentheses immediately following a Task refer to the category and/or class aircraft appropriate to that Task. The meaning of each abbreviation is as follows.

ATP: Initial issuance of an ATP Certificate only (not applicable to Type rating applicants)
ASEL: Airplane – Single-Engine Land
ASES: Airplane – Single-Engine Sea
AMEL: Airplane – Multiengine Land
AMES: Airplane – Multiengine Sea

Note: *When administering a test based on this ACS, the Tasks appropriate to the class airplane (ASEL, ASES, AMEL, or AMES) used for the test must be included in the plan of action. The absence of a class indicates the Task is for all classes.*

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

AA.I.B.K4:
AA = Applicable ACS (Airline Transport Pilot – Airplane)
I = Area of Operation I (Preflight Preparation)
B = Task B (Performance & Limitations)
K4 = Knowledge Task element 4 (Aerodynamics and how it relates to performance.)

Knowledge test questions are mapped 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.

Because all active knowledge test questions for the Airline Transport Pilot Airplane Knowledge Tests (ATM and ATS) have been aligned with the corresponding ACS, evaluators can 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. 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).

The applicant must pass the knowledge test before taking the practical test, if applicable to the certificate or rating sought. 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 the knowledge tests and practical tests. The FAA will revise the ACS as circumstances require.

I. Preflight Preparation

Task	***A. Operation of Systems***
References	14 CFR part 61; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23, FAA-H-8083-25; AC 90-117, AC 91.21-1, AC 91-78, AC 120-76; POH/AFM; FSB report (type specific)
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with airplane systems and their components; and their normal, abnormal, and emergency procedures.
Knowledge	The applicant demonstrates an understanding of:
AA.I.A.K1	**Landing gear**—extension/retraction system(s); indicators, float devices, brakes, antiskid, tires, nose-wheel steering, and shock absorbers.
AA.I.A.K2	**Powerplant**—controls and indications, induction system, carburetor and fuel injection, turbocharging, cooling, mounting points, turbine wheels, compressors, deicing, anti-icing, and other related components.
AA.I.A.K3	**Propellers**—type, controls, feathering/unfeathering, auto-feather, negative torque sensing, synchronizing, synchrophasing, and thrust reverse including uncommanded reverse procedures.
AA.I.A.K4	**Fuel system**—capacity; drains; pumps; controls; indicators; cross-feeding; transferring; jettison; fuel grade, color and additives; fueling and defueling procedures; and fuel substitutions, if applicable.
AA.I.A.K5	**Oil system**—capacity, allowable types of oil, quantities, and indicators.
AA.I.A.K6	**Hydraulic system**—capacity, pumps, pressure, reservoirs, allowable types of fluid, and regulators.
AA.I.A.K7	**Electrical system**—alternators, generators, batteries, circuit breakers and protection devices, controls, indicators, and external and auxiliary power sources and ratings.
AA.I.A.K8	**Pneumatic and environmental systems—**heating, cooling, ventilation, oxygen, pressurization, supply for ice protection systems, controls, indicators, and regulating devices.
AA.I.A.K9	**Avionics and communications**—autopilot; flight director; Electronic Flight Instrument Systems (EFIS); Flight Management System (FMS); Electronic Flight Bag (EFB); Radar; Inertial Navigation Systems (INS); Global Navigation Satellite System (GNSS), Space-Based Augmentation System (SBAS), Ground-Based Augmentation System (GBAS); ground-based navigation systems and components; ADS-B In and Out, traffic awareness/warning/avoidance systems, terrain awareness/warning/alert systems; communication systems (e.g., data link, UHF/VHF/HF, satellite); other avionics, as appropriate; indicating devices; transponder; and emergency locator transmitter.
AA.I.A.K10	**Ice protection**—anti-ice, de-ice, pitot-static system protection, turbine inlet, propeller, windshield, airfoil surfaces.
AA.I.A.K11	**Crewmember and passenger equipment**—oxygen system, survival gear, emergency exits, evacuation procedures and crew duties, quick donning oxygen mask for crewmembers, passenger oxygen system.
AA.I.A.K12	**Flight controls**—ailerons, elevator(s), rudder(s), control tabs, control boost/augmentation systems, flaps, spoilers, leading edge devices, stability augmentation system (e.g., yaw damper), and trim systems.
AA.I.A.K13	**Pitot-static system** with associated instruments and the power source for those flight instruments if applicable. Operation and power sources for other flight instruments.
AA.I.A.K14	**Fire & smoke detection/protection/suppression**—powerplant, cargo and passenger compartments, lavatory, pneumatic and environmental, electrical/avionics, and batteries (on-aircraft and personal electronic devices).
AA.I.A.K15	**Envelope protection**—angle of attack warning and protection and speed protection.
AA.I.A.K16	The contents of the POH or AFM with regard to the systems and components in the airplane.

Task	***A. Operation of Systems***
AA.I.A.K17	How to use a Minimum Equipment List (MEL) and a Configuration Deviation List (CDL).
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.I.A.R1	Failure to detect system malfunctions or failures.
AA.I.A.R2	Improper management of a system failure.
AA.I.A.R3	Failure to monitor and manage automated systems.
AA.I.A.R4	Failure to follow appropriate checklists or procedures.
Skills	For the airplane provided for the practical test, the applicant demonstrates the ability to:
AA.I.A.S1	Explain and describe the operation of each airplane system and its components using correct terminology.
AA.I.A.S2	Recall immediate action items or memory items, if appropriate.
AA.I.A.S3	Identify any system or component limitations listed in the POH/AFM.
AA.I.A.S4	Demonstrate or describe, as appropriate, the process for deferring inoperative equipment (e.g., MEL) and using a CDL.
AA.I.A.S5	Comply with operations specifications, if applicable.
AA.I.A.S6	Through the use of the appropriate checklists and normal and abnormal procedures, demonstrate the proper use of the airplane systems, subsystems, and devices, as determined by the evaluator.

Task	***B. Performance and Limitations***
References	14 CFR parts 1, 61, 91; FAA-H-8083-1, FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23, FAA-H-8083-25; AC 120-58; Chart Supplements; POH/AFM; AIM; AC 20-117, AC 61-138, AC 91-74, AC 91-79, AC 120-27, AC 120-60, AC 135-17
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with operating an aircraft safely within the parameters of its performance, capabilities, and limitations.
Knowledge	The applicant demonstrates understanding of:
AA.I.B.K1	Elements related to performance and limitations by explaining the use of charts, tables, and data to determine performance.
AA.I.B.K2	How to determine the following (as applicable to the category and class sought):
AA.I.B.K2a	a. Accelerate-stop / accelerate-go distance
AA.I.B.K2b	b. Takeoff performance (include balance field length, V_{MCG})
AA.I.B.K2c	c. Climb performance
AA.I.B.K2d	d. Cruise performance
AA.I.B.K2e	e. Descent performance
AA.I.B.K2f	f. Landing distance
AA.I.B.K2g	g. Performance with an engine inoperative for all phases of flight
AA.I.B.K2h	h. Weight and balance and how to shift weight
AA.I.B.K3	Factors affecting performance, to include:
AA.I.B.K3a	a. Atmospheric conditions
AA.I.B.K3b	b. Pilot technique
AA.I.B.K3c	c. Aircraft configuration (e.g., flap setting)
AA.I.B.K3d	d. Airport environment (e.g., runway condition, land and hold short operations (LAHSO))
AA.I.B.K3e	e. Loading (e.g., center of gravity)
AA.I.B.K3f	f. Weight and balance
AA.I.B.K4	Aerodynamics and how it relates to performance.
AA.I.B.K5	Adverse effects of exceeding an airplane limitation or the airplane operating envelope.
AA.I.B.K6	Effects of icing on performance.
AA.I.B.K7	Clean wing concept; deicing and anti-icing procedures to include use of appropriate de-ice fluid, hold-over tables, calculating hold-over times, and pre-takeoff contamination checks.
AA.I.B.K8	Stabilized approach procedures and the decision criteria for go-around or rejected landings.
AA.I.B.K9	Air carrier weight and balance systems (e.g., average weight program). (ATP AMEL, AMES)
AA.I.B.K10	Runway assessment and condition reporting and use of the Runway Condition Assessment Matrix (RCAM). (ATP AMEL, AMES)
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.I.B.R1	Inaccurate use of performance charts, tables, and data.
AA.I.B.R2	Exceeding airplane limitations.
AA.I.B.R3	Possible differences between calculated performance and actual performance.
AA.I.B.R4	Airplane icing and its effect on performance and stall warning.
AA.I.B.R5	Runway excursions.
Skills	For the airplane provided for the practical test, the applicant demonstrates the ability to:
AA.I.B.S1	Describe the airspeeds used during specific phases of flight.

Task	***B. Performance and Limitations***
AA.I.B.S2	Describe the effects of meteorological conditions upon performance characteristics for any phase of flight and correctly apply these factors to a specific chart, table, graph, or other performance data.
AA.I.B.S3	Explain the adverse effects of airframe icing during all phases of flight and describe the procedures for wing contamination recognition and any airplane limitations for icing conditions. If equipped, describe the procedures for de-icing and anti-icing system use and any affects it may have on performance.
AA.I.B.S4	Compute weight and balance, including practical techniques to resolve out-of-limits calculations for a representative scenario, as specified by the evaluator.
AA.I.B.S5	For the flight or a given scenario, determine if the computed center-of-gravity is within the acceptable range and the lateral fuel balance is within limits for takeoff and landing.
AA.I.B.S6	Demonstrate proficient use of appropriate performance charts, tables, graphs, or other data to determine airplane performance and limitations for all phases of flight.

Task	***C. Weather Information (ATP)***
References	14 CFR parts 61 and 91; FAA-H-8083-25, AC 00-6; AC 00-45; AC 00-54, AC 61-138; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with obtaining, understanding, and applying weather information for a flight under IFR. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.I.C.K1	Sources of weather data (e.g., National Weather Service, Flight Service) for flight planning purposes.
AA.I.C.K2	Acceptable weather products and resources utilized for preflight planning, current and forecast weather for departure and en route operations and arrival phases of flight.
AA.I.C.K3	Meteorology applicable to the departure, en route, alternate, and destination for flights conducted under Instrument Flight Rules (IFR) in Instrument Meteorological Conditions (IMC) 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.*
AA.I.C.K3a	a. Atmospheric composition and stability
AA.I.C.K3b	b. Wind (e.g., crosswind, tailwind, windshear, mountain wave, etc.)
AA.I.C.K3c	c. Temperature
AA.I.C.K3d	d. Moisture/precipitation
AA.I.C.K3e	e. Weather system formation, including air masses and fronts
AA.I.C.K3f	f. Clouds
AA.I.C.K3g	g. Turbulence
AA.I.C.K3h	h. Thunderstorms and microbursts
AA.I.C.K3i	i. Icing and freezing level information
AA.I.C.K3j	j. Fog
AA.I.C.K3k	k. Frost
AA.I.C.K4	Flight deck displays of digital weather and aeronautical information, their use to navigate around weather, and equipment limitations.
AA.I.C.K5	Low-visibility operations (e.g., surface movement, category II and III approaches). (ATP AMEL, AMES)
AA.I.C.K6	Flight Risk Assessment Tools.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.I.C.R1	Weather conditions involved in departure and in-flight decision making, to include:
AA.I.C.R1a	a. Circumstances that would make diversion prudent
AA.I.C.R1b	b. Known or forecast icing, winds or turbulence aloft, volcanic ash, destination weather, etc.
AA.I.C.R1c	c. Personal minimums
AA.I.C.R1d	d. Employer or operational limitations, if applicable
AA.I.C.R2	Limitations of:
AA.I.C.R2a	a. Onboard weather equipment
AA.I.C.R2b	b. Aviation weather reports and forecasts
AA.I.C.R2c	c. Inflight weather resources
Skills	The applicant demonstrates the ability to:

Task	*C. Weather Information (ATP)*
AA.I.C.S1	Use a Flight Risk Assessment Tool, if available, and interpret and use weather information in aeronautical decision-making.

Task	***D. High Altitude Aerodynamics (ATP AMEL, AMES)***
References	14 CFR part 61; FAA-H-8083-3; AC 61-138, AC 120-111
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with high altitude airplane aerodynamics.
Knowledge	The applicant demonstrates understanding of:
AA.I.D.K1	Aerodynamics of large transport category airplanes to include flight characteristics of swept wing airplanes (e.g., Mach buffet).
AA.I.D.K2	Energy management.
AA.I.D.K3	Relationship between Mach number, indicated airspeed, true airspeed, and change over altitudes.
AA.I.D.K4	Bank angles at high altitude and its effect on high and low speed operating margins.
AA.I.D.K5	Relationship between altitude capability, weight, and temperature.
AA.I.D.K6	V_{MO}/M_{MO} convergence and stall angle of attack.
AA.I.D.K7	Maximum Lift over Drag Ratio (L/D Max).
AA.I.D.K8	Best range and best endurance.
AA.I.D.K9	Factors which contribute to airplane upsets at high altitude and upset prevention and recovery techniques.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.I.D.R1	Failure to manage the airplane's energy state.
AA.I.D.R2	High operating altitudes at high operational weights.
AA.I.D.R3	High altitude slow-downs and excursions behind the power curve.
AA.I.D.R4	Turbulence at high altitude.
Skills	The applicant demonstrates the ability to:
AA.I.D.S1	If a cruise altitude is reached, manage the airplane's systems and energy state.

Task	***E. Air Carrier Operations (ATP AMEL, AMES)***
References	14 CFR part 121; AC 61-138, AC 00-46, AC 91.21-1, AC 120-66, AC 120-82, AC 120-90, AC 120-101; AFM, AC 91-78, AC 120-76
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with air carrier operations.
Knowledge	The applicant demonstrates understanding of:
AA.I.E.K1	Turbine engines, thrust reversing systems, and system malfunctions.
AA.I.E.K2	Airplane automation components (i.e., flight director, autopilot), their relationship to each other, and how to manage the automation for flight.
AA.I.E.K3	Advanced navigation equipment (e.g., FMS, RNP, ADS-B, EFB, etc.) and how it is used inflight.
AA.I.E.K4	Flightpath warning systems (e.g., TCAS, TAWS) and how to respond to a warning.
AA.I.E.K5	Altitudes and conditions that require the use of oxygen masks.
AA.I.E.K6	Causes and recognition of cabin pressure loss.
AA.I.E.K7	Rudder use in transport aircraft/part 25 certification standards.
AA.I.E.K8	Crew communications (e.g., sterile flight deck rules, briefings).
AA.I.E.K9	Air carrier operational control.
AA.I.E.K10	Elements associated with operating at complex and high traffic airports with emphasis on runway incursion prevention techniques.
AA.I.E.K11	Professional responsibilities associated with being an ATP certificate holder and how to apply leadership skills as pilot in command.
AA.I.E.K12	Crew resource management (CRM) principles and application in a multicrew environment.
AA.I.E.K13	Use of voluntary safety programs to manage risk across an organization (e.g., Threat and error management (TEM)).
AA.I.E.K14	Operations specifications.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.I.E.R1	Turbine engine and thrust reversing system malfunctions.
AA.I.E.R2	Failure to manage automation and navigation equipment.
AA.I.E.R3	Failure to respond to a flightpath warning system alert.
AA.I.E.R4	Loss of cabin pressure.
AA.I.E.R5	Poor crew communication.
Skills	The applicant demonstrates the ability to:
AA.I.E.S1	Apply CRM principles and use in a crew environment, as appropriate.

Task	***F. Human Factors (ATP)***
References	14 CFR part 61; FAA-H-8083-2, FAA-H-8083-25; AIM; AC 61-138, AC 120-100
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 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.I.F.K1	Causes, effects, recognition, and corrective actions associated with aeromedical and physiological issues including: ***Note:*** *If K1 is selected, the evaluator must assess the applicant's knowledge of at least three of the following sub-elements.*
AA.I.F.K1a	a. Hypoxic hypoxia due to altitude increase or oxygen displacement
AA.I.F.K1b	b. Hyperventilation
AA.I.F.K1c	c. Middle ear and sinus problems
AA.I.F.K1d	d. Spatial disorientation
AA.I.F.K1e	e. Motion sickness
AA.I.F.K1f	f. Carbon monoxide poisoning and other forms of hypemic hypoxia
AA.I.F.K1g	g. Stress
AA.I.F.K1h	h. Fatigue
AA.I.F.K1i	i. Dehydration and nutrition
AA.I.F.K1j	j. Hypothermia
AA.I.F.K1k	k. Optical illusions
AA.I.F.K1l	l. Dissolved nitrogen in the bloodstream after scuba dives
AA.I.F.K2	Effects of alcohol, drugs, and over-the-counter medications.
AA.I.F.K3	Aeronautical Decision-Making (ADM) using Crew Resource Management (CRM) or Single Pilot Resource Management (SRM), as appropriate.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.I.F.R1	Aeromedical and physiological issues.
AA.I.F.R2	Hazardous attitudes.
AA.I.F.R3	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.I.F.S1	Perform a self-assessment and determine fitness for flight.

Task	***G. Federal Aviation Regulations (ATP)***
References	14 CFR parts 61, 91, 117, 121, 135; 49 CFR part 830
Objective	To determine that the applicant exhibits satisfactory knowledge of Federal Aviation Regulations as they apply to the privileges and limitations of the ATP certificate and to flight operations that require an ATP certificate. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.I.G.K1	14 CFR part 61, subparts A, B, and G.
AA.I.G.K2	14 CFR part 91, subparts A, B, C, F, G, and H.
AA.I.G.K3	14 CFR part 117 (AMEL, AMES).
AA.I.G.K4	14 CFR part 121, subparts A, G, K, M, O, T, U, and V (AMEL, AMES).
AA.I.G.K5	14 CFR part 135, subparts A, B, C, D, E, F, and G (ASEL, ASES).
AA.I.G.K6	49 CFR part 830
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.I.G.R1	Failure to comply with the applicable CFRs.
Skills	The applicant demonstrates the ability to:
AA.I.G.S1	Apply the CFRs to the flight/operation.

Task	***H. Water and Seaplane Characteristics, Seaplane Bases, Maritime Rules, and Aids to Marine Navigation (ASES, AMES)***
References	14 CFR part 61; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23; USCG Navigation Rules, International-Inland; POH/AFM; Chart Supplements; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with water and seaplane characteristics, seaplane bases, maritime rules, and aids to marine navigation.
Knowledge	The applicant demonstrates understanding of:
AA.I.H.K1	The characteristics of a water surface as affected by features, such as:
AA.I.H.K1a	a. Size and location
AA.I.H.K1b	b. Protected and unprotected areas
AA.I.H.K1c	c. Surface wind
AA.I.H.K1d	d. Direction and strength of water current
AA.I.H.K1e	e. Floating and partially submerged debris
AA.I.H.K1f	f. Sandbars, islands, and shoals
AA.I.H.K1g	g. Vessel traffic and wakes
AA.I.H.K1h	h. Other characteristics specific to the area
AA.I.H.K2	Float and hull construction and its effect on seaplane performance.
AA.I.H.K3	Causes of porpoising and skipping, and the pilot action needed to prevent or correct these occurrences.
AA.I.H.K4	How to locate and identify seaplane bases on charts or in directories.
AA.I.H.K5	Operating restrictions at various bases.
AA.I.H.K6	Right-of-way, steering, and sailing rules pertinent to seaplane operation.
AA.I.H.K7	Marine navigation aids, such as buoys, beacons, lights, sound signals, and range markers.
AA.I.H.K8	Naval vessel protection zones.
AA.I.H.K9	No wake zones.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.I.H.R1	Local conditions.
AA.I.H.R2	Impact of marine traffic.
AA.I.H.R3	Failure to follow right-of-way and sailing rules pertinent to seaplane operations.
AA.I.H.R4	Limited services and assistance available at seaplane bases.
Skills	The applicant demonstrates the ability to:
AA.I.H.S1	Explain how float and hull construction can affect seaplane performance.
AA.I.H.S2	Describe how to correct for porpoising and skipping.
AA.I.H.S3	Locate seaplane bases on charts or in directories and identify any restrictions.
AA.I.H.S4	Identify marine navigation aids.
AA.I.H.S5	Describe what Naval vessel protection zones and no wake zones are.
AA.I.H.S6	Assess the water surface characteristics for the proposed flight.
AA.I.H.S7	Perform correct right-of-way, steering, and sailing operations.

II. Preflight Procedures

Task	***A. Preflight Assessment***
References	14 CFR parts 43, 61, 63, 71, 91, 97, 117, 119, 121, 135; POH/AFM; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23, FAA-H-8083-25; AC 00-6, AC 120-27, AC 120-60, AC 135-17
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with preparing for safe flight. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.II.A.K1	Pilot self-assessment.
AA.II.A.K2	Determining that the aircraft to be used is appropriate, airworthy, and in a condition for safe flight by locating and explaining related documents such as:
AA.II.A.K2a	a. Airworthiness and registration certificates
AA.II.A.K2b	b. Operating limitations, handbooks, and manuals
AA.II.A.K2c	c. Minimum Equipment List (MEL) and Configuration Deviation List (CDL)
AA.II.A.K2d	d. Weight and balance data
AA.II.A.K2e	e. Required inspections or tests and appropriate records applicable to the proposed flight or operation.
AA.II.A.K3	Preventive maintenance that can be performed by the pilot or other designated crewmember.
AA.II.A.K4	Aircraft preflight inspection including:
AA.II.A.K4a	a. Which items must be inspected
AA.II.A.K4b	b. The reasons for checking each item
AA.II.A.K4c	c. How to detect possible defects
AA.II.A.K4d	d. The associated regulations
AA.II.A.K5	Environmental factors including weather, terrain, route selection, and obstructions.
AA.II.A.K6	Requirements for current and appropriate navigation data.
AA.II.A.K7	Operations specifications applying to a particular airplane and operation, if applicable.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.II.A.R1	Human performance factors.
AA.II.A.R2	Inoperative equipment discovered prior to flight.
AA.II.A.R3	Environment (e.g., weather, airports, airspace, terrain, obstacles).
AA.II.A.R4	External pressures.
AA.II.A.R5	Aviation security concerns.
Skills	The applicant demonstrates the ability to:
AA.II.A.S1	Inspect the airplane in accordance with an appropriate checklist demonstrating proper operation of applicable airplane systems. Coordinate checklist with crew, if appropriate.
AA.II.A.S2	Coordinates with ground crew and ensures adequate clearance prior to moving doors, hatches, flight control surfaces, etc.
AA.II.A.S3	Document any discrepancies found; take corrective action and acknowledge limitations imposed by MEL/CDL items, if applicable.
AA.II.A.S4	Determine if the airplane is airworthy and in condition for safe flight.
AA.II.A.S5	Identify and comply with operations specifications as required.
AA.II.A.S6	Assess factors related to the environment (weather, airports, terrain, airspace).

Task	*A. Preflight Assessment*
AA.II.A.S7	Ensure the airplane and surfaces are free of ice, snow, and frost. If icing conditions are present, demonstrates satisfactory knowledge of deicing procedures.

Task	***B. Powerplant Start***
References	FAA-H-8083-2, 14 CFR part 61; POH/AFM; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with powerplant start procedures. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.II.B.K1	Normal and abnormal powerplant start procedures and limitations, including the use of an auxiliary power unit (APU) or external power source (if applicable).
AA.II.B.K2	Starting under various atmospheric conditions.
AA.II.B.K3	Malfunctions during powerplant start, procedures to address the malfunction, and any associated limitations.
AA.I.B.K4	Ground crew personnel necessary and appropriate communication procedures for powerplant start, if applicable.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.II.B.R1	Malfunctions during powerplant start.
AA.II.B.R2	Propeller and turbine powerplant safety.
AA.II.B.R3	Managing situations where specific instructions or checklist items are not published.
AA.II.B.R4	Personnel, vehicles, vessels, and other aircraft in the vicinity during powerplant start.
Skills	The applicant demonstrates the ability to:
AA.II.B.S1	Ensure the ground safety procedures are followed during the before-start, start, and after-start phases.
AA.II.B.S2	Use appropriate ground crew personnel during the start procedures (if applicable).
AA.II.B.S3	Coordinate with the crew, if applicable, and complete the checklist(s) prior to and after powerplant start.
AA.II.B.S4	Respond appropriately to an abnormal start or malfunction.

Task	***C. Taxiing (ASEL, AMEL)***
References	14 CFR part 61; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-25; AC 120-57; AC 120-74; POH/AFM; AIM; Chart Supplements
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with safe taxi operations.
Knowledge	The applicant demonstrates understanding of:
AA.II.C.K1	Current airport aeronautical references and information resources including Chart Supplements, airport diagram, and appropriate references.
AA.II.C.K2	Taxi instructions/clearances including published taxi routes.
AA.II.C.K3	Airport markings, signs, and lights.
AA.II.C.K4	Appropriate aircraft lighting for day and night operations.
AA.II.C.K5	Push-back procedures, if applicable.
AA.II.C.K6	Procedures for:
AA.II.C.K6a	a. Appropriate flight deck activities prior to taxi, including route planning, identifying the location of Hot Spots, and coordinating with crew if, applicable
AA.II.C.K6b	b. Communications at towered and nontowered airports
AA.II.C.K6c	c. Entering or crossing runways
AA.II.C.K6d	d. Night taxi operations
AA.II.C.K6e	e. Low visibility taxi operations and techniques used to avoid disorientation
AA.II.C.K6f	f. Single-engine taxi procedures (AMEL)
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.II.C.R1	Inappropriate activities and distractions.
AA.II.C.R2	Confirmation or expectation bias as related to taxi instructions.
AA.II.C.R3	A taxi route or departure runway change.
AA.II.C.R3	Failure to complete checklist(s).
AA.II.C.R4	Low visibility taxi operations.
Skills	The applicant demonstrates the ability to:
AA.II.C.S1	Record/receive taxi instructions, read back/acknowledge taxi clearances, and review taxi routes on the airport diagram.
AA.II.C.S2	Use an airport diagram or taxi chart during taxi.
AA.II.C.S3	Comply with ATC clearances and instructions and observe all runway hold lines, localizer and glide slope critical areas, beacons, and other airport/taxiway markings and lighting.
AA.II.C.S4	Coordinate with the crew, if applicable, and complete the checklist(s) prior to and during taxi, as appropriate.
AA.II.C.S5	Maintain sterile flight deck and situational awareness.
AA.II.C.S6	Maintain correct and positive airplane control, proper speed, appropriate use of wheel brakes and reverse thrust, and separation between other aircraft, vehicles, and persons to avoid an incursion.
AA.II.C.S7	Demonstrate taxi during day and night operations. If either condition is not available, the applicant must explain the differences between day and night taxi.
AA.II.C.S8	Demonstrate proper use of aircraft exterior lighting for day and night operations. If either condition is not available, the applicant must explain the differences between exterior aircraft lighting used for day and night operations.
AA.II.C.S9	Explain the hazards of low visibility taxi operations.

Task	*D. Taxiing and Sailing (ASES, AMES)*
References	14 CFR part 61; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23, FAA-H-8083-25; AC 120-57; AC 120-74; POH/AFM; AIM; Chart Supplements
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with safe taxi and sailing operations.
Knowledge	The applicant demonstrates understanding of:
AA.II.D.K1	Current airport/seabase aeronautical references and information resources including Chart Supplements, airport diagram, and appropriate references.
AA.II.D.K2	Taxi instructions/clearances, if applicable.
AA.II.D.K3	Airport/seabase markings, signs, and lights.
AA.II.D.K4	Appropriate aircraft lighting for day and night operations.
AA.II.D.K5	Sailing elements and techniques and when sailing should be used.
AA.II.D.K6	Considerations for determining the most favorable sailing course.
AA.II.D.K7	Airport/seabase procedures including:
AA.II.D.K7a	a. Appropriate flight deck activities prior to taxi or sailing, including route planning, and coordinating with crew, if applicable
AA.II.D.K7b	b. Communications at towered and nontowered seabases
AA.II.D.K7c	c. Entering or crossing runways (land operation)
AA.II.D.K7d	d. Night taxi and sailing operations
AA.II.D.K7e	e. Low visibility taxi and sailing operations
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.II.D.R1	Inappropriate activities and distractions.
AA.II.D.R2	Porpoising and skipping.
AA.II.D.R3	Failure to complete checklist(s).
AA.II.D.R4	Low visibility taxi and sailing operations.
AA.II.D.R5	Other aircraft, vessels, and hazards.
Skills	The applicant demonstrates the ability to:
AA.II.D.S1	Record/receive taxi instructions, read back/acknowledge taxi clearances, and review taxi routes on the airport diagram.
AA.II.D.S2	Use an appropriate chart during taxi, if published.
AA.II.D.S3	Comply with ATC clearances, as appropriate, and seabase/airport/taxiway markings, signals and signs.
AA.II.D.S4	Departs the dock/mooring buoy or ramp/beach in a safe manner, considering wind, current, traffic, and hazards.
AA.II.D.S5	Coordinate with the crew, if applicable, and complete the checklist(s) prior to and during taxi or sailing, as appropriate.
AA.II.D.S6	Maintain sterile flight deck and situational awareness.
AA.II.D.S7	Maintain correct and positive airplane control, proper speed, appropriate use of reverse thrust, and separation between other aircraft, vehicles, vessels, and persons to avoid an incursion.
AA.II.D.S8	Position the flight controls, flaps, doors, water rudders, and power correctly for the existing conditions to follow the desired course while sailing and to prevent or correct for porpoising and skipping during step taxi.
AA.II.D.S9	Use the appropriate idle, plow, or step taxi technique.
AA.II.D.S10	Exhibit procedures for steering, maneuvering, maintaining proper position and situational awareness.

Task	*D. Taxiing and Sailing (ASES, AMES)*
AA.II.D.S11	Plan and follow the most favorable taxi or sailing course for current conditions.
AA.II.D.S12	Demonstrate taxi or sailing during day and night operations. If either condition is not available, the applicant must explain the differences between day and night taxi or sailing.
AA.II.D.S13	Demonstrate proper use of aircraft exterior lighting for day and night operations. If either condition is not available, the applicant must explain the differences between exterior aircraft lighting used for day and night operations.
AA.II.D.S14	Explain the hazards of low visibility taxi and sailing operations.
AA.II.D.S15	Comply with the applicable taxi elements in Task C if the practical test is in an amphibious airplane.

Task	***E. Before Takeoff Checks***
References	FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23, FAA-H-8083-25; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with before takeoff checks. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.II.E.K1	Purpose of pre-takeoff checklist items including:
AA.II.E.K1a	a. Reasons for checking each item
AA.II.E.K1b	b. Detecting malfunctions
AA.II.E.K1c	c. Ensuring the airplane is in safe operating condition
AA.II.E.K2	Deicing and anti-icing procedures and holdover times.
AA.II.E.K3	Adverse weather considerations for performance on takeoff (e.g., snow, ice, gusting crosswinds, low-visibility).
AA.II.E.K4	Items to be included in a before takeoff briefing.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.II.E.R1	Division of attention while conducting before takeoff checks.
AA.II.E.R2	Unexpected runway changes by ATC.
AA.II.E.R3	Failure to verify performance data is correct and airspeeds and flight instruments are set for actual conditions and the departure runway.
AA.II.E.R4	Failure to set navigation and communication equipment for departure.
AA.II.E.R5	Failure to configure autopilot and flight director controls for departure.
AA.II.E.R6	Failure to account for adverse weather conditions prior to takeoff (e.g., snow, ice, gusting crosswinds, low-visibility).
Skills	The applicant demonstrates the ability to:
AA.II.E.S1	Determine the airplane's takeoff performance for actual conditions and planned departure runway or waterway.
AA.II.E.S2	Coordinate with the crew, if applicable, and complete the checklist(s) prior to takeoff in a timely manner.
AA.II.E.S3	Determine all systems checked are within their normal operating range and are safe for the proposed flight. During the checks, explain at the request of the evaluator, any system operating characteristic or limitation.
AA.II.E.S4	Determine airspeeds/V-speeds and set flight instruments appropriately, configure flight director, autopilot controls, and navigation and communication equipment for the current flight conditions and takeoff and departure clearances.
AA.II.E.S5	Conduct a briefing that includes procedures for emergency and abnormal situations (e.g., powerplant failure, windshear), which may be encountered during takeoff, and state the planned action if they were to occur.
AA.II.E.S6	Obtain and correctly interpret the takeoff and departure clearance.

III. Takeoffs and Landings

Task	***A. Normal Takeoff and Climb***
References	FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management and skills associated with a normal takeoff and climb. ***Note:*** *If a crosswind condition does not exist, the applicant's knowledge of crosswind elements must be evaluated through oral testing. See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.III.A.K1	Effects of atmospheric conditions, including wind, on takeoff and climb performance.
AA.III.A.K2	Appropriate V-speeds for takeoff and climb.
AA.III.A.K3	Appropriate aircraft configuration and power setting for takeoff and climb.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.III.A.R1	Selection of runway, or runway intersection, based on pilot capability, aircraft limitations, available distance, and wind.
AA.III.A.R2	Effects of:
AA.III.A.R2a	a. Crosswind
AA.III.A.R2b	b. Windshear
AA.III.A.R2c	c. Tailwind
AA.III.A.R2d	d. Wake turbulence
AA.III.A.R2e	e. Runway surface/condition
AA.III.A.R3	Abnormal operations, to include planning for:
AA.III.A.R3a	a. Rejected takeoff
AA.III.A.R3b	b. Engine failure in takeoff/climb phase of flight
AA.III.A.R4	Improper aircraft configuration or settings (e.g., trim, autobrakes).
AA.III.A.R5	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.III.A.R6	Low altitude maneuvering including stall, spin, or Controlled Flight Into Terrain (CFIT).
AA.III.A.R7	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.III.A.S1	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) prior to takeoff in a timely manner.
AA.III.A.S2	Make radio calls as appropriate.
AA.III.A.S3	Verify assigned/correct runway (ASEL, AMEL) or takeoff path (ASES, AMES).
AA.III.A.S4	Verify the airplane is configured for takeoff.
AA.III.A.S5	Position the flight controls for the existing wind conditions.
AA.III.A.S6	Clear the area; taxi into takeoff position and align the airplane on the runway centerline (ASEL, AMEL) or takeoff path (ASES, AMES).
AA.III.A.S7	Retract the water rudders, as appropriate (ASES, AMES).
AA.III.A.S8	Establish and maintain the most efficient planing/liftoff attitude, and correct for porpoising or skipping (ASES, AMES).
AA.III.A.S9	Maintain centerline (ASEL, AMEL) and proper flight control inputs during the takeoff roll.
AA.III.A.S10	Confirm takeoff power and proper engine and flight instrument indications prior to rotation making callouts, as appropriate, for the airplane or per the operator's procedures.

Task	*A. Normal Takeoff and Climb*
AA.III.A.S11	Avoid excessive water spray on the propellers (ASES, AMES).
AA.III.A.S12	Rotate and lift off at the recommended airspeed.
AA.III.A.S13	Establish a power setting and a pitch attitude to maintain the desired climb airspeed/V-speed, ±5 knots for each climb segment.
AA.III.A.S14	Maintain desired heading ±5°.
AA.III.A.S15	Retract the landing gear and flaps in accordance with manufacturer or operator procedures and limitations, as appropriate.
AA.III.A.S16	Avoid wake turbulence, if applicable.
AA.III.A.S17	Follow noise abatement procedures, as practicable.
AA.III.A.S18	Complete appropriate after takeoff checklist(s) in a timely manner.

Task	***B. Normal Approach and Landing***
References	14 CFR part 61; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23; POH/AFM; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a normal approach and landing. ***Note:*** *If a crosswind condition does not exist, the applicant's knowledge of crosswind elements must be evaluated through oral testing. See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.III.B.K1	A stabilized approach, to include energy management concepts.
AA.III.B.K2	Effects of atmospheric conditions, including wind, on approach and landing performance.
AA.III.B.K3	Wind correction techniques on approach and landing.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.III.B.R1	Selection of runway based on pilot capability, aircraft limitations, available distance, and wind.
AA.III.B.R2	Effects of:
AA.III.B.R2a	a. Crosswind
AA.III.B.R2b	b. Windshear
AA.III.B.R2c	c. Tailwind
AA.III.B.R2d	d. Wake turbulence
AA.III.B.R2e	e. Runway surface/condition
AA.III.B.R3	Go-Around/Rejected Landing
AA.III.B.R4	Land and Hold Short Operations (LAHSO)
AA.III.B.R5	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.III.B.R6	Low altitude maneuvering including stall, spin, or CFIT.
AA.III.B.R7	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.III.B.S1	Coordinate with the crew, if applicable, and complete the appropriate checklist(s).
AA.III.B.S2	Make radio calls, as appropriate.
AA.III.B.S3	Maintain a ground track that ensures the desired traffic pattern will be flown taking into consideration obstructions and ATC or evaluator instructions.
AA.III.B.S4	Ensure the aircraft is aligned with the correct/assigned runway or landing surface.
AA.III.B.S5	Scan the runway or landing surface and adjoining area for traffic and obstructions.
AA.III.B.S6	Consider the wind conditions, landing surface, obstructions, and select a suitable touchdown point.
AA.III.B.S7	Establish the recommended approach and landing configuration and airspeed, ±5 knots, and adjust pitch attitude and power as required to maintain a stabilized approach.
AA.III.B.S8	Maintain crosswind correction and directional control throughout the approach and landing.
AA.III.B.S9	Make smooth, timely, and correct control application during the round out and touchdown.
AA.III.B.S10	Touch down at the appropriate speed and pitch attitude at the runway aiming point markings -250/+500 feet, or where there are no runway markings 750 to 1,500 feet from the approach threshold of the runway. (ASEL, AMEL)
AA.III.B.S11	During round out and touchdown contact the water at the proper pitch attitude within 200 feet beyond a specified point (ASES, AMES). In addition, for AMES, the touchdown will be within the first one-third of the water landing area.

Task	***B. Normal Approach and Landing***
AA.III.B.S12	Decelerate to taxi speed (20 knots or less on dry pavement, 10 knots or less on contaminated pavement) to within the calculated landing distance plus 25% for the actual conditions with the runway centerline between the main landing gear. (At least one landing) (ASEL, AMEL)
AA.III.B.S13	Use spoilers, prop reverse, thrust reverse, wheel brakes, and other drag/braking devices, as appropriate to safely slow the airplane. (At least one landing slow to a full stop)
AA.III.B.S14	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.
AA.III.B.S15	Utilize runway incursion avoidance procedures.

Task	***C. Glassy Water Takeoff and Climb (ASES, AMES)***
References	FAA-H-8083-2, FAA-H-8083-23; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with glassy water takeoff and climb. ***Note:*** *If a glassy water condition does not exist, the applicant must be evaluated by simulating the Task.*
Knowledge	The applicant demonstrates understanding of:
AA.III.C.K1	Effects of atmospheric conditions, including wind, on takeoff and climb performance.
AA.III.C.K2	Appropriate V-speeds for takeoff and climb.
AA.III.C.K3	Appropriate aircraft configuration.
AA.III.C.K4	Appropriate use of glassy water takeoff and climb technique.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.III.C.R1	Selection of takeoff path based on pilot capability, aircraft limitations, available distance, and wind.
AA.III.C.R2	Water surface/condition.
AA.III.C.R3	Abnormal operations, to include planning for:
AA.III.C.R3a	a. Rejected takeoff
AA.III.C.R3b	b. Engine failure in takeoff/climb phase of flight
AA.III.C.R4	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.III.C.R5	Low altitude maneuvering including stall, spin, or CFIT.
AA.III.C.R6	Distractions, loss of situational awareness, and/or improper task management.
AA.III.C.R7	Failure to confirm gear position in an amphibious aircraft.
Skills	The applicant demonstrates the ability to:
AA.III.C.S1	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) prior to takeoff in a timely manner.
AA.III.C.S2	Make radio calls as appropriate.
AA.III.C.S3	Position the flight controls for the existing conditions.
AA.III.C.S4	Verify the airplane is configured for takeoff.
AA.III.C.S5	Clear the area; select appropriate takeoff path considering surface conditions and collision hazards.
AA.III.C.S6	Retract the water rudders, as appropriate.
AA.III.C.S7	Set and confirm takeoff power.
AA.III.C.S8	Avoid excessive water spray on the propellers.
AA.III.C.S9	Maintain directional control throughout takeoff and climb.
AA.III.C.S10	Establish and maintain an appropriate planing attitude, directional control, and correct for porpoising, skipping, and increase in water drag.
AA.III.C.S11	Utilize appropriate techniques to lift seaplane from the water considering the glassy water surface conditions.
AA.III.C.S12	Adjust power, as appropriate, and establish a pitch attitude to maintain the appropriate climb airspeed/V-speed, ±5 knots for each climb segment.
AA.III.C.S13	Retract flaps after a positive rate of climb has been verified or in accordance with manufacturer or operator procedures and limitations, as appropriate.
AA.III.C.S14	Follow noise abatement procedures, as practicable.

Task	***D. Glassy Water Approach and Landing (ASES, AMES)***
References	FAA-H-8083-2, FAA-H-8083-23; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a glassy water approach and landing. ***Note:*** *If a glassy water condition does not exist, the applicant must be evaluated by simulating the Task.*
Knowledge	The applicant demonstrates understanding of:
AA.III.D.K1	A stabilized approach, to include energy management concepts.
AA.III.D.K2	Effects of atmospheric conditions, including wind, on approach and landing performance.
AA.III.D.K3	Wind correction techniques on approach and landing.
AA.III.D.K4	When and why glassy water techniques are used.
AA.III.D.K5	How a glassy water approach and landing is executed.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.III.D.R1	Selection of approach path and touchdown area based on pilot capability, aircraft limitations, available distance, and wind.
AA.III.D.R2	Effects of:
AA.III.D.R2a	a. Crosswind
AA.III.D.R2b	b. Windshear
AA.III.D.R2c	c. Tailwind
AA.III.D.R2d	d. Water surface/condition
AA.III.D.R3	Go-around/rejected landing.
AA.III.D.R4	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.III.D.R5	Low altitude maneuvering including stall, spin, or CFIT.
AA.III.D.R6	Distractions, loss of situational awareness, and/or improper task management.
AA.III.D.R7	Failure to confirm gear position in an amphibious aircraft.
Skills	The applicant demonstrates the ability to:
AA.III.D.S1	Coordinate with the crew, if applicable, and complete the appropriate checklist(s).
AA.III.D.S2	Make radio calls as appropriate.
AA.III.D.S3	Ensure that the landing gear and water rudders are retracted, if applicable.
AA.III.D.S4	Consider the landing surface, visual attitude references, water depth, and collision hazards and select the proper approach and landing path.
AA.III.D.S5	Establish the recommended approach and landing configuration and airspeed, and adjust pitch attitude and power as required to maintain a stabilized approach.
AA.III.D.S6	Maintain a stabilized approach and recommended airspeed, ±5 knots.
AA.III.D.S7	Make smooth, timely, and correct power and control adjustments to maintain proper attitude and rate of descent to touchdown.
AA.III.D.S8	Maintain crosswind correction and directional control throughout the approach.
AA.III.D.S9	Contact the water at the correct pitch attitude and slow to idle taxi speed.

Task	***E. Rough Water Takeoff and Climb (ASES, AMES)***
References	FAA-H-8083-2, FAA-H-8083-23; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a rough water takeoff and climb. ***Note:*** *If a rough water condition does not exist, the applicant must be evaluated by simulating the Task.*
Knowledge	The applicant demonstrates understanding of:
AA.III.E.K1	Effects of atmospheric conditions, including wind, on takeoff and climb performance.
AA.III.E.K2	Appropriate V-speeds for takeoff and climb.
AA.III.E.K3	Appropriate aircraft configuration.
AA.III.E.K4	Appropriate use of rough water takeoff and climb technique.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.III.E.R1	Selection of takeoff path based on pilot capability, aircraft limitations, available distance, and wind.
AA.III.E.R2	Effects of:
AA.III.E.R2a	a. Crosswind
AA.III.E.R2b	b. Windshear
AA.III.E.R2c	c. Tailwind
AA.III.E.R2d	d. Wake turbulence
AA.III.E.R2e	e. Water surface/condition
AA.III.E.R3	Abnormal operations, to include planning for:
AA.III.E.R3a	a. Rejected takeoff
AA.III.E.R3b	b. Engine failure in takeoff/climb phase of flight
AA.III.E.R4	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.III.E.R5	Low altitude maneuvering including stall, spin, or CFIT.
AA.III.E.R6	Distractions, loss of situational awareness, and/or improper task management.
AA.III.E.R7	Failure to confirm gear position in an amphibious aircraft.
Skills	The applicant demonstrates the ability to:
AA.III.E.S1	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) prior to takeoff in a timely manner.
AA.III.E.S2	Make radio calls as appropriate.
AA.III.E.S3	Position the flight controls for the existing conditions.
AA.III.E.S4	Verify the airplane is configured for takeoff.
AA.III.E.S5	Clear the area; select appropriate takeoff path considering surface conditions and collision hazards.
AA.III.E.S6	Retract the water rudders, as appropriate.
AA.III.E.S7	Set and confirm takeoff power.
AA.III.E.S8	Avoid excessive water spray on the propellers.
AA.III.E.S9	Maintain directional control and proper wind-drift correction throughout takeoff and climb.
AA.III.E.S10	Establish and maintain an appropriate planing attitude, directional control, and correct for porpoising, skipping, and increase in water drag.
AA.III.E.S11	Establish proper attitude and airspeed, lift off at minimum airspeed and accelerate to appropriate climb airspeed/V-speed, ±5 knots before leaving ground effect.

Task	*E. Rough Water Takeoff and Climb (ASES, AMES)*
AA.III.E.S12	Retract the flaps after a positive rate of climb is established and a safe altitude has been achieved.
AA.III.E.S13	Maintain takeoff power to a safe maneuvering altitude then sets climb power.
AA.III.E.S14	Follow noise abatement procedures, as practicable.

Task	***F. Rough Water Approach and Landing (ASES, AMES)***
References	FAA-H-8083-2, FAA-H-8083-23; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a rough water approach and landing. ***Note:*** *If a rough water condition does not exist, the applicant must be evaluated by simulating the Task.*
Knowledge	The applicant demonstrates understanding of:
AA.III.F.K1	A stabilized approach, to include energy management concepts.
AA.III.F.K2	Effects of atmospheric conditions, including wind, on approach and landing performance.
AA.III.F.K3	Wind correction techniques on approach and landing.
AA.III.F.K4	When and why rough water techniques are used.
AA.III.F.K5	How a rough water approach and landing is executed.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.III.F.R1	Selection of approach path and touchdown area based on pilot capability, aircraft limitations, available distance, and wind.
AA.III.F.R2	Effects of:
AA.III.F.R2a	a. Crosswind
AA.III.F.R2b	b. Windshear
AA.III.F.R2c	c. Tailwind
AA.III.F.R2d	d. Water surface/condition
AA.III.F.R3	Go-around/rejected landing.
AA.III.F.R4	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.III.F.R5	Low altitude maneuvering including stall, spin, or CFIT.
AA.III.F.R6	Distractions, loss of situational awareness, and/or improper task management.
AA.III.F.R7	Failure to confirm gear position in an amphibious aircraft.
Skills	The applicant demonstrates the ability to:
AA.III.F.S1	Coordinate with the crew, if applicable, and complete the appropriate checklist(s).
AA.III.F.S2	Make radio calls as appropriate.
AA.III.F.S3	Ensure that the landing gear and water rudders are retracted, if applicable.
AA.III.F.S4	Consider the landing surface, visual attitude references, water depth, and collision hazards and select the proper approach and landing path.
AA.III.F.S5	Establish the recommended approach and landing configuration and airspeed, and adjust pitch attitude and power as required to maintain a stabilized approach.
AA.III.F.S6	Maintain a stabilized approach and recommended airspeed with gust factor applied, ±5 knots.
AA.III.F.S7	Make smooth, timely, and correct power and control adjustments to maintain proper attitude and rate of descent to touchdown.
AA.III.F.S8	Contact the water at the correct pitch attitude and touchdown speed.
AA.III.F.S9	Make smooth, timely, and correct power and control application during the landing while remaining alert for a go-around should conditions be too rough.
AA.III.F.S10	Maintain positive after-landing control.

Task	*G. Confined-Area Takeoff and Maximum Performance Climb (ASES, AMES)*
References	FAA-H-8083-2, FAA-H-8083-3, FAA-8083-23; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a confined area takeoff and maximum performance climb. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.III.G.K1	Effects of atmospheric conditions, including wind, on takeoff and climb performance.
AA.III.G.K2	Appropriate V-speeds for takeoff and climb.
AA.III.G.K3	Appropriate aircraft configuration.
AA.III.G.K4	Effects of water surface.
AA.III.G.K5	Available techniques for confined-area takeoff and climb.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.III.G.R1	Selection of takeoff path based on pilot capability, aircraft limitations, available distance, and wind.
AA.III.G.R2	Effects of:
AA.III.G.R2a	a. Crosswind
AA.III.G.R2b	b. Windshear
AA.III.G.R2c	c. Tailwind
AA.III.G.R2d	d. Water surface/condition
AA.III.G.R3	Abnormal operations, to include planning for:
AA.III.G.R3a	a. Rejected takeoff
AA.III.G.R3b	b. Engine failure in takeoff/climb phase of flight
AA.III.G.R4	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.III.G.R5	Low altitude maneuvering including stall, spin, or CFIT.
AA.III.G.R6	Distractions, loss of situational awareness, and/or improper task management.
AA.III.G.R7	Failure to confirm gear position in an amphibious aircraft.
Skills	The applicant demonstrates the ability to:
AA.III.G.S1	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) prior to takeoff in a timely manner.
AA.III.G.S2	Make radio calls as appropriate.
AA.III.G.S3	Position the flight controls for the existing conditions.
AA.III.G.S4	Verify the airplane is configured for takeoff.
AA.III.G.S5	Clear the area; select appropriate takeoff path considering surface conditions and collision hazards.
AA.III.G.S6	Retract the water rudders, as appropriate.
AA.III.G.S7	Set and confirm takeoff power.
AA.III.G.S8	Avoid excessive water spray on the propellers.
AA.III.G.S9	Maintain directional control and proper wind-drift correction throughout takeoff and climb.
AA.III.G.S10	Establish and maintain an appropriate planing attitude, directional control, and correct for porpoising, skipping, and increase in water drag.
AA.III.G.S11	Rotate and liftoff at the appropriate airspeed, and accelerate to the recommended obstacle clearance airspeed or V_X using appropriate bank angles to maintain terrain clearance, as needed.

Task	*G. Confined-Area Takeoff and Maximum Performance Climb (ASES, AMES)*
AA.III.G.S12	Climb at the recommended airspeed or in its absence at V_X, +5/-0 knots until the obstacle is cleared, or until the airplane is 50 feet above the surface. In multiengine seaplanes with V_X values within 5 knots of V_{MC}, the use of V_Y or the manufacturer's recommendation is acceptable.
AA.III.G.S13	After clearing all obstacles, accelerate to V_Y ±5 knots.
AA.III.G.S14	Retract flaps and adjust power as needed to maintain V_Y or appropriate climb airspeed, ±5 knots to a safe maneuvering altitude.
AA.III.G.S15	Follow noise abatement procedures, as practicable.

Task	***H. Confined-Area Approach and Landing (ASES, AMES)***
References	FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a confined area approach and landing. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.III.H.K1	A stabilized approach, to include energy management concepts.
AA.III.H.K2	Effects of atmospheric conditions, including wind, on approach and landing performance.
AA.III.H.K3	Available techniques for confined-area approach and landing.
AA.III.H.K4	Wind correction techniques on approach and landing.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.III.H.R1	Selection of approach path and touchdown area based on pilot capability, aircraft limitations, available distance, and wind.
AA.III.H.R2	Effects of:
AA.III.H.R2a	a. Crosswind
AA.III.H.R2b	b. Windshear
AA.III.H.R2c	c. Tailwind
AA.III.H.R2d	d. Water surface/condition
AA.III.H.R3	Go-around/rejected landing.
AA.III.H.R4	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.III.H.R5	Low altitude maneuvering including stall, spin, or CFIT.
AA.III.H.R6	Distractions, loss of situational awareness, and/or improper task management.
AA.III.H.R7	Failure to confirm gear position in an amphibious aircraft.
AA.III.H.R8	Landing in an area or in conditions where a takeoff/climb may not be possible.
Skills	The applicant demonstrates the ability to:
AA.III.H.S1	Coordinate with the crew, if applicable, and complete the appropriate checklist(s).
AA.III.H.S2	Make radio calls as appropriate.
AA.III.H.S3	Ensure that the landing gear and water rudders are retracted, if applicable.
AA.III.H.S4	Consider the landing surface, visual attitude references, water depth, and collision hazards and select the proper approach and landing path.
AA.III.H.S5	Establish the recommended approach and landing configuration and airspeed, and adjust pitch attitude and power as required to maintain a stabilized approach.
AA.III.H.S6	Maintain a stabilized approach and recommended airspeed with gust factor applied, ±5 knots.
AA.III.H.S7	Make smooth, timely, and correct power and control adjustments to maintain proper attitude and rate of descent to touchdown.
AA.III.H.S8	Touch down smoothly at the recommended airspeed and pitch attitude, beyond and within 100 feet of a specified point/area.
AA.III.H.S9	Maintain crosswind correction and directional control throughout the approach and landing.

Task	***I. Rejected Takeoff***
References	FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a rejected takeoff. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.III.I.K1	Conditions and situations that could warrant a rejected takeoff (e.g., takeoff warning systems, powerplant failure, other systems warning/failure).
AA.III.I.K2	Safety considerations following a rejected takeoff.
AA.III.I.K3	The procedure for accomplishing a rejected takeoff.
AA.III.I.K4	Accelerate/stop distance.
AA.III.I.K5	V_1, V_2, and V_R, as applicable to the class of airplane.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.III.I.R1	Selection of takeoff path based on pilot capability, aircraft limitations, available distance, and wind.
AA.III.I.R2	Failure to plan for a powerplant failure during takeoff considering operational factors such as airplane characteristics, runway/takeoff path length, surface conditions, environmental conditions, and obstructions.
AA.III.I.R3	Failure to maintain directional control following a rejected takeoff.
AA.III.I.R4	A rejected takeoff with inadequate stopping distance.
AA.III.I.R5	A high-speed abort.
AA.III.I.R6	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.III.I.S1	Abort the takeoff if the powerplant failure occurs prior to becoming airborne (ASEL, ASES).
AA.III.I.S2	Abort the takeoff if the powerplant failure occurs at a point during the takeoff where the abort procedure can be initiated and the airplane can be safely stopped on the remaining runway/waterway (AMEL, AMES).
AA.III.I.S3	Promptly reduce the power and maintain positive aircraft control using drag and braking devices, as appropriate, to come to a stop.
AA.III.I.S4	Coordinate with the crew, if applicable, and complete the appropriate procedures, checklist(s), and radio calls following a rejected takeoff in a timely manner.

Task	*J. Go-Around/Rejected Landing*
References	14 CFR part 61; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23; POH/AFM; AIM; FSB Report (type specific)
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a go-around/rejected landing. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.III.J.K1	A stabilized approach, to include energy management concepts.
AA.III.J.K2	Effects of atmospheric conditions, including wind and density altitude on a go-around or rejected landing.
AA.III.J.K3	Wind correction techniques on takeoff/departure and approach/landing.
AA.III.J.K4	Situations and considerations on approach that could require a go-around/rejected landing, to include the inability to comply with a LAHSO clearance.
AA.III.J.K5	Go-around/rejected landing procedures, the importance of a timely decision, and appropriate airspeed/V-speeds for the maneuver.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.III.J.R1	Delayed recognition of the need for a go-around/rejected landing.
AA.III.J.R2	Delayed performance of a go-around at low altitude.
AA.III.J.R3	Improper application of power.
AA.III.J.R4	Improper aircraft configuration.
AA.III.J.R5	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.III.J.R6	Low altitude maneuvering including stall, spin, or CFIT.
AA.III.J.R7	Distractions, loss of situational awareness, and/or improper task management.
AA.III.J.R8	Managing a go-around/rejected landing after accepting a LAHSO clearance.
Skills	The applicant demonstrates the ability to:
AA.III.J.S1	Make a timely decision to go-around/reject the landing.
AA.III.J.S2	Apply the appropriate power setting for the flight condition and establish a pitch attitude necessary to obtain the desired performance.
AA.III.J.S3	Establish a positive rate of climb and the appropriate airspeed/V-speed, ±5 knots.
AA.III.J.S4	Configure and trim the airplane, when appropriate.
AA.III.J.S5	Make radio calls as appropriate.
AA.III.J.S6	Maintain the ground track, heading, or course appropriate for the conditions, or as specified by ATC or the evaluator.
AA.III.J.S7	Complete the appropriate procedures and checklist(s) in a timely manner.

IV. Inflight Maneuvers

Task	***A. Steep Turns***
References	FAA-H-8083-2; FAA-H-8083-3, FAA-H-8083-25; POH/AFM, FSB report (type specific)
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with steep turns. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.IV.A.K1	Energy management concepts and the purpose of steep turns.
AA.IV.A.K2	Aerodynamics associated with steep turns, to include:
AA.IV.A.K2a	a. Coordinated and uncoordinated flight
AA.IV.A.K2b	b. Overbanking tendencies
AA.IV.A.K2c	c. Maneuvering speed, including the impact of weight changes
AA.IV.A.K2d	d. Load factor and accelerated stalls
AA.IV.A.K2e	e. Rate and radius of turn
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.IV.A.R1	Spatial disorientation when conducting a steep turn while flying by reference to instruments.
AA.IV.A.R2	Collision hazards, to include aircraft, terrain, obstacles, and wires.
AA.IV.A.R3	Low altitude maneuvering including stall, spin, or CFIT.
AA.IV.A.R4	Distractions, loss of situational awareness, and/or improper task management.
AA.IV.A.R5	Failure to maintain coordinated flight.
Skills	The applicant demonstrates the ability to:
AA.IV.A.S1	Select an entry altitude that will allow the Task to be completed no lower than 3,000 feet above ground level.
AA.IV.A.S2	Establish the manufacturer's recommended airspeed; or if one is not available, an airspeed not to exceed V_A.
AA.IV.A.S3	Roll into a coordinated 180°or 360° turn, as specified by the evaluator, and establish at least a 45° bank solely by reference to instruments.
AA.IV.A.S4	Perform the task in the opposite direction, as specified by the evaluator.
AA.IV.A.S5	Make smooth pitch, bank, and power adjustments as needed.
AA.IV.A.S6	Maintain the entry altitude ±100 feet, airspeed ±10 knots, bank ±5°, and roll out on the entry heading or specified heading, ±10°.
AA.IV.A.S7	Avoid any indication of an impending stall, abnormal flight attitude, or exceeding any structural or operating limitation during any part of the Task.

Task	***B. Recovery from Unusual Flight Attitudes***
References	14 CFR part 61; FAA-H-8083-15; FAA-H-8083-2; AC 120-111; AFM, POH; FSB Report (type specific)
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with recovering from unusual flight attitudes.
Knowledge	The applicant demonstrates understanding of:
AA.IV.B.K1	Procedures for recovery from unusual flight attitudes.
AA.IV.B.K2	Unusual flight attitude causal factors, including physiological factors, system and equipment failures, and environmental factors.
AA.IV.B.K3	The normal operating envelope and structural limitations for the airplane.
AA.IV.B.K4	Effects of engine location, wing design, and other specific design characteristics that could affect aircraft control during the recovery.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.IV.B.R1	Situations that could lead to loss of control or unusual flight attitudes (e.g., stress, task saturation, and distractions).
AA.IV.B.R2	Failure to recognize an unusual flight attitude and follow the proper recover procedure.
AA.IV.B.R3	Exceeding the normal flight envelope during the recovery.
Skills	The applicant demonstrates the ability to:
AA.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, and power corrections, in the correct sequence, to return to a stabilized level flight attitude.

Task	***C. Specific Flight Characteristics***
References	14 CFR part 61; FAA-H-8083-2; POH/AFM; FSB Report (type specific).
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with flight and performance characteristics unique to a specific aircraft type. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.IV.C.K1	All specific flight and/or performance characteristics associated with the aircraft.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.IV.C.R1	Specific flight and performance characteristics, their effects, and failure to follow procedures.
AA.IV.C.R2	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.IV.C.S1	Use proper techniques and procedures, as applicable, to enter into, operate within, and recover from specific flight situations.

V. Stall Prevention

Task	***A. Partial Flap Configuration Stall Prevention***
References	FAA-H-8083-2; FAA-H-8083-3; AC 61-67, AC 120-109; POH/AFM; FSB Report (type specific)
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with stalls in a partial flap configuration. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.V.A.K1	Aerodynamics associated with stalls in a partial flap configuration, to include the relationship between angle of attack, airspeed, load factor, power setting, aircraft weight and balance, aircraft attitude, and sideslip effects.
AA.V.A.K2	Stall characteristics (i.e., airplane design) and impending stall and full stall indications (i.e., how to recognize by sight, sound, or feel).
AA.V.A.K3	Factors and situations that can lead to a stall during takeoff or while on approach and actions that can be taken to prevent it.
AA.V.A.K4	Effects of autoflight, flight envelope protection in normal and degraded modes, and unexpected disconnects of the autopilot or autothrottle/autothrust, if applicable to the aircraft used for the evaluation.
AA.V.A.K5	Fundamentals of stall recovery.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.V.A.R1	Factors and situations that could lead to an inadvertent stall, spin, and loss of control during takeoff or while on approach.
AA.V.A.R2	Range and limitations of stall warning indicators (e.g., aircraft buffet, stall horn, stick shaker, etc.).
AA.V.A.R3	Failure to recognize and recover at the stall warning.
AA.V.A.R4	Improper stall recovery procedure.
AA.V.A.R5	Secondary stalls, accelerated stalls, elevator trim stalls, and cross-control stalls.
AA.V.A.R6	Effect of environmental elements on aircraft performance while in a partial flap configuration as it relates to stalls (e.g., turbulence, microbursts, and high-density altitude).
AA.V.A.R7	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.V.A.R8	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.V.A.S1	Clear the area.
AA.V.A.S2	Select an entry altitude that will allow the recovery to be completed no lower than 3,000 feet AGL (non-transport category airplanes) or 5,000 feet AGL (transport category airplanes). When accomplished in an FSTD, the entry should be consistent with the expected operational environment for a stall on takeoff or while on approach in a partial flap configuration with no minimum entry altitude defined.
AA.V.A.S3	Establish the takeoff or approach configuration (partial flap), as specified by the evaluator, and maintain coordinated flight in simulated or actual instrument conditions throughout the maneuver.
AA.V.A.S4	Either manually or with the autopilot engaged, smoothly adjust pitch attitude, bank angle (15°-30°), and power setting in accordance with evaluator's instructions to an impending stall.

Task	*A. Partial Flap Configuration Stall Prevention*
AA.V.A.S5	Acknowledge the cue(s) and promptly recover at the first indication of an impending stall (e.g., buffet, stall horn, stick shaker, etc.).
AA.V.A.S6	Execute a stall recovery in accordance with procedures set forth in the POH/AFM.
AA.V.A.S7	Retract the flaps or other lift/drag devices to the recommended setting, if applicable; retract the landing gear after a positive rate of climb is established, if applicable; and return to the desired flight path as specified by the evaluator.

Task	***B. Clean Configuration Stall Prevention***
References	FAA-H-8083-2; FAA-H-8083-3; AC 61-67, AC 120-109, POH/AFM; FSB Report (type specific)
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with stalls in a clean configuration. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.V.B.K1	Aerodynamics associated with stalls in a clean configuration, to include the relationship between angle of attack, airspeed, load factor, power setting, aircraft weight and balance, and aircraft attitude.
AA.V.B.K2	Stall characteristics (i.e., airplane design) and impending stall and full stall indications (i.e., how to recognize by sight, sound, or feel).
AA.V.B.K3	Factors and situations that can lead to a stall during cruise flight and actions that can be taken to prevent it.
AA.V.B.K4	Effects of autoflight, flight envelope protection in normal and degraded modes, and unexpected disconnects of the autopilot or autothrottle/autothrust, if applicable to the aircraft used for the evaluation.
AA.V.B.K5	Fundamentals of stall recovery.
AA.V.B.K6	Effects of altitude on performance (e.g., thrust available) and flight control effectiveness during a recovery.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.V.B.R1	Factors and situations that could lead to an inadvertent stall, spin, and loss of control during cruise flight.
AA.V.B.R2	Range and limitations of stall warning indicators (e.g., aircraft buffet, stall horn, stick shaker, etc.).
AA.V.B.R3	Failure to recognize and recover at the stall warning.
AA.V.B.R4	Improper stall recovery procedure.
AA.V.B.R5	Secondary stalls, accelerated stalls, elevator trim stalls, and cross-control stalls.
AA.V.B.R6	Effect of environmental elements on aircraft performance while in cruise flight as it relates to stalls (e.g., turbulence, microbursts, and high-density altitude).
AA.V.B.R7	Collision hazards, to include aircraft, terrain, and obstacles.
AA.V.B.R8	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.V.B.S1	Clear the area.
AA.V.B.S2	Select an entry altitude that will allow the recovery to be completed no lower than 3,000 feet AGL (non-transport category airplanes) or 5,000 feet AGL (transport category airplanes). When accomplished in an FSTD, the entry should be consistent with the expected operational environment for a stall in cruise flight with no minimum entry altitude defined.
AA.V.B.S3	While in cruise flight, maintain coordinated flight in simulated or actual instrument conditions throughout the maneuver.
AA.V.B.S4	Either manually or with the autopilot engaged, smoothly adjust pitch attitude, bank angle (15°-30°), and power setting in accordance with evaluator's instructions to an impending stall.
AA.V.B.S5	Acknowledge the cue(s) and promptly recover at the first indication of an impending stall (e.g., buffet, stall horn, stick shaker, etc.).
AA.V.B.S6	Execute a stall recovery in accordance with procedures set forth in the POH/AFM.
AA.V.B.S7	Return to the desired flight path as specified by the evaluator.

Task	***C. Landing Configuration Stall Prevention***
References	FAA-H-8083-2; FAA-H-8083-3; AC 61-67, AC 120-109; POH/AFM; FSB Report (type specific)
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with stalls in the landing configuration. ***Note:*** *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.V.C.K1	Aerodynamics associated with stalls in the landing configuration, to include the relationship between angle of attack, airspeed, load factor, power setting, aircraft weight and balance, aircraft attitude, and sideslip effects.
AA.V.C.K2	Stall characteristics (i.e., airplane design) and impending stall and full stall indications (i.e., how to recognize by sight, sound, or feel).
AA.V.C.K3	Factors and situations that can lead to a stall when configured for landing and actions that can be taken to prevent it.
AA.V.C.K4	Effects of autoflight, flight envelope protection in normal and degraded modes, and unexpected disconnects of the autopilot or autothrottle/autothrust, if applicable to the aircraft used for the evaluation.
AA.V.C.K5	Fundamentals of stall recovery.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.V.C.R1	Factors and situations that could lead to an inadvertent stall, spin, and loss of control during landing.
AA.V.C.R2	Range and limitations of stall warning indicators (e.g., aircraft buffet, stall horn, stick shaker, etc.).
AA.V.C.R3	Failure to recognize and recover at the stall warning.
AA.V.C.R4	Improper stall recovery procedure.
AA.V.C.R5	Secondary stalls, accelerated stalls, elevator trim stalls, and cross-control stalls.
AA.V.C.R6	Effect of environmental elements on aircraft performance while landing as it relates to stalls (e.g., turbulence, microbursts, and high-density altitude).
AA.V.C.R7	Stalls at a low altitude.
AA.V.C.R8	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.V.C.R9	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.V.C.S1	Clear the area.
AA.V.C.S2	Select an entry altitude that will allow the recovery to be completed no lower than 3,000 feet AGL (non-transport category airplanes) or 5,000 feet AGL (transport category airplanes). When accomplished in an FSTD, the entry should be consistent with the expected operational environment for a stall when fully configured for landing with no minimum entry altitude defined.
AA.V.C.S3	Establish the landing configuration (i.e., lift/drag devices set and landing gear extended) and maintain coordinated flight in simulated or actual instrument conditions throughout the maneuver.
AA.V.C.S4	Either manually or with the autopilot engaged, smoothly adjust pitch attitude, bank angle (15°-30°), and power setting in accordance with evaluator's instructions to an impending stall.
AA.V.C.S5	Acknowledge the cue(s) and promptly recover at the first indication of an impending stall (e.g., buffet, stall horn, stick shaker, etc.).
AA.V.C.S6	Execute a stall recovery in accordance with procedures set forth in the POH/AFM.
AA.V.C.S7	Retract the flaps or other lift/drag devices to the recommended setting, if applicable; retract the landing gear after a positive rate of climb is established, if applicable; and return to the desired flight path as specified by the evaluator.

VI. Instrument Procedures

Task	***A. Instrument Takeoff***
References	14 CFR parts 61 and 91; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-6; FAA-H-8083-15, FAA-H-8083-16, FAA-H-8083-23, FAA-H-8083-25; POH/AFM; AIM; IFP
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with an instrument takeoff.
Knowledge	The applicant demonstrates understanding of:
AA.VI.A.K1	Operational factors that could affect an instrument takeoff (e.g., runway length, surface conditions, wind, wake turbulence, icing conditions, obstructions, available instrument approaches or alternate airports available in the event of an emergency after takeoff).
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VI.A.R1	Selection of runway based on pilot capability, aircraft performance and limitations, available distance, and wind.
AA.VI.A.R2	Effects of:
AA.VI.A.R2a	a. Crosswind
AA.VI.A.R2b	b. Windshear
AA.VI.A.R2c	c. Tailwind
AA.VI.A.R2d	d. Wake turbulence
AA.VI.A.R2e	e. Runway surface/condition
AA.VI.A.R3	Abnormal operations, to include planning for:
AA.VI.A.R3a	a. Rejected takeoff
AA.VI.A.R3b	b. Engine failure in takeoff/climb phase of flight with the ceiling or visibility below the minimums for an instrument approach at departure airport
AA.VI.A.R4	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.VI.A.R5	Low altitude maneuvering including stall, spin, or CFIT.
AA.VI.A.R6	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.VI.A.S1	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) prior to takeoff in a timely manner.
AA.VI.A.S2	Properly set the applicable avionics and flight instruments prior to initiating the takeoff.
AA.VI.A.S3	Make radio calls as appropriate.
AA.VI.A.S4	Verify assigned/correct runway.
AA.VI.A.S5	Position the flight controls for the existing wind conditions.
AA.VI.A.S6	Clear the area; taxi into takeoff position and align the airplane on the runway centerline (ASEL, AMEL) or takeoff path (ASES, AMES).
AA.VI.A.S7	Perform an instrument takeoff with instrument meteorological conditions (IMC) simulated at or before reaching an altitude of 100 feet AGL. If accomplished in a full flight simulator, visibility should be no greater than 1/4 mile, or as specified by applicable operations specifications, whichever is lower.
AA.VI.A.S8	Maintain centerline (ASEL, AMEL) and proper flight control inputs during the takeoff roll.
AA.VI.A.S9	Confirm takeoff power and proper engine and flight instrument indications prior to rotation making callouts, as appropriate, for the airplane or per the operator's procedures.
AA.VI.A.S10	Rotate and lift off at the recommended airspeed, establish the desired pitch attitude, and accelerate to the desired airspeed/ V-speed.

Task	*A. Instrument Takeoff*
AA.VI.A.S11	Transition smoothly from visual meteorological conditions (VMC) to actual or simulated instrument meteorological conditions (IMC).
AA.VI.A.S12	Maintain desired heading ±5° and desired airspeeds ±5 knots.
AA.VI.A.S13	Comply with ATC clearances and instructions issued by ATC or the evaluator, as appropriate.
AA.VI.A.S14	Complete appropriate after takeoff checklist(s) in a timely manner.

Task	***B. Departure Procedures***
References	14 CFR parts 61 and 91; FAA-H-8083-2, FAA-H-8083-15, FAA-H-8083-16; AC 90-100; POH/AFM; AIM; IFP
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with IFR departure procedures (DPs).
Knowledge	The applicant demonstrates understanding of:
AA.VI.B.K1	DPs and associated climb gradients, U.S. Terminal Procedures Publications, and IFR Enroute Low Altitude Charts.
AA.VI.B.K2	Use of a Flight Management System (FMS) or Global Positioning System (GPS) to follow a DP.
AA.VI.B.K3	Pilot/controller responsibilities, communication procedures, and ATC services available to pilots.
AA.VI.B.K4	Two-way radio communication failure procedures after takeoff.
AA.VI.B.K5	Requirements for current and appropriate navigation data.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VI.B.R1	Failure to communicate with ATC or follow published procedures.
AA.VI.B.R2	Failure to recognize limitations of traffic avoidance equipment.
AA.VI.B.R3	Failure to use see and avoid techniques when possible.
AA.VI.B.R4	Improper automation management.
Skills	The applicant demonstrates the ability to:
AA.VI.B.S1	In actual or simulated instrument conditions, select, identify (as necessary) and use the appropriate communication and navigation facilities associated with the proposed flight.
AA.VI.B.S2	Program the FMS prior to departure and set avionics to include flight director and autopilot controls, as appropriate, for the departure, if applicable.
AA.VI.B.S3	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) in a timely manner.
AA.VI.B.S4	Use current and appropriate navigation publications or databases for the proposed flight.
AA.VI.B.S5	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.
AA.VI.B.S6	Intercept all courses, radials, and bearings appropriate to the procedure, route, clearance, or as directed by the evaluator in a timely manner.
AA.VI.B.S7	Comply with all applicable charted procedures.
AA.VI.B.S8	Maintain the appropriate airspeed ±10 knots, headings ±10°, and altitude ±100 feet, and accurately track a course, radial, or bearing.
AA.VI.B.S9	Conduct the departure phase to a point where, in the opinion of the evaluator, the transition to the en route environment is complete.

Task	***C. Arrival Procedures***
References	14 CFR parts 61 and 91; FAA-H-8083-2, FAA-H-8083-15, FAA-H-8083-16; AC 90-100; Enroute Low and High Altitude Charts; Profile Descent Charts; STARs/FMSPs; IFP; POH/AFM; AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with IFR arrival procedures and the use of a Flight Management System, where applicable.
Knowledge	The applicant demonstrates understanding of:
AA.VI.C.K1	Standard Terminal Arrival (STAR) charts, U.S. Terminal Procedures Publications, and IFR Enroute High and Low Altitude Charts.
AA.VI.C.K2	Use of a Flight Management System (FMS) or GPS to follow a STAR.
AA.VI.C.K3	Pilot/controller responsibilities, communication procedures, and ATC services available to pilots.
AA.VI.C.K4	Two-way radio communication failure procedures during an arrival.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VI.C.R1	Failure to communicate with ATC or follow published procedures.
AA.VI.C.R2	Failure to recognize limitations of traffic avoidance equipment.
AA.VI.C.R3	Failure to use see and avoid techniques when possible.
AA.VI.C.R4	Improper automation management.
AA.VI.C.R5	ATC instructions that modify an arrival or take you off and back on an arrival.
Skills	The applicant demonstrates the ability to:
AA.VI.C.S1	In actual or simulated instrument conditions, select, identify (as necessary) and use the appropriate communication and navigation facilities associated with the arrival.
AA.VI.C.S2	Set FMS and avionics to include flight director and autopilot controls for the arrival, if applicable.
AA.VI.C.S3	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) in a timely manner.
AA.VI.C.S4	Use current and appropriate navigation publications or databases for the proposed flight.
AA.VI.C.S5	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.
AA.VI.C.S6	Intercept all courses, radials, and bearings appropriate to the procedure, route, clearance, or as directed by the evaluator in a timely manner.
AA.VI.C.S7	Comply with all applicable charted procedures.
AA.VI.C.S8	Adhere to airspeed restrictions required by regulation, ATC, aircraft limitations, or the evaluator.
AA.VI.C.S9	Establish rates of descent consistent with the route segment, airplane operating characteristics and safety.
AA.VI.C.S10	Maintain the appropriate airspeed/V-speed ±10 knots, but not less than V_{Ref} if applicable, heading ±10°, altitude ±100 feet, and accurately track radials, courses, and bearings.

Task	***D. Nonprecision Approaches***
References	14 CFR parts 61 and 91; FAA-H-8083-15, FAA-H-8083-16; IFP, AIM; AC 120-108
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing nonprecision approach procedures. ***Note**: See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VI.D.K1	Procedures and limitations associated with a nonprecision approach, including the differences between Localizer Performance (LP) and Lateral Navigation (LNAV) approach guidance.
AA.VI.D.K2	Navigation system annunciations expected during an RNAV approach.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VI.D.R1	Failure to follow prescribed procedures (e.g., to prevent descending below the minimum descent altitude (MDA) without proper visual references).
AA.VI.D.R2	Deteriorating weather conditions on approach.
AA.VI.D.R3	An unstable approach, including excessive descent rates.
AA.VI.D.R4	Failure to ensure proper aircraft configuration during an approach and missed approach.
AA.VI.D.R5	Failure to manage automated navigation and autoflight systems.
Skills	The applicant demonstrates the ability to:
AA.VI.D.S1	Accomplish the nonprecision instrument approaches selected by the evaluator.
AA.VI.D.S2	Establish two-way communications with ATC appropriate for the phase of flight or approach segment, and use proper communication phraseology.
AA.VI.D.S3	Select, tune, identify, and confirm the operational status of navigation equipment to be used for the approach.
AA.VI.D.S4	Comply with all clearances issued by ATC or the evaluator.
AA.VI.D.S5	Recognize if any flight instrumentation is inaccurate or inoperative, and take appropriate action.
AA.VI.D.S6	Advise ATC or the evaluator if unable to comply with a clearance.
AA.VI.D.S7	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) in a timely manner.
AA.VI.D.S8	Establish the appropriate airplane configuration and airspeed considering meteorological and operating conditions.
AA.VI.D.S9	Maintain altitude ±100 feet, heading ±5°, airspeed ±10 knots, and accurately track radials, courses, and bearings, prior to beginning the final approach segment.
AA.VI.D.S10	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.
AA.VI.D.S11	Establish a stabilized descent to the appropriate altitude.
AA.VI.D.S12	For the final approach segment, maintain no more than ¼ scale CDI deflection, airspeed ±5 knots of selected value, and altitude above MDA +50/-0 feet (to the VDP or MAP).
AA.VI.D.S13	Execute the missed approach procedure if the required visual references are not distinctly visible and identifiable at the appropriate point or altitude for the approach profile; or execute a normal landing from a straight-in or circling approach.
AA.VI.D.S14	Use a Multi-Function Display (MFD) and other graphical navigation displays, if installed, to monitor position, track wind drift and other parameters to maintain desired flightpath.

Task	***E. Precision Approaches***
References	14 CFR parts 61 and 91; FAA-H-8083-15, FAA-H-8083-16; IFP; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing precision approach procedures. ***Note***: *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VI.E.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:
AA.VI.E.R1	Failure to initiate the missed approach immediately at Decision Altitude (DA)/Decision Height (DH) if the required visual references are not visible.
AA.VI.E.R2	Deteriorating weather conditions on approach.
AA.VI.E.R3	An unstable approach, including excessive descent rates.
AA.VI.E.R4	Failure to ensure proper aircraft configuration during an approach and missed approach.
AA.VI.E.R5	Failure to manage automated navigation and autoflight systems.
Skills	The applicant demonstrates the ability to:
AA.VI.E.S1	Accomplish the precision instrument approaches selected by the evaluator.
AA.VI.E.S2	Establish two-way communications with ATC appropriate for the phase of flight or approach segment, and use proper communication phraseology.
AA.VI.E.S3	Select, tune, identify, and confirm the operational status of navigation equipment to be used for the approach.
AA.VI.E.S4	Comply in a timely manner with all clearances, instructions, and procedures.
AA.VI.E.S5	Recognize if any flight instrumentation is inaccurate or inoperative, and take appropriate action.
AA.VI.E.S6	Advise ATC or the evaluator if unable to comply with a clearance.
AA.VI.E.S7	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) in a timely manner.
AA.VI.E.S8	Establish the appropriate airplane configuration and airspeed considering meteorological and operating conditions.
AA.VI.E.S9	Maintain altitude ±100 feet, heading ±5°, airspeed ±10 knots, and accurately track radials, courses, and bearings, prior to beginning the final approach segment.
AA.VI.E.S10	Apply adjustments to the published DA/DH 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.
AA.VI.E.S11	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.
AA.VI.E.S12	Maintain a stabilized final approach from the Final Approach Fix (FAF) to DA/DH allowing no more than ¼-scale deflection of either the vertical or lateral guidance indications and maintain the desired airspeed ±5 knots.
AA.VI.E.S13	Upon reaching the DA/DH, immediately initiate the missed approach procedures if the required visual references for the runway are not distinctly visible and identifiable (or if in a seaplane); or transition to a normal 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 maneuvering.
AA.VI.E.S14	Use an MFD and other graphical navigation displays, if installed, to monitor position, track wind drift and other parameters to maintain desired flightpath.

Task	***F. Landing from a Precision Approach***
References	14 CFR parts 61 and 91; FAA-H-8083-15; FAA-H-8083-16; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing the procedures for a landing from a precision approach. ***Note**: See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VI.F.K1	Elements related to the pilot's responsibilities, and the environmental, operational, and meteorological factors that affect landing from a precision approach.
AA.VI.F.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:
AA.VI.F.R1	Selection of approach procedure and runway based on pilot capability, aircraft limitations, available distance, and wind.
AA.VI.F.R2	Effects of:
AA.VI.F.R2a	a. Crosswind
AA.VI.F.R2b	b. Windshear
AA.VI.F.R2c	c. Tailwind
AA.VI.F.R2d	d. Wake turbulence
AA.VI.F.R2e	e. Runway surface/condition
AA.VI.F.R3	Planning for:
AA.VI.F.R3a	a. Missed approach
AA.VI.F.R3b	b. LAHSO
AA.VI.F.R4	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.VI.F.R5	Low altitude maneuvering including stall, spin, or CFIT.
AA.VI.F.R6	Distractions, loss of situational awareness, and/or improper task management.
AA.VI.F.R7	Attempting to land from an unstable approach.
AA.VI.F.R8	Flying below the glidepath.
AA.VI.F.R9	Transitioning from flying by instruments to visual references for landing.
Skills	The applicant demonstrates the ability to:
AA.VI.F.S1	Transition at the DA/DH, or a point specified by the evaluator, to a visual flight condition allowing for safe visual maneuvering and a normal landing.
AA.VI.F.S2	Adhere to all ATC or evaluator advisories, such as NOTAMs, windshear, wake turbulence, runway surface, braking conditions, and other operational considerations.
AA.VI.F.S3	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) in a timely manner.
AA.VI.F.S4	Maintain the desired airspeed, ±5 knots, and vertical and lateral guidance within ¼-scale deflection of the indicators during the visual descent from DA/DH to a point over the runway where vertical or lateral guidance must be abandoned to accomplish a normal landing.
AA.VI.F.S5	Touch down at the aiming point markings, -250/+500 feet, or where there are no runway aiming point markings, 750 to 1,500 feet, from the approach threshold of the runway.
AA.VI.F.S6	Maintain positive airplane control throughout the landing using drag and braking devices, as appropriate, to come to a stop.
AA.VI.F.S7	Demonstrate SRM or CRM, as appropriate.
AA.VI.F.S8	Utilize runway incursion avoidance procedures.

Task	*G. Circling Approach*
References	14 CFR parts 61, 91 and 97; FAA-H-8083-15; FAA-H-8083-16; AIM; IFP
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing a circling approach procedure. ***Note**: See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VI.G.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:
AA.VI.G.R1	Failure to follow prescribed circling approach procedures.
AA.VI.G.R2	Executing a circling approach at night or with marginal visibility.
AA.VI.G.R3	Losing visual contact with an identifiable part of the airport.
AA.VI.G.R4	Failure to manage automated navigation and autoflight systems.
AA.VI.G.R5	Failure to maintain an appropriate airspeed while circling.
AA.VI.G.R6	Low altitude maneuvering including stall, spin, or CFIT.
AA.VI.G.R7	Executing an improper missed approach after the MAP while circling.
Skills	The applicant demonstrates the ability to:
AA.VI.G.S1	Perform a circling approach to a runway that includes maneuvering of 90° or more from the final approach course. Comply with the circling approach procedure considering turbulence, windshear, and the maneuvering capabilities of the aircraft.
AA.VI.G.S2	Confirm the direction of traffic and adhere to all restrictions and instructions issued by ATC or the evaluator.
AA.VI.G.S3	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) in a timely manner.
AA.VI.G.S4	Establish the approach and landing configuration for the situation and maintain airspeed, ±5 knots, desired heading/track, ±5°, and altitude, +100/-0 feet, as appropriate; and adjust pitch attitude and power as required to maintain a stabilized approach and a descent rate that ensures arrival at the MDA, prior to or at a point from which a circle-to-land maneuver can be accomplished.
AA.VI.G.S5	If a missed approach occurs, turns in the appropriate direction using the correct procedure and appropriately configures the airplane.

Task	***H. Landing from a Circling Approach***
References	14 CFR parts 61 and 91; FAA-H-8083-15; FAA-H-8083-16; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing the procedures for a landing from a circling approach. ***Note***: *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VI.H.K1	Elements related to the pilot's responsibilities, and the environmental, operational, and meteorological factors that affect landing from a circling approach.
AA.VI.H.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:
AA.VI.H.R1	Selection of approach procedure and runway based on pilot capability, aircraft limitations, available distance, and wind.
AA.VI.H.R2	Effects of:
AA.VI.H.R2a	a. Crosswind
AA.VI.H.R2b	b. Windshear
AA.VI.H.R2c	c. Tailwind
AA.VI.H.R2d	d. Wake turbulence
AA.VI.H.R2e	e. Runway surface/condition
AA.VI.H.R3	Planning for:
AA.VI.H.R3a	a. Missed approach
AA.VI.H.R3b	b. LAHSO
AA.VI.H.R4	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.VI.H.R5	Low altitude maneuvering including stall, spin, or CFIT.
AA.VI.H.R6	Distractions, loss of situational awareness, and/or improper task management.
AA.VI.H.R7	Attempting to land from an unstable approach.
Skills	The applicant demonstrates the ability to:
AA.VI.H.S1	Keep the airport environment in sight and remain within the circling approach radius applicable to the approach category to a position from which a stabilized descent to landing can be made.
AA.VI.H.S2	Adhere to all ATC or evaluator advisories, such as NOTAMs, windshear, wake turbulence, runway surface, braking conditions, and other operational considerations.
AA.VI.H.S3	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) in a timely manner.
AA.VI.H.S4	Aligns the airplane for a normal landing on the selected runway without excessive maneuvering and without exceeding the normal operating limits of the airplane. The angle of bank should not exceed 30°.
AA.VI.H.S5	Make smooth, timely, and correct control application throughout the circling maneuver and maintain appropriate airspeed, ±5 knots. If applicable, maintain altitude +100/−0 feet, and desired heading/track, ±5°.
AA.VI.H.S7	Ensure the airplane is configured for landing.
AA.VI.H.S8	Scan the landing runway and adjoining area for traffic and obstructions. (ASEL, AMEL).
AA.VI.H.S9	Touch down at the aiming point markings - 250/+500 feet, or where there are no runway aiming point markings 750 to 1,500 feet from the approach threshold of the runway.

Task	*H. Landing from a Circling Approach*
AA.VI.H.S10	Maintain positive aircraft control throughout the landing using drag and braking devices, as appropriate, to come to a stop.
AA.VI.H.S11	Demonstrate SRM or CRM, as appropriate.
AA.VI.H.S12	Utilize runway incursion avoidance procedures.

Task	***I. Missed Approaches***
References	14 CFR parts 61 and 91; FAA-H-8083-15, FAA-H-8083-16; IFP; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing a missed approach procedure. ***Note***: *See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VI.I.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:
AA.VI.I.R1	Failure to follow prescribed procedures.
AA.VI.I.R2	Holding, diverting, or electing to fly the approach again.
AA.VI.I.R3	Failure to ensure proper aircraft configuration during an approach and missed approach.
AA.VI.I.R4	Factors that might lead to executing a missed approach procedure before the MAP or to a go-around below DA/MDA.
AA.VI.I.R5	Failure to manage automated navigation and autoflight systems.
Skills	The applicant demonstrates the ability to:
AA.VI.I.S1	Promptly initiate the missed approach procedure and report it to ATC.
AA.VI.I.S2	Apply the appropriate power setting for the flight condition and establish a pitch attitude necessary to obtain the desired performance.
AA.VI.I.S3	Retract the wing flaps/drag devices and landing gear, if appropriate, in the correct sequence and at a safe altitude, and establish a positive rate of climb and the appropriate airspeed/V-speed, ±5 knots.
AA.VI.I.S4	Coordinate with the crew, if applicable, and complete the appropriate procedures and checklist(s) in a timely manner.
AA.VI.I.S5	Comply with the published or alternate missed approach procedure.
AA.VI.I.S6	Advise ATC or the evaluator if unable to comply with a clearance, restriction, or climb gradient.
AA.VI.I.S7	Request, if appropriate, ATC clearance to the alternate airport, clearance limit, or as directed by the evaluator.
AA.VI.I.S8	Maintain the heading, course, or bearing ±5°, and altitude(s) ±100 feet during the missed approach procedure.
AA.VI.I.S9	Use an MFD and other graphical navigation displays, if installed, to monitor position and track to help navigate the missed approach.
AA.VI.I.S10	Demonstrate SRM or CRM, as appropriate.
AA.VI.I.S11	Re-engage autopilot (if installed) at appropriate times during the missed approach procedure.

Task	*J. Holding Procedures*
References	14 CFR parts 61 and 91; FAA-H-8083-15, FAA-H-8083-16; AC 91-74; POH/AFM; AIM; IFP
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with holding procedures. ***Note**: See Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VI.J.K1	Elements related to holding procedures, including reporting criteria, appropriate speeds, and recommended entry procedures for standard, nonstandard, published, and non-published holding patterns.
AA.VI.J.K2	Determining holding endurance based upon factors to include an expect further clearance (EFC) time, fuel on board, fuel flow while holding, fuel required to destination and alternate, etc., as appropriate.
AA.VI.J.K3	When to declare minimum fuel or a fuel-related emergency.
AA.VI.J.K4	Use of automation for holding to include autopilot and flight management systems, if equipped.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VI.J.R1	Recalculating fuel reserves if assigned an unanticipated EFC time.
AA.VI.J.R2	Scenarios and circumstances that could result in minimum fuel or the need to declare an emergency.
AA.VI.J.R3	Scenarios that could lead to holding, including deteriorating weather at the planned destination.
AA.VI.J.R4	Improper holding entry and improper wind correction while holding.
AA.VI.J.R5	Holding while in icing conditions.
AA.VI.J.R6	Improper automation management.
Skills	The applicant demonstrates the ability to:
AA.VI.J.S1	Correctly identifies instrument navigation aids associated with the assigned hold.
AA.VI.J.S2	Uses an entry procedure appropriate for a standard, nonstandard, published, or non-published holding pattern.
AA.VI.J.S3	Changes to the appropriate holding airspeed for the airplane and holding altitude to cross the holding fix at or below maximum holding airspeed.
AA.VI.J.S4	Comply with the holding pattern leg length and other restrictions, if applicable, associated with the holding pattern.
AA.VI.J.S5	Comply with ATC reporting requirements.
AA.VI.J.S6	Use proper wind correction procedures to maintain the desired pattern and to arrive over the fix as close as possible to a specified time.
AA.VI.J.S7	Maintain the airspeed ±10 knots, altitude ±100 feet, headings ±10°, and accurately track a selected course, radial, or bearing.
AA.VI.J.S8	If available, uses automation to include autopilot, flight director controls, and navigation displays associated with the assigned hold.
AA.VI.J.S9	Updates fuel reserve calculations based on EFC times.

VII. Emergency Operations

Task	***A. Emergency Procedures***
References	14 CFR part 91; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23, FAA-H-8083-25; AC 91-74; POH/AFM; AIM; FSB report (type specific)
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with emergency procedures.
Knowledge	The applicant demonstrates understanding of:
AA.VII.A.K1	Declaring an emergency.
AA.VII.A.K2	Situations that would require an emergency descent.
AA.VII.A.K3	Causes of inflight fire or smoke.
AA.VII.A.K4	Airplane decompression.
AA.VII.A.K5	When an emergency evacuation may be necessary.
AA.VII.A.K6	Actions required if icing conditions exceed the capabilities of the airplane.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VII.A.R1	Failure to follow proper procedures or checklists in an emergency.
AA.VII.A.R2	Multiple failures or system abnormalities.
AA.VII.A.R3	Failure to consider altitude, wind, terrain, and obstructions in an emergency.
AA.VII.A.R4	Distractions, loss of situational awareness, and/or improper task management.
Skills	For the airplane provided for the practical test, the applicant demonstrates the ability to:
AA.VII.A.S1	Explain or describe an emergency procedure for a situation(s) presented by the evaluator.
AA.VII.A.S2	Use proper procedures for an emergency situation(s) presented by the evaluator, such as:
AA.VII.A.S2a	a. Emergency descent
AA.VII.A.S2b	b. Inflight fire and smoke
AA.VII.A.S2c	c. Decompression
AA.VII.A.S2d	d. Emergency evacuation
AA.VII.A.S2e	e. Airframe icing
AA.VII.A.S2f	f. Others as specified in the AFM/POH
AA.VII.A.S3	Fly by reference to standby flight instruments.
AA.VII.A.S4	Coordinate with the crew, if applicable, and complete the appropriate checklist(s) in a timely manner.
AA.VII.A.S5	Communicate with ATC and the evaluator, as appropriate for the situation.

Task	***B. Powerplant Failure During Takeoff***
References	FAA-H-8083-2, FAA-H-8083-3, POH/AFM; FSB report (type specific)
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a powerplant failure during takeoff. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VII.B.K1	The procedures used during a powerplant failure on takeoff, the appropriate reference airspeeds, and the specific pilot actions required.
AA.VII.B.K2	Operational considerations to include: airplane performance (e.g., sideslip, bank angle, rudder input), takeoff warning systems, runway length, surface conditions, density altitude, wake turbulence, environmental conditions, obstructions, and other related factors that could adversely affect safety.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VII.B.R1	Failure to plan for a powerplant failure during takeoff considering operational factors such as takeoff warning inhibit systems, other airplane characteristics, runway/takeoff path length, surface conditions, environmental conditions, obstructions, and LAHSO operations.
AA.VII.B.R2	Failure to brief the plan for a powerplant failure during takeoff, in a crew environment.
AA.VII.B.R3	Failure to follow proper procedures or checklists in an emergency.
AA.VII.B.R4	Failure to correctly identify the inoperative engine (AMEL, AMES).
AA.VII.B.R5	Inability to climb or maintain altitude with an inoperative powerplant (AMEL, AMES).
AA.VII.B.R6	Failure to consider altitude, wind, terrain, and obstructions in an emergency.
AA.VII.B.R7	Low altitude maneuvering including stall, spin, or CFIT.
AA.VII.B.R8	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.VII.B.S1	Following the powerplant failure, adjust the powerplant controls as recommended by the manufacturer for the existing conditions.
AA.VII.B.S2	Establish a power-off descent approximately straight-ahead, if the powerplant failure occurs after becoming airborne and before reaching an altitude where a safe turn can be made (ASEL, ASES) or the performance capabilities and operating limitations of the airplane will not allow the climb to continue (AMEL, AMES).
AA.VII.B.S3	Continue the takeoff if the (simulated) powerplant failure occurs at a point where the airplane can continue to a specified airspeed and altitude at the end of the runway commensurate with the airplane's performance capabilities and operating limitations(AMEL, AMES).
AA.VII.B.S4	After establishing a climb, maintain the desired airspeed, ±5 knots. Use flight controls in the proper combination as recommended by the manufacturer, or as required, to maintain best performance and trim as required (AMEL, AMES).
AA.VII.B.S5	Maintain the appropriate heading, ±5°, when powerplant failure occurs (AMEL, AMES).
AA.VII.B.S6	Coordinate with the crew, if applicable, and complete the checklist(s) following the powerplant failure.

Task	***C. Powerplant Failure (Simulated) (ASEL, ASES)***
References	FAA-H-8083-2, FAA-H-8083-3; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a powerplant failure and associated emergency approach and landing procedures. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VII.C.K1	Immediate action items and emergency procedures for a forced landing.
AA.VII.C.K2	Airspeed, to include:
AA.VII.C.K2a	a. Importance of best glide speed and its relationship to distance
AA.VII.C.K2b	b. Difference between best glide speed and minimum sink speed
AA.VIII.C.K2c	c. Effects of wind on glide distance
AA.VII.C.K3	Effects of atmospheric conditions on emergency approach and landing.
AA.VII.C.K4	A stabilized approach, to include energy management concepts.
AA.VII.C.K5	Emergency Locator Transmitter (ELTs) and other emergency locating devices.
AA.VII.C.K6	ATC services to aircraft in distress.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VII.C.R1	Failure to consider altitude, wind, terrain, obstructions, gliding distance, and available landing distance.
AA.VII.C.R2	Failure to plan and follow a flightpath to the selected landing area.
AA.VII.C.R3	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.VII.C.R4	Improper aircraft configuration.
AA.VII.C.R5	Low altitude maneuvering including stall, spin, or CFIT.
AA.VII.C.R6	Distractions, loss of situational awareness, and/or improper task management.
AA.VII.C.R7	A powerplant failure in IMC conditions.
Skills	The applicant demonstrates the ability to:
AA.VII.C.S1	Recognize the powerplant failure.
AA.VII.C.S2	Determine the cause for the simulated powerplant failure (if altitude permits) and if a restart is a viable option.
AA.VII.C.S3	Maintain positive control throughout the maneuver.
AA.VII.C.S4	Establish and maintain the recommended best glide airspeed, ±5 knots.
AA.VII.C.S5	Configure the airplane in accordance with the POH/AFM and existing conditions.
AA.VII.C.S6	Select a suitable landing area considering altitude, wind, terrain, obstructions, and available glide distance.
AA.VII.C.S7	Establish a proper flight path to the selected landing area.
AA.VII.C.S8	Complete emergency checklist items appropriate to the airplane in a timely manner and as recommended by the manufacturer or operator.

Task	***D. Inflight Powerplant Failure and Restart (AMEL, AMES)***
References	FAA-H-8083-2, FAA-8083-3, POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with an inflight powerplant failure in a multiengine airplane and restart procedures. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VII.D.K1	Flight characteristics and controllability associated with maneuvering the airplane with powerplant(s) inoperative to include the importance of drag reduction.
AA.VII.D.K2	Powerplant restart procedures and conditions where a restart attempt is appropriate.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VII.D.R1	Failure to plan for a powerplant failure during flight.
AA.VII.D.R2	Failure to follow checklist procedures for a powerplant failure or a powerplant restart.
AA.VII.D.R3	Incorrect diagnosis of the cause of the powerplant failure.
AA.VII.D.R4	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.VII.D.R5	Improper aircraft configuration.
AA.VII.D.R6	Factors and situations that could lead to an inadvertent stall, spin, and loss of control with an inflight powerplant failure.
AA.VII.D.R7	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.VII.D.S1	Recognize and correctly identify powerplant failure(s), complete memory items (if applicable), and maintain positive airplane control.
AA.VII.D.S2	Coordinate with crew, as appropriate, and complete the appropriate emergency procedures and checklist(s) for propeller feathering or powerplant shutdown.
AA.VII.D.S3	Use flight controls in the proper combination as recommended by the manufacturer, or as required, to maintain best performance, and trim as required.
AA.VII.D.S4	Determine the cause for the powerplant(s) failure and if a restart is a viable option.
AA.VII.D.S5	Maintain the operating powerplant(s) within acceptable operating limits.
AA.VII.D.S6	Maintain the airspeed ±10 knots, the specified heading ±10°, and altitude ±100 feet as specified by the evaluator and within the airplane's capability.
AA.VII.D.S7	Demonstrate powerplant restart procedures in accordance with manufacturer or operator specified procedures and checklists, if applicable.

Task	***E. Approach and Landing with a Powerplant Failure (Simulated) (AMEL, AMES)***
References	FAA-H-8083-2, FAA-H-8083-3; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with an approach and landing with a powerplant failure in a multiengine airplane. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VII.E.K1	Flight characteristics and controllability associated with maneuvering to a landing with inoperative powerplant(s).
AA.VII.E.K2	Go-around/rejected landing considerations with a powerplant failure.
AA.VII.E.K3	How to determine a suitable airport.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VII.E.R1	Failure to plan for a powerplant failure inflight or during an approach.
AA.VII.E.R2	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.VII.E.R3	Improper aircraft configuration.
AA.VII.E.R4	Low altitude maneuvering including stall, spin, or CFIT.
AA.VII.E.R5	Distractions, loss of situational awareness, and/or improper task management.
AA.VII.E.R6	Go-around/rejected landing with a powerplant failure.
Skills	The applicant demonstrates the ability to:
AA.VII.E.S1	Recognize and correctly identify powerplant failure(s), complete memory items (if applicable), and maintain positive airplane control.
AA.VII.E.S2	Coordinate with crew, if applicable, and complete the appropriate emergency procedures and checklist(s) for simulated propeller feathering or simulated powerplant shutdown.
AA.VII.E.S3	Use flight controls in the proper combination as recommended by the manufacturer, or as required, to maintain best performance, and trim as required.
AA.VII.E.S4	Maintain the operating powerplant(s) within acceptable operating limits.
AA.VII.E.S5	Make radio calls, as appropriate.
AA.VII.E.S6	Proceed toward the nearest suitable airport.
AA.VII.E.S7	Prior to beginning the final approach segment, maintain the desired altitude ±100 feet, the desired airspeed ±10 knots, the desired heading ±5°, and accurately track courses, radials, and bearings.
AA.VII.E.S8	Establish the recommended approach and landing configuration and airspeed, ±5 knots, and adjust pitch attitude and power as required to maintain a stabilized approach.
AA.VII.E.S9	Maintain crosswind correction and directional control throughout the approach and landing.
AA.VII.E.S10	Make smooth, timely, and correct control application during the round out and touchdown.
AA.VII.E.S11	Touch down at the appropriate speed and pitch attitude at the runway aiming point markings -250/+500 feet, or where there are no runway markings 750 to 1,500 feet from the approach threshold of the runway. (AMEL)
AA.VII.E.S12	During round out and touchdown contact the water at the proper pitch attitude within 200 feet beyond a specified point. In addition, the touchdown will be within the first one-third of the water landing area. (AMES)
AA.VII.E.S13	Maintain positive aircraft control throughout the landing using drag and braking devices, as appropriate, to come to a stop.
AA.VII.E.S14	Coordinate with crew, if applicable, to complete after landing checklists.

Task	***F. Precision Approach (Manually Flown) with a Powerplant Failure (Simulated) (AMEL, AMES)***
References	FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-15, FAA-H-8083-16; POH/AFM; IFP
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a precision approach (manually flown) with a powerplant failure in a multiengine airplane. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VII.F.K1	Flight characteristics and controllability associated with maneuvering to a landing with inoperative powerplant(s).
AA.VII.F.K2	Missed approach considerations with a powerplant failure.
AA.VII.F.K3	How to determine a suitable airport.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VII.F.R1	Failure to plan for a powerplant failure inflight or during an approach.
AA.VII.F.R2	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.VII.F.R3	Improper aircraft configuration.
AA.VII.F.R4	Low altitude maneuvering including stall, spin, or CFIT.
AA.VII.F.R5	Distractions, loss of situational awareness, and/or improper task management.
AA.VII.F.R6	Landing with a powerplant failure.
AA.VII.F.R7	Missed approach with a powerplant failure.
AA.VII.F.R8	Maneuvering in IMC with a powerplant failure.
Skills	The applicant demonstrates the ability to:
AA.VII.F.S1	Recognize and correctly identify powerplant failure(s), complete memory items (if applicable), and maintain positive airplane control.
AA.VII.F.S2	Coordinate with crew, if applicable, and complete the appropriate emergency procedures and checklist(s) for simulated propeller feathering or simulated powerplant shutdown.
AA.VII.F.S3	Use flight controls in the proper combination as recommended by the manufacturer, or as required, to maintain best performance, and trim as required.
AA.VII.F.S4	Maintain the operating powerplant(s) within acceptable operating limits.
AA.VII.F.S5	Make radio calls, as appropriate.
AA.VII.F.S6	Proceed toward the nearest suitable airport.
AA.VII.F.S7	Coordinate with crew, if applicable, and complete the approach and landing checklists.
AA.VII.F.S8	Establish the appropriate airplane configuration and airspeed considering meteorological and operating conditions.
AA.VII.F.S9	Prior to beginning the final approach segment, maintain the desired altitude ±100 feet, the desired airspeed ±10 knots, the desired heading ±5°, and accurately track courses, radials, and bearings.
AA.VII.F.S10	Apply adjustments to the published DA/DH and visibility criteria for the aircraft approach category, as appropriate, for factors that include NOTAMs, Inoperative aircraft or navigation equipment, inoperative visual aids associated with the landing environment, etc.
AA.VII.F.S11	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.

Task	***F. Precision Approach (Manually Flown) with a Powerplant Failure (Simulated) (AMEL, AMES)***
AA.VII.F.S12	Fly and maintain a stabilized approach, adjusting pitch and power as required, allowing no more than ¼-scale deflection of either the vertical or lateral guidance indications.
AA.VII.F.S13	Maintain a stabilized final approach from the FAF to the DA/DH allowing no more than ¼-scale deflection of either the vertical or lateral guidance indications and maintain the desired airspeed ±5 knots.
AA.VII.F.S14	Maintain crosswind correction and directional control throughout the approach and landing or missed approach.
AA.VII.F.S15	Immediately initiate the missed approach procedures when at the DA/DH, and the required visual references for the runway are not unmistakably visible and identifiable.
AA.VII.F.S16	Transition to a normal landing approach (missed approach for seaplanes) 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 maneuvering.
AA.VII.F.S17	Make smooth, timely, and correct control application during the round out and touchdown or during the missed approach.

Task	***G. Landing from a No Flap or a Nonstandard Flap Approach***
References	FAA-H-8083-2, FAA-H-8083-3; POH/AFM; FSB Report (type specific)
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with a no flap or a nonstandard flap approach and landing. ***Note:*** *See Appendix 6: Safety of Flight and Appendix 7: Aircraft, Equipment, and Operational Requirements & Limitations for related considerations.*
Knowledge	The applicant demonstrates understanding of:
AA.VII.G.K1	Airplane flight characteristics when flaps, leading edge devices, and other similar devices malfunction or become inoperative.
AA.VII.G.K2	Other airplane system limitations when landing at a high speed.
AA.VII.G.K3	How to determine required landing distance and a suitable runway for landing.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VII.G.R1	Hazards associated with a no flap or nonstandard flap approach and landing to include an asymmetrical flap situation.
AA.VII.G.R2	Selection of runway based on pilot capability, aircraft limitations, available distance, and wind.
AA.VII.G.R3	Effects of:
AA.VII.G.R3a	a. Crosswind
AA.VII.G.R3b	b. Windshear
AA.VII.G.R3c	c. Tailwind
AA.VII.G.R3d	d. Wake turbulence
AA.VII.G.R3e	e. Runway surface/condition
AA.VII.G.R4	Go-around/rejected landing.
AA.VII.G.R5	Collision hazards, to include aircraft, terrain, obstacles, vessels, vehicles, persons, wildlife, and wires.
AA.VII.G.R6	Low altitude maneuvering including stall, spin, or CFIT.
AA.VII.G.R7	Distractions, loss of situational awareness, and/or improper task management.
Skills	The applicant demonstrates the ability to:
AA.VII.G.S1	Identify the malfunction.
AA.VII.G.S2	Coordinate with crew, if applicable, to complete applicable checklist(s) for the malfunction, approach, and landing.
AA.VII.G.S3	Communicate with ATC as needed and select an airport/runway with sufficient length for landing.
AA.VII.G.S4	Calculate the correct airspeeds/V-speeds for approach and landing.
AA.VII.G.S5	Establish the recommended approach and landing configuration and airspeed, and adjust pitch attitude and power as required to maintain a stabilized approach.
AA.VII.G.S6	Consider the wind conditions, landing surface, obstructions, and select a suitable touchdown point.
AA.VII.G.S7	Make smooth, timely, and correct control application during the round out and touchdown.
AA.VII.G.S8	Touchdown at an acceptable point on the runway.
AA.VII.G.S9	Maintain positive aircraft control throughout the landing using drag and braking devices, as appropriate, to come to a stop.

VIII. Postflight Procedures

Task	***A. After Landing, Parking and Securing (ASEL, AMEL)***
References	FAA-H-8083-2; FAA-H-8083-3; POH/AFM; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with normal after landing, parking, and securing procedures.
Knowledge	The applicant demonstrates understanding of:
AA.VIII.A.K1	Aircraft shutdown, securing, and postflight inspection.
AA.VIII.A.K2	Documenting in-flight/postflight discrepancies.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VIII.A.R1	Inappropriate activities and distractions.
AA.VIII.A.R2	Confirmation or expectation bias as related to taxi instructions.
AA.VIII.A.R3	Propeller, turbofan inlet, and exhaust safety.
AA.VIII.A.R4	Airport specific security procedures.
AA.VIII.A.R5	Disembarking passengers.
Skills	The applicant demonstrates the ability to:
AA.VIII.A.S1	Demonstrate runway incursion avoidance procedures.
AA.VIII.A.S2	Park at the gate or in an appropriate area, considering the safety of nearby persons and property.
AA.VIII.A.S3	Coordinate with the crew, if applicable, and complete the appropriate checklist(s).
AA.VIII.A.S4	Conduct a postflight inspection and document discrepancies and servicing requirements, if any.
AA.VIII.A.S5	Secure the aircraft.

Task	***B. Seaplane Post-Landing Procedures (ASES, AMES)***
References	FAA-H-8083-2; FAA-H-8083-23; POH/AFM; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with anchoring, docking, mooring, and ramping/beaching.
Knowledge	The applicant demonstrates understanding of:
AA.VIII.B.K1	Mooring.
AA.VIII.B.K2	Docking.
AA.VIII.B.K3	Anchoring.
AA.VIII.B.K4	Ramping/beaching.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
AA.VIII.B.R1	Inappropriate activities and distractions.
AA.VIII.B.R2	Confirmation or expectation bias as related to taxi instructions.
AA.VIII.B.R3	Propeller, turbofan inlet, and exhaust safety.
AA.VIII.B.R4	Airport/seabase security procedures.
AA.VIII.B.R5	Disembarking passengers.
Skills	The applicant demonstrates the ability to:
AA.VIII.B.S1	If anchoring, select a suitable area considering seaplane movement, water depth, tide, wind, and weather changes. Use an adequate number of anchors and lines of sufficient strength and length to ensure the seaplane's security.
AA.VIII.B.S2	If not anchoring, approach the dock/mooring buoy or beach/ramp in the proper direction and at a safe speed, considering water depth, tide, current, and wind.
AA.VIII.B.S3	Coordinate with the crew, if applicable, and complete the appropriate checklist(s).
AA.VIII.B.S4	If anchoring/mooring/beaching, secure the seaplane considering the effects of wind, waves, and changes in water level; if ramping, comply with appropriate ground movement procedures.
AA.VIII.B.S5	Conduct a postflight inspection and document discrepancies and servicing requirements, if any.

Appendix Table of Contents

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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, when applicable.

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
ATM	Airline Transport Pilot Multiengine Airplane	125	18	4.0	70
ATS	Airline Transport Pilot Single-Engine Airplane	90	21	3.0	70
ACM	Airline Transport Pilot Multiengine Airplane Canadian Conversion	60	23	2.5	70
ASC	Airline Transport Pilot Single-Engine Airplane Canadian Conversion	40	23	2.5	70

Knowledge Test Blueprint

Airline Transport Pilot Single-Engine Airplane

ATS Knowledge Areas Required by 14 CFR part 61, section 61.155 to be on the Knowledge Test	Percentage of Test Questions
Aerodynamics	5 – 10%
Aeronautical Decision Making	5 – 10%
Air Traffic Control Procedures	5 – 10%
Aircraft Performance	5 – 10%
Crew Resource Management (CRM)	5 – 10%
Human Factors	5 – 10%
Meteorology	10 – 15%
National Weather Service	3 – 8%
Navigation	10 – 15%
Regulations	5 – 10%
Weather / Weather Charts	10 – 15%
Weight and Balance	5 – 10%
Windshear / Turbulence	5 – 10%
Total Number of Questions	90

Airline Transport Pilot Multiengine Airplane

ATM Knowledge Areas Required by 14 CFR part 61, section 61.155 to be on the Knowledge Test	Percentage of Test Questions
Aeronautical Decision Making	3 – 10%
Regulations	10 – 15%
Windshear / Turbulence	5 – 10%
Aerodynamics	8 – 15%
Air Traffic Control Procedures	8 – 15%
Aircraft Performance	10 – 15%
Crew Resource Management (CRM)	5 – 10%
Meteorology	10 – 15%
Weather / Weather Charts	5 – 10%
National Weather Service	5 – 10%
Navigation	10 – 15%
Human Factors	3 – 10%
Weight and Balance	3 – 10%
Air Carrier Operations	5 – 10%
Leadership / Professional Development / Safety Culture	3 – 10%
Total Number of Questions	125

Aviation English Language Standard

In accordance with the requirements of 14 CFR section 61.153(b), 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 English Language Standard (AELS) is the FAA evaluator's benchmark. It requires the applicant to demonstrate at least the ICAO level 4 standard.

Knowledge Test Requirements-Airplane Category, Single and Multiengine Class

To be eligible to take an ATP Knowledge Test, you must provide proper identification and meet the minimum age requirements in accordance with 14 CFR part 61, section 61.35. To verify your eligibility to take the test, you must provide identification that includes the applicant's:

- Photograph;
- Signature;
- Date of birth;
- If the permanent mailing address is a post office box number, then the applicant must provide a government-issued residential address

If applying for the ATP - Airplane Multiengine (ATM) test or ATP - Airplane Multiengine Canadian Conversion (ACM) test, the applicant must provide a graduation certificate from an approved provider of the ATP Certification Training Program (ATP CTP) in accordance with part 61, section 61.35.

An applicant retesting **after failure** of any ATP knowledge test 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 in accordance with 14 CFR part 61, section 61.49. For the ATP - Airplane Multiengine (ATM) test or ATP - Airplane Multiengine Canadian Conversion (ACM) test, the authorized instructor must meet the ATP

CTP instructor requirements. 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: *For a replacement knowledge test report, see Appendix 3: Airman Knowledge Test Report.*

If an applicant seeks to add an additional category or class to an existing ATP certificate, reference part 61, section 61.165 for any additional knowledge test requirements.

An applicant seeking only to add an airplane type rating to an existing airman certificate in the same category and class (i.e., not adding a new category, class, or upgrading the certificate) is not required to pass a knowledge test in accordance with part 61, sections 61.63(d) and 61.165(e) prior to taking the practical test.

Acceptable forms of authorization for ATP Airplane Canadian Conversion (ACM and ASC) only:

- Confirmation of Verification Letter issued by FAA Airmen Certification Branch (Knowledge Testing Authorization Requirements Matrix).
- Requires **no** instructor endorsement or other form of written authorization, **except** those applicants seeking a multiengine airplane ATP certificate. Those applicants are required to provide a graduation certificate from an approved provider of the ATP CTP.

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 one year.

Testing Procedures for Applicants Requesting Special Accommodations

An applicant with learning or reading disability may request approval from the FAA Airman Testing Branch through the responsible Flight Standards Office or International Field Office/International Field Unit (IFO/IFU) to take an 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 Flight Standards Office or IFO/IFU inspector must contact the FAA Airman Testing Branch for assistance in selecting the test site and assisting the proctor. Before approving any option, the Flight Standards Office 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. 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 from the month the applicant completes the knowledge test unless it is a multiengine airplane ATP AKTR, That AKTR is valid for 60 calendar months from 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 unless otherwise permitted to use an expired AKTR in accordance with part 61, section 61.39.

To obtain a duplicate AKTR due to loss or destruction of the original, the applicant must mail a signed request accompanied by a check or money order made payable to the FAA in the amount of $12.00 to the following address:

Federal Aviation Administration
Airmen Certification Branch
P.O. Box 25082
Oklahoma City, OK 73125-0082

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. An authorized instructor can then provide remedial training in the deficient areas and evaluators can re-test this element during the practical exam.

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

AA.I.B.K6:
AA = Applicable ACS (Airline Transport Pilot – Airplane)
I = Area of Operation (Preflight Preparation)
B = Task (Performance and Limitations)
K6 = Knowledge Task element 6 (Effects of icing on performance.)

Knowledge test questions are linked to the ACS codes, which will soon replace the system of Learning Statement Codes (LSC) codes. 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, if applicable, 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 Commercial Pilot Airplane Knowledge Test (CAX) 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. 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).

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 ATP Certificate in the airplane category can be found in 14 CFR part 61, sections 61.39 and 61.153.

There are a number of additional regulations in 14 CFR part 61 that outline requirements for an ATP certificate or the addition of an airplane type rating. Some of the key sections are highlighted below. Careful review of these sections is necessary to ensure that all of the requirements are met.

- Section 61.63 provides the endorsement and training record requirements for an applicant seeking an airplane type rating to be added to an airman certificate (other than an ATP certificate).
- Section 61.157 provides the endorsement and training record requirements for an applicant seeking an airplane type rating to be added to an ATP certificate or for an airplane type rating to be concurrently completed with the original issuance of an ATP certificate.
- Section 61.159 details the aeronautical experience needed to be eligible for an ATP certificate in the airplane category.
- Section 61.160 outlines the eligibility requirements for a multiengine ATP certificate with restricted privileges with reduced aeronautical experience. It also specifies the limitations that must be placed on the ATP certificate if the applicant uses this section to qualify for the certificate.
- Section 61.165 defines the requirements for the addition of an aircraft category or class rating to an ATP certificate.

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 Checklist in this Appendix in preparation to take the practical test.

Instructor Responsibilities

The instructor, if used, 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) areas which were shown to be deficient by the FAA Airman Knowledge Test Report.

Evaluator Responsibilities

An evaluator is:

- Aviation Safety Inspector (ASI)
- Pilot examiner (other than administrative pilot examiners);
- Training center evaluator (TCE);
- Aircrew Program Designee (APD);
- 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, risk management, and skills (flight proficiency), and for each Task in the appropriate ACS. This responsibility also includes verifying the experience requirements specified for a certificate or rating and training requirements for an aircraft type 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 procedures outlined in the AC 60-28, FAA English Language Standard for an FAA Certificate Issued Under 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, and it must include all of the required Areas of Operation and Tasks. For initial issuance or to add a category or class to an ATP certificate, 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 unless otherwise noted; and

Any Task elements in which the applicant was shown to be deficient on the knowledge test, if a knowledge test is required.

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 may use questions during flight to test knowledge and risk management elements not evident in the demonstrated skills. To the greatest extent practicable, evaluators shall 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 sub-elements, the evaluator may select an appropriate sub-element (e.g., AA.I.B.K3f – Weight and balance). Tasks requiring evaluation of more than one sub-element are annotated accordingly. If the broader primary element is selected, the evaluator must develop questions only from material covered in the references listed for the Task.

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 operations of aircraft certificated for more than one required pilot crewmember, or single-pilot competence in an operation or airplane that is certificated for single-pilot operations.

Satisfactory performance will result in the issuance of a temporary certificate or the continuation or reinstatement of an operating privilege, as appropriate to the checking event being completed.

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 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. If the applicant's inability to meet the 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 those Areas of Operation and the associated Tasks satisfactorily performed. Though not required, the evaluator has discretion to reevaluate any Task, including those previously passed, during the retest.

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.

Practical Test Checklist (Applicant)
Appointment with Evaluator

Evaluator's Name: _____

Location: _____

Date/Time: _____

Note: Applicability of each item is contingent on the aircraft or Flight Simulation Training Device used.

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 (Printed or Electronic)
- ☐ Computer and Plotter
- ☐ Flight Plan Form
- ☐ Flight Logs (printed or electronic)
- ☐ Chart Supplements, Airport Diagrams, and Appropriate Publications
- ☐ Current AIM

Personal Records

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

Additional Rating Task Table

For an applicant who holds an ATP certificate and seeks an additional airplane category and/or class rating at the ATP 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 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 an Airplane Single-Engine Land Rating to an existing ATP 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.

ATP Pilot Ratings Held

Areas of Operation	ASES	AMEL	AMES	RH
I	A,B	A,B	A,B	A,B
II	A,C,E	A,E	A,C,E	A,B,C,E
III	A,B,I	A,B	A,B,I	A,B,I,J
IV	C	C	C	All
V	None	None	None	All
VI	None	None	None	All
VII	A,B,C,G,	A,B,C,G	A,B,C,G	A,B,C,G
VIII	A	None	A	A

Addition of an Airplane Single-Engine Sea Rating to an existing ATP 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.

ATP Pilot Ratings Held

Areas of Operation	ASEL	AMEL	AMES	RH
I	A,B	A,B,H	A,B	A,B,H
II	A,B,D,E	A,B,D,E	A,E	A,B,D,E
III	A,B,C,D,E, F,G,H,I	A,B,C,D,E, F,G,H,I	A,B,I	All
IV	C	C	C	All
V	None	None	None	All
VI	None	None	None	All
VII	A,B,C,G	A,B,C,G	A,B,C,G	A,B,C,G
VIII	B	B	None	B

Addition of an Airplane Multiengine Land Rating to an existing ATP 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.

ATP Pilot Ratings Held

Areas of Operation	ASEL	ASES	AMES	RH
I	A,B,D,E	A,B,D,E	A,B	A,B,C, D,E,F,G
II	A,B,E	A,B,C,E	A,B,C,E	A,B,C,E
III	A,B,I	A,B,I	A,B,I	A,B,I,J
IV	All	All	C	All
V	All	All	None	All
VI	None	None	None	All
VII	A,B,D, E,F,G	A,B,D, E,F,G	A,B,E,G	A,B,D, E,F,G
VIII	A	A	A	A

Addition of an Airplane Multiengine Sea Rating to an existing ATP 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.

ATP Pilot Ratings Held

Areas of Operation	AMEL	ASEL	ASES	RH
I	A,B,H	A,B,C,D, E,F,G,H	A,B,C,D, E,F,G,H	A,B,C,D, E,F,G,H
II	A,B,D,E	A,B,D,E	A,B,D,E	A,B,D,E
III	A,B,C,D, E,F,G,H,I	A,B,C,D, E,F,G,H,I	A,B,I	All
IV	C	All	C	All
V	None	All	All	All
VI	None	A,G,H	None	All
VII	A,B,E,G	A,B,D, E,F,G	A,B,D, E,F,G	A,B,D, E,F,G
VIII	B	B	B	B

Addition of a VFR Only Type Rating to an Existing Pilot Certificate

In accordance with section 61.63(e) or section 61.157(g), as applicable, an applicant may add a type rating to a pilot certificate with an airplane that is not capable of instrument flight and therefore completion of the applicable Tasks by reference to instruments is not possible. This results in a "VFR only" limitation to be added to the type rating on the pilot certificate. The following table identifies the Tasks required for the category and class of type rating sought.

Category and Class of Type Rating

Areas of Operation	AMEL	ASEL	AMES	ASES
I	A,B	A,B	A,B,H	A,B,H
II	A,B,C,E	A,B,C,E	A,B,D,E	A,B,D,E
III	A,B,I,J	A,B,I,J	All	All
IV	All	All	All	All
V	All	All	All	All
VI	None	None	None	None
VII	A,B,D,E,G	A,B,C,G	A,B,D,E,G	A,B,C,G
VIII	A	A	B	B

Note: *Any task that is normally required to be performed by reference to instruments would be conducted using visual references for the purposes of a VFR type rating.*

Removal of the "Second-In-Command Required" Limitation from a Type Rating

A pilot, who holds an airplane type rating with a "Second-In-Command Required" Limitation, may be tested to remove the limitation and be issued an unrestricted type rating. The practical test to remove the restriction does not require evaluation of all Areas of Operation and Tasks as a single-pilot. The practical test is conducted in accordance with the Airline Transport Pilot and Type Rating for Airplane ACS (FAA-S-ACS-11 as amended), and the pilot must demonstrate single-pilot competency in the following Areas of Operation and Tasks listed below.

Areas of Operation	AMEL Tasks	AMES Tasks
I	None	None
II	A,B,C,E	A,B,D,E
III	A,B,I,J	All
IV	B,C	B,C
V	None	None
VI	All	All
VII	A,B,D,E,F,G	A,B,D,E,F,G
VIII	A	B

Airplane Multiengine Land Limited to Center Thrust

A center thrust limitation for the AMEL rating is issued to applicants who complete the practical test for the AMEL rating in an aircraft that does not have a manufacturer's published V_{MC}. It can also be issued to a military pilot seeking a commercial certificate under 14 CFR part 61, section 61.73 who can only show qualification in a multiengine airplane that is limited to center thrust.

When conducting a practical test for a pilot that has not previously demonstrated competence in a multiengine airplane with a published V_{MC}, or when removing the center thrust limitation from the AMEL rating, the applicant must be tested on the following Areas of Operation and Tasks from the Airline Transport Pilot and Type Rating for

Airplane ACS (FAA-S-ACS-11 as amended) and Commercial Pilot – Airplane ACS (FAA-S-ACS-7 as amended) in a multiengine airplane that has a manufacturer's published V_{MC} speed. This speed can be found on the type certificate data sheet (TCDS) or in the AFM. If the limitation will be removed under part 121, 135, or 142, it must be done in accordance with an approved curriculum or training program.

Airline Transport Pilot/Type Rating for Airplane ACS (FAA-S-ACS-11 as amended)

Areas of Operation	Tasks
III	I
VII	B,D,E

Commercial Pilot – Airplane ACS (FAA-S-ACS-7 as amended)

Areas of Operation	Tasks
X	A,B

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.

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 and inadvertent loss of control.

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 airplane, 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 cockpit.

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 in all Tasks in this practical test standard, the evaluator should take note of the applicant's use of CRM or SRM, as applicable. 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 (SOPs). SRM specifically refers to the management of all resources onboard the aircraft as well as outside resources available to the single pilot. Resources a pilot may involve in decisions as part of CRM/SRM include dispatchers, flight attendants, maintenance personnel, flight operations managers, and air traffic control.

Deficiencies in CRM/SRM often 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.

For aircraft requiring only one pilot, the evaluator may not assist the applicant in the management of the aircraft, radio communications, tuning and identifying navigational equipment, or using navigation charts. If the evaluator, other than an FAA Inspector, is qualified and current in the specific make and model aircraft that is certified for two or more crewmembers, he or she may occupy a duty position.

If the evaluator occupies a duty position on an aircraft that requires two or more crewmembers, the evaluator must fulfill the duties of that position. Moreover, when occupying a required duty position, the evaluator must perform CRM functions as briefed and requested by the applicant except during the accomplishment of steep turns and approach to stalls. During these two Tasks the applicant must demonstrate their ability to control the aircraft without the intervention from the pilot monitoring.

Multiengine Considerations

When a practical test is conducted in an airplane certificated under 14 CFR part 23 (except commuter category), for which no V_1, V_R, or V_2 speeds are published, the failure of the most critical powerplant should be simulated at a point after reaching a minimum of V_{SSE}, and at an altitude not lower than 400 feet above ground level (not applicable if in an FSTD). The evaluator must also consider atmospheric conditions, terrain, and type of aircraft used.

The applicant must supply an airplane that does not prohibit the demonstration of feathering the propeller inflight unless the conditions described in the next paragraph for a type rating are met. For multiengine practical tests conducted in the airplane, the evaluator will set zero thrust after the applicant has simulated feathering the propeller following a simulated engine failure. The applicant must demonstrate feathering one propeller in flight unless the manufacturer prohibits this action. The applicant must also demonstrate at least one landing with a simulated feathered propeller with the engine set to zero thrust.

In a multiengine airplane or FSTD equipped with propellers (including turboprop), the applicant must demonstrate feathering one propeller and engine shutdown unless:

• the practical test is for a type rating, and

• the airplane used for the practical test was not certificated with inflight unfeathering capability.

In this situation, the applicant may perform a simulated powerplant failure. In all other cases, the applicant must demonstrate the ability to safely feather and unfeather the propeller while airborne.

For safety reasons, when the practical test is conducted in an airplane, the applicant must perform Tasks that require feathering or shutdown only under conditions and at a position and altitude where it is possible to make a safe landing on an established airport if there is difficulty in unfeathering the propeller or restarting the engine. The evaluator must select an entry altitude that will allow the single-engine demonstration Tasks to be completed no lower than 3,000 feet AGL or the manufacturer's recommended altitude, whichever is higher). If it is not possible to unfeather the propeller or restart the engine while airborne, the applicant and the evaluator should

treat the situation as an emergency. At altitudes lower than 3,000 feet AGL, engine failure should be simulated by reducing throttle to idle and then establishing zero thrust.

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

Engine failure (simulated) during takeoff should be accomplished prior to reaching 50 percent of the calculated VMC.

Single-Engine Considerations

For safety reasons, the evaluator will not simulate a powerplant failure in a single-engine airplane unless it is possible to safely complete a landing.

High Performance Aircraft Considerations

In some high performance airplanes, the power setting may have to be reduced below the ACS guidelines power setting to prevent excessively high pitch attitudes greater than 30° nose up.

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.

Multiengine practical tests require normal engine shutdowns and restarts in the air, to include propeller feathering and unfeathering. The Airplane Flight Manual (AFM) must not prohibit these procedures, but low power settings for cooling periods prior to the actual shutdown in accordance with the AFM are acceptable and encouraged. For a type rating in an airplane not certificated with inflight unfeathering capability, a simulated powerplant failure is acceptable.

If the multiengine airplane used for the practical test does not publish a V_{MC}, then the center thrust limitation will be added to the certificate issued from this check, unless the applicant has previously demonstrated competence in a multiengine airplane with a published V_{MC}.

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.

For a type rating in an aircraft covered under the FAA's Specialty Aircraft Examiner (SAE) program, the evaluator has discretion to omit any skill element(s) deemed unsuitable or unsafe for the operational and/or performance characteristics of the aircraft, provided that such determinations are coordinated with the Specialty Aircraft Examiner Branch.

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.

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 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 navigation equipment to perform precision and non-precision instrument approach procedures.

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 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 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. The use of a view-limiting device does not apply to specific elements within a Task when there is a requirement for visual references.

If a type rating practical test is given in an amphibian airplane, the type rating must bear the limitation "Limited to Land" or "Limited to Sea," as appropriate, unless the applicant demonstrates proficiency in both land and sea operations.

Operational Requirements, Limitations, & Task Information

Except for water operations, the applicant must perform the tasks in actual or simulated instrument conditions unless the aircraft's type certificate makes the aircraft incapable of operating under instrument flight rules (IFR). See Appendix 5 for required Tasks to be completed for a VFR Only type rating.

Successful checks conducted under the applicable sections of parts 91, subpart K, 121, and 135 are considered to have met the flight proficiency requirements of section 61.157 for the issuance of an ATP certificate and an appropriate rating. Section 61.157 also defines an appropriate evaluator for those checks. As a result, an operator's approved training and checking program is controlling.

In an airplane with a single powerplant, unless the applicant holds a commercial pilot certificate of the same category and class, he or she must accomplish three Power-Off 180° Accuracy Approach and Landings, with one of them from a forward slip. The three landing must be accomplished to the standards specified in the Commercial Pilot – Airplane ACS, Area of Operations IV, Task M.

I. Preflight Preparation

Task C. Weather Information

Any risk assessment tool is acceptable provided the applicant is able to assess and mitigate risks.

Task F. Human Factors

The ability to perform a self-assessment and determine fitness for flight is also applicable to practical tests given in an FSTD.

Task G. Federal Aviation Regulations

Evaluator has the discretion to choose a representative sampling of one or more rule parts.

II. Preflight Procedures

Task A. Preflight Assessment

If a flight engineer is a required crewmember for a particular type airplane, the actual visual inspection may be waived. The actual visual inspection may be replaced by using an approved pictorial means that realistically portrays the location and detail of inspection items. On airplanes requiring a flight engineer, an applicant must demonstrate satisfactory knowledge of the flight engineer functions for the safe completion of the flight if the flight engineer becomes ill or incapacitated during a flight.

Task B. Powerplant Start

For practical tests in an airplane, an applicant's ability to respond to a powerplant start failure or malfunction can be assessed through scenario-based oral questioning.

Task E. Before Takeoff Checks

Each applicant must give a briefing before each takeoff. If the operator or aircraft manufacturer has not specified a briefing, the briefing must cover the items appropriate for the conditions, such as: departure runway, departure

procedure, power settings, speeds, abnormal or emergency procedures prior to or after reaching decision speed (i.e., V_1 or V_{MC}), emergency return intentions, and what is expected of the other crewmembers during the takeoff/departure. If the first takeoff briefing is satisfactory, the evaluator may allow the applicant to brief only the changes, during the remainder of the flight.

III. Takeoffs and Landings

Briefings

Each applicant must give a briefing before each takeoff and landing. If the operator, aircraft manufacturer, or training provider has not specified a briefing, the briefing must cover the items appropriate for the conditions, such as: departure runway, departure procedure, power settings, speeds, abnormal or emergency procedures prior to or after reaching decision speed (i.e., V_1 or V_{MC}), emergency return intentions, go-around/rejected landing procedures, initial rate of descent, and what is expected of the other crewmembers during the takeoff and landing. For single-pilot operations, the evaluator should request that the applicant verbalize the briefings. If the first takeoff and landing briefings are satisfactory, the evaluator may allow the applicant to brief only the changes, during the remainder of the flight.

Landings

The applicant must make at least three actual landings with at least one to a full stop.

Task G. Confined-Area Takeoff and Maximum Performance Climb (ASES, AMES)

This Task simulates a takeoff from an area that would require a takeoff and spiral climb; or a straight-ahead takeoff and climb from a narrow waterway with obstructions at either end. The evaluator must assess both takeoff situations for this Task.

In multiengine seaplanes with V_X values within 5 knots of V_{MC}, the use of V_Y or the manufacturer's recommendation may be more appropriate for this demonstration.

Task H. Confined-Area Approach and Landing (ASES, AMES)

This Task simulates an approach and landing to a small pond, which would require a spiral approach, wings level landing, and step turn upon landing; and a straight ahead approach and landing to a narrow waterway with obstructions at either end. The evaluator must evaluate both landing situations for this Task.

Task I. Rejected Takeoff

If completed in a multiengine airplane, the powerplant failure must be simulated before reaching 50 percent of V_{MC}.

Task J. Go-Around/Rejected Landing

The instrument conditions need not be simulated below 100 feet above the runway. This maneuver should be initiated approximately 50 feet above the runway or landing area and approximately over the runway threshold.

For those applicants seeking a VFR-only type rating and where this maneuver is accomplished with a simulated engine failure, it should not be initiated at speeds or altitudes below that recommended in the AFM/POH.

IV. Inflight Maneuvers

Task A. Steep Turns

The applicant must demonstrate his or her ability to control the aircraft without the intervention from the pilot monitoring, if applicable.

This task is to be conducted by reference to instruments. If IFR, the pilots should be situationally aware of location and any potential traffic.

For a VFR-only type rating, however, this Task will still be performed in visual conditions and the pilot should clear the area of traffic prior to beginning the maneuver; AA.IV.A.S3 would not be required to be by reference to instruments.

Task C. Specific Flight Characteristics

If the airplane does not have any specific flight characteristics identified in the FSB Report, this Task is not required.

V. Stall Prevention

The applicant must demonstrate his or her ability to control the aircraft without the intervention from the pilot monitoring, if applicable.

For Tasks A, B, and C, one must be with the autopilot engaged, if installed; and one must be accomplished while in a turn with a bank angle of 15-30 degrees. In addition, these Tasks should be accomplished by reference to flight instruments. For a VFR only type rating, however, the tasks should be accomplished in visual conditions.

When conducted in the airplane, if a limitation of power application is prudent for operational considerations, the power should be set in accordance with the evaluator's instructions.

Evaluation criteria for a recovery from an approach to stall should not mandate a predetermined value for altitude loss and should not mandate maintaining altitude during recovery. Valid evaluation criteria must take into account the multitude of external (such as density altitude) and internal variables (i.e., airplane mass, drag configuration and powerplant response time) which affect the recovery altitude.

VI. Instrument Procedures

Briefings

Each applicant must give a briefing before each takeoff/departure and approach/landing. If the operator, aircraft manufacturer, or training provider has not specified a briefing, the briefing must cover the items appropriate for the conditions, such as: departing/landing runway, departure/arrival procedure, instrument approach procedure, power settings, speeds, missed approach procedures, final approach fix, altitude at final approach fix, initial rate of descent, DA/DH/MDA, time to missed approach, and what is expected of the other crewmembers during the approach/landing. For single-pilot operations, the evaluator should request that the applicant verbalize the briefings. If the first takeoff/departure and approach/landing briefings are satisfactory, the evaluator may allow the applicant to brief only the changes, during the remainder of the flight.

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 airplane/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 ¼-scale deflection of either the vertical or lateral deviation indications during the final approach. As markings on flight instruments vary, a ¼-scale deflection of either vertical or lateral guidance is deemed to occur when it is displaced ¼ of the distance that it may be deflected from the indication representing that the aircraft is on the correct flight path.

Task D. Nonprecision Approaches

The evaluator will select nonprecision approaches representative of the type 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 an 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 the discretion to have the applicant perform a landing or missed approach at the completion of each nonprecision approach.

Task E. Precision Approaches

The applicant must accomplish at least two precision approaches in simulated or actual weather conditions to the decision altitude (DA) using aircraft navigational equipment for centerline and vertical guidance.

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.

At least one must be flown without the use of an autopilot. Manually flown precision approaches may use raw data displays or may be flight director assisted, at the discretion of the evaluator.

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.

At least one approach may be flown via the autopilot, if equipped, and if the DA/DH does not violate the authorized minimum altitude for autopilot operation.

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

Task F. Landing from a Precision Approach

If circumstances beyond the control of the applicant prevent an actual landing, the evaluator may accept an approach to a point where, in his or her judgment, a safe landing and a full stop could have been made, and credit given for a missed approach.

Task G. Circling Approach

The evaluator will select a runway that requires at least a 90-degree turn from the final approach course.

If an applicant is employed by a certificate holder whose manual prohibits a circling approach when the weather is below 1,000 feet and 3 miles' visibility, the applicant is not required to be checked on the circling maneuver (Tasks G and H). That applicant's pilot certificate must include a limitation restricting a circling approach to visual meteorological conditions (VMC) only. For example, the certificate notation would be: "CL-65 CIRC APCH VMC ONLY." This restriction may be removed when the applicant receives training in the circling maneuver (Tasks G and H) in the same airplane for which he or she has the limitation and satisfactorily demonstrates a circling

approach and landing in that same airplane as part of an approved curriculum or training program with an appropriately qualified evaluator.

If the initial ATP certificate is issued concurrently with an airplane type rating and the circling maneuver (Tasks G and H) is not performed, the ATP certificate would also have a circling limitation. For example, the certificate notation would state:

"ATP CIRC APCH VMC ONLY, CL-65 CIRC APCH VMC ONLY." This restriction may be removed from the ATP certificate upon completion of an approved curriculum or training program to remove the limitation as previously stated.

Task H. Landing from a Circling Approach

See previous task information for applicants that are not required to be checked on the circling maneuver (Tasks G and H).

Task I. Missed Approaches

The applicant must perform two missed approaches with one being from a precision approach.

One complete published missed approach must be accomplished. Additionally, in multiengine airplanes, a missed approach must be accomplished with one engine inoperative (or simulated inoperative). The engine failure may be experienced any time prior to the initiation of the approach, during the approach, or during the transition to the missed approach attitude and configuration.

Descending below the MDA or continuing a precision approach below DH/DA as appropriate, unless the runway environment is in sight is considered unsatisfactory performance. However, even if the missed approach is properly initiated at DA/DH, most airplanes descend below DA/DH because of the momentum of the airplane transitioning from a stabilized approach to a missed approach. This descent below DA/DH is not considered unsatisfactory, as long as the precision approach was not continued below DA/DH.

VII. Emergency Operations

Task B. Powerplant Failure During Takeoff

In a multiengine airplane certificated under 14 CFR parts 23 Commuter category, SFAR 41C 4(b), and part 25, with published V_1, V_R, or V_2 speeds, the failure of the most critical powerplant should be simulated at a point:

after V_1 and prior to V_2, if in the opinion of the evaluator, it is appropriate under the prevailing conditions; or

as close as possible after V_1 when V_1 and V_2 or V_1 and V_R are identical.

In a multiengine airplane certificated under 14 CFR part 23 (except commuter category), (for which no V_1, V_R, or V_2 speeds are published) the failure of the most critical powerplant should be simulated at a point after reaching a minimum of V_{SSE} and, if accomplished in the aircraft, at an altitude not lower than 400 feet AGL, giving consideration to local atmospheric conditions, terrain, and aircraft performance available.

In a simulator, there are no limitations on powerplant failures in either airplane by certification basis.

If the powerplant failure occurs after becoming airborne and before reaching an altitude where a safe turn can be made (ASEL, ASES) or the performance capabilities and operating limitations of the airplane will not allow the climb to continue (AMEL, AMES) the applicant should establish a power-off descent approximately straight-ahead.

For a 14 CFR part 25 or 14 CFR part 23, section 23.3(d) commuter multiengine airplane, if the (simulated) powerplant failure occurs at a point where the airplane can continue to a specified airspeed and altitude at the end of the runway commensurate with the airplane's performance capabilities and operating limitations, the takeoff should be continued. (AMEL, AMES)

Task C. Powerplant Failure (Simulated) (ASEL, ASES)

No simulated powerplant failure will be given by the evaluator in an airplane when an actual touchdown cannot be safely completed, should it become necessary.

Task D. Powerplant Failure and Restart Procedures (AMEL, AMES)

The feathering of one propeller and engine shutdown must be demonstrated in any multiengine airplane (or FSTD) equipped with propellers (includes turboprop), unless the airplane is an exception by the type rating and airplane certification. The propeller must be feathered and unfeathered while airborne. In a multiengine jet airplane or FSTD representing a multiengine airplane, one engine must be shut down and a restart must be demonstrated while airborne, if applicable.

When conducted in an FSTD, feathering or shutdown may be performed in conjunction with any Task and at locations and altitudes at the discretion of the evaluator.

Task E. Approach and Landing with a Powerplant Failure (Simulated) (AMEL, AMES)

In airplanes with three powerplants, the applicant must follow a procedure (if approved) that approximates the loss of two powerplants, the center and one outboard powerplant. In other multiengine airplanes, the applicant must follow a procedure, which simulates the loss of 50 percent of available powerplants, the loss being simulated on one side of the airplane.

Task F. Precision Approach (Manually Flown) with a Powerplant Failure (Simulated) (AMEL, AMES)

At least one must be flown without the use of an autopilot. The applicant should begin manually flying prior to the final approach segment. Manually flown precision approaches may use raw data displays or may be flight director assisted, at the discretion of the evaluator. The simulated powerplant failure should occur before initiating the final approach segment and continue to a landing or a missed approach procedure, at the evaluator's discretion.

Task G. Landing from a No Flap or a Nonstandard Flap Approach

This Task need not be accomplished for a particular airplane type if the Administrator has determined that the probability of flap extension failure on that type airplane is extremely remote due to system design. The evaluator must determine whether checking on slats only and partial-flap approaches are necessary for the practical test. However, probability of asymmetrical flap failures should be considered in this making this determination.

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

Use of FSTDs

Title 14 of the Code of Federal Regulations (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 FSTDs 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 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 qualification performance standard (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 ATP – airplane practical test is permitted only when accomplished in accordance with an FAA approved curriculum or training program.

Use of ATDs

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).

[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 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 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.

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 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). The LOA will be valid for a 5-year period with a specific expiration date and include the amount of credit a pilot may take for training and experience.

> ***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 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 ATP – Airplane practical test is not permitted.*

Credit for Time in an FSTD

14 CFR part 61, section 61.159 and 61.160 specify the minimum aeronautical experience requirements for a person applying for an ATP certificate. Paragraph (a)(6) of this section specifies the amount of credit a pilot can take towards the total time in an FFS or FTD as part of an approved training course in parts 121, 135, 141[3], or 142. Section 61.159 also provides allowances for crediting time in an FSTD towards time in class and instrument time. Credit may only be taken for time in a FFS towards time in class for multiengine airplanes; time in a FTD may not be used.

Credit for Time in an ATD

14 CFR part 61, section 61.159 and 61.160 specify the minimum aeronautical experience requirements for a person applying for an ATP certificate. In order to credit the time, the ATD must be FAA-approved and the 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 parts 61 and 141. Time with an instructor in an AATD may be credited towards the aeronautical experience requirements for the ATP certificate as specified in the LOA for the device used. Time in a BATD cannot be used for the ATP certificate. Time in an ATD cannot be used for credit towards the required time in class either. It is recommended that applicants who intend to take credit for time in an AATD towards the aeronautical experience requirements for the ATP certificate 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 AC 61-136A.

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:

[3] As part of program approval, part 141 training providers must also adhere to the requirements for permitted time in an FFS or FTD per Appendices E or K to Part 141, as appropriate to the course of training.

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 part 141 or part 142 of this chapter; or under 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 or 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, section 61.64(b) states if an airplane is not used during the practical test for a type rating for a turbojet airplane (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 an airplane, 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 an airplane, 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 pneumatics systems. However, when the same emergency condition is addressed in a FSTD, all Task elements must be accomplished as would be expected under actual circumstances.

Similarly, safety of flight precautions taken in the airplane for the accomplishment of a specific maneuver or procedure (such as limiting altitude in an approach to stall or setting maximum airspeed for an engine failure expected to result in a rejected takeoff) need not be taken when a 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 shall 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 91	General Operating and Flight Rules
14 CFR part 93	Special Air Traffic Rules
14 CFR part 97	Standard Instrument Procedures
14 CFR part 117	Flight and Duty Limitations and Rest Requirements: Flightcrew Members
14 CFR part 119	Certification: Air Carriers and Commercial Operators
14 CFR part 121	Domestic, Flag, and Supplemental Operations
14 CFR part 135	Requirements for Commuter and On Demand Operations
49 CFR part 830	Notification and Reporting of Aircraft Accidents, or Incidents and
AC 00-45	Aviation Weather Services
AC 00-46	Aviation Safety Reporting (Program) System (ASRP/ASRS)
AC 20-117	Hazards Following Ground Deicing and Ground Operations in Conditions Conducive to Aircraft Icing
AC 90-100	U.S Terminal and En Route Area Navigation (RNAV) Operations
AC 90-117	Data Link Communications
AC 120-108	Continuous Descent Final Approach
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 120-66	Aviation Safety Action Program (ASAP)
AC 120-76	Authorization for Use of Electronic Flight Bags
AC 120-82	Flight Operational Quality Assurance (FOQA)
AC 120-90	Line Operations Safety Audit (LOSA)
AC 120-101	Part 121 Air Carrier Operational Control
AC 120-109	Stall Prevention and Recovery Training
AC 120-111	Upset Prevention and Recovery Training
AIM	Aeronautical Information Manual
FAA-H-8083-1	Aircraft Weight and Balance Handbook
FAA-H-8083-2	Risk Management Handbook
FAA-H-8083-3	Airplane Flying Handbook
FAA-H-8083-6	Advanced Avionics Handbook
FAA-H-8083-15	Instrument Flying Handbook
FAA-H-8083-16	Instrument Procedures Handbook
FAA-H-8083-23	Seaplane, Skiplane, and Float/Ski Equipped Helicopter Operations
FAA-H-8083-25	Pilot's Handbook of Aeronautical Knowledge
FMSPs	Flight Management System Procedures
FSB Report	Flight Standardization Board Report (if available)
IFP	Instrument Flight Procedures
POH/AFM	Pilot's Operating Handbook/FAA-Approved Airplane Flight Manual
NOTAMs	Notice to Airman
Other	Chart Supplements
	USCG Navigation Rules, International-Inland

- ***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
AFS	Flight Standards Service
AELS	Aviation English Language Standard
AFM	Aircraft Flight Manual
AGL	Above Ground Level
AIM	Aeronautical Information Manual
AMEL	Airplane Multiengine Land
AMES	Airplane Multiengine Sea
ASEL	Airplane Single-engine Land
ASES	Airplane Single-engine Sea
ASI	Aviation Safety Inspector
ATC	Air Traffic Control
ATD	Aviation Training Device
ATP	Airline Transport Pilot
BATD	Basic Aviation Training Device
CDI	Course Deviation Indicator
CRM	Crew Resource Management
CTP	Certification Training Program
DA	Decision Altitude
DH	Decision Height
DPE	Designated Pilot Examiner
ELT	Emergency Locator Transmitter
FAA	Federal Aviation Administration
FFS	Full Flight Simulator
FMS	Flight Management System
FSB	Flight Standardization Board
FSTD	Flight Simulation Training Device
FTD	Flight Training Device
GBAS	Ground Based Augmentation System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System

Abb./Acronym	Definition
HAT	Height Above Threshold (Touchdown)
IFP	Instrument Flight Procedures
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
LAHSO	Land and Hold Short Operations
LDA	Localizer-Type Directional Aid
LOA	Letter of Authorization
LOC	ILS Localizer
LPV	Localizer Performance with Vertical Guidance
MAP	Missed Approach Point
MFD	Multi-Function Display
NAS	National Airspace System
NOTAMs	Notices to Airmen
NSP	National Simulator Program
PIC	Pilot-in-Command
POA	Plan of Action
POH	Pilot's Operating Handbook
PTS	Practical Test Standards
QPS	Qualification Performance Standard
RNAV	Area Navigation
RNP	Required Navigation Performance
SAE	Specialty Aircraft Examiner
SMS	Safety Management System
SOP	Standard Operating Procedures
SRM	Single Pilot Resource Management
USCG	United States Coast Guard
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
VOR	Very High Frequency Omnidirectional Range
V_1	The maximum speed in the takeoff at which the pilot must take the first action (e.g., apply brakes, reduce thrust, deploy speed brakes) to stop the airplane within the accelerate-stop distance. V_1 also means the minimum speed in the takeoff, following a failure of the critical engine at V_{EF}, at which the pilot can continue the takeoff and achieve the required height above the takeoff surface within the takeoff distance.
V_2	Takeoff safety speed
V_{MC}	Minimum control speed with critical engine inoperative
V_{MCG}	Minimum control speed on the ground with the critical engine inoperative
V_R	Rotation speed

Abb./Acronym	Definition
V_{SSE}	Safe, intentional one-engine-inoperative speed. Originally known as safe single-engine speed
V_X	Best Angle of Climb Speed
V_{XSE}	Best angle of climb speed with one engine inoperative
V_Y	Best Rate of Climb Speed

Compiled working group comments & requested changes to ATP ACS

Comments and Requested Changes to ATP ACS, FAA-S-ACS-11

Page #	Location	Issue Type	Issue Description
1	Introduction	Request for additional guidance	Request additional guidance on how part 121 air carriers, including those who conduct training and checking under AQP, are to use the ACS.
1-2	Using the ACS	Missing Content	This section is silent on the significant importance of information to be found in Appendix 7 Operational Requirements, Limitations, & Task Information. Furthermore, where specific tasks contain a link to Appendix 7, the phraseology is weak and misleading when it states "for related considerations." Those aren't mere considerations, they are actual requirements which must be accounted for within the POA. Such an important aspect on the use of the ACS should be covered in this section.
3	AA.I.A.S3	Request for additional guidance	The list of aircraft limitations can be quite long. Suggest some language be added to allow for relevant/appropriate memory vs reference items.
7	I.C.K5	Question	How does it work to have a test type defined at the Task Element level? i.e. the full task is designated "ATP" (type rating) – does the "(ATP AMES, AMES)" mean this specific task is only applicable to type ratings in multi-engine airplanes?
9	AA.I.E.K7	Edit	Suggest revising to "Rudder use in 14 CFR part 25 transport aircraft certification standards."
11	I.G.	Reference and Task element	Part 119 is part of FAA Knowledge Exam; add as Reference and separate task element (between 117 and 121)? Parts 25, 125, 63, 71, 97 have also been tested on, to a lesser extent. Include if still part of expected knowledge.
11	I.G.K2	Missing subpart	Part 91, Subpart K (fractional ownership) has been expected knowledge for ATPs in the past; if still part of FAA Knowledge Exam include in list.
19	Objective	Missing Content	Any task (takeoff or landing) which requires a crosswind, does not go on to describe a minimum magnitude of crosswind. Nor can it be found in Appendix 7, even though it refers to it.
21 and/or A-21	III.B. Appendix 7	III. Landings	Current ACS note states must make at least 3 landings, 1 to a full stop. Do we need to add the note for single engine operations per 8081-5F VI. A. (yellow highlight indicates what isn't currently accounted for in ACS): In an airplane with a single powerplant, unless the applicant holds a commercial pilot certificate, he or she must accomplish 3 accuracy approaches and spot landings from an altitude of 1,000 feet or less, with the engine power lever in idle and 180 degrees of change in direction. The airplane must touch the ground in a normal landing attitude beyond and within 200 feet of a designated line or point on the runway. At least 1 landing must be from a forward slip.
35	IV.C.K1	Missing element?	PTS specifically mentioned "dutch rolls" – was this intentionally removed from ACS or do we need to add back into the element?

Page #	Location	Issue Type	Issue Description
52	AA.VII.A.S2e	Request for additional guidance	Does this assume the new simulator extended envelope data package which better replicates actual ice characteristics vs. merely adding artificial weight?
A-2	Knowledge Test Requirements- Airplane Category, Single and Multiengine Class	Clarification	In the paragraph describing retesting **after failure** of any ATP knowledge test: This requirement appears to come from AC 61-138 and is overly restrictive. Many applicants for the ATP may take the examination at a site other than the provider of the ATP CTP course. As such, access to someone who meets the ATP CTP instructor qualification may be difficult or cost prohibitive. Additional training should be allowed by any CFI holding an ATP certificate. AC 61-38 should be revised to address an equivalent experience in military flight crew operations or instructor qualification under 14 CFR Part 142. The ability to teach air carrier operations in that Part should suffice to meet the requirements of 61-38 instructor qualification.
A-5	Testing Procedures for Applicants Requesting Special Accommodations	Clarification	This is perplexing and appears to conflict with the basic requirements for certification - language skills and medical fitness.
A-6	Appendix 3	Request for additional guidance	Under AQP there might be several events where this could be done. Must it be accomplished by the evaluator (APD issuing the LOE), or could it also be accomplished at an earlier point during the Qual Program?
A-8	Evaluator Responsibilities (3rd paragraph below the bullet points)		As written, this statement implies that the evaluator does not have to meet all the Areas of Operation and Tasks, just as many of the required elements as possible. Later, the statement is made that all Tasks must be evaluated, in line with the past PTS guidance. What is meant by this statement? More clarification required. What is meant by the phrase "elect to suspend and later resume" in this section? This results in the evaluator being injected into the profile, and detracting from the applicant's exercise of command. More detail is needed to train our evaluators and establish standardization.
A-8	Evaluator Responsibilities	Additional guidance	Request additional guidance on how part 121 air carriers, including those who conduct training and checking under AQP, are to use the ACS.
A-9	Possible Outcomes of the Test (1st and 2nd paragraphs)	Additional guidance	Request additional guidance on how the ACS will be used for a 61.58 check.
A-10	Unsatisfactory Performance (2nd paragraph)		This paragraph conflicts with the guidance that the evaluator is tasked to determine the ability of the applicant to read, speak, and understand English *prior* to the practical test.
A-12	Additional Rating Task Table (1st paragraph)		Request additional guidance on how to remove an SIC only type rating that was issued in accordance with section 61.55.

Page #	Location	Issue Type	Issue Description
A-12	Additional Rating Task Table (1st paragraph)		The statement: *"Please note, however, that the evaluator has discretion to evaluate the applicant's competence in the remaining Areas of Operation and Tasks."* Appears in much of the FAA guidance, but fails to provide any direction on when such discretion should be exercised. The applicant should know what needs to be accomplished, and not be subjected to additional Tasks at the whim of an examiner. How does an evaluator rationalize declaring an applicant unsuccessful for a Task that isn't called for and for which most other evaluators would not require the applicant to demostrate?
A-16	**Use of Checklists** (2nd paragraph)		This paragraph fails to address the environment where the aircraft TCDS stipulates a crew compliment of two or more. In those instances, the evaluator is assessing that the applicant directs the completion of any memory items, calls for the proper non-normal checklist when conditions permit, and ensures the other member of the crew executes the checklist properly.
A-17	Multiengine Considerations		As this section is written, none of it appears to apply to Part 25 turbojet or turbofan aircraft as the discussion never redirects from propeller-driven aircraft. if that isn't the case, it is not obvious.
A-19	Equipment Requirements and Limitations	Request for additional guidance	There is provided an alternative means under Part 142 for the equipment exam to be conducted prior to the Practical Test. Might there be some equivalent/similar process allowed under Part 121?
A-21	III. Takeoffs and Landings (Briefings paragraph)		The briefing requirement transitions to the landing phase. As such, it should be a separate paragraph. Further, Boeing calls for the approach and landing briefing earlier in the flight profile than the landing phase. Hence, it would be attributed to a Task in AoO VI.
A-21	III. Takeoffs and Landings (Briefings paragraph)		This section is a duplicate of what is provided in the paragraph above. If you look at Task IIE, it mentions "Conduct a briefing that includes procedures for emergency and abnormal situations (e.g., powerplant failure, windshear), which may be encountered during takeoff, and state the planned action if they were to occur." However, the briefing should be more than that, and the statement should reference the manufacturer as a source for the breifing items. Tasks in AoO III don't call for a briefing as a skill, and thus this statement should be relegated to the preflight phase. Boeing procedures call for the briefing to be accomplished prior to starting engines for safety reasons, and update as necessary during taxi out. Thus, placement prior to movement is inappropriate.
A-21	III. Takeoffs and Landings (Landings paragraph)		Recommend adding the following sentences: "*Rejected landings in which the airplane wheels make contact with the runway surface suffice as a landing. One of the landings may be accomplished using installed autoland capabilities."*

Page #	Location	Issue Type	Issue Description
			Rational: The ability to count a rejected landing (below 50 feet) that doesn't result in touchdown greatly benefits the ability to vary the profile and results in greater efficiency in training delivery, especially with the landing from a circling approach. Once the placement of the airplane is ascertained and the airplane is stabilizied on a path to that point, the landing should be counted. Autoland events are accomplished with the pilot positioned ready to take control of the aircraft. As such, they must accomplish the same energy state and placement accuracy assessments as in a manual landing. As more aircraft obtain the ability to conduct automated low visibility landings, the ability to ensure proper management of that task becomes critical. Allowing one autoland landing to count would support greater safety and training efficiency in meeting operator CAT II/III approach needs.
A-21	IV. Inflisht Maneuvers Task A. Steep Turns (First paragraph)		Recommend adding the following sentence: *"Applicants are allowed to make use of all aircraft instrumentation, to include flight path vectors and heading markers, and may obtain callouts from the pilot monitoring provided specific items are briefed prior to the Task."*
A-23	Task D. Nonprecision Approaches (3rd bullet point)		There should be a stipulation that this task need not be accomplished when system redundancies make the condition highly improbable.
A-23	Task E. Precision Approaches (Paragraph 2; 1st bullet point)		Recommend adding a clarifying sentence - revised bullet would read: "At least one must be flown without the use of an autopilot. *The applicant should begin manually flying prior to the final approach segment.* Manually flown precision approaches may use raw data displays or may be flight director assisted, at the discretion of the evaluator."
A-23	Task F. Landing from a Precision Approach		Recommend revising section as follows: If circumstances beyond the control of the applicant prevent an actual landing, the evaluator may accept an approach to a point where, in his or her judgment, a safe landing and a full stop could have been made, and credit given for *the landing and* a missed approach. Does this allow for the landing to be credited even though it was not accomplished?It implies that it does, by stipulating "a safe landing and a full stop" as a criteria. As read, a landing and a missed approach could be received. This allowance should be extended to the use of FSTD training to provide for profile variation and training efficiency. Part 142 training program profiles provide considerable landing practice and, as such, the evaluation should give credit in a similar fashion.

Page #	Location	Issue Type	Issue Description
A-23	Task H. Landing from a Circling Approach		Recommend the following revision: See previous task information for applicants that are not required to be checked on the circling maneuver (Tasks G and H). *The evaluator may accept an approach to a point where, in his or her judgment, a safe landing and a full stop could have been made, and credit given for the landing and a missed approach.*
A-24	VII. Emergency Operations Task B. Powerplant Failure During Takeoff (Paragraph 3)	Clarification	Does this means that the powerplant failure in an FSTD can occur after V2?
A-24	Appendix 7, VII.	Part 23 reference	VII. Emergency Operations, Task B Powerplant Failure During Takeoff – references Part 23 Commuter category; current Part 23 is now called “Normal category airplanes” – need to adjust sentences accordingly.
A-24	Appendix 7, VII.	SFAR 41C 4(b)	VII. Emergency Operations references “In a multiengine airplane certificated under 14 CFR parts 23 Commuter category, SFAR 41C 4(b), and part 25, with published V_1, V_R, or V_2 speeds, the failure of the most critical powerplant should be simulated at a point:…” Not sure what SFAR 41C 4(b) is in reference too – is this still a valid SFAR or is it now a Part 91 or 25 Appendix?
A-25	Task D. Powerplant Failure and Restart Procedures (AMEL, AMES)		Recommend changing last sentence to read: “In a multiengine jet airplane or FSTD representing a multiengine airplane, one engine must be shut down and a restart *considered* while airborne, if applicable.” Rational: The requirement to shutdown a powerplant in an FSTD can be met following an engine fire or failure on takeoff, as authorized. However, the requirement to restart that powerplant should be restated as "consideration" for the restart. Many applicants may not deem a restart necessary; further, as some airplane types have no "elective" shutdown checklist, the event must be initiated from the basis of a non-normal that would mandate a shutdown. Many of them do not lend themselves to restart. At the air carrier level, this is unnecessary on a practical test given the volume of activity to be accomplished.
A-25	Task G. Landing from a No Flap or		Recommend adding a reference to the FSB as follows: This Task need not be accomplished for a particular airplane type if the Administrator has determined that the probability of flap extension failure on that type airplane is extremely remote

Page #	Location	Issue Type	Issue Description
	a Nonstandard Flap Approach		due to system design *or a particular configuration is required by the airplane FSB report.* The evaluator must determine whether checking on slats only and partial-flap approaches are necessary for the practical test. However, probability of asymmetrical flap failures should be considered in this making this determination.

Commercial Pilot – Military Competence

Airman Certification Standards

FAA-S-ACS-12

U.S. Department
of Transportation

**Federal Aviation
Administration**

FAA-S-ACS-12

Commercial Pilot – Military Competence

Airman Certification Standards

February 2018

**Flight Standards Service
Washington, DC 20591**

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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-12 will be effective in June 2018.

Foreword

The Federal Aviation Administration (FAA) has published the Commercial Pilot – Military Competence Airman Certification Standards (ACS) document to communicate the aeronautical knowledge standards for military or former military pilots seeking a commercial pilot certificate with the appropriate aircraft category and class rating per 14 CFR part 61, section 61.73.

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.

John S. Duncan
Director, Flight Standards Service

Revision History

Document #	Description	Revision Date
FAA-S-ACS-12	Commercial Pilot – Military Competence Airman Certification Standards	June 2018

Table of Contents

Introduction

Airman Certification Standards Concept

The goal of the airman certification process is to ensure the applicant possesses the knowledge and ability to manage risk and demonstrate the skills consistent with the privileges of a Commercial Pilot Certificate and any associated ratings being exercised, in order to act as pilot-in-command (PIC).

The Commercial Pilot – Military Competence Airman Certification Standards identifies the areas of knowledge that the FAA has determined as necessary for a military pilot to receive a Commercial Pilot Certificate. The FAA has determined that only knowledge areas that are outlined in 14 CFR part 61, section 61.73 will be tested.

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 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). Other materials, such as airman knowledge testing supplements in the FAA-CT-8080 series and an FAA online training course, provide guidance to applicants on aeronautical knowledge and risk management.

The FAA recognizes that safe operations in today's complex National Airspace System (NAS) require a systematic integration of aeronautical knowledge that an airman must possess. This ACS integrates the elements of knowledge in 14 CFR to Commercial Pilot standards, and any associated ratings that an applicant is entitled.

In keeping with this integrated and systematic approach, the knowledge Task elements of each Task identify what the applicant must know and understand for the issuance of a Commercial Pilot Certificate under 14 CFR part 61. The applicant demonstrates this understanding by passing the knowledge test.

Using the ACS

The ACS consists of ***Areas of Operation*** arranged in a logical sequence, beginning with Commercial Pilot Privileges and Limitations and ending with Accident Reporting. Each Area of Operation includes ***Tasks*** appropriate to that Area of Operation. Each Task begins with an ***Objective*** stating what the applicant should know. The ACS then lists the aeronautical knowledge elements relevant to the specific Task. The ACS uses ***Notes*** to emphasize special considerations. The ACS uses the terms "will" and "must" to convey directive (mandatory) information. The terms “may” and “should” denote 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 “Qualifications and Responsibilities to Act as a Commercial Pilot” (MC.I.A.K1), the applicant should be prepared for questions on any currency and recordkeeping presented in the References for that Task.

Each Task in the ACS is coded according to a scheme that includes four elements. For example, in the Task, “Pilot Qualifications and Responsibilities” (MC.I.A.K1) the applicant should use the References for that Task and be prepared for questions on currency and recordkeeping.

MC.I.A.K1
- **MC** = Applicable ACS (Military Competency)
- **I** = Area of Operation (Commercial Pilot Privileges and Limitations)
- **A** = Task (Qualifications and Responsibilities to Act as a Commercial Pilot)
- **K1** = Task element Knowledge 1 (Currency and recordkeeping)

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. The LSCs translations may be found at www.faa.gov. Each LSC provides the applicant with information that will assist in future test taking.

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.

For those applicants who do not pass the knowledge test, remedial instruction and an endorsement from an instructor is required for retesting. See Appendix 1 for details on passing the Military Competency Non-Category Specific (MCN) knowledge test.

The FAA encourages applicants to use this ACS when preparing for the knowledge test. In the case where an applicant has failed the knowledge test, the FAA encourages the applicant and his/her instructor to use this ACS when preparing to retest.

I. Commercial Pilot Privileges and Limitations

Task	*A. Pilot Qualifications and Responsibilities*
References	14 CFR parts 61, 91, FAA-H-8083-3, FAA-H-8083-25
Objective	To determine that the applicant exhibits satisfactory knowledge associated with operating as pilot-in-command (PIC) as a commercial pilot.
Knowledge	The applicant demonstrates understanding of:
MC.I.A.K1	Currency and recordkeeping.
MC.I.A.K2	Documents required to exercise commercial pilot privileges, as per 14 CFR part 61.
MC.I.A.K3	Passenger briefing requirements, to include operation and required use of safety restraint systems.
MC.I.A.K4	Responsibility of the PIC, as per 14 CFR part 91, subparts A-E.
MC.I.A.K5	Regulatory requirements for supplemental oxygen use by flight crew and passengers.

Task	*B. Airworthiness Requirements*
References	14 CFR parts 39, 43, 91; FAA-H-8083-3, FAA-H-8083-25
Objective	To determine that the applicant exhibits satisfactory knowledge associated with airworthiness requirements, including aircraft certificates.
Knowledge	The applicant demonstrates understanding of:
MC.I.B.K1	General airworthiness requirements and compliance for aircraft, including:
MC.I.B.K1a	• Certificate location and expiration dates
MC.I.B.K1b	• Required inspections and aircraft logbook documentation
MC.I.B.K1c	• Airworthiness Directives and Special Airworthiness Information Bulletins
MC.I.B.K1d	• Aircraft Flight Manual/POH, markings, and placards
MC.I.B.K2	Pilot-performed preventive maintenance.
MC.I.B.K3	Equipment requirements for day and night flight, to include:
MC.I.B.K3a	a. Flying with inoperative equipment
MC.I.B.K3b	• Using an approved Minimum Equipment List (MEL)
MC.I.B.K3c	• Required discrepancy records or placards
MC.I.B.K4	Emergency Locator Transmitter (ELT) operations, limitations, and testing requirements.

Task	*C. Medical Certification and Qualification*
References	14 CFR parts 61, 67, 68, 91; FAA-H-8083-3, FAA-H-8083-25; AC 68-1
Objective	To determine that the applicant exhibits satisfactory knowledge associated with aeromedical certificate requirements.
Knowledge	The applicant demonstrates understanding of:
MC.I.C.K1	Medical certificates, classes, and validity time period.
MC.I.C.K2	Inspection of medical certificates.
MC.I.C.K3	Medical certificates and exercising pilot certificate privileges.
MC.I.C.K4	Use of U.S. Armed Forces Medical Examination.
MC.I.C.K5	BasicMed and exercising Commercial Pilot privileges.

II. Air Traffic

Task	***A. National Airspace System***
References	14 CFR parts 71, 91, 93; FAA-H-8083-3; Chart Supplements, Navigation Charts; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge associated with the National Airspace System (NAS) operating under VFR as a commercial pilot.
Knowledge	The applicant demonstrates understanding of:
MC.II.A.K1	Types of airspace/airspace classes and associated requirements and limitations.
MC.II.A.K2	Charting symbology.
MC.II.A.K3	Special use airspace (SUA), special flight rules areas (SFRA), temporary flight restrictions (TFR), and other airspace areas.
MC.II.A.K4	Altitude selection accounting for terrain and obstacles, VFR cruising altitudes.
MC.II.A.K5	Compliance with ATC clearances and instructions.
MC.II.A.K6	Airport operations.
MC.II.A.K7	Right-of-way rules.

III. Accident Reporting

Task	***A. Accident Reporting***
References	49 CFR part 830; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge associated with the reporting of aircraft accidents.
Knowledge	The applicant demonstrates understanding of:
MC.III.A.K1	National Transportation Safety Board (NTSB) accident/incident reporting.

Appendix Table of Contents

A

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

Knowledge Test Description

The knowledge test is an important part of the airman certification process. Applicants who meet the requirements in 14 CFR part 61, section 61.73 must pass the knowledge test before applying for a Commercial Pilot Certificate and any associated ratings that the airman may qualify to hold.

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. The knowledge test applicant has up to two hours to complete the test.

Knowledge Test Blueprint

MCN Knowledge Areas Required by 14 CFR part 61, section 61.73 to be on the Knowledge Test	Percent of Questions Per Test
Commercial Pilot Privileges and Limitations	30%–35%
Air Traffic	30%–35%
General Operating Rules	30%–35%
Accident Reporting	10%–20%
Total Number of Questions	**50**

English Language Standard

In accordance with the requirements of 14 CFR part 61, section 61.123(b) and the FAA English Language Standard, throughout the application and testing process, the applicant must demonstrate the ability to read, write, speak, and understand the English language. However, the FAA may make an exception if the person is unable to meet one of these requirements due to medical reasons, such as a hearing impairment.

Knowledge Test Requirements

There are no eligibility requirements for taking the MCN knowledge test outlined in 14 CFR part 61. If you do not meet the eligibility requirements to be issued a Commercial Pilot Certificate under 14 CFR part 61, section 61.73, your application for certification will be denied even if you have successfully passed the MCN Knowledge Test.

To be eligible to take the knowledge test, you must meet the following in accordance with the requirements of 14 CFR part 61, section 61.123(a):

- Be at least 18 years of age.
- Provide 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

A list of acceptable documents used to provide proper identification can be found in Advisory Circular (AC) 61-65, Certification: Pilots and Flight and Ground Instructors (as amended).

Achieving a score of 70% or better is required to be considered as satisfactorily passing the knowledge test for a Commercial Pilot Certificate, and its associated ratings, when the applicant is applying under 14 CFR part 61, section 61.73.

14 CFR part 61, section 61.49 lists the acceptable forms of retest authorization for all Commercial Pilot tests, including the MCN:

> 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).*

A current or former military pilot who is applying for a Commercial Pilot Certificate under 14 CFR part 61, section 61.73 is not required to pass a practical test to become certificated. Because of this, there is not a requirement for a certificated instructor to review the questions that incorrectly answered on the knowledge test. The FAA encourages Military Competence applicants to review the topics that were incorrectly answered on the knowledge test by use of the PLT Codes that are printed on the knowledge test report. By doing this, the applicant can be aware of areas he/she should review before exercising the privileges of his/her pilot certificate.

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 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.

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

To obtain a duplicate AKTR due to loss or destruction of the original, the applicant must mail a signed request accompanied by a check or money order made payable to the FAA in the amount of $12.00 the following address:

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 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:

MC.I.A.K1:
MC = Applicable ACS (Military Competency for Commercial Pilot Certification)
I = Area of Operation (Commercial Pilot Privileges and Limitations)
A = Task (Qualifications and Responsibilities to Act as a Commercial Pilot)
K1 = Task element Knowledge 1 (Currency and recordkeeping.)

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.

Because all active knowledge test questions for the Military Competency Non-Category Specific (MCN) have been aligned with the corresponding ACS, applicants can continue to use LSC codes in conjunction with the ACS for the time being. The applicant and his/her instructor should look up the LSC code(s) on the applicant’s AKTR in the Learning Statement Reference Guide. After noting the subject area(s), the applicant and his/her instructor 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).

Appendix 4: Certificate Eligibility and Prerequisites

Current and former pilots of the U.S. Armed Forces may apply and receive a Commercial Pilot Certificate issued by the Federal Aviation Administration (FAA) as per the eligibility and requirements outlined in 14 CFR part 61, section 61.73. To be eligible, a current or former pilot in the U.S. Armed Forces must present the following documents:

- Official U.S. Armed Forces record that shows the person is or was a U.S. military pilot
- An official record that shows the pilot graduated from a U.S. Armed Forces undergraduate pilot training school in an aircraft as a military pilot.
- Has passed the military competence aeronautical knowledge test.
- Before the date of application, an official U.S. military pilot and instrument check in the aircraft category, class, and type, if a class or type rating is applicable.
- Logged 10 hours as a military pilot in a U.S. military aircraft category, class, and type, if a type rating is applicable.

To add an instrument rating to that pilot certificate, the current or former U.S. Armed Forces pilot will:

- Have passed an instrument proficiency check in the U.S. Armed Forces in the aircraft category
- Have an official U.S. Armed Forces record that shows the person is instrument qualified to conduct instrument flying on Federal airways in that aircraft category and class

An aircraft type rating may only be issued if that aircraft has a comparable civilian type designated by the Administrator.

The information published above should only be used as a general guide. Please refer to 14 CFR part 61, section 61.73, and review all pertinent information that may apply to your individual circumstance.

Appendix 5: 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
49 CFR part 830	Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail, Cargo, and Records
AC 60-28	FAA English Language Standard for an FAA Certificate Issued Under 14 CFR Parts 61, 63, 65, and 107
AC 61-65	Certification: Pilots and Flight and Ground Instructors
AC 68-1	BasicMed
AIM	Aeronautical Information Manual
FAA-H-8083-3	Airplane Flying Handbook
FAA-H-8083-25	Pilot's Handbook of Aeronautical Knowledge
Other	Chart Supplement
	Navigation Charts

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 6: Abbreviations and Acronyms

The following abbreviations and acronyms may be used in the ACS.

Abb./Acronym	Definition
14 CFR	Title 14 of the Code of Federal Regulations
AC	Advisory Circular
ACS	Airman Certification Standards
AELS	Aviation English Language Standard
AFB	Office of Foundational Business (FAA)
AFS	Flight Standards Service
AIM	Aeronautical Information Manual
AKTC	Airman Knowledge Testing Center
AKTR	Airman Knowledge Test Report
ATC	Air Traffic Control
ATIS	Automatic Terminal Information Service
AWOS	Automated Weather Observation System
CFI	Certificated Flight Instructor
CFR	Code of Federal Regulations
CTAF	Common Traffic Advisory Frequency
DOT	Department of Transportation
ELT	Emergency Locator Transmitter
FAA	Federal Aviation Administration
FSDO	Flight Standards District Office
FTN	FAA Tracking Number
GPS	Global Positioning System
IACRA	Integrated Airman Certification and Rating Application
LSC	Learning Statement Code
MCN	Military Competency Non-Category Specific Knowledge Test
MEL	Minimum Equipment List
MTR	Military Training Routes
NAS	National Airspace System
NOTAM	Notices to Airmen
NSA	National Security Areas
ODA	Organization Designation Authorization
PIC	Pilot-in-Command
PLT	Pilot Learning Statement Code
SAFO	Safety Alert for Operators
SFRA	Special Flight Rules Area
SMS	Safety Management System
SUA	Special Use Airspace
TFR	Temporary Flight Restrictions
TRSA	Terminal Radar Service Areas
UNICOM	Aeronautical Advisory Communications Stations
VFR	Visual Flight Rules

Compiled working group comments & requested changes to Commercial Pilot – Military Competence ACS

Comments and Requested Changes to COM MIL COMP ACS, FAA-S-ACS-12

Page #	Location	Issue Type	Issue Description
Cover	Date	Date on cover	Change from February 2018 to June 2018
3	Task A	New task element	Add (CA.I.A.K2) Privileges and Limitations as a new task element MC.I.A.K6
3	MC.I.	Layout	AOO. I- Task A, B & C Left column (Task-References-Objectives-Knowledge) do not line up on all three tasks.
3	MC.I.B.K3	Content	Should this state 'VFR' day and night flight?
3	MC.I.C.K3	Content	Element better covered in Task A with the addition of Privileges and Limitations. Recommend removing MC.I.C.K3 and have it covered in Task A.
5	Task A	Content	Objective – add incidents. '…aircraft accidents and incidents'.
S-1	Knowledge Test Description	Add table	Suggest adding a table consistent with ACS-6 (see pg A-1) and ACS-8, above the Test Blueprint with the Knowledge Test Table showing Test Code, Test Name, Number of Questions, Age, Allotted Time and Passing Score
A-2	1	Recommended phraseology change	**Change:** 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.) **To:** Before starting the actual test, the testing center will provide an opportunity to practice using the testing center's computer testing software. 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.) **Rationale:** Do not recommend using the term "navigation" as that is a specific aviation/maritime skill. Remove period between software and (e.g.,

Aviation Maintenance Technician – General, Airframe, and Powerplant

Airman Certification Standards

FAA-S-ACS-1

U.S. Department
of Transportation

**Federal Aviation
Administration**

FAA-S-ACS-1

Aviation Maintenance Technician – General, Airframe, Powerplant

Airman Certification Standards

Effective Date: TBD

**Flight Standards Service
Washington, DC 20591**

Acknowledgments

The U.S. Department of Transportation, Federal Aviation Administration (FAA), Airman Testing Standards 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 to AFS630comments@faa.gov.

Material in FAA-S-ACS-1 will be effective **TBD**. All previous editions of the Aviation Mechanic General, Airframe, and Powerplant Practical Test Standards (FAA-S-8081-26, -27, and -28) will be obsolete as of this date for Aviation Maintenance Technician applicants.

Foreword

The FAA has published the Aviation Maintenance Technician (AMT) – General, Airframe, Powerplant ACS document to communicate the aeronautical knowledge, risk management, and skill standards for AMT certification. This ACS incorporates and supersedes the previous editions of the following documents:

- FAA-S-8081-26A, Aviation Mechanic General Practical Test Standards (with Change 1, dated 4/27/15);
- FAA-S-8081-27A, Aviation Mechanic Airframe Practical Test Standards (with Change 1, dated 4/27/15, and Change 2, dated 9/29/15);
- FAA-S-8081-28A, Aviation Mechanic Powerplant Practical Test Standards (with Change 1, dated 4/27/15); and
- FAA-G-8082-3A, Aviation Maintenance Technician-General, Airframe, and Powerplant Knowledge Test Guide (dated September 2008).

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, risk management and skill 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 maintenance and 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 oral and practical test. The FAA acknowledges and appreciates the many hours that these aviation experts have contributed toward this goal. This degree 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
Director, Flight Standards Service

Revision History

Document#	Description	Revision Date
FAA-S-8081-26A	Aviation Mechanic General Practical Test Standards (Change 1)	April 27, 2015
FAA-S-8081-27A	Aviation Mechanic Airframe Practical Test Standards (Changes 1 and 2)	September 29, 2015
FAA-S-8081-28A	Aviation Mechanic Powerplant Practical Test Standards (Change 1)	April 27, 2015
FAA-S-ACS-1	Aviation Maintenance Technician – General, Airframe, and Powerplant Airman Certification Standards	**TBD**

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 basic skills consistent with the privileges of the certificate or rating being exercised. The Airman Certification Standards (ACS) concept forms a more comprehensive standard for what an applicant must know, consider, and do for the safe conduct and successful completion of each subject to be tested on the knowledge exam and oral and practical tests.

In fulfilling its responsibilities for the airman certification process, the FAA Flight Standards Service (AFS) plans, develops, and maintains materials related to airman certification training and testing. The FAA knowledge test measures the minimum standard of aeronautical knowledge required by Title 14 of the Code of Federal Regulations (14 CFR) part 65. Other materials, such as handbooks in the FAA-H-8083 series, provide guidance to applicants on aeronautical knowledge, risk management, and associated skills, including the knowledge and skill required to identify hazards and mitigate risks.

Safe operations on today's aircraft require integration of aeronautical knowledge, risk management, and skill standards. To accomplish these goals, the FAA drew upon the expertise of organizations and individuals across the aviation and training community to develop the ACS. The ACS defines the elements of knowledge and skill for each airman certificate or rating defined in 14 CFR part 65.

Through the oral and practical portion of the test, the FAA evaluators will assess the applicant's application of the knowledge, risk management, and skill in the subject area. The oral questioning may 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 and demonstrate skill as required for the circumstances of the given scenario.

Note: *As used in the ACS, an evaluator is any person authorized to conduct airman testing (e.g., an FAA aviation safety inspector (ASI) or designated mechanic examiner (DME)).*

Compliance with these procedures makes certain that airman applicants meet a satisfactory level of competency and workmanship required for certification. Each applicant is required to demonstrate a minimum satisfactory competency level, regardless of his/her previous education or background.

Evaluators will adhere to the following standards is mandatory when evaluating an applicant's test performance for an FAA Airframe and/or Powerplant Certificate:

- 14 CFR part 65, section 65.79
- General Aviation Airman Designee Handbook, FAA Order 8900.2 (as revised)
- Applicable ACS

All applicants for an FAA Aviation Maintenance Technician Certificate must qualify by meeting the prescribed requirements as stated in 14 CFR part 65, section 65.77. They must additionally pass a knowledge test, and the oral and practical tests for the certificate and/or rating sought, in accordance with 14 CFR part 65, sections 65.75 and 65.77.

Note: *FAA knowledge tests contain topics that include the maintenance, repair, alteration, and inspection of aviation products and relevant FAA regulations.*

Using the ACS

Title 49 U.S. Code Subpart III, Chapter 447 is the foundation for the FAA's safety regulations. The FAA requires that all practical tests be conducted in accordance with the appropriate Aviation Mechanic ACS and the policies and standardized procedures set forth in the current version of FAA Order 8900.2, General Aviation Airman Designee Handbook.

Note: *An evaluator conducting an oral and/or practical test must not test more than one applicant at a time.*

Definitions within:

- **Knowledge—**(FAA knowledge exam, oral) elements are indicated by use of the words "Exhibits knowledge in...."
- **Risk—** (oral, practical) elements are indicated by the use of the words “Determine, Identify, Creates…”
- **Skill—**(practical) elements are indicated by the use of the words "Demonstrates the skill to perform...."

The ACS consists of ***Sections* (General, Airframe, Powerplant)**. Each Section includes ***Subjects*** appropriate to that Section and consistent with 14 CFR part 65. Each Subject 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 Subjects, 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 Subject indicate the source material for Subject elements. For example, in Subjects such as “Fundamentals of Electricity and Electronics” (MG.I.A.K1), the applicant must be prepared for questions on electron theory presented in the references for that Subject.

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

MG.I.A.K1:
MG = Applicable ACS (Aviation Mechanic-General)
I = Section (General)
A = Subject (Fundamentals of Electricity and Electronics)
K1 = Subject Element Knowledge 1 (Electron theory (conventional flow vs. electron flow).)

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 will list an ACS code that correlates to a specific Subject element for a given Section and Subject. At that time, remedial instruction and re-testing will be specific, targeted, and based on specified learning criteria.

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., “AMG,” “AMA,” and “AMP” codes) will continue to be displayed on the Airman Knowledge Test Report (AKTR).

Each ACS code is tied to a unique Subject element in the ACS itself. Because of this fundamental difference, there is no one-to-one correlation between LSC (AMG, AMA, AMP) codes and ACS codes.

Because all active knowledge test questions for the General (AMG), Airframe (AMA), and Powerplant (AMP) knowledge tests have been aligned with the corresponding ACS, evaluators can continue to use Learning Statement codes in conjunction with the ACS for the time being. The evaluator should look up the learning statement code(s) on the applicant’s AKTR in the Learning Statement Reference Guide. After noting the subject area(s), the evaluator can use the corresponding Subject(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 Subject.

Except as provided by 14 CFR part 65, section 65.80, the applicant must pass the knowledge test before taking the oral and practical test.

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

I. General

Subject	***A. Fundamentals of Electricity and Electronics***
References	FAA-H-8083-30
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with basic electricity applicable to the AMT.
Knowledge	The applicant demonstrates understanding of:
MG.I.A.K1	Electron theory (conventional flow vs. electron flow).
MG.I.A.K2	Magnetism.
MG.I.A.K3	Capacitance in a circuit.
MG.I.A.K4	Inductance in a circuit.
MG.I.A.K5	Alternate Current (AC) electrical circuits.
MG.I.A.K6	Direct Current (DC) electrical circuits.
MG.I.A.K7	Ohm's law.
MG.I.A.K8	Kirchhoff's laws.
MG.I.A.K9	Voltage.
MG.I.A.K10	Current.
MG.I.A.K11	Resistance.
MG.I.A.K12	Power.
MG.I.A.K13	Series circuits.
MG.I.A.K14	Parallel circuits.
MG.I.A.K15	Aircraft batteries.
MG.I.A.K16	Transformers.
MG.I.A.K17	Circuit continuity.
MG.I.A.K18	Controlling devises including switches and relays.
MG.I.A.K19	Protective devices including fuses, circuit breakers, and current limiters.
MG.I.A.K20	Resistor types and color coding.
MG.I.A.K21	Semiconductors including diodes, transistors and integrated circuits.
MG.I.A.K22	Digital logic, including RAM, ROM, NVRAM, AND-gate, OR-gate, inverter, flip-flop.
MG.I.A.K23	Binary numbers.
MG.I.A.K24	Electrostatic discharge.
MG.I.A.K25	Electrical circuit drawings.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MG.I.A.R1	Failure to observe safety precautions when taking voltage, current, resistance, and capacitance measurements.
MG.I.A.R2	Hazards associated with handling, storage, and inspection of different types of batteries (i.e. lead acid, NiCad, lithium ion, gel cell).
MG.I.A.R3	Hazards associated with high-voltage circuits (e.g., strobe lighting).
MG.I.A.R4	Failure to observe safety precautions when working around batteries.
Skills	The applicant demonstrates the ability to:
MG.I.A.S1	Perform circuit continuity test.
MG.I.A.S2	Measure voltage.
MG.I.A.S3	Measure current.
MG.I.A.S4	Measure resistance.
MG.I.A.S5	Test a switch or relay.

Subject	***A. Fundamentals of Electricity and Electronics***
MG.I.A.S6	Test a fuse or circuit breaker.
MG.I.A.S7	Read and interpret aircraft electrical circuit diagrams, and symbols, including solid state devices and logic functions.
MG.I.A.S8	Troubleshoot a circuit.
MG.I.A.S9	Identify symbols used in electrical and electronic schematic diagrams (e.g., grounds, shields, resistors, capacitors, fuses, circuit breakers, batteries, diodes, transistors, and integrated circuits).
MG.I.A.S10	Demonstrate how to test for short-circuit and open-circuit conditions.
MG.I.A.S11	Measure voltage drop across a resistor.
MG.I.A.S12	Determine or measure for open electrical circuits.
MG.I.A.S13	Inspect an aircraft battery.
MG.I.A.S14	Service an aircraft battery.

Subject	***B. Aircraft Drawings***
References	FAA-H-8083-30, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft drawings.
Knowledge	The applicant demonstrates understanding of:
MG.I.B.K1	Drawings, blueprints, sketches, and/or system schematics including commonly used lines, symbols and terminology.
MG.I.B.K2	Repair or alteration of an aircraft system or component(s) using drawings/blueprints and/or system schematics to determine whether it conforms to its type design.
MG.I.B.K3	Inspection of an aircraft system or component(s) using drawings/blueprints and/or schematics.
MG.I.B.K4	Terms used in conjunction with aircraft drawings/blueprints and/or system schematics.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MG.I.B.R1	Misinterpretation of plus or minus tolerances as depicted on aircraft drawings.
MG.I.B.R2	Misuse of manufacturers specifications for design of alterations and repairs.
MG.I.B.R3	Failure to ensure the drawing or schematic is the one applicable to the particular aircraft by model and serial number.
MG.I.B.R4	Failure to identify the correct and most current version and applicability of drawing being used.
Skills	The applicant demonstrates the ability to:
MG.I.B.S1	Draw a sketch of a repair or alteration.
MG.I.B.S2	Identify the meaning of lines and symbols used in an aircraft drawing.
MG.I.B.S3	Interpret dimensions used in an aircraft drawing.
MG.I.B.S4	Identify changes on an aircraft drawing.
MG.I.B.S5	Determine material requirements from an aircraft drawing.
MG.I.B.S6	Interpret graphs and charts.

Subject	***C. Weight and Balance***
References	FAA-H-8083-30, AC 43.13-1, FAA-H-8083-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with weight and balance.
Knowledge	The applicant demonstrates understanding of:
MG.I.C.K1	Weight and balance terminology.
MG.I.C.K2	Purpose for weighing an aircraft.
MG.I.C.K3	Weighing procedures, including the general preparations for weighing, with emphasis on aircraft weighing area considerations.
MG.I.C.K4	Procedures for calculation of the following: arm, positive or negative moment, center of gravity (CG) or moment index.
MG.I.C.K5	Purpose and application of weight and CG limits.
MG.I.C.K6	Purpose of determining CG.
MG.I.C.K7	Adverse loading considerations and how to calculate if adverse loading will cause an out of limit condition.
MG.I.C.K8	Determine proper empty weight configuration.
MG.I.C.K9	Proper ballast placement.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MG.I.C.R1	Situations that may lead to unsafe conditions when jacking an aircraft.
MG.I.C.R2	Weighing an aircraft without following recommended procedures.
MG.I.C.R3	Misuse of scales.
MG.I.C.R4	Adverse aerodynamic effect of CG that is forward or aft of CG limits.
MG.I.C.R5	Adverse aerodynamic and performance effects of weight in excess of limits.
Skills	The applicant demonstrates the ability to:
MG.I.C.S1	Research and explain the procedures for weighing an aircraft.
MG.I.C.S2	Perform weight and balance calculations.
MG.I.C.S3	Calculate ballast weight shift and required weight location.
MG.I.C.S4	Check aircraft weighing scales for calibration.
MG.I.C.S5	Calculate weight and balance for an aircraft after an equipment change.
MG.I.C.S6	Compute forward and aft loaded CG limit.
MG.I.C.S7	Create a maintenance record for a weight and balance change.
MG.I.C.S8	Compute the empty weight and empty weight CG of an aircraft.
MG.I.C.S9	Calculate the moment of an item of equipment.
MG.I.C.S10	Identify tare items.
MG.I.C.S11	Locate weight and balance information.
MG.I.C.S12	Locate datum.
MG.I.C.S13	Locate weight and balance placarding and limitation requirements for an aircraft.
MG.I.C.S14	Revise an aircraft equipment list after equipment change.
MG.I.C.S15	Calculate the change needed to correct an out of balance condition.
MG.I.C.S16	Determine an aircraft's CG range using aircraft specifications, Type Certificate Data Sheets (TCDSs), and aircraft listings.
MG.I.C.S17	Calculate a weight change and complete required records.

Subject	***D. Fluid Lines and Fittings***
References	FAA-H-8083-30, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with fluid lines and fittings.
Knowledge	The applicant demonstrates understanding of:
MG.I.D.K1	Tubing and hose materials, applications, sizes, and fittings.
MG.I.D.K2	Flexible hose identification.
MG.I.D.K3	Rigid line fabrication and installation techniques/practices.
MG.I.D.K4	Flexible hose fabrication and installation techniques/practices.
MG.I.D.K5	Importance of using a torque wrench when securing fluid hose and line fittings.
MG.I.D.K6	Use of torque seal or similar witness techniques after installing critical fluid hose and line fittings.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MG.I.D.R1	Failure to follow proper system configuration prior to and during maintenance.
MG.I.D.R2	Misuse of required safety equipment.
MG.I.D.R3	Failure to use precautions when working with hazardous fluids.
MG.I.D.R4	Failure to observe precautions when working with high-pressure fluid systems.
MG.I.D.R5	Hazards associated with a twisted hose.
MG.I.D.R6	Hazards associated with a loosened fitting or a hose that has moved out-of-position.
MG.I.D.R7	Improper use of tools while applying torque to a fluid line.
Skills	The applicant demonstrates the ability to:
MG.I.D.S1	Fabricate an aircraft rigid line or a flexible hose.
MG.I.D.S2	Install an aircraft rigid line.
MG.I.D.S3	Install an aircraft flexible hose.
MG.I.D.S4	Perform a rigid line or flexible hose inspection.
MG.I.D.S5	Identify installation and security requirements for rigid lines and flexible hoses.
MG.I.D.S6	Identify fluid lines, pneumatic lines, and fittings.
MG.I.D.S7	Fabricate a flare on tubing.
MG.I.D.S8	Fabricate a flareless-fitting-tube connection.

Subject	***E. Aircraft Materials, Hardware, and Processes***
References	FAA-H-8083-30, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with materials, hardware, and processes.
Knowledge	The applicant demonstrates understanding of:
MG.I.E.K1	Materials commonly used in aircraft and their general application.
MG.I.E.K2	Heat treatment processes, using D or DD “icebox” rivets.
MG.I.E.K3	Forces placed on aircraft materials (e.g., tension, compression, torsion, bending, strain, and shear).
MG.I.E.K4	Hardware commonly used in aircraft (e.g., bolts, nuts, screws, pins, washers, turnlock fasteners, cables, cable fittings, and rigid line couplings).
MG.I.E.K5	Safety wire and safety clip requirements and techniques.
MG.I.E.K6	Precision measurement tools, principles, and procedures.
MG.I.E.K7	Non-destructive testing methods for various materials.
MG.I.E.K8	Torqueing tools, principles, and procedures.
MG.I.E.K9	Suitability and compatibility of materials and hardware used for maintenance.
MG.I.E.K10	Relationship between torque and fastener preload.
MG.I.E.K11	Aircraft inspection methods and tools for materials, hardware, and processes.
MA.II.E.K.12	Characteristics of acceptable welds.
MA.II.E.K.13	Characteristics of unacceptable welds.
MA.II.E.K14	Procedures for weld repairs.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MG.I.E.R1	Improper use of personal protective equipment (PPE).
MG.I.E.R2	Consequences of improper torque.
MG.I.E.R3	Consequences associated with used hardware or suspected unapproved parts (SUPS).
MG.I.E.R4	Misunderstanding and misapplication of torqueing techniques on critical, highly-stressed fasteners.
Skills	The applicant demonstrates the ability to:
MG.I.E.S1	Install safety wire on nuts, bolts, and/or turnbuckles.
MG.I.E.S2	Determine and properly torque aircraft hardware.
MG.I.E.S3	Perform a visual inspection of various welds.
MG.I.E.S4	Identify aircraft materials and hardware based on manufacturer’s markings.
MG.I.E.S5	Select and install aircraft bolts.
MG.I.E.S6	Make precision measurements with an instrument that has a Vernier micrometer scale.
MG.I.E.S7	Check the concentricity of a shaft.
MG.I.E.S8	Identify aircraft control cable components.
MG.I.E.S9	Fabricate a cable assembly using a swaged end fitting.
MG.I.E.S10	Select the correct aluminum alloy for a structural repair.
MG.I.E.S11	Identify rivets by physical characteristics.
MG.I.E.S12	Determine suitability of materials for aircraft repairs.
MG.I.E.S13	Distinguish between heat-treated and non-heat-treated aluminum alloys.
MG.I.E.S14	Check for proper calibration of a micrometer.
MG.I.E.S15	Inspect and check welds.

Subject	***F. Ground Operations and Servicing***
References	FAA-H-8083-30, AC 43.13-1, AC 150/5210-20
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with ground operation and servicing.
Knowledge	The applicant demonstrates understanding of:
MG.I.F.K1	Aircraft towing procedures.
MG.I.F.K2	Aircraft securing procedures.
MG.I.F.K3	Aviation fueling/defueling procedures.
MG.I.F.K4	Airport operation area procedures and ATC communications, including runway incursion prevention.
MG.I.F.K5	Engine starting, ground operation, and aircraft taxiing procedures.
MG.I.F.K6	Types/classes of fire extinguishers and procedures.
MG.I.F.K7	Aircraft oil, hydraulic and pneumatic, and deicing servicing procedures.
MG.I.F.K8	Oxygen system servicing procedures.
MG.I.F.K9	Characteristics of aviation gasoline and/or turbine fuels, including basic types and means of identification.
MG.I.F.K10	Fuel additives commonly used in the field.
MG.I.F.K11	Use of approved grades/types of fuel in aircraft engines.
MG.I.F.K12	Tool and hardware accountability.
MG.I.F.K13	Material handling.
MG.I.F.K14	Parts protections.
MG.I.F.K15	Hazardous materials, Safety Data Sheets (SDS), and PPE.
MG.I.F.K16	Foreign object damage effects
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks encompassing:
MG.I.F.R1	Dangers associated with engine starting and ground operations.
MG.I.F.R2	Consequences of misfueling and/or using incorrect and/or contaminated fuel.
MG.I.F.R3	Dangers associated with failure to use an engine start/run-up checklist.
MG.I.F.R4	Failure to observe oxygen system safety practices/precautions during servicing.
MG.I.F.R5	Hazards involved in preparing to tow an aircraft.
MG.I.F.R6	Ground operations of aircraft engines with cowling removed contrary to manufacturer instructions.
MG.I.F.R7	Hazards associated with ground operation of aircraft in the vicinity of other aircraft or ground support equipment.
MG.I.F.R8	Hazards associated with engine starting and operation while troubleshooting or adjustment of engine controls.
MG.I.F.R9	Hazards associated with fueling/defueling ungrounded aircraft or using improper equipment.
MGI.F.R10	Consequences of improperly connecting external power equipment to an aircraft.
Skills	The applicant demonstrates the ability to:
MG.I.F.S1	Secure an aircraft.
MG.I.F.S2	Prepare an aircraft for towing.
MG.I.F.S3	Follow a start-up checklist for an aircraft reciprocating or turbine engine.
MG.I.F.S4	Start and operate an aircraft engine.
MG.I.F.S5	Use appropriate hand signals for the movement of aircraft.
MG.I.F.S6	Prepare an aircraft for fueling.
MG.I.F.S7	Inspect an aircraft fuel system for water and Foreign Object Debris (FOD) contamination.
MG.I.F.S8	Identify procedures for extinguishing fires in an engine induction system.

Subject	***F. Ground Operations and Servicing***
MG.I.F.S9	Connect external power to an aircraft.
MG.I.F.S10	Identify different grades of aviation fuel.
MG.I.F.S11	Identify procedures for securing a turbine-powered aircraft after engine shutdown.
MG.I.F.S12	Select an approved fuel for an aircraft.
MG.I.F.S13	Perform a foreign object damage control procedure.

Subject	***G. Cleaning and Corrosion Control***
References	FAA-H-8083-30, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with cleaning, corrosion control, and aircraft finishes.
Knowledge	The applicant demonstrates understanding of:
MG.I.G.K1	Aircraft cleaning procedures.
MG.I.G.K2	Corrosion theory and causation.
MG.I.G.K3	Types and effects of corrosion.
MG.I.G.K4	Corrosion prone areas in aircraft.
MG.I.G.K5	Corrosion preventive maintenance procedures.
MG.I.G.K6	Corrosion identification and inspection.
MG.I.G.K7	Corrosion removal and treatment procedures.
MG.I.G.K8	Corrosion Preventive Compounds (CPC) (e.g., waxy sealants, thin-film dielectrics).
MG.I.G.K9	Selection of optimal CPC and frequency of treatment.
MG.I.G.K10	Use of high-pressure application equipment (e.g., fogging).
MG.I.G.K11	Improper use of cleaners on aluminum or composite materials.
MG.I.G.K12	Dissimilar metals causing accelerated corrosion, and role of protective barriers to mitigate this risk.
MG.I.G.K13	Conversion coatings.
MG.I.G.K14	Materials used for protection of airframe structures.
MG.I.G.K15	Primer materials.
MG.I.G.K16	Topcoat materials.
MG.I.G.K17	Surface preparation for a desired finishing material.
MG.I.G.K18	Effects of ambient conditions on finishing materials.
MG.I.G.K19	Effects of improper surface preparation on finishing materials.
MG.I.G.K20	Regulatory requirements for replacing identification, registration markings, and placards.
MG.I.G.K21	Inspection of aircraft finishes.
MG.I.G.K22	Safety practices/precautions when using finishing materials (e.g., PPE, fire prevention).
MG.I.G.K23	Finishing materials application techniques and practices.
MG.I.G.K24	Control surface balance considerations after refinishing.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MG.I.G.R1	Failure to identify health concerns when using paints, solvents, finishing materials, and processes.
MG.I.G.R2	Improper ventilation.
MG.I.G.R3	Misidentification of materials and processes to be used for cleaning or corrosion treatment on a given part or structure to prevent further damage.
MG.I.G.R4	Failure to follow SDS PPE instructions for products used during removal and treatment of corrosion.
MG.I.G.R5	Failure to follow fire prevention measures when working with flammable chemicals.
MG.I.G.R6	Improper disposal of chemicals and waste materials.
MG.I.G.R7	Inappropriate use of PPE when working with paints and solvents.
MG.I.G.R8	Improper application of or incompatible finishing materials.
Skills	The applicant demonstrates the ability to:
MG.I.G.S1	Perform a portion of an aircraft corrosion inspection.
MG.I.G.S2	Identify and select aircraft corrosion prevention/cleaning materials.
MG.I.G.S3	Apply corrosion prevention/coating materials.

Subject	***G. Cleaning and Corrosion Control***
MG.I.G.S4	Inspect finishes and identify defects.
MG.I.G.S5	Inspect an aircraft compartment for corrosion.
MG.I.G.S6	Identify procedures to clean and protect plastics.
MG.I.G.S7	Determine location and/or size requirements for aircraft registration numbers.
MG.I.G.S8	Prepare composite surface for painting.
MG.I.G.S9	Identify finishing materials and appropriate thinners.
MG.I.G.S10	Layout and mask a surface in preparation for painting.
MG.I.G.S11	Prepare metal surface for painting.
MG.I.G.S12	Determine what paint system can be used on a given aircraft.
MG.I.G.S13	Apply etch solution and conversion coating.
MG.I.G.S14	Identify types of protective finishes.

Subject	***H. Mathematics***
References	FAA-H-8083-30, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with mathematics as it relates to aircraft maintenance. *Note: The practical portion of the Mathematics subject area may be tested simultaneously when performing calculation(s) in subject areas Basic Electricity and/or Weight and Balance.*
Knowledge	The applicant demonstrates understanding of:
MG.I.H.K1	Areas of various geometrical shapes.
MG.I.H.K2	Volumes of various geometrical shapes.
MG.I.H.K3	Definitions/descriptions of geometrical terms, including but not limited to any of the following: polygon, pi, diameter, radius, and hypotenuse.
MG.I.H.K4	Ratio problems, including examples of where or how they may be used in relation to aircraft maintenance or system(s) operation.
MG.I.H.K5	Proportion and percentage problems, including examples of where or how they may be used in relation to aircraft maintenance or system(s) operation.
MG.I.H.K6	Algebraic operations, including examples of where or how they may be used in relation to aircraft maintenance.
MG.I.H.K7	Conditions or areas where metric conversion may be necessary.
MG.I.H.K8	Scientific (exponential) notation, decimal notation, fractional notation, binary notation, and conversion between these various forms of numeric notation.
MG.I.H.K9	Rounding numbers.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks encompassing:
MG.I.H.R1	Failure to use the precedence of algebraic operators when solving an algebraic equation.
MG.I.H.R2	Failure to maintain the correct positive or negative integer in mathematical operations.
MG.I.H.R3	Implications of rounding numbers when precision is needed.
Skills	The applicant demonstrates the ability to:
MG.I.H.S1	Determine the square root of given numbers.
MG.I.H.S2	Compute the volume of a cylinder.
MG.I.H.S3	Compute the area of a wing.
MG.I.H.S4	Calculate the volume of a shape; such as a baggage compartment or fuel tank.
MG.I.H.S5	Convert fractional numbers to decimal equivalents.
MG.I.H.S6	Compare two numerical values using ratios.
MG.I.H.S7	Compute compression ratio.
MG.I.H.S8	Compute the torque value when converting from inch-pounds to foot-pounds or from foot-pounds to inch-pounds.

Subject	*I. Regulations, Maintenance Forms, Records, and Publications*
References	FAA-H-8083-30, 14 CFR, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with regulations, publications, and recordkeeping.
Knowledge	The applicant demonstrates understanding of:
MG.I.I.K1	Privileges and limitations of a mechanic certificate.
MG.I.I.K2	Recent experience requirements and how to re-establish once lost.
MG.I.I.K3	Maintenance record entry for approval for return to service after maintenance and/or alterations.
MG.I.I.K4	Maintenance record entry for approval for return to service after inspection.
MG.I.I.K5	The purpose and use of FAA forms (e.g., FAA Forms 337, 8010-4, 8100-2, 8130-3).
MG.I.I.K6	Maintenance terminology as defined in 14 CFR part 1 (e.g., time in service, maintenance, preventive maintenance, major alteration, major repair, minor alteration minor repair).
MG.I.I.K7	Criteria and responsibility for determining whether a repair or alteration is major or minor.
MG.I.I.K8	The regulatory framework including general subject matter of the relevant parts of 14 CFR relevant to aircraft maintenance and mechanics.
MG.I.I.K9	Agency publications and guidance materials including aircraft specifications, TCDSs, advisory circulars, and Airworthiness Directives (ADs).
MG.I.I.K10	Alternative methods of ADs compliance.
MG.I.I.K11	Manufacturer publications including maintenance manuals, service bulletins, maintenance alerts, and master minimum equipment list.
MG.I.I.K12	FAA databases and resources available including TCDSs and supplemental type certificates.
MG.I.I.K13	Compliance requirements for manufacturer-specified methods, techniques and practices.
MG.I.I.K14	Compliance requirements for manufacturer-specified maintenance and inspection intervals.
MG.I.I.K15	FAA-approved maintenance data including maintenance manuals and other methods, techniques and practices acceptable by the administrator.
MG.I.I.K16	Difference between approved data and acceptable data, and when each is required.
MG.I.I.K17	FAA-approved airworthiness limitations.
MG.I.I.K18	Alert, Caution, and Warning Indications; understand the basic definition of warnings, cautions, and notes that are used in maintenance and operating manuals.
MG.I.I.K19	Inoperative equipment.
MG.I.I.K20	Discrepancy records or placards.
MG.I.I.K21	The use of useable on, or effectivity, codes in parts manuals.
MG.I.I.K22	Determining the serial number effectivity of an item.
MG.I.I.K23	Limitations of a certificate and/or rating.
MG.I.I.K24	Mechanic address change notification procedures.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MG.I.I.R1	Hazards resulting from incomplete or inaccurate documentation.
MG.I.I.R2	Improper use of SDS.
MG.I.I.R3	Complacency during documentation phase of maintenance procedures.
MG.I.I.R4	Failure to adhere to warnings, cautions, or notes as they are used in maintenance and operational manuals.
MG.I.I.R5	Incorrectly determining if a component is applicable to a given aircraft.
Skills	The applicant demonstrates the ability to:
MG.I.I.S1	Complete an FAA Form 337 for a major repair or alteration.
MG.I.I.S2	Examine an FAA Form 337 for accuracy.

Subject	***I. Regulations, Maintenance Forms, Records, and Publications***
MG.I.I.S3	Determine an aircraft's inspection status by reviewing the aircraft's maintenance records.
MG.I.I.S4	Complete an aircraft maintenance record entry for the compliance of a reoccurring AD for a specific airframe, aircraft engine, appliance or propeller.
MG.I.I.S5	Compare an equipment list for an aircraft to equipment installed.
MG.I.I.S6	Locate applicable FAA aircraft specifications and/or FAA TCDS for an aircraft or component.
MG.I.I.S7	Locate aircraft flight control travel limits.
MG.I.I.S8	Determine applicability of an AD.
MG.I.I.S9	Check a Technical Standard Order (TSO) or part manufacturing authorization for the proper markings.
MG.I.I.S10	Use a manufacturer's illustrated parts catalog to locate a specific part number and applicability.
MG.I.I.S11	Locate supplemental type certificates applicable to a specific aircraft.
MG.I.I.S12	Determine the conformity of aircraft instrument range markings and/or placarding.
MG.I.I.S13	Determine approved replacement parts for installation on a given aircraft.
MG.I.I.S14	Determine maximum allowable weight of a specific aircraft.
MG.I.I.S15	Determine whether a given repair or alteration is major or minor.
MG.I.I.S16	Determine applicability of approved data for a major repair.
MG.I.I.S17	Explain the difference between "approved data" (required for major repair/alteration) and "acceptable data" (required for minor repair/alteration).
MG.I.I.S18	Complete a 100-hour inspection aircraft maintenance record entry.

Subject	***J. Physics for Aviation***
References	FAA-H-8083-30, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aviation physics.
Knowledge	The applicant demonstrates understanding of:
MG.I.J.K1	Matter and energy.
MG.I.J.K2	Work, power, force, and motion.
MG.I.J.K3	Simple machines and mechanics.
MG.I.J.K4	Heat and pressure.
MG.I.J.K5	Bernoulli's Principle.
MG.I.J.K6	Newton's Law of Motion.
MG.I.J.K7	Gas law and fluid mechanics.
MG.I.J.K8	Theory of flight (aerodynamics).
MG.I.J.K9	Standard atmosphere and factors affecting atmospheric conditions.
MG.I.J.K10	Primary and secondary aircraft flight controls.
MG.I.J.K11	Additional aerodynamic devices including vortex generators, wing fences, and stall strips.
MG.I.J.K12	Relationship between temperature, density, weight, and volume.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MG.I.J.R1	Changes in aircraft and engine performance due to density altitude.
MG.I.J.R2	Effect a repair can have on a flight surface.
MG.I.J.R3	Improper use of performance/testing data.
MG.I.J.R4	Hazards associated with using incorrect units (e.g., Celsius vs. Fahrenheit).
Skills	The applicant demonstrates the ability to:
MG.I.J.S1	Convert temperature units (e.g., from Celsius to Fahrenheit).
MG.I.J.S2	Determine density altitude.
MG.I.J.S3	Determine pressure altitude.
MG.I.J.S4	Calculate force, area, or pressure in a specific application.
MG.I.J.S5	Demonstrate the mechanical advantage of various types of levers.
MG.I.J.S6	Design an inclined plane on paper, indicating the mechanical advantage.
MG.I.J.S7	Identify changes in pressure and velocity as a fluid passes through a venturi.

Subject	***K. Inspection Concepts and Techniques***
References	FAA-H-8083-30, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft inspections.
Knowledge	The applicant demonstrates understanding of:
MG.I.K.K1	Measuring tools including calipers, micrometers, and gauges.
MG.I.K.K2	Calibration and tool accuracy requirements.
MG.I.K.K3	Nondestructive Testing (NDT) procedures and methods.
MG.I.K.K4	Aircraft inspection programs (e.g., progressive, 100-hour, annual, and other FAA-approved inspections).
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MG.I.K.R1	Failure to demagnetize a component following a magnetic particle inspection.
MG.I.K.R2	Inaccurate use of precision measuring instruments.
MG.I.K.R3	Noncalibrated precision measuring equipment.
MG.I.K.R4	Misuse of inspection techniques.
MG.I.K.R5	Failure to use precautions to prevent damage to aircraft components and/or test equipment when performing tests using an ohmmeter.
Skills	The applicant demonstrates the ability to:
MG.I.K.S1	Use Vernier calipers.
MG.I.K.S2	Use micrometers.
MG.I.K.S3	Use measurement gauges.
MG.I.K.S4	Perform a visual inspection.
MG.I.K.S5	Perform a dye penetrant inspection.
MG.I.K.S6	Inspect aircraft for compliance with an AD.
MG.I.K.S7	Identify NDT methods for composite, surface metal, and subsurface metal defects.
MG.I.K.S8	Perform a tap test on a composite component.

Subject	***L. Human Factors***
References	FAA-H-8083-30, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with human factors.
Knowledge	The applicant demonstrates understanding of:
MG.I.L.K1	Safety culture and organizational factors.
MG.I.L.K2	Human error principles.
MG.I.L.K3	Event investigation.
MG.I.L.K4	Human performance and limitations.
MG.I.L.K5	Physical and social environment.
MG.I.L.K6	Communication/reporting of hazards.
MG.I.L.K7	Teamwork and leadership.
MG.I.L.K8	Professionalism and integrity.
MG.I.L.K9	Shift and task turnover.
MG.I.L.K10	Conditions/preconditions for unsafe acts.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MG.I.L.R1	Failure to report hazards.
MG.I.L.R2	Fatigue management and fitness for duty.
MG.I.L.R3	Non-invasive, condition-monitoring technologies.
Skills	The applicant demonstrates the ability to:
MG.I.L.S1	File a Malfunction or Defect Report.
MG.I.L.S2	Brief a shift turnover for continuity of work.
MG.I.L.S3	Locate information regarding human factors errors.

II. Airframe Structures

Subject	***A. Metallic Structures***
References	FAA-H-8083-31, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft metallic structures.
Knowledge	The applicant demonstrates understanding of:
MA.II.A.K1	Inspection/testing of metal structures.
MA.II.A.K2	Types of sheet metal defects.
MA.II.A.K3	Selection of sheet metal repair materials.
MA.II.A.K4	Layout and forming of sheet metal components.
MA.II.A.K5	Selection of rivets and hardware for a sheet metal repair.
MA.II.A.K6	Heat treatment processes for aluminum.
MA.II.A.K7	Rivet layout.
MA.II.A.K8	Rivet installation methods.
MA.II.A.K9	Maintenance safety practices/precautions for sheet metal repairs or fabrications.
MA.II.A.K10	Flame welding gasses.
MA.II.A.K11	Storage/handling of welding gasses.
MA.II.A.K12	Flame welding practices and techniques.
MA.II.A.K13	Inert-gas welding practices and techniques.
MA.II.A.K14	Purpose and types of shielding gasses.
MA.II.A.K15	Types of steel tubing welding repairs.
MA.II.A.K16	Procedures for weld repairs.
MA.II.A.K17	Soldering preparation, types of solder, and/or flux usage.
MA.II.A.K18	Welding and/or soldering safety practices/precautions.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.II.A.R1	Improper selection of repair materials.
MA.II.A.R2	Failure to utilize maintenance safety practices/precautions for sheet metal structures.
MA.II.A.R3	Inappropriate use of PPE when working with sheet metal structures.
MA.II.A.R4	Failure to observe safety procedures for handling, storage, and use of compressed gas
MA.II.A.R5	Failure to observe safety procedures in the use of electric welding equipment.
Skills	The applicant demonstrates the ability to:
MA.II.A.S1	Install and remove solid rivets.
MA.II.A.S2	Install and remove a blind rivet.
MA.II.A.S3	Determine applicability of sheet metal for a repair in a specific application.
MA.II.A.S4	Select and install special purpose fasteners.
MA.II.A.S5	Design a repair using a Manufacturer's Structural Repair Manual.
MA.II.A.S6	Prepare and install a patch to repair an aircraft or component.
MA.II.A.S7	Make a drawing of a repair including the number of rivets and size of sheet metal required.
MA.II.A.S8	Remove a repair that was installed with rivets.
MA.II.A.S9	Trim and form a piece of sheet metal to fit a prepared area.
MA.II.A.S10	Fabricate an aluminum part in accordance with a drawing.
MA.II.A.S11	Determine a rivet pattern for a specific repair.

Subject	***A. Metallic Structures***
MA.II.A.S12	Countersink rivet holes in sheet metal.
MA.II.A.S13	Perform a repair on a damaged aluminum sheet.
MA.II.A.S14	Determine extent of damage and decide if metallic structure is repairable.
MA.II.A.S15	Inspect and check welds.

Subject	***B. Non-Metallic Structures***
References	FAA-H-8083-31, AC 43-13.1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft non-metallic structures.
Knowledge	The applicant demonstrates understanding of:
MA.II.B.K1	Wood structures inspection techniques, tools, and practices for wood structures.
MA.II.B.K2	Effects of moisture/humidity on wood.
MA.II.B.K3	Types and/or general characteristics of wood used in aircraft structures.
MA.II.B.K4	Permissible substitutes and/or other materials used in the construction and repair of wood structures.
MA.II.B.K5	Acceptable and unacceptable wood defects.
MA.II.B.K6	Wood repair techniques and practices.
MA.II.B.K7	Factors used in determining the proper type covering material.
MA.II.B.K8	Types of approved aircraft covering material.
MA.II.B.K9	Seams commonly used with aircraft covering.
MA.II.B.K10	Covering textile terms.
MA.II.B.K11	Structure surface preparation.
MA.II.B.K12	Covering methods commonly used.
MA.II.B.K13	Covering means of attachment.
MA.II.B.K14	Areas on aircraft covering most susceptible to deterioration.
MA.II.B.K15	Aircraft covering preservation/restoration.
MA.II.B.K16	Inspection of aircraft covering.
MA.II.B.K17	Covering repair techniques and practices.
MA.II.B.K18	Inspection/testing of composite structures.
MA.II.B.K19	Types of composite structure defects.
MA.II.B.K20	Composite structure fiber, core, and/or matrix materials.
MA.II.B.K21	Composite materials storage practices and shelf life.
MA.II.B.K22	Composite structure repair methods, techniques, and practices.
MA.II.B.K23	Thermoplastic material inspection/types of defects.
MA.II.B.K24	Thermoplastic material storage and handling.
MA.II.B.K25	Thermoplastic material installation procedures.
MA.II.B.K26	Care and maintenance of windows.
MA.II.B.K27	Window temporary and/or permanent repairs.
MA.II.B.K28	Maintenance safety practices/precautions for composite materials/structures, and/or windows.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.II.B.R1	Using the wrong type of glue (adhesive) or fasteners for aircraft structure.
MA.II.B.R2	Improper composite structure repairs.
MA.II.B.R3	Exposure to materials used in composite repair.
MA.II.B.R4	Improper storage of composite materials.
MA.II.B.R5	Incorrect measuring and mixing of materials associated with composite construction.
MA.II.B.R6	Use of materials that are not part of an approved repair system.
MA.II.B.R7	Hazards associated with using materials beyond their shelf-life.
Skills	The applicant demonstrates the ability to:
MA.II.B.S1	Identify appropriate fasteners on composite structures.

Subject	***B. Non-Metallic Structures***
MA.II.B.S2	Inspect and repair fiberglass.
MA.II.B.S3	Inspect composite, plastic, or glass-laminated structures.
MA.II.B.S4	Clean and inspect acrylic type windshields.
MA.II.B.S5	Locate and explain procedures for a temporary repair to a side window.
MA.II.B.S6	Identify window enclosure materials.
MA.II.B.S7	Prepare composite surface for painting.
MA.II.B.S8	Perform a tap test on composite material.
MA.II.B.S9	Locate and explain repair standard dimensions.
MA.II.B.S10	Locate and explain repair procedures for elongated boltholes.
MA.II.B.S11	Determine extent of damage and decide if nonmetallic structure is repairable.
MA.II.B.S12	Perform lay up for a repair to a composite panel, including preparation for vacuum bagging, using a Manufacturer's Repair Manual.

Subject	***C. Flight Controls***
References	FAA-H-8083-31, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft assembly and rigging.
Knowledge	The applicant demonstrates understanding of:
MA.II.C.K1	Control cables.
MA.II.C.K2	Control cable maintenance.
MA.II.C.K3	Cable connectors.
MA.II.C.K4	Cable guides.
MA.II.C.K5	Control stops.
MA.II.C.K6	Push pull tubes.
MA.II.C.K7	Torque tubes.
MA.II.C.K8	Bell cranks.
MA.II.C.K9	Flutter and flight control balance.
MA.II.C.K10	Rigging of airplane flight controls.
MA.II.C.K11	Airplane flight controls and/or stabilizer systems.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.II.C.R1	Misuse of and incorrect interpretation of a cable tension chart.
MA.II.C.R2	Improperly rigging aircraft flight controls.
MA.II.C.R3	Improper selection and misuse of lifting equipment used to move aircraft components into place for assembly.
MA.II.C.R4	Failure to maintain a calibration schedule for cable tension meters and other rigging equipment.
MA.II.C.R5	Incorrect use and misinterpretation of cable tensiometers.
Skills	The applicant demonstrates the ability to:
MA.II.C.S1	Identify fixed-wing aircraft rigging adjustment locations.
MA.II.C.S2	Identify control surfaces that provide movement about an aircraft's axes.
MA.II.C.S3	Inspect a primary and secondary flight control surface.
MA.II.C.S4	Remove and/or reinstall a primary flight control surface.
MA.II.C.S5	Inspect primary control cables.
MA.II.C.S6	Adjust and secure a primary flight control cable.
MA.II.C.S7	Adjust push-pull flight control systems.
MA.II.C.S8	Check the balance of a flight control surface.
MA.II.C.S9	Determine allowable axial play limits for a flight control bearing.
MA.II.C.S10	Inspect a trim tab for freeplay, travel, and operation.
MA.II.C.S11	Balance a control surface.

Subject	***D. Airframe Inspection***
References	FAA-H-8083-31, AC 43-13.1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with airframe inspections.
Knowledge	The applicant demonstrates understanding of:
MA.II.D.K1	Inspection requirements under 14 CFR Part 91.
MA.II.D.K2	Maintenance recordkeeping requirements under 14 CFR Part 43.
MA.II.D.K3	Requirements for complying with ADs.
MA.II.D.K4	Compliance with service letters, service bulletins, or instructions for continued airworthiness.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.II.D.R1	Misinterpretation of inspection instructions, which can lead to over or under maintenance being performed.
MA.II.D.R2	Limitations of visual inspection and where its use would not be applicable.
MA.II.D.R3	Failure to observe safety considerations when performing radiographic inspections.
MA.II.D.R4	Improper selection and misuse of checklists and other maintenance publications.
MA.II.D.R5	Incorrect maintenance record documentation.
Skills	The applicant demonstrates the ability to:
MA.II.D.S1	Perform an airframe inspection to include a records check.
MA.II.D.S2	Perform a portion of a 100-hour inspection in accordance with part 43.
MA.II.D.S3	Enter results of a 100-hour inspection in a maintenance record.
MA.II.D.S4	Determine compliance with a specific AD.
MA.II.D.S5	Provide a checklist for conducting a 100-hour inspection.
MA.II.D.S6	Determine if any additional inspections are required during a particular 100-hour inspection; i.e., 300-hour filter replacement.
MA.II.D.S7	*Inspect seat and seatbelt to include TSO markings.*

III. Airframe Systems

Subject	***A. Landing Gear Systems***
References	FAA-H-8083-31, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft landing gear.
Knowledge	The applicant demonstrates understanding of:
MA.III.A.K1	Fixed and retractable landing gear systems.
MA.III.A.K2	Fixed and retractable landing gear components.
MA.III.A.K3	Landing gear strut servicing/lubrication.
MA.III.A.K4	Inspection of bungee and spring steel landing gear systems.
MA.III.A.K5	Steering systems.
MA.III.A.K6	Landing gear position and warning system inspection, check, and servicing.
MA.III.A.K7	Brake assembly inspection.
MA.III.A.K8	Anti-skid system components and operation.
MA.III.A.K9	Wheel, brake, and tire construction.
MA.III.A.K10	Tire storage, care, and/or servicing.
MA.III.A.K11	Landing gear and/or tire and wheel safety.
MA.III.A.K12	Brake actuating systems.
MA.III.A.K.13	Alternative landing gear systems (e.g., skis, floats).
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.III.A.R1	Failure to observe landing gear and/or tire and wheel safety practices/precautions.
MA.III.A.R2	Improper use of aircraft jacks.
MA.III.A.R3	Hazards associated with high pressure fluids and gasses.
MA.III.A.R4	Hazards associated with the storage and handling of hydraulic fluids.
MA.III.A.R5	High-pressure strut or system disassembly.
MA.III.A.R6	Hazards associated with operation of retractable landing gear systems around personnel.
Skills	The applicant demonstrates the ability to:
MA.III.A.S1	Inspect and service landing gear.
MA.III.A.S2	Inspect, check, and service an anti-skid system.
MA.III.A.S3	Locate and explain procedures for checking operation of an anti-skid warning system.
MA.III.A.S4	Locate and explain troubleshooting procedures for an anti-skid system.
MA.III.A.S5	Jack aircraft.
MA.III.A.S6	Troubleshoot a landing gear retraction check.
MA.III.A.S7	Inspect wheels, brakes, bearings, and tires.
MA.III.A.S8	Install brake lining(s) or brake assembly.
MA.III.A.S9	Service landing gear and/or oil shock strut.
MA.III.A.S10	Bleed air from a hydraulic brake system.
MA.III.A.S11	Troubleshoot hydraulic brake systems.
MA.III.A.S12	Remove, inspect, and/or install a wheel brake assembly.
MA.III.A.S13	Inspect a tire for defects.
MA.III.A.S14	Locate tire storage practices.
MA.III.A.S15	Replace air/oil shock strut air valve.
MA.III.A.S16	Troubleshoot an air/oil shock strut.

Subject	***A. Landing Gear Systems***
MA.III.A.S17	Service a nosewheel shimmy damper.
MA.III.A.S18	Inspect nosewheel steering system for proper adjustment.
MA.III.A.S19	Inspect landing gear alignment.
MA.III.A.S20	Replace master brake cylinder packing seals.
MA.III.A.S21	Troubleshoot aircraft steering system.
MA.III.A.S22	Identify landing gear position and warning system components.
MA.III.A.S23	Troubleshoot landing gear position and/or warning systems.
MA.III.A.S24	Inspect and/or repair landing gear position indicating system.
MA.III.A.S25	Adjust the operation of a landing gear warning system.
MA.III.A.S26	Remove, install, and/or adjust a landing gear down-lock switch.
MA.III.A.S27	Inspect a brake for serviceability.
MA.III.A.S28	Troubleshoot nosewheel shimmy.
MA.III.A.S29	Inspect tube landing gear for damage.

Subject	***B. Hydraulic and Pneumatic Systems***
References	FAA-H-8083-31, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft hydraulic and pneumatic power systems.
Knowledge	The applicant demonstrates understanding of:
MA.III.B.K1	Hydraulic system components and fluids.
MA.III.B.K2	Hydraulic system operation.
MA.III.B.K3	Hydraulic system servicing requirements.
MA.III.B.K4	Hydraulic system inspection, check, servicing, and troubleshooting.
MA.III.B.K5	Pneumatic system types and components.
MA.III.B.K6	Pneumatic system servicing requirements.
MA.III.B.K7	Servicing, function, and/or operation of accumulators.
MA.III.B.K8	Types of hydraulic/pneumatic seals and/or fluid/seal compatibility.
MA.III.B.K9	Servicing hydraulic and/or pneumatic systems.
MA.III.B.K10	Pressure regulators and valves.
MA.III.B.K11	Filter maintenance procedures.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.III.B.R1	Incorrectly relieving system pressure prior to system servicing or disassembly.
MA.III.B.R2	Hazards associated with high pressure gasses and fluids.
MA.III.B.R3	Hazards associated with the storage and handling of hydraulic fluids.
MA.III.B.R4	Cross-contamination of hydraulic fluids.
MA.III.B.R5	Incompatibility between hydraulic seals and hydraulic fluids.
Skills	The applicant demonstrates the ability to:
MA.III.B.S1	Identify different types of hydraulic fluids.
MA.III.B.S2	Identify different packing seals.
MA.III.B.S3	Install seals and backup rings in a hydraulic component.
MA.III.B.S4	Remove and install a selector valve.
MA.III.B.S5	Check a pressure regulator and adjust as necessary.
MA.III.B.S6	Remove, clean, inspect, and install a hydraulic system filter.
MA.III.B.S7	Service a hydraulic system accumulator.
MA.III.B.S8	Service a hydraulic system reservoir.
MA.III.B.S9	Remove, install, and/or perform an operational check of a hydraulic pump.
MA.III.B.S10	Troubleshoot hydraulic power system.
MA.III.B.S11	Purge air from a hydraulic system.
MA.III.B.S12	Remove and/or install a system pressure relief valve.
MA.III.B.S13	Inspect a hydraulic power system for leaks.
MA.III.B.S14	Troubleshoot a pneumatic power system leak.
MA.III.B.S15	Service pneumatic brake system air bottles.
MA.III.B.S16	Inspect a pneumatic air bottle for condition and determine service life (hydrostatic testing).
MA.III.B.S17	Adjust a pneumatic power system relief valve.
MA.III.B.S18	Locate and explain hydraulic fluid servicing instructions and identify/select fluid for a given aircraft.
MA.III.B.S19	Locate installation procedures for a seal, backup ring, and/or gasket.
MA.III.B.S20	Locate procedures for checking pneumatic/bleed air overheat warning systems.

Subject	***C. Environmental Systems***
References	FAA-H-8083-31, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft cabin atmosphere control.
Knowledge	The applicant demonstrates understanding of:
MA.III.C.K1	Pressurization systems.
MA.III.C.K2	Bleed air heating.
MA.III.C.K3	Aircraft instrument cooling.
MA.III.C.K4	Exhaust heat exchanger and/or system component(s) function, operation, and/or inspection procedures.
MA.III.C.K5	Combustion heater and/or system component(s) function, operation, and/or inspection procedures.
MA.III.C.K6	Vapor-cycle system and/or system component(s) operation, servicing, and/or inspection procedures.
MA.III.C.K7	Air-cycle system and/or system component(s) operation and/or inspection procedures.
MA.III.C.K8	Cabin pressurization and/or system component(s) operation and/or inspection procedures.
MA.III.C.K9	Types of oxygen systems and/or oxygen system component(s) operation (e.g., chemical generator, pressure cylinder).
MA.III.C.K10	Oxygen system maintenance procedures.
MA.III.C.K.11	Water and waste systems.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.III.C.R1	Hazards associated with oxygen system maintenance.
MA.III.C.R2	Failure to observe environmental precautions for recovery of vapor-cycle refrigerant.
MA.III.C.R3	Failure to observe safety precautions when handling, or performing maintenance on, chemical oxygen generating systems.
MA.III.C.R4	Failure to observe safety precautions associated with the storage, handling, and use of compressed gas cylinder and high-pressure systems.
MA.III.C.R5	Failure to observe manufacturer's recommended servicing procedures, including refrigerant types.
MA.III.C.R6	Hazards associated with maintenance of combustion heaters.
Skills	The applicant demonstrates the ability to:
MA.III.C.S1	Inspect an oxygen system.
MA.III.C.S2	Purge an oxygen system prior to servicing.
MA.III.C.S3	Service an oxygen system.
MA.III.C.S4	Clean and inspect a pilot emergency oxygen mask and supply hoses.
MA.III.C.S5	Inspect an oxygen system pressure regulator.
MA.III.C.S6	Inspect an oxygen system cylinder for serviceability.
MA.III.C.S7	Inspect a chemical oxygen generator for serviceability and safe handling.
MA.III.C.S8	Troubleshoot an ignition system for a combustion heater.
MA.III.C.S9	Locate the procedures for servicing a refrigerant (vapor-cycle) system.
MA.III.C.S10	Inspect a combustion heater fuel system for leaks.
MA.III.C.S11	Locate the troubleshooting procedures for an air-cycle system.
MA.III.C.S12	Locate the servicing procedures and correctly attach service equipment for a vapor-cycle air conditioning system.
MA.III.C.S13	Inspect a cabin heater system equipped with an exhaust heat exchanger for cracks.
MA.III.C.S14	Clean and inspect an outflow valve for a pressurization system.
MA.III.C.S15	Locate troubleshooting procedures for a pressurization system.
MA.III.C.S16	Troubleshoot an air-cycle air conditioning system.

Subject	***D. Aircraft Instrument Systems***
References	14 FR parts 43 and 91, FAA-H-8083-31, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft instruments.
Knowledge	The applicant demonstrates understanding of:
MA.III.D.K1	Annunciator indicating systems and the meaning of warning, caution, and advisory lights.
MA.III.D.K2	Magnetic compass operation.
MA.III.D.K3	Magnetic compass swinging procedures.
MA.III.D.K4	Pressure indicating instruments.
MA.III.D.K5	Temperature indicating instruments.
MA.III.D.K6	Position indication sensors and instruments.
MA.III.D.K7	Gyroscopic instruments.
MA.III.D.K8	Direction indicating instruments.
MA.III.D.K9	Instrument pneumatic systems.
MA.III.D.K10	Pitot static system.
MA.III.D.K11	Fuel quantity indicating systems.
MA.III.D.K12	Instrument range markings.
MA.III.D.K13	Electronic displays.
MA.III.D.K14	Electrostatic sensitive devices.
MA.III.D.K15	Built in test equipment.
MA.III.D.K16	Electronic flight instrument system.
MA.III.D.K17	Engine indication and crew alerting system.
MA.III.D.K18	Heads-up guidance system.
MA.III.D.K19	14 CFR parts 43 and/or 91 requirements for static system leak checks.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.III.D.R1	Misuse of pressurized air and/or water during maintenance or cleaning of aircraft instrument systems.
MA.III.D.R2	Inappropriate or no action in response to a reported intermittent warning or caution annunciator light illumination.
MA.III.D.R3	Failure to observe safety precautions when performing maintenance on equipment identified as electrostatic sensitive.
MA.III.D.R4	Mishandling of mechanical gyros or instruments containing mechanical gyros.
MA.III.D.R5	Failure to observe precautions when performing pitot/static systems test to prevent instrument damage.
Skills	The applicant demonstrates the ability to:
MA.III.D.S1	Perform a static system leak test.
MA.III.D.S2	Remove and install an instrument.
MA.III.D.S3	Install range marks on an instrument glass.
MA.III.D.S4	Determine barometric pressure using an altimeter.
MA.III.D.S5	Check for proper range markings on an instrument.
MA.III.D.S6	Inspect a magnetic compass.
MA.III.D.S7	Locate the procedures for troubleshooting a vacuum operated instrument system.
MA.III.D.S8	Select proper altimeter for installation on a given aircraft.
MA.III.D.S9	Identify exhaust gas temperature system components.
MA.III.D.S10	Inspect a vacuum system filter for serviceability.
MA.III.D.S11	Adjust gyro/instrument air pressure/vacuum.

Subject	***D. Aircraft Instrument Systems***
MA.III.D.S12	Inspect an aircraft's alternate air (static) source.
MA.III.D.S13	Locate the adjustment procedures for a stall warning system.
MA.III.D.S14	Inspect outside air temperature gauge for condition and operation.

Subject	***E. Communication and Navigation Systems***
References	14 CFR part 91, FAA-H-8083-31, AC 43.13-1, AC 43.13-2
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft communication and navigation systems.
Knowledge	The applicant demonstrates understanding of:
MA.III.E.K1	Radio operating principles.
MA.III.E.K2	Radio components.
MA.III.E.K3	Antenna identification and inspection and mounting requirements.
MA.III.E.K4	Interphone and intercom systems.
MA.III.E.K5	Very High Frequency (VHF), High Frequency (HF), and SATCOM systems.
MA.III.E.K6	Aircraft Communication Addressing and Reporting System (ACARS) theory, components, and operation.
MA.III.E.K7	Emergency Locator Transmitter (ELT).
MA.III.E.K8	Automatic Direction Finder (ADF).
MA.III.E.K9	VHF omnidirectional radio range (VOR) theory, components, and operation.
MA.III.E.K10	Distance Measuring Equipment (DME) theory, components, and operation.
MA.III.E.K11	Instrument Landing System (ILS) theory, components, and operation.
MA.III.E.K12	Global Positioning System (GPS) theory, components, and operation.
MA.III.E.K13	Traffic Collision Avoidance System (TCAS), theory, components, and operation.
MA.III.E.K14	Weather radar.
MA.III.E.K15	Ground Proximity Warning Systems (GPWS) theory, components, and operation.
MA.III.E.K16	Auto-pilot theory, components, and operation.
MA.III.E.17	Auto-throttle theory, components, and operation.
MA.III.E.K18	Stability augmentation.
MA.III.E.K19	Antennas and antenna inspection requirements.
MA.III.E.K20	Automatic Dependent Surveillance Broadcast (ADS-B) theory, components, and operation.
MA.III.E.K21	Radio Altimeter (RA) theory, components, and operation.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.III.E.R1	Failure to use caution when testing ELT systems.
MA.III.E.R2	Failure to use precautions when performing maintenance on high power/high frequency systems (e.g., weather radar and SATCOM).
MA.III.E.R3	Improper wire harness routing and interference consequences.
MA.III.E.R4	Failure to consider safety and interference when mounting antennas.
MA.III.E.R5	Hazards associated with electro-static discharge.
MA.III.E.R6	Hazards associated with working around live electrical systems.
Skills	The applicant demonstrates the ability to:
MA.III.E.S1	Locate and explain return-to-service instructions for an autopilot system.
MA.III.E.S2	Locate and explain autopilot inspection procedures.
MA.III.E.S3	List autopilot major components.
MA.III.E.S4	Locate and identify navigation and/or communication antennas.
MA.III.E.S5	Check VHF communications for operation.
MA.III.E.S6	Inspect a coaxial cable installation for security.
MA.III.E.S7	Check an emergency locator transmitter for operation.
MA.III.E.S8	Inspect ELT batteries for expiration date and locate proper testing procedures.

Subject	***E. Communication and Navigation Systems***
MA.III.E.S9	Inspect electronic equipment mounting base for security and condition.
MA.III.E.S10	Inspect electronic equipment shock mount bonding jumpers for resistance.
MA.III.E.S11	Inspect static discharge wicks for security and/or resistance.
MA.III.E.S12	Inspect a radio installation for security.
MA.III.E.S13	Locate and explain the installation procedures for antennas including mounting and coaxial connections.
MA.III.E.S14	Make a list of required placards for communication and navigation avionic equipment.
MA.III.E.S15	Locate and explain the adjustment procedures for a stall warning system.

Subject	***F. Aircraft Fuel Systems***
References	FAA-H-8083-31, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft fuel.
Knowledge	The applicant demonstrates understanding of:
MA.III.F.K1	Fuel system types.
MA.III.F.K2	Fuel system components including filters and selector valves.
MA.III.F.K3	Aircraft fuel tanks/cells
MA.III.F.K4	Fuel flow.
MA.III.F.K5	Fuel transfer and defueling.
MA.III.F.K6	Fuel jettisoning/dump systems.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.III.F.R1	Hazards associated with fuel system maintenance.
MA.III.F.R2	Fuel system contamination.
MA.III.F.R3	Hazards associated with fuel spills.
MA.III.F.R4	Hazards associated with performing fuel system maintenance requiring fuel tank entry.
MA.III.F.R5	Failure to observe proper safety procedures when defueling aircraft.
Skills	The applicant demonstrates the ability to:
MA.III.F.S1	Inspect, check, troubleshoot, or repair a fuel system.
MA.III.F.S2	Inspect a metal fuel tank.
MA.III.F.S3	Inspect a bladder fuel tank.
MA.III.F.S4	Inspect an integral fuel tank.
MA.III.F.S5	Check manually operated fuel valves for proper operation and/or leaks.
MA.III.F.S6	Troubleshoot a fuel valve problem.
MA.III.F.S7	Drain fuel system sump(s).
MA.III.F.S8	Service a fuel system strainer.
MA.III.F.S9	Inspect a fuel quantity indicating system.
MA.III.F.S10	Locate fuel system operating instructions.
MA.III.F.S11	Locate fuel system inspection procedures.
MA.III.F.S12	Locate fuel system crossfeed procedures.
MA.III.F.S13	Locate fuel system required placards.
MA.III.F.S14	Locate fuel system defueling procedures.
MA.III.F.S15	Troubleshoot fuel pressure warning system.
MA.III.F.S16	Locate troubleshooting procedures for fuel temperature systems.
MA.III.F.S17	Remove and/or install a fuel quantity transmitter.
MA.III.F.S18	Troubleshoot fuel quantity indicating system.
MA.III.F.S19	Troubleshoot aircraft fuel systems.
MA.III.F.S21	Inspect a fuel selector valve.

Subject	***G. Aircraft Electrical Systems***
References	FAA-H-8083-31, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft electrical systems.
Knowledge	The applicant demonstrates understanding of:
MA.III.G.K1	Generators, DC generation systems, and DC power distribution systems.
MA.III.G.K2	Alternators, AC generation systems, and AC power distribution systems.
MA.III.G.K3	Starter generators.
MA.III.G.K4	Constant Speed Drive (CSD) and Integrated Drive Generator (IDG) systems and components.
MA.III.G.K5	Voltage regulators and overvolt and overcurrent protection.
MA.III.G.K6	Inverter systems.
MA.III.G.K7	Aircraft wiring sizes, types, and selection.
MA.III.G.K8	Derating factors in switch selection.
MA.III.G.K9	Aircraft wiring shielding.
MA.III.G.K10	Aircraft lightning protection.
MA.III.G.K11	Aircraft bonding.
MA.III.G.K12	Aircraft lighting systems.
MA.III.G.K13	Electrical system troubleshooting.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.III.G.R1	Failure to use caution when testing/troubleshooting electrical systems or components.
MA.III.G.R2	Hazards associated with connecting or disconnecting external power.
MA.III.G.R3	Hazards associated with performing maintenance on energized circuits/systems.
MA.III.G.R4	Failure to use caution when performing maintenance in areas containing aircraft wiring.
MA.III.G.R5	Improperly routing and securing wires and wire bundles.
MA.III.G.R6	Failure to use the correct size wire in an electrical circuit.
MA.III.G.R7	Hazards created by incorrect selection or installation of wire terminals.
MA.III.G.R8	Hazards associated with soldering.
Skills	The applicant demonstrates the ability to:
MA.III.G.S1	Inspect aircraft wiring to verify installation and routing.
MA.III.G.S2	Perform wire terminating and splicing.
MA.III.G.S3	Assemble an aircraft electrical connector.
MA.III.G.S4	Use a wiring circuit diagram to identify components.
MA.III.G.S5	Solder aircraft wiring.
MA.III.G.S6	Troubleshoot an airframe electrical circuit.
MA.III.G.S7	Install airframe electrical wiring, switches, or protective devices.
MA.III.G.S8	Secure wire bundles.
MA.III.G.S9	Determine an electrical load in a given aircraft system.
MA.III.G.S10	Install bonding jumpers.
MA.III.G.S11	Check output voltage of a DC generator.
MA.III.G.S12	Check the resistance of an electrical system component.
MA.III.G.S13	Inspect generator brush serviceability and brush spring tension.
MA.III.G.S14	Inspect and check anti-collision, position, and/or landing lights for proper operation.
MA.III.G.S15	Inspect components in an electrical system.
MA.III.G.S16	Troubleshoot a DC electrical system supplied by an AC electrical system.

Subject	***G. Aircraft Electrical Systems***
MA.III.G.S17	Identify components in an electrical schematic where AC is rectified to a DC voltage.
MA.III.G.S18	Perform a continuity test to verify the condition of a conductor.
MA.III.G.S19	Perform a test on a conductor for a short to ground.
MA.III.G.S20	Perform a test on a conductor for a short to other conductors.
MA.III.G.S21	Troubleshoot an electric fault.

Subject	***H. Ice and Rain Control Systems***
References	FAA-H-8083-31, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft ice and rain control systems.
Knowledge	The applicant demonstrates understanding of:
MA.III.H.K1	Aircraft icing causes/effects.
MA.III.H.K2	Ice detection systems.
MA.III.H.K3	Anti-ice systems and components.
MA.III.H.K4	De-ice systems and components.
MA.III.H.K5	Wiper blade, chemical, and pneumatic bleed air rain control systems.
MA.III.H.K6	Anti-icing and de-icing system maintenance.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.III.H.R1	Hazards associated with system testing or maintenance.
MA.III.H.R2	Improper storage and handling of deicing fluids.
MA.III.H.R3	Improper selection and/or misuse of appropriate cleaning materials for heated windshields.
Skills	The applicant demonstrates the ability to:
MA.III.H.S1	Inspect and operationally check pitot-static anti-ice system.
MA.III.H.S2	Inspect and/or operationally check deicer boot.
MA.III.H.S3	Clean a pneumatic deicer boot.
MA.III.H.S4	Troubleshoot an electrically-heated pitot system.
MA.III.H.S5	Inspect thermal anti-ice systems.
MA.III.H.S6	Inspect and operationally check an electrically-heated windshield.
MA.III.H.S7	Inspect an electrically-operated windshield wiper system.
MA.III.H.S8	Replace blades on a windshield wiper system.
MA.III.H.S9	Inspect a pneumatic rain removal system.
MA.III.H.S10	Inspect a chemical rain repellent system.
MA.III.H.S11	Locate procedures for application of chemical rain protection of a windscreen.

Subject	***I. Airframe Fire Protection Systems***
References	FAA-H-8083-31, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft overheat and fire detection, protection, and suppression systems.
Knowledge	The applicant demonstrates understanding of:
MA.III.I.K1	Types of fires and aircraft fire zones.
MA.III.I.K2	Overheat and fire detection and warning systems.
MA.III.I.K3	Overheat and fire detection system maintenance and inspection.
MA.III.I.K4	Smoke and carbon monoxide detection systems.
MA.III.I.K5	Fire extinguishing agents.
MA.III.I.K6	Types of fire extinguishing systems.
MA.III.I.K7	Fire extinguishing system maintenance and inspection requirements.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.III.I.R1	Failure to use precautions when performing maintenance on circuits associated with fire bottle squibs.
MA.III.I.R2	Inappropriate use of PPEs when working on or testing fire extinguishing systems.
MA.III.I.R3	Hazards associated with fire extinguishing agents.
Skills	The applicant demonstrates the ability to:
MA.III.I.S1	Troubleshoot an aircraft fire detection or extinguishing system.
MA.III.I.S2	Determine proper container pressure for an installed fire extinguisher system.
MA.III.I.S3	Identify maintenance procedures for fire detection and/or extinguishing system(s) and/or system component(s).
MA.III.I.S4	Inspect a smoke and/or toxic gas detection system.
MA.III.I.S5	Inspect a carbon monoxide detector.
MA.III.I.S6	Locate the procedures for checking a smoke detection system.
MA.III.I.S7	Locate the procedures for inspecting an overheat detection system.
MA.III.I.S8	Inspect fire protection system cylinders and check for hydrostatic test date.
MA.III.I.S9	Inspect fire detection/protection system.
MA.III.I.S10	Perform operational check of an optical flame detector.
MA.III.I.S11	Inspect fire extinguishing agent bottle discharge cartridge.
MA.III.I.S12	Inspect a continuous-loop type fire detection system.

Subject	***J. Rotorcraft Fundamentals***
References	FAA-H-8083-31, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with rotorcraft systems.
Knowledge	The applicant demonstrates understanding of:
MA.III.J.K1	Rotorcraft aerodynamics.
MA.III.J.K2	Flight controls.
MA.III.J.K3	Transmissions.
MA.III.J.K4	Rigging requirements for rotary wing aircraft.
MA.III.J.K5	Design, type, and operation of rotor systems.
MA.III.J.K6	Helicopter skid shoe and tube inspection.
MA.III.J.K7	Rotor blade functions and construction.
MA.III.J.K8	Rotor vibrations, track, and balance.
MA.III.J.K9	Drive system vibrations and inspection.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MA.III.J.R1	Dangers of working around helicopter blades during ground operations.
MA.III.J.R2	Hazards associated with ground-handling procedures.
MA.III.J.R3	Improper procedures during ground operations and functional tests.
MA.III.J.R4	Improper maintenance and inspection of rotorcraft systems and components.
Skills	The applicant demonstrates the ability to:
MA.III.J.S1	Locate components of a helicopter rotor system.
MA.III.J.S2	Locate helicopter rotor blade track and balance procedures.
MA.II.J.S3	Locate and explain procedures needed to rig helicopter controls.
MA.II.J.S4	Locate and explain procedures to track and balance a rotor system.

IV. Powerplant Theory and Maintenance

Subject	***A. Reciprocating Engines***
References	14 CFR part 43, FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft reciprocating engines.
Knowledge	The applicant demonstrates understanding of:
MP.IV.A.K1	Types of reciprocating engines.
MP.IV.A.K2	Reciprocating engine operating principles/theory of operation.
MP.IV.A.K3	Internal combustion engine operating principles/theory of operation.
MP.IV.A.K4	Horizontally-opposed engine construction and internal components.
MP.IV.A.K5	Radial engine construction and internal components.
MP.IV.A.K6	Storage and preservation.
MP.IV.A.K7	Reciprocating engine performance (e.g., PLANK, SFC).
MP.IV.A.K8	Reciprocating engine maintenance and inspection.
MP.IV.A.K9	Reciprocating engine ground operations.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.IV.A.R1	Hazards associated with performing maintenance, which requires moving the propeller.
MP.IV.A.R2	Failure to observe safety considerations in preparation and ground operation of a reciprocating engine.
MP.IV.A.R3	Failure to take appropriate actions in the event of a reciprocating engine fire.
MP.IV.A.R4	Failure to observe manufacturer's procedures during maintenance.
Skills	The applicant demonstrates the ability to:
MP.IV.A.S1	Perform a cylinder assembly inspection.
MP.IV.A.S2	Operate and troubleshoot reciprocating engine.
MP.IV.A.S3	Install piston and/or knuckle pin(s).
MP.IV.A.S4	Identify the parts of a cylinder.
MP.IV.A.S5	Identify the parts of a crankshaft.
MP.IV.A.S6	Identify and inspect various types of bearings.
MP.IV.A.S7	Inspect and/or rig cable and push-pull engine controls.
MP.IV.A.S8	Inspect engine mounts.
MP.IV.A.S9	Demonstrate engine starting procedures.
MP.IV.A.S10	Locate top dead-center position of number one cylinder.
MP.IV.A.S11	Perform cylinder compression test.

Subject	***B. Turbine Engines***
References	14 CFR part 43, FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft turbine engines.
Knowledge	The applicant demonstrates understanding of:
MP.IV.B.K1	Turbine engine operating principles/theory of operation.
MP.IV.B.K2	Types of turbine engines.
MP.IV.B.K3	Turbine engine construction and internal components.
MP.IV.B.K4	Turbine engine performance and monitoring.
MP.IV.B.K5	Turbine engine troubleshooting procedures.
MP.IV.B.K6	Procedures required after the installation of a turbine engine.
MP.IV.B.K7	Causes for turbine engine performance loss.
MP.IV.B.K8	Bleed air systems.
MP.IV.B.K9	Storage and preservation.
MP.IV.B.K10	Auxiliary power unit(s).
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.IV.B.R1	Hazards associated with operation of a turbine engine.
MP.IV.B.R2	Failure to use precautions when performing maintenance on a turbine engine.
MP.IV.B.R3	Failure to take appropriate actions in the event of a turbine engine fire.
MP.IV.B.R4	Failure to use precautions to prevent foreign object damage.
Skills	The applicant demonstrates the ability to:
MP.IV.B.S1	Identify different turbine compressors.
MP.IV.B.S2	Identify different types of turbine engine blades.
MP.IV.B.S3	Identify components of turbine engines.
MP.IV.B.S4	Map airflow direction and pressure changes in turbine engines.
MP.IV.B.S5	Remove and install a fuel nozzle in a turbine engine.
MP.IV.B.S6	Inspect a combustion liner.
MP.IV.B.S7	Locate the procedures for the adjustment of a fuel control unit.
MP.IV.B.S8	Perform turbine engine inlet guide vane and compressor blade inspection.
MP.IV.B.S9	Locate the installation or removal procedures for a turbine engine.
MP.IV.B.S10	Locate the procedures for trimming a turbine engine.
MP.IV.B.S11	Identify damaged turbine engine blades.
MP.IV.B.S12	Identify causes for turbine engine performance loss.
MP.IV.B.S13	Inspect the first two stages of a turbine fan or compressor for foreign object damage.

Subject	***C. Engine Inspection***
References	14 CFR part 43, FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft engine inspections.
Knowledge	The applicant demonstrates understanding of:
MP.IV.C.K1	Inspection requirements under 14 CFR Part 91.
MP.IV.C.K2	Identification of life limited parts and their replacement interval.
MP.IV.C.K3	Special inspections.
MP.IV.C.K4	Use of FAA-approved data.
MP.IV.C.K5	Compliance with service letters, service bulletins, or instructions for continued airworthiness, or Airworthiness Directives.
MP.IV.C.K6	Maintenance recordkeeping requirements under 14 CFR Part 43.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.IV.C.R1	Failure to observe safety precautions when performing a compression test on a reciprocating engine.
MP.IV.C.R2	Hazards associated with performing maintenance on an operating reciprocating engine.
MP.IV.C.R3	Hazards associated with performing maintenance on an operating turbine engine.
Skills	The applicant demonstrates the ability to:
MP.IV.C.S1	Perform a compression check on a cylinder.
MP.IV.C.S2	Evaluate powerplant for compliance with FAA-approved data.
MP.IV.C.S3	Perform a powerplant records inspection.
MP.IV.C.S4	Inspect for compliance with applicable ADs.
MP.IV.C.S5	Determine engine installation eligibility.
MP.IV.C.S6	Determine compliance with engine specifications or TCDS or engine listings.
MP.IV.C.S7	Perform a portion of a required inspection on an engine.
MP.IV.C.S8	Check engine controls for proper operation and adjustment.
MP.IV.C.S9	Inspect an engine for leaks after performing maintenance.
MP.IV.C.S10	Inspect an aircraft engine accessory for serviceability.
MP.IV.C.S11	Inspect engine records for time or cycles on life-limited parts.
MP.IV.C.S.12	Perform a 100-hour inspection on a propeller.
MP.IV.C.S.13	Perform a portion of a 100-hour inspection on an engine in accordance with Part 43.

V. Powerplant Systems and Components

Subject	***A. Engine Instrument Systems***
References	FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft engine instruments.
Knowledge	The applicant demonstrates understanding of:
MP.V.A.K1	Fuel flow.
MP.V.A.K2	Temperature (e.g. exhaust gas, oil, oil cylinder head, turbine inlet).
MP.V.A.K3	Speed indicating systems.
MP.V.A.K4	Pressure (e.g., air, fuel, manifold, oil).
MP.V.A.K5	Position indicating.
MP.V.A.K6	Torque meters.
MP.V.A.K7	Engine pressure ratio (EPR).
MP.V.A.K8	Engine indicating and crew alerting.
MP.V.A.K9	Digital engine control module (e.g., Full Authority Digital Engine Controls (FADEC)).
MP.V.A.K10	Electronic centralized aircraft monitoring.
MP.V.A.K11	Engine instrument range markings.
MP.V.A.K12	Annunciator indicating systems (e.g., warning, caution, and advisory lights).
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.V.A.R1	Failure to avoid damage to the instrument or indicating system.
MP.V.A.R2	Improperly-calibrated or erroneous engine instruments.
Skills	The applicant demonstrates the ability to:
MP.V.A.S1	Troubleshoot an engine oil temperature instrument system.
MP.V.A.S2	Troubleshoot a low fuel pressure indicating system.
MP.V.A.S3	Remove, inspect, and/or install a fuel-flow transmitter.
MP.V.A.S4	Remove, inspect, and/or install fuel flow gauge.
MP.V.A.S5	Identify components of an electric tachometer system.
MP.V.A.S6	Check fuel flow transmitter power supply.
MP.V.A.S7	Inspect tachometer markings for accuracy.
MP.V.A.S8	Perform resistance measurements of thermocouple indication system.
MP.V.A.S9	Remove, inspect, and/or install turbine engine Exhaust Gas Temperature (EGT) component.
MP.V.A.S10	Locate procedures for troubleshooting a turbine EPR system.
MP.V.A.S11	Troubleshoot a tachometer system.
MP.V.A.S12	Replace a cylinder head temperature thermocouple.
MP.V.A.S13	Inspect EGT probes.
MP.V.A.S14	Locate and inspect engine low fuel pressure warning system components.
MP.V.A.S15	Check aircraft engine manifold pressure gauge for proper operation.
MP.V.A.S16	Inspect a manifold pressure system.
MP.V.A.S17	Repair a low oil pressure warning system.
MP.V.A.S18	Troubleshoot an EGT indicating system.
MP.V.A.S19	Inspect an oil temperature probe.

Subject	***B. Engine Fire Protection Systems***
References	FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft engine fire detection and protection systems.
Knowledge	The applicant demonstrates understanding of:
MP.V.B.K1	Types of fires and engine fire zones.
MP.V.B.K2	Fire detection warning system operation.
MP.V.B.K3	Fire detection system maintenance and inspection requirements.
MP.V.B.K4	Fire extinguishing agents, types of systems, and operation.
MP.V.B.K5	Fire extinguishing system maintenance and inspection.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.V.B.R1	Failure to observe safety considerations when working with container discharge cartridges.
MP.V.B.R2	Hazards associated with extinguishing agents.
MP.V.B.R3	Failure to observe precautions when performing maintenance on circuits associated with electrically-activated container discharge cartridges (squibs).
Skills	The applicant demonstrates the ability to:
MP.V.B.S1	Troubleshoot and repair an engine fire detection system.
MP.V.B.S2	Identify fire detection sensing units.
MP.V.B.S3	Inspect fire detection continuous loop system.
MP.V.B.S4	Inspect fire detection thermal switch or thermocouple system.
MP.V.B.S5	Locate troubleshooting procedures for a fire detection system.
MP.V.B.S6	Inspect engine fire extinguisher system blowout plugs.
MP.V.B.S7	Inspect a turbine engine fire extinguisher container.
MP.V.B.S8	Inspect fire extinguisher discharge circuit.
MP.V.B.S9	Troubleshoot and repair a fire extinguishing system.
MP.V.B.S10	Inspect a fire extinguisher container discharge cartridge (squib).
MP.V.B.S11	Inspect fire extinguisher container and determine hydrostatic test requirements.
MP.V.B.S12	Inspect flame detectors for operation.
MP.V.B.S13	Check operation of fire warning press-to-test and troubleshoot faults.
MP.V.B.S14	Identify continuous-loop fire detection system components.

Subject	***C. Engine Electrical Systems***
References	FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft engine electrical systems.
Knowledge	The applicant demonstrates understanding of:
MP.V.C.K1	Generators.
MP.V.C.K2	Alternators.
MP.V.C.K3	Starter generators.
MP.V.C.K4	Voltage regulators and overvoltage and overcurrent protection.
MP.V.C.K5	DC generation systems.
MP.V.C.K6	AC generation systems.
MP.V.C.K7	The procedure for locating the correct electrical cable/wire size needed to fabricate a cable/wire.
MP.V.C.K8	The purpose and procedure for paralleling a dual-generator electrical system.
MP.V.C.K9	CSD and IDG systems and components.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.V.C.R1	Failure to observe proper polarity when performing electrical system maintenance.
MP.V.C.R2	Inappropriate actions in response to a warning or caution annunciator light.
MP.V.C.R3	Failure to observe safety precautions when performing maintenance on energized aircraft circuits/systems.
MP.V.C.R4	Failure to observe safety concerns with routing and security of wiring near flammable fluid lines.
Skills	The applicant demonstrates the ability to:
MP.V.C.S1	Inspect engine electrical wiring, switches, and protective devices.
MP.V.C.S2	Determine suitability of a replacement component by part number.
MP.V.C.S3	Replace an engine-driven generator or alternator.
MP.V.C.S4	Inspect an engine-driven generator or alternator in accordance with manufacturer's instructions.
MP.V.C.S5	Troubleshoot an aircraft electrical generating system.
MP.V.C.S6	Remove and/or install an engine direct-drive electric starter.
MP.V.C.S7	Troubleshoot a direct-drive electric starter system.
MP.V.C.S8	Inspect an electrical system cable.
MP.V.C.S9	Determine wire size for engine electrical system.
MP.V.C.S10	Repair a broken engine electrical system wire.
MP.V.C.S11	Replace a wire bundle lacing.
MP.V.C.S12	Troubleshoot an electrical system using a schematic or wiring diagram.
MP.V.C.S13	Fabricate a bonding jumper.
MP.V.C.S14	Inspect a turbine engine starter generator.
MP.V.C.S15	Inspect engine electrical connectors.

Subject	***D. Lubrication Systems***
References	FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft lubrication systems.
Knowledge	The applicant demonstrates understanding of:
MP.V.D.K1	Types, grades, and uses of engine oil.
MP.V.D.K2	Lubrication system operation and components.
MP.V.D.K3	Wet-sump system.
MP.V.D.K4	Dry-sump system.
MP.V.D.K5	Chip detectors.
MP.V.D.K6	Servicing of engine lubricating systems.
MP.V.D.K7	Excessive aircraft engine oil consumption.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.V.D.R1	Improper use or mixing of engine oils.
MP.V.D.R2	Failure to follow manufacturer's recommendations regarding the use of engine lubricants.
MP.V.D.R3	Improper handling, storage, and disposal of used lubricating oil.
Skills	The applicant demonstrates the ability to:
MP.V.D.S1	Inspect an oil cooler.
MP.V.D.S2	Determine the correct type of oil for a specific engine.
MP.V.D.S3	Identify turbine engine oil filter bypass indicator.
MP.V.D.S4	Determine approved oils for different climatic temperatures.
MP.V.D.S5	Locate procedures for obtaining oil samples.
MP.V.D.S6	Inspect an oil filter or screen.
MP.V.D.S7	Perform oil pressure adjustment.
MP.V.D.S8	Identify oil system components.
MP.V.D.S9	Replace an oil system component.
MP.V.D.S10	Identify oil system flow.
MP.V.D.S11	Troubleshoot an engine oil pressure malfunction.
MP.V.D.S12	Troubleshoot an engine oil temperature system.
MP.V.D.S13	Identify types of metal found in an oil filter.
MP.V.D.S14	Remove and inspect an engine chip detector.

Subject	***E. Ignition and Starting Systems***
References	FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft ignition and starting systems.
Knowledge	The applicant demonstrates understanding of:
MP.V.E.K1	Ignition system theory.
MP.V.E.K2	Spark plug theory.
MP.V.E.K3	Shower of sparks and impulse coupling.
MP.V.E.K4	Three electrical circuits of a magneto system.
MP.V.E.K5	Solid-state ignition systems.
MP.V.E.K6	Digital engine control module (e.g., FADEC).
MP.V.E.K7	Engine starters.
MP.V.E.K8	Magneto system components and operation.
MP.V.E.K9	Turbine engine ignition systems.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.V.E.R1	Hazards associated with advanced and retarded ignition timing (piston engine).
MP.V.E.R2	Failure to observe precautions when performing maintenance on engines with capacitor discharge ignition systems.
MP.V.E.R3	Failure to observe safety precautions when working around reciprocating engines with an ungrounded magneto.
Skills	The applicant demonstrates the ability to:
MP.V.E.S1	Set magneto internal timing.
MP.V.E.S2	Time magneto to engine.
MP.V.E.S3	Remove, clean, and install spark plug.
MP.V.E.S4	Troubleshoot and repair an ignition system.
MP.V.E.S5	Inspect an electrical starting system.
MP.V.E.S6	Inspect magneto breaker points.
MP.V.E.S7	Inspect an ignition harness.
MP.V.E.S8	Inspect a magneto impulse coupling.
MP.V.E.S9	Troubleshoot an electrical starting system.
MP.V.E.S10	Troubleshoot ignition switch circuit.
MP.V.E.S11	Inspect and check gap of spark plugs.
MP.V.E.S12	Identify the correct spark plugs used for replacement installation.
MP.V.E.S13	Troubleshoot a turbine or reciprocating engine ignition system.
MP.V.E.S14	Identify the correct igniter plug and replace turbine engine igniter plugs.
MP.V.E.S15	Troubleshoot turbine engine igniters.
MP.V.E.S16	Inspect turbine engine ignition system.
MP.V.E.S17	Inspect igniters.

Subject	***F. Fuel Metering Systems***
References	FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft fuel metering systems.
Knowledge	The applicant demonstrates understanding of:
MP.V.F.K1	Fuel/air ratio and fuel metering.
MP.V.F.K2	Float carburetor theory, components, operation, and adjustments.
MP.V.F.K3	Pressure carburetor theory, operation, and adjustments.
MP.V.F.K4	Continuous flow fuel injection theory, components, operation, troubleshooting and adjustment.
MP.V.F.K5	Digital engine control module (e.g., FADEC).
MP.V.F.K6	Hydromechanical fuel control system design and components.
MP.V.F.K7	Fuel nozzles and manifolds design, operation, and maintenance.
MP.V.F.K8	Components of a turbine engine fuel metering system.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.V.F.R1	Failure to consider safety precautions when adjusting a turbine engine fuel control.
MP.V.F.R2	Failure to consider safety precautions when adjusting reciprocating engine fuel control systems.
MP.V.F.R4	Improper handling of fuel metering system components that may contain fuel.
Skills	The applicant demonstrates the ability to:
MP.V.F.S1	Inspect, troubleshoot, and/or repair a continuous flow fuel injection system.
MP.V.F.S2	Remove, inspect, and install a turbine engine fuel nozzle.
MP.V.F.S3	Identify carburetor components.
MP.V.F.S4	Identify fuel and air flow through a float-type carburetor.
MP.V.F.S5	Remove and/or install a carburetor main metering jet.
MP.V.F.S6	Inspect a carburetor fuel inlet screen.
MP.V.F.S7	Adjust a continuous flow fuel injection system.
MP.V.F.S8	Inspect the needle, seat, and float level on a float-type carburetor.
MP.V.F.S9	Remove and/or install a float-type carburetor.
MP.V.F.S10	Adjust carburetor idle speed and/or mixture.
MP.V.F.S11	Locate procedures for a turbine engine Revolutions Per Minute (RPM) overspeed inspection.
MP.V.F.S12	Inspect fuel metering cockpit controls for proper adjustment.
MP.V.F.S13	Locate procedures for adjusting a hydromechanical fuel control unit.
MP.V.F.S14	Remove and/or install a turbine engine fuel control unit.

Subject	*G. Engine Fuel Systems*
References	FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft engine fuel systems.
Knowledge	The applicant demonstrates understanding of:
MP.V.G.K1	Inspection requirements for an engine fuel system.
MP.V.G.K2	Fuel system operation.
MP.V.G.K3	Fuel heaters.
MP.V.G.K4	Fuel lines.
MP.V.G.K5	Fuel pumps.
MP.V.G.K6	Fuel valves.
MP.V.G.K7	Fuel filters.
MP.V.G.K8	Engine fuel drains.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.V.G.R1	Failure to observe safety considerations during fuel system maintenance.
MP.V.G.R2	Improper handling of engine fuel control units that may contain fuel.
Skills	The applicant demonstrates the ability to:
MP.V.G.S1	Identify components of an engine fuel system.
MP.V.G.S2	Remove and/or install an engine-driven fuel pump.
MP.V.G.S3	Inspect a remotely operated fuel valve for proper operation.
MP.V.G.S4	Rig a remotely operated fuel valve.
MP.V.G.S5	Inspect a main fuel filter assembly for leaks.
MP.V.G.S6	Inspect fuel boost pump.
MP.V.G.S7	Locate and identify a turbine engine fuel heater.
MP.V.G.S8	Inspect fuel pressure warning light function.
MP.V.G.S9	Adjust fuel pump fuel pressure.
MP.V.G.S10	Inspect engine fuel system fluid lines and/or components.
MP.V.G.S11	Troubleshoot abnormal fuel pressure.
MP.V.G.S12	Locate the procedures for troubleshooting a turbine engine fuel heater system.
MP.V.G.S13	Remove, clean, and/or replace an engine fuel filter.
MP.V.G.S14	Troubleshoot engine fuel pressure fluctuation.
MP.V.G.S15	Inspect fuel selector valve.
MP.V.G.S16	Determine correct fuel nozzle spray pattern.
MP.V.G.S17	Locate and identify fuel selector placards.

Subject	***H. Engine Induction Systems***
References	FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft induction and engine airflow systems.
Knowledge	The applicant demonstrates understanding of:
MP.V.H.K1	Reciprocating and turbine engine induction system theory, components, and operation.
MP.V.H.K2	Causes and effects of induction system icing.
MP.V.H.K3	Superchargers and controls.
MP.V.H.K4	Turbochargers, intercoolers, and controls.
MP.V.H.K5	Engine anti-ice systems.
MP.V.H.K6	Induction system filtering.
MP.V.H.K7	Carburetor heaters.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.V.H.R1	Hazards of performing maintenance on turbochargers.
MP.V.H.R2	Hazards associated with the ground operation of aircraft engines.
MP.V.H.R3	Failure to observe precautions associated with maintenance-related FOD.
Skills	The applicant demonstrates the ability to:
MP.V.H.S1	Inspect a carburetor heat system.
MP.V.H.S2	Inspect an alternate air valve for proper operation.
MP.V.H.S3	Inspect an induction system drain for proper operation.
MP.V.H.S4	Inspect a turbine engine air intake anti-ice system.
MP.V.H.S5	Service an induction air filter.
MP.V.H.S6	Inspect a turbocharger for leaks and security.
MP.V.H.S7	Inspect and service a turbocharger waste gate.
MP.V.H.S8	Inspect an induction system for obstruction.
MP.V.H.S9	Inspect an air intake manifold for leaks.
MP.V.H.S10	Locate a reciprocating engine induction leak.
MP.V.H.S11	Inspect a particle separator.
MP.V.H.S12	Identify components of a turbocharger induction system.
MP.V.H.S13	Identify turbine engine ice and rain protection system components.
MP.V.H.S14	Inspect an air inlet duct for security.

Subject	***I. Engine Cooling Systems***
References	FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft engine cooling systems.
Knowledge	The applicant demonstrates understanding of:
MP.V.I.K1	Air cooling system theory, components, and operation.
MP.V.I.K2	Pressure cowling air flow and control.
MP.V.I.K3	Turbine engine internal cooling.
MP.V.I.K4	Engine baffle and seal installation.
MP.V.I.K5	Liquid cooling system theory, components, and operation.
MP.V.I.K6	Augmenter cooling system.
MP.V.I.K7	Turbine engine insulation blankets and shrouds.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.V.I.R1	Hazards of performing maintenance on engine cooling systems.
MP.V.I.R2	Hazards associated with chemicals used in liquid cooling systems.
MP.V.I.R3	Failure to follow manufacturer's instructions during ground operation of aircraft engines.
Skills	The applicant demonstrates the ability to:
MP.V.I.S1	Perform an induction and cooling system inspection.
MP.V.I.S2	Repair cylinder baffle.
MP.V.I.S3	Inspect cylinder baffling.
MP.V.I.S4	Inspect cowl flap system for normal operation.
MP.V.I.S5	Inspect cylinder cooling fins.
MP.V.I.S6	Identify location of turbine engine insulation blankets.
MP.V.I.S7	Identify turbine engine cooling air flow.
MP.V.I.S8	Locate the proper specifications for coolant used in a liquid cooled engine.
MP.V.I.S9	Identify exhaust augmenter cooled engine components.
MP.V.I.S10	Inspect engine cooling rigid and flexible ducting and/or baffle seals.
MP.V.I.S11	Inspect engine exhaust augmenter cooling system.

Subject	***J. Engine Exhaust and Reverser Systems***
References	FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft engine exhaust and reverser systems.
Knowledge	The applicant demonstrates understanding of:
MP.V.J.K1	Reciprocating engine exhaust system theory, components, and operation.
MP.V.J.K2	Turbine engine exhaust system theory, components, and operation.
MP.V.J.K3	Noise suppression theory, components, and operation (e.g., mufflers, hush kits, augmenter tubes).
MP.V.J.K4	Thrust reverser theory, components, and operation.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.V.J.R1	Improper maintenance and inspection of exhaust system components.
MP.V.J.R2	Hazards associated with the operation of turbine engine reversing systems.
MP.V.J.R3	Hazards associated with the operation of reciprocating engines with exhaust systems leaks.
MP.V.J.R4	Dangers associated with exhaust system failures.
MP.V.J.R5	Hazards associated with the ground operation of aircraft engines.
Skills	The applicant demonstrates the ability to:
MP.V.J.S1	Identify the type of exhaust system on a particular aircraft.
MP.V.J.S2	Inspect a turbine engine exhaust system component.
MP.V.J.S3	Inspect a reciprocating engine exhaust system.
MP.V.J.S4	Inspect exhaust system internal baffles or diffusers.
MP.V.J.S5	Inspect exhaust heat exchanger.
MP.V.J.S6	Locate procedures for testing and/or troubleshooting a turbine thrust reverser system.
MP.V.J.S7	Perform a pressure leak check of a reciprocating engine exhaust system.

Subject	***K. Propellers***
References	FAA-H-8083-32, AC 43.13-1
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with aircraft propellers.
Knowledge	The applicant demonstrates understanding of:
MP.V.K.K1	Propeller theory and operation.
MP.V.K.K2	Types of propellers and blade design.
MP.V.K.K3	Pitch control and adjustment.
MP.V.K.K4	Constant speed propeller and governor theory and operation.
MP.V.K.K5	Turbine engine propeller reverse/beta range operation.
MP.V.K.K6	Propeller servicing, maintenance, and inspection requirements.
MP.V.K.K7	Procedures for removal and installation of a propeller.
MP.V.K.K8	Propeller TCDS.
MP.V.K.K9	Propeller synchronization systems.
MP.V.K.K10	Propeller ice control systems.
Risk Management	The applicant demonstrates the ability to identify, assess, and mitigate risks, encompassing:
MP.V.K.R1	Hazards associated with ground operation.
MP.V.K.R2	Improper propeller maintenance and inspections.
Skills	The applicant demonstrates the ability to:
MP.V.K.S1	Remove and/or install a propeller.
MP.V.K.S2	Check blade static tracking.
MP.V.K.S3	Inspect a propeller for condition and airworthiness.
MP.V.K.S4	Measure propeller blade angle.
MP.V.K.S5	Repair an aluminum propeller blade.
MP.V.K.S6	Perform propeller lubrication.
MP.V.K.S7	Locate and explain the procedures for balancing a fixed-pitch propeller.
MP.V.K.S8	Adjust a propeller governor.
MP.V.K.S9	Identify propeller range of operation.
MP.V.K.S10	Repair metal propeller leading/trailing edge damage.
MP.V.K.S11	Determine what minor propeller alterations are acceptable using the propeller specifications, TCDS, and/or listings.
MP.V.K.S12	Inspect and/or repair a propeller anti-icing or de-icing system.

Appendix Table of Contents

Appendix 1: Knowledge Test Description, Requirements, and Registration

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. Federal Aviation Administration (FAA) airman knowledge tests are effective instruments for aviation safety and regulation measurement. However, these tests can only sample the vast amount of knowledge every AMT needs.

Comments may be e-mailed to AFS630Comments@faa.gov.

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.

There are three Aviation Maintenance Technician knowledge tests:

Test Code	Test Name	Number of Questions	Age	Allotted Time	Passing Score
AMG	Aviation Maintenance Technician – General	60	N/A	2.0	70
AMA	Aviation Maintenance Technician – Airframe	100	N/A	2.0	70
AMP	Aviation Maintenance Technician – Powerplant	100	N/A	2.0	70

Knowledge Test Blueprint

AMG Knowledge Areas Required by 14 CFR section 65.75 are on the Knowledge Test	Percent of Questions Per Test
Basic Electricity	5 – 15%
Aircraft Drawings	5 – 10%
Weight and Balance	5 – 10%
Fluid Lines and Fittings	5 – 10%
Materials, Hardware, and Processes	5 – 10%
Ground Operation and Servicing	5 – 15%
Cleaning and Corrosion Control	5 – 10%
Mathematics	5 – 10%
Regulations, Publications, and Recordkeeping	5 – 10%
Aviation Physics	5 – 10%
Inspections	5 – 10%
Human Factors	5 – 10%
Total Number of Questions	**60**

AMA Knowledge Areas Required by 14 CFR section 65.75 are on the Knowledge Test	Percent of Questions Per Test
Metallic Structures	5 – 15%
Non-Metallic Structures	5 – 10%
Aerodynamics, Aircraft Assembly, and Rigging	5 – 10%
Airframe Inspection	5 – 15%
Landing Gear	5 – 10%
Hydraulic and Pneumatic Systems	5 – 10%
Cabin Atmosphere Control	5 – 10%
Aircraft Instrument Systems	5 – 10%
Communication and Navigation	5 – 10%
Aircraft Fuel	5 – 10%
Aircraft Electrical	5 – 10%
Ice and Rain Protection	5 – 10%
Overheat and Fire Protection Systems	5 – 10%
Rotorcraft Fundamentals	5 – 10%
Total Number of Questions	**100**

AMP Knowledge Areas Required by 14 CFR section 65.75 are on the Knowledge Test	Percent of Questions Per Test
Reciprocating Engines	5 – 15%
Turbine Engines	5 – 10%
Engine Inspection	5 – 10%
Engine Indicating Systems	5 – 10%
Engine Fire Protection Systems	5 – 10%
Engine Electrical	5 – 15%
Lubrication	5 – 10%
Ignition and Starting	5 – 10%
Fuel Metering Systems	5 – 10%
Engine Fuel Systems	5 – 10%
Induction and Engine Airflow	5 – 10%
Engine Cooling Systems	5 – 10%
Engine Exhaust and Reverser Systems	5 – 10%
Propellers	5 – 10%
Total Number of Questions	**100**

English Language Standard

In accordance with the requirements of 14 CFR part 65, section 65.71 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 for 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

An airman applicant may present one or more of the following item(s) as authorization to take an AMT test:

- Original FAA Form 8610-2, Airman Certificate and/or Rating Application.
    - ***Note 1:*** *The proctor should verify that applicable blocks are marked (in upper left corner of form). Those not applicable will have a line drawn through them. (Example located in FAA Order 8080.6, Appendix.) If either or both the Airframe and Powerplant boxes are checked on the FAA Form 8610-2, along with the 'Original Issuance' box (and NOT the 'Added Rating' box), this serves as authorization for the Aviation Mechanic General (AMG) test.* ***Do not accept an "original issuance" application for an AMG test only****. (If the 'Added Rating' box is marked, this indicates that the AMG test is* ***not*** *required.)*
    - ***Note 2:*** *The proctor should ensure block V is completed, including the date, inspector's original signature, and FAA Flight Standards District Office (FSDO) identifier. (A sample form is located in FAA Order 8080.6, Appendix.)*
    - ***Note 3:*** *The applicant must retain both original 8610-2 forms issued by the FSDO. The proctor must make a copy of the form and attach it to the applicable daily log (refer to FAA Order 8080.6, 'Test Procedures-General' Chapter); or, if the testing center is approved for electronic filing, the proctor must file the form electronically in accordance with (IAW) their Airman Knowledge Testing (AKT) Organization Designation Authorization (ODA) Holder's Procedures Manual.*
- Certificate of graduation or completion from an FAA-certificated Aviation Maintenance Technician School (AMTS).
    - ***Note 1:*** *The proctor must ensure the certificate includes the AMTS name and certificate number, graduation date, curriculum from which the applicant graduated, applicant name, and signature of an authorized school official.*
    - ***Note 2:*** *The proctor must ensure the applicant is only allowed the test(s) authorized on the certificate.*
    - ***Note 3:*** *The proctor must make a legible photocopy of the certificate presented at the time of applicant processing, and attach this copy to the applicable daily log; or, if the testing center is approved for electronic filing, the proctor must file the certificate electronically in accordance with their AKT ODA Holder's Procedures Manual. The proctor must return the original certificate to the applicant.*
- Military Certificate of Eligibility.
    - ***Note 1:*** *The proctor must ensure the applicant is only allowed the test(s) authorized on the certificate; and that the test date does not precede the certificate date. (A sample certificate is located in Order 8080.6, Appendix.)*
    - ***Note 2:*** *The proctor must make a legible photocopy of the certificate presented at the time of applicant processing, and attach this copy to the applicable daily log; or, if the testing center is approved for electronic filing, the proctor must file the certificate electronically in accordance with their AKT ODA Holder's Procedures Manual. The proctor must return the original certificate to the applicant.*
- Acceptable form of authorization for AMG (**only** for applicants attending exempted AMTSs):
- Evidence of authorization to take the general test based on the school having an exemption, issued per 14 CFR part 11, from part 65, section 65.75 (a).

Acceptable forms of retest authorization for ALL tests listed above:

- Original passing AKTR.
- Original expired AKTR.
- Original failed AKTR.
    - ***Note 1:*** *Requires a 30-day waiting period for retesting if the applicant presents a failed AKTR, but no authorized instructor endorsement.*
    - ***Note 2:*** *Retests do not require a 30-day waiting period if the applicant presents a signed statement from an airman holding the certificate and rating(s) sought by the applicant. This statement must certify that the airman has given the applicant additional instruction in each of the subjects failed, and that the airman considers the applicant ready for retesting.*
    - ***Note 3:*** *An applicant retesting* ***after failure*** *is required to submit the applicable AKTR indicating failure to the testing center prior to retesting.*
    - *The original failed AKTR must be retained by the proctor and attached to the applicable daily log. If the testing center is approved for electronic filing, the proctor must: initial the AKTR within the embossed seal; file the AKTR in accordance with their AKT ODA Holder's Procedures Manual; verify the original failed AKTR has been successfully captured and stored prior to destruction; and destroy the AKTR.*

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 a knowledge test, contact one of the providers listed at www.faa.gov.

Knowledge Test Registration

The first step in taking a knowledge test is the registration process. You may either call one of the test providers or testing centers or simply use the walk-in basis. If you choose to register via phone, you will need to select a testing center and schedule a test date. You may register for tests several weeks in advance, and you may cancel your appointment according to the test provider's cancellation policy, if applicable, in order to avoid a cancellation fee.

The next step in taking a knowledge test is providing proper identification. An acceptable identification document includes a recent photograph, date of birth, signature, and actual residential address, if different from the mailing address. This information may be presented in more than one form of identification. Acceptable forms of identification include, but are not limited to, drivers' licenses, government identification cards, passports, alien residency (green) cards, and military identification cards. Information on acceptable forms of identification is available at www.faa.gov/training_testing/testing.

You also need to present authorization to test. Acceptable forms of authorization are:

- FAA Form 8610-2.
- A graduation certificate or certificate of completion to an affiliated testing center as previously explained.
- An original (not photocopy) failed Airman Knowledge Test Report, passing Airman Knowledge Test Report, or expired Airman Knowledge Test Report.

Information on acceptable forms of authorization is available at www.faa.gov/training_testing/testing.

Before you take the actual test, you will have the option to take a sample test. The actual test is time limited; however, you should have sufficient time to complete and review your test.

Appendix 2: Knowledge Test Procedures

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

You may use aids, reference materials, and test materials within the guidelines listed below, if actual test questions or answers are not revealed. All models of aviation-oriented calculators may be used, including small electronic calculators that perform only arithmetic functions (add, subtract, multiply, and divide). Simple programmable memories, which allow addition to, subtraction from, or retrieval of one number from the memory, are permissible. Also, simple functions such as square root and percent keys are permissible.

The following guidelines apply:

1. You may use any reference materials provided with the test. In addition, you may use scales, straightedges, protractors, plotters, and electronic or mechanical calculators that are directly related to the test.
2. Manufacturer's permanently inscribed instructions on the front and back of such aids (e.g., formulas, conversions, and weight and balance formulas) are permissible.
3. Testing centers may provide a calculator to you and/or deny use of your personal calculator based on the following limitations:
    a. Prior to and upon completion of the test while in the presence of the proctor, you must actuate the ON/OFF switch and perform any other function that ensures erasure of any data stored in memory circuits.
    b. The use of electronic calculators incorporating permanent or continuous type memory circuits without erasure capability is prohibited. The proctor may refuse the use of your calculator when unable to determine the calculator's erasure capability.
    c. Printouts of data must be surrendered at the completion of the test if the calculator incorporates this design feature.
    d. The use of magnetic cards, magnetic tapes, modules, computer chips, or any other device upon which prewritten programs or information related to the test can be stored and retrieved is prohibited.
    e. You are not permitted to use any booklet or manual containing instructions related to use of test aids.
4. Dictionaries are not allowed in the testing area.
5. The proctor makes the final determination relating to test materials and personal possessions you may take into the testing area.

Applicant Misconduct During Testing

To avoid test compromise, airman knowledge 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 any time a proctor suspects 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 may also be prohibited from applying for or taking any test for a certificate or rating for a period of up to one 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 FSDO or International Field Office (IFO) to take an airman knowledge test, using one of the three options listed below, in preferential order:

Option 1: The applicant may request up to 1½ times the standard time allotted to complete the airman knowledge test.

Option 2: The applicant may use a self-contained, electronic device which pronounces and displays typed-in words (e.g., the Franklin Speaking Wordmaster®) to facilitate the testing process. The applicant must provide his or her own device, with approval of the device to be determined by the proctor.

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, for private listening, in order to avoid disturbing others during testing.*

Option 3: The applicant may 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; and must provide reading assistance only (i.e., no explanation of words or terms). When an applicant requests this option, the FSDO or IFO representative must contact the Airman Testing Branch for assistance in selecting the test site and assisting proctor.

Note: *Applicants desiring to test using procedures other than those described in the preceding options must first seek permission from the Airman Testing Branch.*

Before approving any option, the FSDO or IFO representative must advise the applicant of the regulatory certification requirement to be able to read, write, speak, and understand the English language.

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, for private listening, in order to avoid disturbing others during testing.*

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. When taking the practical test, the applicant must present the original Airman Knowledge Test Report 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 (U.S. funds), payable to the FAA to:

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 Subject in the ACS document includes an ACS code. This ACS code will soon be displayed on the AKTR to indicate what Subject 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 exam.

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

MG.I.A.K1:
MG = Applicable ACS (Aviation Mechanic-General)
I = Section (General)
A = Subject (Basic Electricity)
K1 = Subject element Knowledge 1 [Electron theory (conventional flow vs. electron flow).]

Knowledge test questions are mapped to the ACS codes, which will soon replace the system of "Learning Statement Codes." After this transition occurs, the AKTR will list an ACS code that correlates to a specific Subject element for a given Section and Subject. Remedial study and re-testing will be specific, targeted, and based on specified learning criteria.

Missed Knowledge Test Questions

As part of the oral portion of the Oral and Practical Test, applicants will be retested on the subjects identified by the codes shown on the AKTR.

Appendix 4: The Oral and Practical Test – Eligibility and Prerequisites

Each applicant for a Mechanic certificate must successfully pass an Oral and Practical test. These tests are normally conducted by an FAA Designated Mechanic Examiner (DME). An applicant who is prepared for the Oral and Practical test will contact a DME and make an appointment for the test. A list of DMEs is available at www.faa.gov, or contact your local Flight Standards District Office for more information on DMEs in your area.

Prior to the actual test, the DME will conduct a pre-test interview with the applicant to determine eligibility and to provide information needed for the test, such as the date/time and location of the test and obtain the codes from the AKTR. FAA designees are allowed to charge a reasonable fee for their services and this fee should be discussed and agreed upon prior to the scheduled test.

In accordance with the requirements of 14 CFR 65.71 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. All testing instructions and oral questions will be conducted in English. Normal restatement of questions as would be done for a native English speaker is permitted, and does not constitute grounds for disqualification.

Bring to the O&P Test:

- Two identically prepared FAA Form 8610-2, Airman Certificate and/or Rating Applications with original signatures.
- If testing on the basis of:
    - Graduation from an FAA-approved 14 CFR part 147 Aircraft Maintenance Technician School (AMTS), provide the original graduation certificate(s) for the applicable rating applied for.
    - A Military Certificate of Eligibility, provide the original certificate showing eligibility for the ratings applied for.
    - Practical experience as provided in 14 CFR part 65, section 65.77, an FAA signature in Block V of FAA Form 8610-2 authorizing the applicant to test.
    - 14 CFR part 65, section 65.80 for AMTS students who have made satisfactory progress, a signature in Block II of FAA Form 8610-2 from a school official and FAA Inspector authorizing the applicant to test.
- Knowledge test results indicating a passing grade (70% or >) for the appropriate tests based on ratings applied for. Test results must not be expired at the scheduled completion of the O&P test.
- A current government issued photo identification with a signature from the issuing official, such as a passport, U.S. Military ID, Driver's License, etc.

The oral portion of the Oral and Practical Test will consist of questions to re-test the knowledge proven deficient on the FAA knowledge test. Applicants should expect to be questioned on the topics associated with the codes displayed on their AKTR.

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 subjects appropriate to the certificate and rating sought. The applicant should use this ACS and its references in preparation to take the oral and practical test.

An applicant is not permitted to know, before testing begins, which selections from each subject area are to be included in his/her test. Therefore, an applicant should be well prepared in all knowledge, risk management, and skill elements included in the ACS.

The oral portion of the test will consist of question specific to the topics associated with the codes on the AKTR. Applicants will need to demonstrate mastery of the subjects missed on the FAA knowledge test. The practical portion of the test will continue with oral questioning, specific to the projects being tested.

The practical portion of the subject areas may be test simultaneously with the oral portion, provided all skill elements are covered. For example, Mathematics may be combined when performing calculation(s) in subject areas such as Basic Electricity or Weight and Balance.

Additional information on requirements for conducting a practical test is contained in FAA Order 8900.2 (as revised).

All applicants must demonstrate an approval for return to service standard, where applicable, and demonstrate the ability to locate and apply the required reference materials. In instances where an approval for return to service standard cannot be achieved, the applicant must be able to explain why the return to service standard was not met (e.g., when tolerances are outside of a product's limitations).

AMT applicants meeting the experience requirements of 14 CFR 65.77 are eligible to take the airman knowledge test for the general, airframe, and powerplant knowledge exams without any additional formal training. It is highly recommended that applicants seek guidance from an experienced certificated mechanic, and/or review the references listed in this ACS in those subject areas in which they may not have direct experience. It is the applicants' responsibility to prepare and review the subjects listed in this ACS in order to increase one's ability to obtain a passing score on the exam.

Examiner Responsibilities

The examiner must generate a complete test planning sheet to conduct the oral and practical test. The evaluator must ask the applicant to provide the missed codes from the AKTR prior to generating the test planning sheet. The examiner must include all the questions and projects obtained from the Internet-based Oral and Practical Test Generator at: https://av-info.faa.gov/DsgReg/Login.aspx. (See FAA Order 8900.2, chapter 6, for details.) The Oral and Practical Test Generator will include oral questions from the knowledge elements of the ACS to retest those topics missed on the FAA Knowledge Exam; these should be asked during the oral portion of the test. The Oral and Practical Test Generator will include questions on the knowledge and risk management elements of the ACS, specific to the selected projects; these should be asked, in context, during the practical demonstration portion of the test.

The examiner who conducts the practical test is responsible for determining the applicant has met the prescribed experience requirements as stated in 14 CFR part 65, section 65.77, or is an authorized school student per 14 CFR part 65, section 65.80. (See FAA Order 8900.2 (as revised) for information about testing under the provisions of 14 CFR part 65, section 65.80.)

At the initial stage of the oral and practical test, the examiner must also determine that the applicant meets FAA Aviation English Language Proficiency (AELP) standards by verifying that he or she can read, write and understand instructions and communicate in English. The examiner should use the English Language Skill Standards, required by 14 CFR part 65, when examining the applicant's ability to meet the standard.

The examiner must personally observe all practical projects performed by the applicant. The examiner who conducts the practical test is responsible for determining that the applicant meets acceptable standards of knowledge and skill in the assigned subject areas within the appropriate ACS.

The following terms may be reviewed with the applicant prior to, or during, element assignment.

1. **Inspect**—means to examine by sight and/or touch (with or without inspection enhancing tools/equipment).
2. **Check**—means to verify proper operation.
3. **Troubleshoot**—means to analyze and identify malfunctions.
4. **Service**—means to perform functions that assure continued operation.
5. **Repair**—means to correct a defective condition; and repair of an airframe or powerplant system includes component replacement and adjustment.
6. **Overhaul**—means disassembled, cleaned inspected, repaired as necessary, and reassembled.

An applicant is not permitted to know before testing begins which selections in each subject area are to be included in his/her test. Therefore, an applicant should be well prepared in **all** knowledge, risk, and skill elements included in the airman certification standards.

The practical portion of the subject areas may be tested simultaneously with other subject areas provided all skill elements are covered. For example, “Mathematics” can be combined when performing calculation(s) in subject areas such as Basic Electricity and Weight and Balance.

Further information and requirements for conducting a practical test is contained in FAA Order 8900.2 (as revised).

The evaluator who conducts the oral and practical test is responsible for determining that the applicant meets the established standards of aeronautical knowledge, risk management, and skill for each subject in the appropriate ACS. This responsibility includes verifying the experience requirements specified for a certificate or rating.

In the integrated ACS framework, the sections contain subjects, which are further broken down into knowledge elements (i.e., K1), risk management elements (i.e., R1), and skill elements (i.e., S1). Knowledge and risk management elements are primarily evaluated during the knowledge testing phase of the airman certification process. The evaluator administering the oral and practical test has the discretion to combine subjects/elements as appropriate to testing scenarios.

Appendix 6: Safety

General

Safety must be the prime consideration at all times. The examiner and applicant must be constantly alert while performing maintenance or troubleshooting projects. Should any project require an action that would jeopardize safety, the examiner will ask the applicant to simulate that portion of the project.

The DME will ensure the applicant follows all safety recommendations/precautions while performing the assigned projects including, but not limited to, the following:

1. Approach to the project; proper information and tools; preparation of the equipment; and observation of safety precautions, such as wearing safety glasses, hearing protection, and any other required Personal Protective Equipment (PPE).
2. Cleaning, preparing, and protecting parts; skill in handling tools; thoroughness and cleanliness.
3. Use of current maintenance and/or overhaul publications and procedures.
4. Application of appropriate rules, risk management, and safety assessments.
5. Attitude toward safety, manufacturer's recommendations, and acceptable industry practices.

The applicant should be aware that any disregard for safety is not tolerated and will result in a failure.

Appendix 7: References

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

Reference	Title
14 CFR part 43	Maintenance, Preventive Maintenance, Rebuilding and Alteration
14 CFR part 45	Identification and Registration Marking
14 CFR part 65	Certification: Airmen Other Than Flight Crewmembers
14 CFR part 91	General Operating and Flight Rules
14 CFR part 147	Aviation Maintenance Technician Schools
FAA-H-8083-1	Weight and Balance Handbook
FAA-H-8083-30	Aviation Maintenance Technician Handbook – General
FAA-H-8083-31	Aviation Maintenance Technician Handbook – Airframe (Volumes 1 and 2)
FAA-H-8083-32	Aviation Maintenance Technician – Powerplant (Volumes 1 and 2)
AC 43.13-1	Acceptable Methods, Techniques and Practices Aircraft Inspection & Repair
AC 43.13-2	Acceptable Methods, Techniques and Practical Aircraft Alterations
AC 43-204	Visual Inspection for Aircraft
AC 45-2	Identification and Registration Marking
AC 60-11	Test Aids and Materials that May be Used by Airman Knowledge Testing Applicants
AC 60-28	English Language Skill Standards Required by 14 CFR Parts 61, 63, and 65

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 8: 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
AC	Advisory Circular
AC	Alternate Current
ACARS	Aircraft Communication Addressing and Reporting System
ACS	Airman Certification Standards
AD	Airworthiness Directive
ADF	Automatic Direction Finder
ADS-B	Automatic Dependent Surveillance Broadcast
AELP	Aviation English Language Proficiency
AFS	Flight Standards Service
AIS	Audio Integration System
AKT	Airman Knowledge Test
AKTR	Airman Knowledge Test Report
AMA	Airframe
AMG	General
AMP	Powerplant
AMT	Aviation Maintenance Technician
AMTS	Aviation Maintenance Technician School
ASI	Aviation Safety Inspector
ASRS	Aviation Safety Reporting System
ATC	Air Traffic Control
CFR	Code of Federal Regulations
CG	Center of Gravity
CPC	Corrosion Preventive Compounds
CSD	Constant Speed Drive
DC	Direct Current
DME	Designated Mechanic Examiner
DME	Distance Measuring Equipment
EGT	Exhaust Gas Temperature
ELT	Emergency Locator Transmitter
EPR	Engine Pressure Ratio
FAA	Federal Aviation Administration
FADEC	Full Authority Digital Engine Controls
FOD	Foreign Object Debris
FSDO	Flight Standards District Office
GPS	Global Positioning System

GPWS	Ground Proximity Warning Systems
HF	High Frequency
IDG	Integrated Drive Generator
IFR	Instrument Flight Rules
ILS	Instrument Landing System
INS	Inertial Navigation System
LSC	Learning Statement Code
MAC	Mean Aerodynamic Chord
NDT	Nondestructive Testing
NiCad	Nickle-Cadmium (battery)
NVRAM	Nonvolatile Random Access Memory
ODA	Organization Designation Authorization
RA	Radio Altimeter
RAM	Random Access Memory
ROM	Read Only Memory
RPM	Revolutions Per Minute
SATCOM	Satellite Communications
SDS	Safety Data Sheets
SFC	Specific Fuel Consumption
SMS	Safety Management System
STC	Supplemental Type Certificate
SUPS	Suspected Unapproved Parts
TCAS	Traffic Collision Avoidance System
TCDS	Type Certificate Data Sheet
TSO	Technical Standard Order
VHF	Very High Frequency
VOR	Very High Frequency Omnidirectional Radio Range

Aviation Maintenance Technician – Powerplant Handbook

FAA-H-8083-32A

Comments and Requested Changes to AMT Powerplant Handbook, FAA-H-8083-32A

https://s3.amazonaws.com/FAA/AMT+Powerplant+Volume+1+DRAFT+_1%2C+Nov+17%2C+2017.pdf
https://s3.amazonaws.com/FAA/AMT+Powerplant+Volume+2+DRAFT+_1%2C+Nov+17%2C+2017.pdf

Page #	Location	Issue Type	Issue Description
General			The reading level on this material is higher than we are likely to see in most Part 147 schools. I tested incoming students for many years and found that most read at an 8th grade level. The samples I took from this material never got down to an 8th grade level, and ran as high as 14.7. The average of the samples that I checked was 11.3. This will limit the value of this handbook.
General			The material reads like it was assembled by a committee. There is a high degree of repetition. Concepts introduced in one section are presented again as new material a few sections later. While I am an advocate of the value of repetition as a learning tool, this is somewhat distracting.
General		Organization	Suggested to divide information throughout by recip and turbine engines
Throughout	Ch 4, 7, Glossary	Outdated terminology	Search “flyweights” and replace with “counterweights”
Ch 1	Radial: 1-2, 1-4, 1-5		I was quite disappointed that the handbook still spends a great deal of time on radial engines, and then only one paragraph each on the new piston technologies. They may be covered again, later in the handbook, but shorting them in this introductory chapter is a missed opportunity.
Ch 11	New piston technologies		See comment regarding Ch 1 – much discussion on radial engines, minimum on new 2-cycle engines. This chapter mentions operational items with no introduction or explanation. It appears that knowledge of two-cycle engines is assumed.
4-2			under Magneto-Ignition System Operating Principles; suggest modifying the first sentence as follows: The magneto, a special type of engine-driven alternating current (AC) generator, uses a permanent magnet as a source of energy.
4-4			the last paragraph on page 4-6 states, Since there are four lobes on the cam,….., please reword the sentence to indicate that this particular example has four lobes on the cam, there are some magnetos with cams that have only two lobes.
4-8			In the last paragraph on the page it states; "By reversing the polarity during servicing by rotating the plugs to new locations", the wording can be confusing. Consider revising to read; "Reversing the polarity during servicing by rotating the plugs to new locations."
4-10	Column 1, second paragraph from bottom		First sentence, "When the ignition switch is placed in the on position switch open," Please add comma after the word position.
4-32	Right column	Incomplete information	Spark plug tray states it is used to keep spark plugs from bumping into is each other. (It is used to identify where the spark plug came from and for proper rotation not just a storage tray)
4-13	Fig 4-22		Caption for figure reads; "Typical six-cylinder engine electronic control and low-voltage harness." The caption does not match the picture, it is clearly a four cylinder , high tension magneto system harness.
4-13	Low-Voltage Harness		The first sentence refers to figure 4-22 as a low voltage harness, which clearly resembles a high voltage harness.
4-16			Between pages 4-15 and 4-16 the discussion jumps from FADEC Electronic Control Systems to Low Voltage Booster Coils used on Radial

Page #	Location	Issue Type	Issue Description
			engines. This leads to confusion on the part of the reader. There should be some type of transition into Low Voltage Ignition Systems.
4-18			The discussion on the impulse coupling make it sound like it's design has more disadvantages than advantages.
4-20			Last sentence of first paragraph; consider rewording for grammar, "Both magnetos now fire at the normal running advanced degree position of crankshaft rotation before top dead center piston position.
4-20		Low-Tension Retard Breaker vibrator	First sentence states, "is designed for light aircraft reciprocating engines." This system was designed for use on radial engines that were typically installed on heaver aircraft.
4-25			Recommend adding a picture of the Eastern Electronics E50 timing light as well as the Inductor Magneto Synchronizer.
4-34	Figure 4-56	Wrong picture	It is closer than the picture in the previous edition but it shows a flat (automotive) gauge rather than a round or “wire gauge”. Other companies make round wire gauges but the only picture I could grab quickly was from the Champion website catalog:  **CT-450**
4-43	Left column	Add info	Check System Operation states” the ignitor can also be checked by removing the it and activating the cycle” (this procedure is not common practice, only when the maintenance manual uses it as an alternate method.)
11-16	Left column		Continental O-200 series engines are discussed, but they have omitted the D model which is a product developed especially for light sport aircraft. They shaved 25 pounds off of the engine to help performance.
G-26	Glossary	Typo	Standard day conditions: It says 52°F when it should say 59°

Flight Instructor for Airplane

Airman Certification Standards

FAA-S-ACS-9

U.S. Department
of Transportation

**Federal Aviation
Administration**

FAA-S-ACS-9

Instructor

Airman Certification Standards

Date TBD

**Flight Standards Service
Washington, DC 20591**

Acknowledgments

The U.S. Department of Transportation, Federal Aviation Administration (FAA), Airman Testing Standards Branch, AFS-630, and 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-9 will be effective XXXX 201X. All previous editions of the Flight Instructor for Airplane Practical Test Standards will be obsolete as of this date for Airplane applicants.

Foreword

The Federal Aviation Administration (FAA) has published the Instructor Airman Certification Standards (ACS) document to communicate the aeronautical knowledge, risk management, and flight proficiency standards for the Flight Instructor certificate (FI) in the airplane category. This ACS incorporates and supersedes the previous Practical Test Standards (PTS), FAA-ACS-8081-9, for Flight Instructor Airplane applicants.

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
Director, Flight Standards Service

Revision History

Rev. #	Description	Effective Date
FAA-S-8081-6D	Flight Instructor Practical Test Standards for Airplane, (with Changes 1-4)	January 2010
FAA-S-ACS-9	Flight Instructor for Airplane, Airman Certification Standards	XXXX, 201X

Table of Contents

Introduction

Airman Certification Standards Concept

The goal of the airman certification process is to ensure the flight instructor applicant possesses knowledge, risk management and skill consistent with the privileges of the certificate or rating being exercised, as well as the ability to teach these concepts while managing the risks inherent with instructional flight.

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.

The FAA recognizes that safe operation in today's complex National Airspace System (NAS) require a more systematic integration of aeronautical knowledge, risk management, and flight proficiency standards than those prescribed in the PTS. The FAA further recognizes the need to more clearly calibrate knowledge, risk management and skills to the level of the certificate or rating, and to align standards with guidance and test questions.

To accomplish this goal, 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 either the knowledge exam or the practical test.

The ACS significantly improves the knowledge test part of the certification process by enabling the development of test questions, from FAA reference documents, that are meaningful and relevant to safe operation in the NAS. The ACS does not change the tolerances for any skill Task, and it is important for applicants, instructors, and evaluators to understand that the addition of knowledge and risk management elements is not intended to lengthen or expand the scope of the practical test. Rather, the integration of knowledge and risk management elements associated with each Task is intended to enable a more holistic approach to learning, training, and testing. During the ground portion of the practical test, for example, the ACS provides greater context and structure both for retesting items missed on the knowledge test and for sampling the applicant’s mastery of knowledge and risk management elements associated with a given skill Task.

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, designated pilot examiner, or other individual authorized to conduct test for a certificate or rating).*

Using the ACS

The ACS for the flight instructor consists of ***Areas of Operation*** arranged in a logical sequence, beginning with Fundamentals of Instructing, Technical Subject Areas, 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. When a **Foundational ACS** is listed for a Task, it indicates the Foundational ACS (Private or Commercial) Area of Operation and referenced Task for the Task elements. For example, in Area of Operation II. *Technical Subject Areas*, Task F. *Navigation and Flight Planning*, the applicant must be prepared for questions on any element of Cross-Country Flight Planning Task in the Commercial Pilot Foundational ACS.

The abbreviation(s) within parentheses immediately following a Task refer to the category and/or class aircraft appropriate to that Task. The meaning of each abbreviation is as follows.

ASEL: Airplane – Single-Engine Land
ASES: Airplane – Single-Engine Sea
AMEL: Airplane – Multiengine Land
AMES: Airplane – Multiengine Sea

Note: *When administering a test based on this ACS, the Tasks appropriate to the class airplane (ASEL, ASES, AMEL, or AMES) used for the test must be included in the plan of action. The absence of a class indicates the Task is for all classes.*

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

AIA.II.B.K6:
AIA = Applicable ACS Applicable ACS and Section denoting Aircraft category (Instructor, Airplane, which is Section 2 of this document)
II = Area of Operation (Technical Subject Areas)
B = Task (14 CFR and Publications)
K6 = Task Element Knowledge 6 (Flight information publications (e.g., Aeronautical Information Manual (AIM) and Chart Supplements U.S. (formerly Airport/Facility Directory)).

Knowledge test questions are linked to the ACS codes, which will soon replace the system of “Learning Statement Codes.” After this transition occurs, the airman knowledge test report 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 element(s).

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 Learning Statement Codes (e.g., “PLT” codes will continue to be displayed on the Airman Knowledge Test Report (AKTR). The PLT 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 (PLT) codes and ACS codes.

Because all active knowledge test questions for the Fundamentals of Instructing and Flight Instructor knowledge tests have been aligned with the corresponding ACS, evaluators can use PLT codes in conjunction with the ACS for a more targeted retesting of missed knowledge. The evaluator should look up the PLT code(s) on the applicant’s AKTR in the 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).

The applicant must pass the Fundamentals of Instructing knowledge test (if required) and the appropriate Flight Instructor knowledge test before taking the practical test. The practical test is conducted in accordance with the ACS that is 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 to measure progress during training, and as a reference to ensure the applicant is adequately prepared for the knowledge and practical tests. The FAA will revise the ACS as circumstances require.

Organization

The Instructor ACS includes sections that define the acceptable standards for knowledge, risk management, and skills in the aeronautical proficiency Tasks unique to a particular instructor certificate or rating.

Instructor-Applicants, instructors, and evaluators need to understand that the Instructor ACS is not a stand-alone document. Rather, it is to be used in conjunction with the appropriate ACS for which the instructor-applicant seeks authorization to provide instruction. Therefore, in addition to mastery of the knowledge and skills defined in the Instructor ACS, the instructor-applicant must demonstrate instructional competence and risk management with the Tasks in the appropriate ACS, to include analyzing and correcting common learner errors.

Because the ***Fundamentals of Instructing (FOI)*** Area of Operation is foundational to each particular instructor certificate or rating, FOI Tasks are incorporated as a stand-alone Area of Operation at the beginning of this ACS, which will be referenced in each certificate/rating.

The FAA encourages applicants and instructors to use the ACS to measure progress during training, and as a reference to ensure the applicant is adequately prepared for the knowledge and practical tests. The FAA will revise the ACS as circumstances require.

Instructional Knowledge

Tasks will often include the beginning phrase with the Knowledge elements: “The applicant demonstrates instructional knowledge by describing and explaining: “instructional knowledge” means the instructor applicant can effectively present the what, how and why involved with the task elements.

Risk Management for the Instructor

Risk Management is a critical component to aviation safety. The Instructor is involved with risk management on multiple levels. The levels include not only managing risk of a particular phase of flight or maneuver, but also teaching risk management, both in the classroom and in the cockpit, and managing the additional risks of in-flight instruction with a Pilot-in-Training (PIT). Appendix 6 of this ACS outlines the scope of Risk Management that an Instructor applicant (flight) will need to demonstrate.

The Fundamentals of Instructing (FOI) includes a Task G: *Aeronautical Decision Making and Risk Management* that focuses on teaching risk management and on those risks encountered by a flight instructor while providing in-flight instruction not experienced by a pilot during their personal training or other flight operations.

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Section 1. Fundamentals of Instructing

Fundamentals of Instructing

Task	***Task A. Learning Process*** PTS I.B
References	FAA-H-8083-9
Objective	To determine that the applicant understands the elements of the learning process and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates understanding of:
AI.I.A.K1	Definitions of learning, with practical examples that show when learning has occurred.
AI.I.A.K2	Educational theories as they apply to ground and flight instruction, to include:
AIA.I.A.K2a	a. Theories of learning
AI.I.A.K2b	b. Learner motivation, to include instructor's role in fostering motivation.
AI.I.A.K2c	c. Learning styles and their impact on effective instruction.
AI.I.A.K2d	d. Transfer of learning.
AI.I.A.K2e	e. Memory and retention.
AI.I.A.K3	Levels of learning, to include:
AI.I.A.K3a	a. Acquisition and application of higher order thinking skills.
AI.I.A.K3b	b. Appropriate use of scenario-based training and different types of practice to achieve different levels of learning
Risk Management	The applicant demonstrates the ability to identify and mitigate the risks arising from:
AI.I.A.R1	Inadequate or incomplete instruction.
AI.I.A.R2	Lack of learner motivation.
AI.I.A.R3	Failure to recognize and correct learner errors.
Skills	The applicant demonstrates the ability to:
AI.I.A.S1	Explain and apply educational theories to ground and flight instructional scenarios specified by the evaluator.
AI.I.A.S2	Recognize and correct conditions that undermine the learning process.

Task	***Task B. Human Behavior and Effective Communication***
References	FAA-H-8083-9
Objective	To determine that the applicant understands the elements of human behavior and effective communication and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates understanding of:
AI.I.B.K1	Elements of human behavior, to include:
AI.I.B.K1a	a. Human needs.
AI.I.B.K1b	b. Personality types.
AI.I.B.K1c	c. Normal and abnormal emotional reactions.
AI.I.B.K1d	d. Defense mechanisms.
AI.I.B.K2	Human factors such as situational awareness, workload, and stress, and how they affect learning.
AI.I.B.K3	Effective communication, to include:
AI.I.B.K3a	a. Basic elements of communication.
AI.I.B.K3b	b. Techniques for effective communication.
AI.I.B.K3c	c. Barriers to effective communication and how to avoid them.
Risk Management	The applicant demonstrates the ability to identify and mitigate the risks arising from:
AI.I.B.R1	Failure to recognize and accommodate human behavior.
AI.I.B.R2	Failure to use effective and appropriate communication techniques.
Skills	The applicant demonstrates the ability to:
AI.I.B.S1	Give examples of how human behavior (e.g., needs, personality types) affects motivation and learning.
AI.I.B.S2	Describe techniques the instructor can use to identify and manage:
AI.I.B.S2a	a. Normal and abnormal emotional reactions
AI.I.B.S2b	b. Defense mechanisms
AI.I.B.S3	Use effective communication in ground and flight instructional scenarios specified by the evaluator.

Task	***Task C. Teaching Process and Methods***
References	FAA-H-8083-9
Objective	To determine that the applicant understands the elements of the teaching process and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates understanding of:
AI.I.C.K1	Essential teaching skills, to include:
AI.I.C.K1a	a. Various methods of presentation (e.g., lecture, discussion, scenario).
AI.I.C.K1b	b. Organization of content.
AI.I.C.K1c	c. Recognition and accommodation of differences in learning style.
AI.I.C.K1d	d. Importance of communicating the “why” and “how” as well as the “what.”
AI.I.C.K1e	e. Response to learner questions.
Risk Management	The applicant demonstrate the ability to identify and mitigate the risks arising from:
AI.I.C.R1	Failure to use effective teaching methods.
Skills	The applicant demonstrates the ability to:
AI.I.C.S1	Prepare an instructional plan of action using teaching methods and materials appropriate for Task and learner characteristics in a scenario specified by the evaluator, to include:
AI.I.C.S1b	a. Aeronautical knowledge ground lesson applicable for a classroom.
AI.I.C.S1c	b. Maneuver ground lesson for an individual pilot in training.
AI.I.C.S1d	c. Maneuver introduction for a flight lesson.

Task	***Task D. Assessment***
References	FAA-H-8083-9
Objective	To determine that the applicant understands the elements of effective assessment and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates understanding of:
AI.I.D.K1	Purpose and characteristics of effective assessment.
AI.I.D.K2	Assessment methods and techniques, to include:
AI.I.D.K2a	a. Critique
AI.I.D.K2b	b. Oral questions
AI.I.D.K2c	c. Written tests
AI.I.D.K2d	d. Authentic assessment
AI.I.D.K2e	e. Collaborative assessment/learner-centered grading
Risk Management	The applicant demonstrate the ability to identify and mitigate the risks arising from:
AI.I.D.R1	Failure to deliver an effective assessment
Skills	The applicant demonstrates the ability to:
AI.I.D.S1	Use appropriate methods and techniques to assess learner performance in a ground and/or flight training scenario specified by the evaluator.

Task	***Task E. Instructor Responsibilities and Professional Characteristics***
References	FAA-H-8083-9
Objective	To determine that the applicant understands instructor responsibilities and professional characteristics and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates understanding of:
AI.I.E.K1	Instructor responsibilities, to include:
AI.I.E.K1a	a. Providing effective instruction that enables learners to gain the knowledge and skill required for initial certification and safe operation.
AI.I.E.K1b	b. Evaluating and supervising pilots in training.
AI.I.EK1c	c. Modeling and demanding the highest standards for knowledge, risk management, and skill in aviation operations.
AI.I.E.K1d	d. Conducting specialized training, evaluating proficiency, and granting privileges through appropriate endorsements.
AI.I.E.K1e	e. Recommending applicants for knowledge and practical tests.
AI.I.E.1f	f. Minimizing learner frustrations.
AI.I.E.K1g	g. Recognizing and managing abnormal behaviors.
AI.I.E.K2	Instructor professional characteristics, to include:
AI.I.E.K2a	a. Preparing for each instructional activity.
AI.I.E.K2b	b. Making learner's needs the top priority.
AI.I.E.K2c	c. Advancing professional knowledge and skills.
Risk Management	The applicant demonstrate the ability to identify and mitigate the risks arising from:
AI.I.E.R1	Failure to fulfill instructor responsibilities.
AI.I.E.R2	Failure to exhibit professionalism.
Skills	The applicant demonstrates the ability to:
AI.I.E.S1	Deliver ground and/or flight instruction on an evaluator-assigned Task, and in accordance with a scenario specified by the evaluator, in a manner consistent with instructor responsibilities and professional characteristics as stated in K1-K2 above.

Task	***Task F. Risk Management and Aeronautical Decision-Making***
References	FAA-H-8083-9; FAA-H-8083-2; FAA-H-8083-25
Objective	To determine that the applicant understands the elements of risk management and aeronautical decision-making and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates understanding of:
AI.I.F.K1	Definition and principles of risk management, to include:
AI.I.F.K1a	a. Identification of hazards (e.g., PAVE items, hazardous attitudes)
AI.I.F.K1b	b. Assessing the level of risk
AI.I.F.K1c	c. Methods of mitigating risk (e.g., CRM, SRM, personal minimums)
AI.I.F.K2	Definition and principles of aeronautical decision-making (ADM)
Risk Management	The applicant demonstrate the ability to identify and mitigate the risks arising from:
AI.I.F.R1	Hazards associated with providing flight instruction.
AI.I.F.R2	Obstacles to maintaining situational awareness during flight instruction.
AI.I.F.R3	Failure to recognize and manage hazards arising from human behavior.
Skills	The applicant demonstrates the ability to:
AI.I.F.S1	Use scenario-based training (SBT) to demonstrate, teach, and assess risk management and ADM skills in the context of a Task and scenario specified by the evaluator.
AI.I.F.S2	Identify, assess, and mitigate risks commonly associated with providing flight instruction through maintaining:
AI.I.F.S2a	a. Awareness and oversight of the learner's actions, with timely intervention or mitigation as needed.
AI.I.F.S2b	b. Awareness of the learner's cognitive/physiological state, with timely action to mitigate anxiety, fatigue, etc.
AI.I.F.S2c	c. Overall situational awareness while delivering flight instruction, to include continuous awareness of the aircraft's dynamic state and navigation position as well as vigilance for unexpected events in the training environment.
AI.I.F.S3	Model and teach safety practices, to include maintaining:
AI.I.F.S3a	a. Collision avoidance while simultaneously providing instruction.
AI.I.F.S3b	b. A "sterile cockpit" as appropriate.
AI.I.F.S3c	c. Coordinated flight.
AI.I.G.S3d	d. Positive exchange of flight controls.

Section 2: Ground Instructor

Completion Standards

A. Basic Ground Instructor (BGI)

(1) Pass the Fundamentals of Instructing (FOI) Knowledge Test (if required), which is comprised of questions from the FOI Tasks.

(2) Pass the BGI Knowledge Test, which is comprised of questions developed from the Knowledge elements of Tasks contained in the Sport Pilot, Recreational Pilot, and Private Pilot ACS (or PTS) documents.

B. Advanced Ground Instructor (AGI)

(1) Pass the FOI Knowledge Test (if required), which is comprised of questions from the Tasks.

(2) Pass the AGI Knowledge Test, which is comprised of questions developed from the Knowledgeelements of Tasks contained in the Sport Pilot, Recreational Pilot, Private Pilot and Commercial Pilot ACS (or PTS) documents.

C. Instrument Ground Instructor (IGI)

(1) Pass the FOI Knowledge Test (if required), which is comprised of questions from the FOI Tasks in this Section.

(2) Pass the IGI Knowledge Test, which is comprised of questions developed from the Knowledgeelements of Tasks contained in the Instrument Instructor section of the Instructor ACS.

D. ACS System Reference Matrix

The ACS System Reference Matrix below includes the appropriate ACS document reference for each Task required for the FOI Knowledge Test.

Ground Instructor (Section 1) ACS Task	ACS	AI ACS Reference (Task)
Learning Process	AI-FOI	A. Learning Process
Human Behavior and Effective Communication	AI-FOI	B. Human Behavior and Effective Communication
Teaching Process	AI-FOI	C. Teaching Process and Methods
Teaching Methods	AI-FOI	C. Teaching Process and Methods
Assessment	AI-FOI	D. Assessment
Flight Instructor Characteristics & Responsibilities	AI-FOI	E. Instructor Responsibilities & Prof. Characteristics
Flight Instructor Characteristics & Responsibilities	AI-FOI	F. Risk Management & Aeronautical Decision-Making

Legend:

AI-FOI Instructor Airman Certification Standards: Fundamentals of Instructing (FOI) Tasks

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Section 3. Flight Instructor – Airplane

Completion Standards

A. Knowledge Test

(1) Pass the appropriate Knowledge Test.

B. Practical Test

(1) To determine that the instructor-applicant can:

(a) Demonstrate instructional competence in the Tasks;
(b) Facilitate the learning of subject material;
(c) Explain and demonstrate the maneuvers;
(d) Exemplify risk management skills;
(e) Promote professionalism; and
(f) Analyze and correct common learner errors.

C. Evaluator's Practical Test Checklist

The following Evaluator's Practical Test Checklist (below) sets forth the ACS or Foundational ACS reference for each Task required by the Flight Instructor-Airplane ACS. This checklist should be used to ensure that each required Task is accomplished.

The Flight Instructor-Airplane section of the Instructor ACS is intended to be used in conjunction with the Fundamentals of Instructing (FOI) (immediately following the Introduction of this document), the Commercial Pilot ACS, and the Private Pilot ACS (separate documents). All Tasks will indicate the referenced ACS if the foundational Task elements are contained in other than this *Instructor Airplane* section of the *Instructor ACS* [AIA].

Evaluator's Practical Test Checklist

Flight Instructor – Airplane (AIA)

Applicant's Name: _____

Examiner's Name: _____

Date: _____

Areas of Operation:

Note: ACS document or Foundational ACS reference for Instructor-Airplane Tasks are indicated in brackets with Area of Operation and Task identifier e.g. [AIA/CAX-I.G.] for Commercial ACS, Area of Operation I. Preflight Preparation, Task G, Operation of Systems. All Tasks incorporating descriptions contained in the CAX or PAR are further described in the AIA.

Legend:

AI-FOI	Instructor Airman Certification Standards: Fundamentals of Instructing (FOI) Tasks
AIA	Instructor Airman Certification Standards: Flight Instructor – Airplane (Section 2)
CAX	Commercial Pilot – Airplane Airman Certification Standards
PAR	Private Pilot – Airplane Airman Certification Standards

I. Fundamentals of Instructing

Note: The evaluator must select Tasks E and F and one other Task.

- ☐ A. Learning Process [AI-FOI]
- ☐ B. Human Behavior and Effective Communication [AI-FOI]
- ☐ C. Teaching Process and Methods [AI-FOI]
- ☐ D. Assessment [AI-FOI]
- ☐ E. Instructor Responsibilities and Professional Characteristics [AI-FOI]
- ☐ F. Risk Management and Aeronautical Decision-Making [AI-FOI]

II. Technical Subject Areas

Note: The evaluator must select Tasks C and D and at least one other Task.

- ☐ A. Principles of Flight [AIA]
- ☐ B. 14 CFR and Publications [AIA]
- ☐ C. Endorsements and Logbook Entries [AIA]
- ☐ D. Runway Incursion Avoidance [AIA]
- ☐ E. Human Factors [AIA/CAX-I.H.]
- ☐ F. Navigation and Flight Planning [AIA/CAX-I.D.]
- ☐ G. Airplane Flight Controls and Operation of Systems [AIA/CAX-I.G.]
- ☐ H. Airplane Performance, Limitations, Weight and Balance [AIA/CAX-I.F.]
- ☐ I. Night Operations [AIA/PAR-IX.A. & CAX-II.D,K6d]
- ☐ J. High Altitude Operations-Supplemental Oxygen [AIA/CAX-VIII.A.]
- ☐ K. High Altitude Operations-Pressurization [AIA/CAX-VIII.B.]
- ☐ L. National Airspace System [AIA/CAX-I.E.]
- ☐ M. Pilotage and Dead Reckoning [AIA/ CAX-VI.A.]
- ☐ N. Navigation Systems and Radar Services [AIA/CAX-VI.B.]

- ☐ O. Water and Seaplane Characteristics, Seaplane Bases, Maritime Rules and Aids to Marine Navigation (ASES, AMES) [AIA/CAX-I.I.]

III. Preflight Preparation

Note: The evaluator must select at least one Task.

- ☐ A. Pilot Qualifications [AIA]
- ☐ B. Airworthiness Requirements [AIA/CAX-I.B.]
- ☐ C. Weather Information [AIA/CAX-I.C.]

IV. Preflight Lesson on a Maneuver to be Performed in Flight

- ☐ A. Maneuver Lesson [AIA]

V. Preflight Procedures

Note: The evaluator must select at least one Task.

- ☐ A. Preflight Assessment [AIA/CAX-II.A.]
- ☐ B. Cockpit Management [AIA/CAX-II.B.]
- ☐ C. Engine Starting [AIA/CAX-II.C.]
- ☐ D. Taxiing, Airport Signs, Markings, and Lighting [AIA/CAX-II.D.]
- ☐ E. Taxiing and Sailing (ASES, AMES) [AIA/CAX-II.E.]
- ☐ F. Before Takeoff Check [AIA/CAX-II.F.]

VI. Airport and Seaplane Base Operations

- ☐ A. Radio Communications and Light Gun Signals [AIA/CAX-III.A.]
- ☐ B. Traffic Patterns [AIA/CAX-III.B.]

VII. Takeoffs, Landings, and Go-Arounds

Note: The evaluator must select at least two takeoff and two landing Tasks.

- ☐ A. Normal Takeoff and Climb [AIA/CAX-IV.A.]
- ☐ B. Normal Approach and Landing [AIA/CAX-IV.B.]
- ☐ C. Soft-Field Takeoff and Climb [AIA/CAX-IV.C.]
- ☐ D. Soft-Field Approach and Landing [AIA/CAX-IV.D.]
- ☐ E. Short-Field Takeoff and Maximum Performance Climb (ASEL, AMEL) [AIA/CAX-IV.E.]
- ☐ F. Short-Field Approach and Landing (ASEL, AMEL) [AIA/CAX-IV.F.]
- ☐ G. Confined Area Takeoff and Maximum Performance Climb (ASES, AMES) [AIA/CAX-IV.G]
- ☐ H. Confined Area Approach and Landing (ASES, AMES) [AIA/CAX-IV.H.]
- ☐ I. Glassy-Water Takeoff and Climb (ASES, AMES) [AIA/CAX-IV.I.]
- ☐ J. Glassy-Water Approach and Landing (ASES, AMES) [AIA/CAX-IV.J.]
- ☐ K. Rough-Water Takeoff and Climb (ASES, AMES) [AIA/CAX-IV.K.]
- ☐ L. Rough-Water Approach and Landing (ASES, AMES) [AIA/CAX-IV.L.]
- ☐ M. Forward Slip to a Landing (ASEL, ASES) [AIA/PAR-IV.M.]
- ☐ N. Go-Around/Rejected Landing [AIA/CAX-IV.N.]
- ☐ O. Power-Off 180° Accuracy Approach and Landing (ASEL, ASES) [AIA/CAX-IV.M]

VIII. Fundamentals of Flight

Note: The evaluator must select at least one Task.

- ☐ A. Straight-and-Level Flight [AIA]
- ☐ B. Level Turns [AIA]
- ☐ C. Straight Climbs and Climbing Turns [AIA]
- ☐ D. Straight Descents and Descending Turns [AIA]

IX. Performance Maneuvers

Note: The evaluator must select at least Task A or B, and Task C or D.

- ☐ A. Steep Turns [AIA/CAX-V.A.]
- ☐ B. Steep Spiral [AIA/CAX-V.B.]
- ☐ C. Chandelles [AIA/CAX-V.C.]
- ☐ D. Lazy Eights [AIA/CAX-V.D.]

X. Ground Reference Maneuvers

Note: The evaluator must select both Tasks A and B**.**

- ☐ A. Ground Reference Maneuvers [AIA/PAR-V.B.]
- ☐ B. Eights on Pylons [AIA/CAX-V.E.]

XI. Slow Flight, Stalls and Spins

Note: The evaluator must select Task A, at least one proficiency stall (Task B or C), at least one demonstration stall (Task D, E, F, or G), and Task H.

- ☐ A. Maneuvering During Slow Flight [AIA/CAX-VII.A.]
- ☐ B. Power-Off Stalls (Proficiency) [AIA/PAR-VII.B.]
- ☐ C. Power-On Stalls (Proficiency) [AIA/PAR-VII.C.]
- ☐ D. Cross-controlled Stalls (Demonstration) [AIA]
- ☐ E. Elevator Trim Stalls (Demonstration) [AIA]
- ☐ F. Secondary Stalls (Demonstration) [AIA]
- ☐ G. Accelerated Maneuver Stalls (Demonstration) [AIA]
- ☐ H Spin Awarness and Spins [AIA]

XII. Basic Instrument Maneuvers

Note: The evaluator must select at least one Task.

- ☐ A. Straight-and-Level Flight [AIA/PAR-VIII.A.]
- ☐ B. Constant Airspeed Climbs [AIA/PAR-VIII.B.]
- ☐ C. Constant Airspeed Descents [AIA/PAR-VIII.C.]
- ☐ D. Turns to Headings [AIA/PAR-VIII.D.]
- ☐ E. Recovery from Unusual Flight Attitudes [AIA/PAR-VIII.E.]

XIII. Emergency Procedures

Note: The evaluator must select at least Tasks A and C.

- ☐ A. Emergency Descent [AIA/CAX-IX.A.]

- ☐ B. Emergency Approach and Landing (Simulated) [AIA/CAX-IX.B.]
- ☐ C. Systems and Equipment Malfunctions [AIA/CAX-IX.C.]
- ☐ D. Emergency Equipment and Survival Gear [AIA/CAX-IX.D.]

XIV. Multiengine Operations

- ☐ A.
- ☐ B.
- ☐ C.
- ☐ D.
- ☐ E.
- ☐ F.
- ☐ G.
- ☐ H.

XV. Postflight Procedures

Note: The evaluator must select Task A and, for ASES Applicants, Task B.

- ☐ A. After Landing, Parking and Securing [AIA/CAX-XI.A.]
- ☐ B. Seaplane Post-Landing Procedures (ASES, AMES) [AIA/CAX-XI.B.]

[Flight Instructor Multiengine Airplane Tasks will be developed and incorporated in Section 2 of this ACS prior to publication.]

Areas of Operation

The Areas of Operation for the Flight Instructor-Airplane certificate are set forth below. Some of the Tasks included in these Areas of Operation incorporate by reference descriptions contained elsewhere. In particular, during the Flight Instructor-Airplane practical test the applicant will be evaluated on various Tasks described in the FOI section of this Instructor ACS, the Commercial Pilot Airplane (CAX) ACS or the Private Pilot Airplane (PAR) ACS document(s). Tasks that incorporate descriptions by reference are indicated with preceding notes and annotated on the Evaluator's Practical Test Checklist.

The instructor-applicant will be required to demonstrate instructional competence in the Task elements, skills, associated with each Task, regardless of whether the Task is unique to the Instructor or whether it is incorporated by reference from the CAX ACS or the PAR ACS. Instructional competence includes the ability to demonstrate instructional knowledge of the elements of each Task and the ability to demonstrate and simultaneously explain the skills associated with each Task from an instructional standpoint, while simultaneously managing the risks associated with flight instruction. Where indicated below, the instructor-applicant must also demonstrate instructional competence with respect to describing, analyzing, and correcting common errors associated with certain Tasks described in CAX or the PAR ACS document(s).

I. Fundamentals of Instructing

For each of the Tasks included in this Area of Operation, refer to the description contained in the FOI.

Note: The evaluator must select Tasks E and F and one other Task.

Task A. Learning Process

Task B. Human Behavior and Effective Communication

Task C. Teaching Process and Methods

Task D. Assessment

Task E. Instructor Responsibilities and Professional Characteristics

Task F. Risk Management and Aeronautical Decision-Making

II. Technical Subject Areas

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

Task	***Task A. Principles of Flight***
References	FAA-H-8083-3, FAA-H-8083-25
Objective	To determine that the applicant understands the elements of aerodynamics appropriate to the desired instructor certificate and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.II.A.K1	Airfoil design characteristics.
AIA.II.A.K2	Airplane stability, maneuverability and controllability.
AIA.II.A.K3	Turning tendency (e.g., torque, p-factor, spiraling slipstream, and gyroscopic precession).
AIA.II.A.K4	Forces acting on an airplane.
AIA.II.A.K5	Load factors in airplane design.
AIA.II.A.K6	Wingtip vortices and precautions to be taken.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.II.A.R1	Failure to understand the basic aerodynamic principles of flight.
Skills	The applicant demonstrates the ability to:
AIA.II.A.S1	Deliver instruction on principles of flight, to include at least one of the elements listed in K1-K6, in a lesson or scenario specified by the evaluator:

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

Task	***Task B. 14 CFR and Publications***
References	14 CFR parts 1, 61, 91; NTSB part 830; FAA-H-8083-25; AIM; POH/AFM
Objective	To determine that the applicant understands the Code of Federal Regulations and other publications relevant to safe operation and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction..
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.II.B.K1	The purpose, general content, means of distribution/access and of verifying currency of each of the following documents:
AIA.II.B.K1a	a. 14 CFR parts 1, 61, and 91.
AIA.II.B.K1b	b. NTSB part 830.
AIA.II.B.K1c	c. Advisory Circulars.
AIA.II.B.K1d	d. Airman Certification Standards or Practical Test Standards
AIA.II.B.K1e	e. Pilot's Operating Handbooks or FAA-approved airplane flight manuals.
AIA.II.B.K1f	f. Flight information publications (e.g., Aeronautical Information Manual (AIM) and Chart Supplements U.S. (formerly Airport/Facility Directory)).
Risk Management	The applicant demonstrate the ability to teach and manage the risks arising from:
AIA.II.B.R1	[Intentionally left blank]
Skills	The applicant demonstrates the ability to:
AIA.II.B.S1	Deliver instruction on 14 CFR parts 1, 61, and 91 plus at least one of the elements in K1a-K1f above in a lesson or scenario specified by the evaluator:

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

Task	***Task C Endorsements and Logbook Entries***
References	14 CFR parts 61; AC 61-65
Objective	To determine that the applicant understands the elements of logbook entries and endorsements and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.II.C.K1	Required logbook entries for instruction given.
AIA.II.C.K2	Required student pilot solo endorsements and logbook entries.
AIA.II.C.K3	Other required pilot logbook endorsements (e.g., tailwheel, high performance).
AIA.II.C.K4	Preparation of a recommendation for a pilot practical test, to include appropriate logbook entry and relevant certificate/rating application for:
AIA.II.C.K4a	a. Initial pilot certification
AIA.II.C.K4b	b. Additional pilot certification
AIA.II.C.K4c	c. Additional aircraft qualification
AIA.II.C.K5	Required endorsement of a pilot logbook for the satisfactory completion of the required FAA flight review.
AIA.II.C.K6	Required flight instructor records.
Risk Management	The applicant demonstrate the ability to teach and manage the risks arising from:
AIA.II.C.R1	[Intentionally left blank]
Skills	The applicant demonstrates the ability to:
AIA.II.C.S1	Prepare simulated logbook entries and endorsements required for at least two of the events specified in K1-K5 above.

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

Task	***Task D. Runway Incursion Avoidance***
References	FAA-H-8083-2; FAA-H-8083-3, FAA-H-8083-25; AC 91-73, A/FD, AIM
Objective	To determine that the applicant understands the elements of runway incursion avoidance and demonstrates the ability to apply that knowledge in ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.II.D.K1	Taxi instructions/clearances.
AIA.II.D.K2	Airport markings, signs, and lights.
AIA.II.D.K3	Procedures for:
AIA.II.D.K3a	a. Appropriate flight deck activities during taxiing including taxi route planning, briefing the location of Hot Spots, communicating and coordinating with ATC
AIA.II.D.K3b	b. Safe taxi at towered and non-towered airports
AIA.II.D.K3c	c. Entering or crossing runways
AIA.II.D.K3d	d. Night taxi operations
AIA.II.D.K3e	e. Low visibility taxi operations
Risk Management	The applicant demonstrate the ability to teach and manage the risks arising from:
AIA.II.D.R1	Distractions, loss of situational awareness, and/or improper Task management.
AIA.II.D.R2	Confirmation or expectation bias as related to taxi instructions.
Skills	The applicant demonstrates the ability to:
AIA.II.D.S1	Deliver instruction on the elements and techniques for runway incursion avoidance in a scenario specified by the evaluator.

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

For each of the following Tasks (E through O) included in the Technical Subject Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an "AIA" for Instructor Airplane, **i.e. AIA.CA.I.H.K1a = Hypoxia.**

Task	**Task E. Human Factors**
Foundational ACS	Refer to the Commercial Pilot ACS, Task I.H, Human Factors
Objective	To determine that the applicant understands the elements of personal health, flight physiology, aeromedical and human factors as they relate to safety of flight and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Personal health, flight physiology, aeromedical and human factors relating to safety of flight as noted in the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements related to personal health, flight physiology, aeromedical and human factors relating to safety of flight as noted in the referenced Task.
Skills	The applicant demonstrates the ability to:
*	Deliver instruction on personal health, flight physiology, aeromedical and human factors relating to safety of flight in accordance with the referenced Task in a scenario specified by the evaluator.

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

For each of the following Tasks (E through O) included in the Technical Subject Areas Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an "AIA" for Instructor Airplane, **i.e. AIA.CA.I.D.K1F = TAS and ground speed.**

Task	***Task F. Navigation and Flight Planning***
Foundational ACS	Refer to the Commercial Pilot ACS, Task I.D, Cross-Country Flight Planning
Objective	To determine that the applicant understands the elements of VFR cross-country flight planning and navigation and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Flight planning and navigation on cross-country flights in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of cross-country flight planning and navigation in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
*	Deliver instruction on cross-country flight planning and navigation in accordance with the referenced Task in a scenario specified by the evaluator.

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

For each of the following Tasks (E through O) included in the Technical Subject Areas Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an "AIA" for Instructor Airplane, **i.e. AIA.CA.I.G.R1 = Handling a failure properly**

Task	***Task G. Airplane Flight Controls and Operation of Systems*** .
Foundational ACS	Refer to the Commercial Pilot ACS, Task I.G., Operation of Systems
Objective	To determine that the applicant understands the elements of flight controls and safe operation of systems on the airplane provided for the flight test and has the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	The flight controls and systems operation in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements related to flight controls and operation of systems in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
*	Deliver instruction on airplane flight controls and operating aircraft systems in accordance with the referenced Task in a scenario specified by the evaluator.

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

For each of the following Tasks (E through O) included in the Technical Subject Areas Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an "AIA" for Instructor Airplane, **i.e. AIA.CA.I.F.R1 = Performance charts**

Task	***Task H. Airplane Performance, Limitations, Weight and Balance***
Foundational ACS	Refer to the Commercial Pilot ACS, Task I.F., Performance and Limitations
Objective	To determine that the applicant understands the elements of operating an aircraft safely within the parameters of its performance capabilities and limitations and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Airplane performance, limitations and weight and balance in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements related to aircraft performance, limitations and weight and balance in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
*	Deliver instruction on aircraft performance, limitations and weight and balance in accordance with the referenced Task for the aircraft to be used in the practical test.

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

For each of the following Tasks (E through O) included in the Technical Subject Areas Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an "AIA" for Instructor Airplane, **i.e. AIA.PA.XI.A.R2 = CFIT avoidance.**

Task	***Task I. Night Operation***
Foundational ACS	Refer to the Private Pilot ACS, Task XI.A., Night Preparation and Commercial Pilot ACS II.D.K6d Night Taxi Operations.
Objective	To determine that the applicant understands the elements of night operations and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Night operations in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements related to night operations in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
*	Deliver instruction on night operations in accordance with the referenced Task.
AIA.II.I.S2	Provide a pre-takeoff briefing appropriate for night operations

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

For each of the following Tasks (E through O) included in the Technical Subject Areas Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an "AIA" for Instructor Airplane, **i.e. AIA.CA.IX.A.R4 = Combustion hazards in an oxygen-rich environment**

Task	***Task J. High Altitude Operations – Supplemental Oxygen***
Foundational ACS	Refer to the Commercial Pilot ACS, Task VIII.A., Supplemental Oxygen
Objective	To determine that the applicant understands the elements of flight at altitudes where supplemental oxygen is required or recommended.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	High altitude operations involving supplemental oxygen in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements related to high altitude operations requiring supplemental oxygen in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
*	Deliver instruction on high altitude operations involving the use of supplemental oxygen in accordance with the referenced Task.

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

For each of the following Tasks (E through O) included in the Technical Subject Areas Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IX.B.R1 = High altitude flight**

Task	***Task K. High Altitude Operations – Pressurization***
Foundational ACS	Refer to the Commercial Pilot ACS, Task VIII.B., Pressurization
Objective	To determine that the applicant understands the elements of flight in pressurized aircraft at high altitudes and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	High altitude operations involving pressurized aircraft in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements related to high altitude operations involving pressurized aircraft in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
*	Deliver instruction on high altitude operations involving pressurized aircraft in accordance with the referenced Task.

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

For each of the following Tasks (E through O) included in the Technical Subject Areas Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.I.E.K2 = Charting Symbology**

Task	***Task L. National Airspace System***
Foundational ACS	Refer to the Commercial Pilot ACS, Task I.E., National Airspace System
Objective	To determine that the applicant understands the elements of operating under VFR in the National Airspace System as a private or commercial pilot and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	The National Airspace System in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements related to operating in the National Airspace System in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
*	Deliver instruction on the National Airspace System in accordance with the referenced Task.

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

For each of the following Tasks (E through O) included in the Technical Subject Areas Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, i.e. **AIA.CA.VI.A.K3 = Topography**

Task	***Task M. Pilotage and Dead Reckoning***
Foundational ACS	Refer to the Commercial Pilot ACS, Task VI.A., Pilotage and Dead Reckoning
Objective	To determine that the applicant understands the elements associated with pilotage and dead reckoning and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Pilotage and dead reckoning in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements related to pilotage and dead reckoning in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
*	Deliver instruction on pilotage and dead reckoning in accordance with the referenced Task.

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

For each of the following Tasks (E through O) included in the Technical Subject Areas Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, i.e. **AIA.CA.VI.B.K4 = Transponder (Modes(s) A, C, and S)**

Task	***Task N. Navigation Systems and Radar Services***
Foundational ACS	Refer to the Commercial Pilot ACS, Task VI.B., Navigation Systems and Radar Services
Objective	To determine that the applicant understands the elements of navigation systems and radar services and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Navigation systems and radar services in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements elated to navigation systems and radar services in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
*	Deliver instruction on navigation systems and radar services in accordance with the referenced Task.

Note: The evaluator must select Tasks C and D and at least one other Task from Area of Operation II, Technical Subject Areas.

For each of the following Tasks (E through O) included in the Technical Subject Areas Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, i.e. **AIA.CA.I.I.R2 = Impact of marine traffic**

Task	***Task O. Water and Seaplane Characteristics, Seaplane Bases, Maritime Rules and Aids to Marine Navigation (ASES, AMES)***
Foundational ACS	Refer to the Commercial Pilot ACS, Task I.I., Water and Seaplane Characteristics, Seaplane Bases, Maritime Rules and Aids to Marine Navigation (ASES, AMES)
Objective	To determine that the applicant understands the elements associated with water and seaplane characteristics, seaplane bases, maritime rules, and aids to marine navigation, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Water and Seaplane Characteristics, Seaplane Bases, Maritime Rules and Aids to Marine Navigation in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements related to Water and Seaplane Characteristics, Seaplane Bases, Maritime Rules and Aids to Marine Navigation in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
*	Deliver instruction on Water and Seaplane Characteristics, Seaplane Bases, Maritime Rules and Aids to Marine Navigation in accordance with the referenced Task.

III. Preflight Preparation

Note: The evaluator must select at least one Task from Area of Operation III, Preflight Preparation.

Task	***Task A. Pilot Qualifications***
References	14 CFR parts 61, 67, 91; FAA-H-8083-3, FAA-H-8083-25; Commercial Pilot ACS Task I.A and Private Pilot ACS Task I.A; POH/AFM
Objective	To determine that the applicant understands the elements of pilot training and qualification requirements for certificates and ratings at the sport, recreational, private, and commercial levels, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.III.A.K1	Certification requirements, currency, and recordkeeping, to include training and logbook entries.
AIA.III.A.K2	Privileges and limitations of pilot certificates and ratings at sport, recreational, private, and commercial levels.
AIA.III.A.K3	Documents required to exercise privileges of the specified certificate and/or rating.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.III.A.R1	[Intentionally left blank]
Skills	The applicant demonstrates the ability to:
AIA.III.A.S1	Deliver instruction on at least two of the elements specified in K1 through K3 above in a scenario specified by the evaluator.

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Note: The evaluator must select at least one Task from Area of Operation III, Preflight Preparation.

Tasks B and C in the *Preflight Preparation* Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane.

Task	***Task B. Airworthiness Requirements*** .E
Foundational ACS	Refer to the Commercial Pilot ACS, Task I.B., Airworthiness Requirements
Objective	To determine that the applicant understands the elements of airworthiness requirements, including aircraft certificates, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Airworthiness requirements in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Airworthiness requirements in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
AIA.III.B.S1	Deliver instruction on Airworthiness Requirements in accordance with the referenced Task.

Note: The evaluator must select at least one Task from Area of Operation III, Preflight Preparation.

Tasks B and C in the *Preflight Preparation* Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, i.e. **AIA.CA.I.C.K1 = Acceptable sources of weather data for flight planning purposes**

Task	***Task C. Weather Information***
Foundational ACS	Refer to the Commercial Pilot ACS, Task I.C., Weather Information
Objective	To determine that the applicant understands the elements of weather information for a flight under VFR, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Weather Information in accordance with the referenced Task.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Weather information in accordance with the referenced Task.
Skills	The applicant demonstrates the ability to:
AIA.III.C.S1	Deliver instruction on weather information in accordance with the referenced Task, using a scenario specified by the evaluator.

IV. Preflight Lesson on a Maneuver to be Performed in Flight

Task	***Task A. Maneuver Lesson***
References	FAA-H-8083-3, FAA-H-8083-9, FAA-H-8083-23, FAA-H-8083-25; Commercial Pilot ACS, Private Pilot ACS; POH/AFM
Objective	To determine that the applicant understands the elements of a maneuver Task selected from AIA VII through AIA XIII and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.IV.A.K1	Purpose of the maneuver.
AIA.IV.A.K2	Elements of the maneuver and common learner errors associated with it.
AIA.IV.A.K3	Desired outcome(s), including completion standards.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.IV.A.R1	Selected maneuver Task.
Skills	The applicant demonstrates the ability to:
AIA.IV.A.S1	Deliver instruction on the selected maneuver, using teaching methods and aids that incorporate K1 through K3 above as appropriate.

V. Preflight Procedures

Note: The evaluator must select at least one Task from Area of Operation V, Preflight Procedures.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.II.A.K1 = Pilot self-assessment**

Task	***Task A. Preflight Assessment***
Foundational ACS	Refer to the Commercial Pilot ACS, Task II.A, Preflight Assessment
Objective	To determine that the applicant understands the elements of preflight assessment and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Preflight assessment as noted in the referenced Task.
AIA.V.A.K2	Common errors related to preflight assessment, to include:
AIA.V.A.K2a	a. Failure to use a checklist.
AIA.V.A.K2b	b. Improper use of a checklist.
AIA.V.A.K2c	c. Allowing distractions to interrupt a visual inspection
AIA.V.A.K2d	d. Inability to recognize discrepancies
AIA.V.A.K2e	e. Failure to ensure servicing with the proper fuel and oil
AIA.V.A.K2f	f. Failure to ensure proper loading and securing of baggage, cargo, and equipment
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of preflight assessment as noted in the referenced Task.
AIA.V.A.R2	Instructional risks associated with preflight assessment.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain preflight assessment as noted in the referenced Task.
AIA.V.A.S2	Analyze and correct simulated common errors related to preflight assessment, to include those stipulated in K2a through K2f above.

Note: The evaluator must select at least one Task from Area of Operation V, Preflight Procedures.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.II.B.K3 = Use of appropriate checklists**

Task	***Task B. Flight Deck Management***
Foundational ACS	Refer to the Commercial Pilot ACS, Task II.B., Flight Deck Management
Objective	To determine that the applicant understands the elements of flight deck management and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Flight deck management as noted in the referenced Task.
AIA.V.B.K2	Common errors related to flight deck management encompassing:
AIA.V.B.K2a	a. Failure to place and secure essential materials and equipment for easy access
AIA.V.B.K2b	b. Failure to properly adjust and secure safety belts, shoulder harnesses, rudder pedals, and seats
AIA.V.B.K2c	c. Failure to brief occupants on use of safety belts, opening door(s), sterile cockpit, keeping hands and feet away from controls, and emergency procedures.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of flight deck management as noted in the referenced Task.
AIA.V.B.R2	Instructional risks associated with flight deck management.
Skills	The applicant exhibits the ability to :
*	Demonstrate and simultaneously explain flight deck management as noted in the referenced Task.
AIA.V.B.S2	Analyze and correct simulated common errors related to flight deck management, to include those stipulated in K2a through K2e above.

Note: The evaluator must select at least one Task from Area of Operation V, Preflight Procedures.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.II.C.R3 = Abnormal start**

Task	***Task C. Engine Starting***
Foundational ACS	Refer to the Commercial Pilot ACS, Task II.C., Engine Starting
Objective	To determine that the applicant understands the elements of engine starting and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Engine starting as noted in the referenced Task.
AIA.V.C.K2	Common errors related to engine starting encompassing:
AIA.V.C.K2a	a. Failure to use the appropriate checklist
AIA.V.C.K2b	b. Failure to use safety precautions related to starting, to include ensuring proper clearance around the aircraft.
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of engine starting as noted in the referenced Task.
AIA.V.C.R2	Instructional risks associated with engine starting.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain engine starting as noted in the referenced Task.
AIA.V.C.S2	Analyze and correct simulated common errors related to engine starting including those stipulated in K2a through K2b above.

Note: The evaluator must select at least one Task from Area of Operation V, Preflight Procedures.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.II.D.K5 = Aircraft lighting**

Task	***Task D. Taxiing***
Foundational ACS	Refer to the Commercial Pilot ACS, Task II.D. Taxiing (ASEL, AMEL).
Objective	To determine that the applicant understands the elements of taxiing an airplane and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Taxiing as noted in the referenced Task.
AIA.V.D.K2	Common errors related to taxiing encompassing:
AIA.V.D.K2a	a. Improper use of brakes and/or power to manage taxi speed
AIA.V.D.K2b	b. Improper positioning of the flight controls for various wind conditions
AIA.V.D.K2c	c. Improper taxi speed
AIA.V.D.K2d	d. Failure to comply with airport/taxiway/runway surface markings, signs, signals, lighting and ATC clearances or instructions
AIA.V.D.K2e	e. Failure to use proper runway incursion avoidance procedures (e.g., planning and briefing the taxi route).
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of taxiing as noted in the referenced Task.
AIA.V.D.R2	Instructional risks associated with taxiing.
Skills	The applicant exhibits the ability to:
AIA.V.D.S1	Demonstrate and simultaneously explain taxiing as noted in the referenced Task.
AIA.V.D.S2	Analyze and correct simulated common errors related to taxiing, to include those stipulated in K2a through K2e above.

Note: The evaluator must select at least one Task from Area of Operation V, Preflight Procedures.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.II.E.K5 = Aircraft lighting**

Task	***Task E. Taxiing and Sailing (ASES)***
Foundational ACS	Refer to the Commercial Pilot ACS, Task II.E., Taxiing and Sailing (ASES, AMES)
Objective	To determine that the applicant understands the elements of taxiing and sailing and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Taxiing and sailing as noted in the referenced Task.
AIA.V.E.K2	Common errors related to taxiing and/or sailing encompassing:
	Taxiing
AIA.V.E.K2a	a. Improper positioning of flight controls for wind conditions
AIA.V.E.K2b	b. Improper control of speed and direction
AIA.V.E.K2c	c. Failure to prevent porpoising and skipping
AIA.V.E.K2d	d. Failure to use the most suitable course and available marking aids, signs and lighting
AIA.V.E.K2e	e. Failure to use proper clearing procedures to avoid hazards
AIA.V.E.K2f	f. Failure to follow right-of-way rules
	Sailing
AIA.V.E.K2g	g. Failure to select the most favorable course to destination
AIA.V.E.K2h	h. Improper use of controls, flaps, and water rudders
AIA.V.E.K2i	i. Improper procedure when changing direction
AIA.V.E.K2j	j. Improper procedure for speed control
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of taxiing and sailing as noted in the referenced Task.
AIA.V.E.R2	Instructional risks associated with taxiing and sailing.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain taxiing and sailing as noted in the referenced Task.
AIA.V.E.S2	Analyze and correct simulated common errors related to taxiing and sailing, to include those stipulated in K2a through K2f (taxiing) and/or K2g through K2j (sailing).

Note: The evaluator must select at least one Task from Area of Operation V, Preflight Procedures.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.II.F.K1 = Purpose of pre-takeoff checklist items**

Task	***Task F. Before Takeoff Check***
Foundational ACS	Refer to the Commercial Pilot ACS, Task II.F., Before Takeoff Check
Objective	To determine that the applicant understands the elements of before takeoff checks and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Before takeoff checks as noted in the referenced Task.
AIA.V.F.K2	Common errors related to before takeoff checks encompassing:
AIA.V.F.K2a	a. Failure to use the appropriate checklist
AIA.V.F.K2b	b. Failure to review takeoff and emergency procedures
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of before takeoff checks as noted in the referenced Task.
AIA.V.F.R2	Instructional risks associated with before takeoff check.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain before takeoff checks as noted in the referenced Task.
AIA.V.F.S2	Analyze and correct simulated common errors related to before takeoff checks, to include those stipulated in K2a and K2b above.

VI. Airport and Seaplane Base Operations

Note: The evaluator must select at least one other Task from Area of Operation VI, Airport and Seaplane Base Operations.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.III.A.K5 = Lost communication procedures**

Task	***Task A. Communications and Light Signals***
Foundational ACS	Refer to the Commercial Pilot ACS, Task III.A., Communications and Light Signals
Objective	To determine that the applicant understands the elements of communications and ATC light signals and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Communications and light signals as noted in the referenced Task.
AIA.VI.A.K2	Common errors related to communications and light signals encompassing:
AIA.VI.A.K2a	a. Failure to use proper frequencies
AIA.VI.A.K2b	b. Improper procedure and phraseology when using communications (e.g., neglecting to state the aircraft call sign/N-number at non-towered airports, failure to accurately state position, runway of takeoff, and the airport of operation)
AIA.VI.A.K2c	c. Failure to acknowledge or correctly comply with ATC clearances and instructions
AIA.VI.A.K2d	d. Failure to understand or correctly comply with light signals
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of communications and light signals as noted in the referenced Task.
AIA.VI.A.R2	Instructional risks associated with communications and light signals.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain communications and light signals as noted in the referenced Task.
AIA.VI.A.S2	Analyze and correct common errors related to communications and light signals, to include those stipulated in K2a through K2d above.

Note: The evaluator must select at least one other Task from Area of Operation VI, Airport and Seaplane Base Operations.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.III.B.K6 = Proper communications procedures**

Task	***Task B. Traffic Patterns***
Foundational ACS	Refer to the Commercial Pilot ACS, Task III.B., Traffic Patterns
Objective	To determine that the applicant understands the elements of airport traffic patterns and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Airport traffic patterns as noted in the referenced Task.
AIA.VI.B.K2	Common errors related to traffic patterns encompassing:
AIA.VI.B.K2a	a. Failure to comply with traffic pattern instructions, procedures, and rules
AIA.VI.B.K2b	b. Improper correction for wind drift
AIA.VI.B.K2c	c. Inadequate spacing from other traffic
AIA.VI.B.K2d	d. Poor altitude or airspeed control
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of airport traffic patterns as noted in the referenced Task.
AIA.VI.B.R2	Instructional risks associated with traffic patterns.
Skills	The applicant exhibits the ability to:
	Demonstrate and simultaneously explain airport traffic patterns as noted in the referenced Task.
AIA.VI.B.S2	Analyze and correct simulated common errors related to airport traffic patterns, to include those stipulated in K2a through K2d above.

VII. Takeoffs, Landings, and Go-Arounds

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.A.K3 = Appropriate aircraft configuration**

Task	***Task A. Normal Takeoff and Climb***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.A., Normal Takeoff and Climb
Objective	To determine that the applicant understands the elements of normal takeoff and climb and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Normal takeoff and climb as noted in the referenced Task.
AIA.VII.A.K2	Common errors related to normal takeoff and climb encompassing:
AIA.VII.A.K2a	a. Improper use of takeoff performance data and limitations
AIA.VII.A.K2b	b. Improper use of checklist
AIA.VII.A.K2c	c. Improper runway incursion avoidance procedures
AIA.VII.A.K2d	d. Improper use of controls during a normal or crosswind takeoff
AIA.VII.A.K2e	e. Inappropriate lift-off procedures
AIA.VII.A.K2f	f. Improper climb attitude, power setting, and airspeed (V_Y)
AIA.VII.A.K2g	g. Failure to confirm instrument indications (proper power, oil pressure, fuel flow, airspeed alive) prior to rotation
AIA.VII.A.K2h	h. Failure to maintain directional control
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of normal takeoff and climb as noted in the referenced Task.
AIA.VII.A.R2	Instructional risks associated with normal takeoff and climb.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain a normal takeoff and climb as noted in the referenced Task.
AIA.VII.A.S2	Analyze and correct simulated common errors related to normal takeoff and climb, to include those stipulated in K2a through K2g above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.B.K3 = Wind correction techniques on approach and landing**

Task	***Task B. Normal Approach and Landing***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.B., Normal Approach and Landing
Objective	To determine that the applicant understands the elements of normal approach and landing and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Normal approach and landing as noted in the referenced Task.
AIA.VII.B.K2	Common errors related to normal approach and landing encompassing:
AIA.VII.B.K2a	a. Improper use of landing performance data and limitations
AIA.VII.B.K2b	b. Failure to establish approach and landing configuration at appropriate time or in proper sequence
AIA.VII.B.K2c	c. Failure to establish and maintain a stabilized approach
AIA.VII.B.K2d	d. Failure to consider the effect of wind and landing surface
AIA.VII.B.K2e	e. Improper procedure in use of power, wing flaps, or trim
AIA.VII.B.K2f	f. Inappropriate removal of hand from throttle
AIA.VII.B.K2g	g. Improper procedure during round out and touchdown
AIA.VII.B.K2h	h. Failure to hold back elevator pressure after touchdown
AIA.VII.B.K2i	i. Closing the throttle too soon after touchdown
AIA.VII.B.K2j	j. Poor directional control during round out, touchdown, and/or after touchdown
AIA.VII.B.K2k	k. Improper use of brakes
AIA.VII.B.K2l	l. Failure to ensure receipt and acknowledgement of landing clearance
AIA.VII.B.K2m	m. Failure to use runway incursion avoidance practices
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of normal approach and landing as noted in the referenced Task.
AIA.VII.B.R2	Instructional risks associated with normal approach and landing.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain normal approach and landing as noted in the referenced Task.
AIA.VII.BS2	Analyze and correct simulated common errors related to normal approach and landing to include those stipulated in K2a through K2j above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.C.K4 = Ground effect**

Task	***Task C. Soft-Field Takeoff and Climb***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.C., Soft-Field Takeoff and Climb (ASEL)
Objective	To determine that the applicant understands the elements of soft-field takeoff and climb and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Soft-field takeoff and climb as noted in the referenced Task.
AIA.VII.C.K2	Common errors related to soft-field takeoff and climb encompassing:
AIA.VII.C.K2a	a. Improper use of takeoff performance data and limitations
AIA.VII.C.K2b	b. Improper use of checklist
AIA.VII.C.K2c	c. Improper runway incursion avoidance procedures
AIA.VII.C.K2d	d. Improper use of controls during a soft-field takeoff
AIA.VII.C.K2e	e. Improper lift-off procedures
AIA.VII.C.K2f	f. Improper climb attitude, power setting, and airspeed (V_Y or V_X)
AIA.VII.C.K2g	g. Failure to confirm instrument indications (proper power, oil pressure, fuel flow, airspeed alive) prior to rotation
AIA.VII.C.K2h	h. Failure to maintain directional control
AIA.VII.C.K2i	i. Climbing out of ground effect prior to accelerating to V_X or V_Y
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of soft-field takeoff and climb as noted in the referenced Task.
AIA.VII.C.R2	Instructional risks associated with soft-field takeoff and climb.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain soft-field takeoff and climb as noted in the referenced Task.
AIA.VII.C.S2	Analyze and correct simulated common errors related to soft-field takeoff and climb, to include those stipulated in K2a through K2h above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.D.K3 = Wind correction techniques on approach and landing**

Task	***Task D. Soft-Field Approach and Landing***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.D., Soft-Field Approach and Landing (ASEL)
Objective	To determine that the applicant understands the elements of soft-field approach and landing and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Soft-field approach and landing as noted in the referenced Task.
AIA.VII.D.K2	Common errors related to soft-field approach and landing, encompassing:
AIA.VII.D.K2a	a. Improper use of landing performance data and limitations
AIA.VII.D.K2b	b. Failure to establish approach and landing configuration at appropriate time or in proper sequence
AIA.VII.D.K2c	c. Failure to establish and maintain a stabilized approach
AIA.VII.D.K2d	d. Failure to consider the effect of wind and landing surface
AIA.VII.D.K2e	e. Improper procedure in use of power, wing flaps, or trim
AIA.VII.D.K2f	f. Inappropriate removal of hand from throttle
AIA.VII.D.K2g	g. Improper procedure during round out and touchdown
AIA.VII.D.K2h	h. Failure to hold back elevator pressure after touchdown
AIA.VII.D.K2i	i. Closing the throttle too soon after touchdown
AIA.VII.D.K2j	j. Poor directional control during round out, touchdown, and/or after touchdown
AIA.VII.D.K2k	k. Improper use of brakes
AIA.VII.D.K2l	l. Failure to ensure receipt and acknowledgement of landing clearance
AIA.VII.D.K2m	m. Improper runway incursion avoidance procedures
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of soft-field approach and landing as noted in the referenced Task.
AIA.VII.D.R2	Instructional risks associated with soft-field approach and landing.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain soft-field approach and landing as noted in the referenced Task.
AIA.VII.D.S2	Analyze and correct simulated common errors related to soft-field approach and landing, to include those stipulated in K2a through K2j above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAXACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.E.K3 = Appropriate aircraft configuration**

Task	***Task E. Short-Field Takeoff and Maximum Performance Climb (ASEL, AMEL)***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.E., Short-Field Takeoff and Maximum Performance Climb (ASEL, AMEL)
Objective	To determine that the applicant understands the elements of short-field takeoff and maximum performance climb and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Short-field takeoff and maximum performance climb as noted in the referenced Task.
AIA.VII.E.K2	Common errors related to short-field takeoff and maximum performance climb encompassing:
AIA.VII.E.K2a	a. Improper use of takeoff performance data and limitations
AIA.VII.E.K2b	b. Improper use of checklist
AIA.VII.E.K2c	c. Improper runway incursion avoidance procedures
AIA.VII.E.K2d	d. Improper use of controls during a short-field takeoff
AIA.VII.E.K2e	e. Improper lift-off procedures
AIA.VII.E.K2e	f. Improper initial climb attitude, power setting, and airspeed (V_X) to clear obstacle and then transition to V_Y
AIA.VII.E.K2g	g. Failure to confirm instrument indications (proper power, oil pressure, fuel flow, airspeed alive) prior to rotation
AIA.VII.E.K2h	h. Failure to maintain directional control
AIA.VII.E.K2i	i. Failure to fully release brakes at start of takeoff roll
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of short-field takeoff and maximum performance climb as noted in the referenced Task.
AIA.VII.E.R2	Instructional risks associated with short-field takeoff and maximum performance climb.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain short-field takeoff and maximum performance climb as noted in the referenced Task.
AIA.VII.E.S2	Analyze and correct common errors related of short-field takeoff and maximum performance climb, to include those stipulated in K2a through K2g above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.F.K3 = Wind correction techniques on approach and landing**

Task	***Task F. Short-Field Approach and Landing***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.F., Short-Field Approach and Landing (ASEL, AMEL)
Objective	To determine that the applicant understands the elements of short-field approach and landing and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Short-field approach and landing as noted in the referenced Task.
AIA.VII.F.K2	Common errors related to short-field approach and landing, encompassing:
AIA.VII.F.K2a	a. Improper use of landing performance data and limitations
AIA.VII.F.K2b	b. Failure to establish approach and landing configuration at appropriate time or in proper sequence
AIA.VII.F.K2c	c. Failure to establish and maintain a stabilized approach
AIA.VII.F.K2d	d. Failure to consider the effect of wind and landing surface
AIA.VII.F.K2e	e. Improper procedure in use of power, wing flaps, or trim
AIA.VII.F.K2f	f. Inappropriate removal of hand from throttle
AIA.VII.F.K2g	g. Improper procedure during round out and touchdown
AIA.VII.F.K2h	h. Failure to hold back elevator pressure after touchdown
AIA.VII.F.K2i	i. Closing the throttle too soon after touchdown
AIA.VII.F.K2j	j. Poor directional control during round out, touchdown, and/or after touchdown
AIA.VII.F.K2k	k. Improper use of brakes
AIA.VII.F.K2l	l. Failure to ensure receipt and acknowledgement of landing clearance
AIA.VII.F.K2m	m. Improper runway incursion avoidance procedures
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of short-field approach and landing as noted in the referenced Task.
AIA.VII.F.R2	Instructional risks associated with short-field approach and landing.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain short-field approach and landing as noted in the referenced Task.
AIA.VII.F.S2	Analyze and correct simulated common errors related to short-field approach and landing, to include those stipulated in K2a through K2j above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.G.K10 = Emergency procedures during takeoff and climb.**

Task	***Task G. Confined Area Takeoff and Maximum Performance Climb (ASES, AMES)***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.G., Confined Area Takeoff and Maximum Performance Climb (ASES, AMES)
Objective	To determine that the applicant understands the elements of confined area takeoff and maximum performance climb and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Confined area takeoff and maximum performance climb as noted in the referenced Task.
AIA.VII.G.K2	Common errors related to confined area takeoff and maximum performance climb, encompassing:
AIA.VII.G.K2a	a. Improper takeoff water way clearance procedures
AIA.VII.G.K2b	b. Poor judgment in the selection of a suitable takeoff area
AIA.VII.G.K2c	c. Improper use of controls during a confined area takeoff
AIA.VII.G.K2d	d. Improper lift-off procedures
AIA.VII.G.K2e	e. Hazards of inadvertent contact with the water after becoming airborne
AIA.VII.G.K2f	f. Improper initial climb attitude, power setting, and airspeed (V_X) to clear obstacle and then transition to V_Y
AIA.VII.G.K2g	g. Improper use of checklist
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of confined area takeoff and maximum performance climb as noted in the referenced Task.
AIA.VII.G.R2	Instructional risks associated with confined area takeoff and maximum performance climb.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain confined area takeoff and maximum performance climb as noted in the referenced Task.
AIA.VII.G.S2	Analyze and correct simulated common errors related to confined area takeoff and maximum performance climb, to include those stipulated in K2a through K2f above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.H.K5 = Energy management.**

Task	***Task H. Confined Area Approach and Landing (ASES, AMES)***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.H., Confined Area Approach and Landing (ASES, AMES)
Objective	To determine that the applicant understands the elements of confined area approach and landing and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Confined area approach and landing as noted in the referenced Task.
AIA.VII.H.K2	Common errors related to confined area approach and landing, encompassing:
AIA.VII.H.K2a	a. Improper use of landing performance data and limitations
AIA.VII.H.K2b	b. Failure to establish approach and landing configuration at appropriate time or in proper sequence
AIA.VII.H.K2c	c. Failure to establish and maintain a stabilized approach
AIA.VII.H.K2d	d. Improper procedure in use of power, wing flaps, or trim
AIA.VII.H.K2e	e. Inappropriate removal of hand from throttle
AIA.VII.H.K2f	f. Improper procedure during round out and touchdown
AIA.VII.H.K2g	g. Failure to maintain positive control after landing
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of confined area approach and landing as noted in the referenced Task.
AIA.VII.H.R2	Instructional risks associated with confined area approach and landing.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain confined area approach and landing as noted in the referenced Task.
AIA.VII.H.S2	Analyze and correct simulated common errors related to confined area approach and landing, to include those stipulated in K2a through K2g above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.I.K1 = Water effects on operations**

Task	***Task I. Glassy-Water Takeoff and Climb (ASES, AMES)***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.I., Glassy-Water Takeoff and Climb (ASES, AMES)
Objective	To determine that the applicant understands the elements of glassy-water takeoff and climb and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Glassy-water takeoff and climb as noted in the referenced Task.
AIA.VII.I.K2	Common errors related to glassy-water takeoff and climb, encompassing:
AIA.VII.I.K2a	a. Improper takeoff water way clearance procedures
AIA.VII.I.K2b	b. Poor judgment in the selection of a suitable takeoff area
AIA.VII.I.K2c	c. Improper use of controls during a glassy-water takeoff
AIA.VII.I.K2d	d. Improper lift-off procedures
AIA.VII.I.K2e	e. Hazards of inadvertent contact with the water after becoming airborne
AIA.VII.I.K2f	f. Improper climb attitude, power setting, and airspeed (V_Y or V_X)
AIA.VII.I.K2g	g. Improper use of checklist
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of glassy-water takeoff and climb as noted in the referenced Task.
AIA.VII.I.R2	Instructional risks associated with glassy-water takeoff and climb.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain glassy-water takeoff and climb as noted in the referenced Task.
AIA.VII.I.S2	Analyze and correct simulated common errors related to glassy-water takeoff and climb, to include those stipulated in K2a through K2g above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.J.K4 = Stabilized approach.**

Task	***Task J. Glassy-Water Approach and Landing (ASES, AMES)***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.J., Glassy-Water Approach and Landing (ASES, AMES)
Objective	To determine that the applicant understands the elements of glassy-water approach and landing and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Glassy-water approach and landing as noted in the referenced Task.
AIA.VII.J.K2	Common errors related glassy-water approach and landing, encompassing:
AIA.VII.J.K2a	a. Improper use of landing performance data and limitations
AIA.VII.J.K2b	b. Failure to establish approach and landing configuration at appropriate time or in proper sequence
AIA.VII.J.K2c	c. Failure to establish and maintain a stabilized approach
AIA.VII.J.K2d	d. Improper procedure in use of power, wing flaps, or trim
AIA.VII.J.K2e	e. Inappropriate removal of hand from throttle
AIA.VII.J.K2f	f. Improper procedure during round out and touchdown
AIA.VII.J.K2g	g. Failure to maintain positive control after landing
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of glassy-water approach and landing as noted in the referenced Task.
AIA.VII.J.R2	Instructional risks associated with glassy-water approach and landing.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain glassy-water approach and landing as noted in the referenced Task.
AIA.VII.J.S2	Analyze and correct simulated common errors related to glassy-water approach and landing, to include those stipulated in K2a through K2g above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.K.S9 = Complete the appropriate checklist.**

Task	***Task K. Rough Water Takeoff and Climb (ASES, AMES)***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.K., Rough Water Takeoff and Climb (ASES, AMES)
Objective	To determine that the applicant understands the elements of rough water takeoff and climb and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Rough water takeoff and climb as noted in the referenced Task.
AIA.VII.K.K2	Common errors related to rough water takeoff and climb, encompassing:
AIA.VII.K.K2a	a. Improper takeoff water way clearance procedures
AIA.VII.K.K2b	b. Poor judgment in the selection of a suitable takeoff area
AIA.VII.K.K2c	c. Improper use of controls during a rough-water takeoff
AIA.VII.K.K2d	d. Improper lift-off procedures
AIA.VII.K.K2e	e. Hazards of inadvertent contact with the water after becoming airborne
AIA.VII.K.K2f	f. Improper climb attitude, power setting, and airspeed (V_Y or V_X)
AIA.VII.K.K2g	g. Improper use of checklist
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of rough water takeoff and climb as noted in the referenced Task.
AIA.VII.K.R2	Instructional risks associated with rough water takeoff and climb.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain rough water takeoff and climb as noted in the referenced Task.
AIA.VII.K.S2	Analyze and correct simulated common errors related to rough water takeoff and climb, to include those stipulated in K2a through K2g above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.L.K4 = Stabilized approach.**

Task	***Task L. Rough Water Approach and Landing (ASES, AMES)***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.L., Rough Water Approach and Landing (ASES, AMES)
Objective	To determine that the applicant understands the elements of rough water approach and landing and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Rough water approach and landing as noted in the referenced Task.
AIA.VII.L.K2	Common errors related rough water approach and landing, encompassing:
AIA.VII.L.K2a	a. Improper use of landing performance data and limitations
AIA.VII.L.K2b	b. Failure to establish approach and landing configuration at appropriate time or in proper sequence
AIA.VII.L.K2c	c. Failure to establish and maintain a stabilized approach
AIA.VII.L.K2d	d. Improper procedure in use of power, wing flaps, or trim
AIA.VII.L.K2e	e. Inappropriate removal of hand from throttle
AIA.VII.L.K2f	f. Improper procedure during round out and touchdown
AIA.VII.L.K2g	g. Failure to maintain positive control after landing
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of rough water approach and landing as noted in the referenced Task.
AIA.VII.L.R2	Instructional risks associated with rough water approach and landing.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain rough water approach and landing as noted in the referenced task.
AIA.VII.L.S2	Analyze and correct simulated common errors related to rough water approach and landing, to include those stipulated in K2a through K2g above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.PA.IV.M.K3 = Landing distance.**

Task	***Task M. Forward Slip to a Landing (ASEL, ASES)***
Foundational ACS	Refer to the Private Pilot ACS, Task IV.M., Forward Slip to a Landing
Objective	To determine that the applicant understands the elements of forward slip to a landing and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Forward slip to a landing as noted in the referenced Task.
AIA.VII.M.K2	Common errors related to forward slip to a landing, encompassing:
AIA.VII.M.K2a	a. Improper use of landing performance data and limitations
AIA.VII.M.K2b	b. Failure to establish approach and landing configuration at appropriate time or in proper sequence
AIA.VII.M.K2c	c. Failure to maintain a stabilized approach while slipping
AIA.VII.M.K2d	d. Carrying power in a forward slip
AIA.VII.M.K2e	e. Inappropriate removal of hand from throttle
AIA.VII.M.K2f	f. Improper procedure during transition from the slip to the touchdown
AIA.VII.M.K2g	g. Poor directional control after touchdown
AIA.VII.M.K2h	h. Improper use of brakes (landplane)
Risk Management	The applicant demonstrates the ability to teach and manage:
*	Elements of go-around/rejected landing as noted in the referenced Task.
AIA.VII.M.R2	Instructional risks associated with forward slip to a landing.
Skills	The applicant exhibits the ability to by:
*	Demonstrate and simultaneously explain forward slip to a landing as noted in the referenced Task.
AIA.VII.M.S2	Analyze and correct simulated common errors related to forward slip to a landing, to include those stipulated in K2a through K2h above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.N.K3 = Energy management.**

Task	***Task N. Go-Around/Rejected Landing***
Foundational ACS	Refer to the to the Commercial Pilot ACS, Task IV.N., Go-Around/Rejected Landing
Objective	To determine that the applicant understands the elements of go-around/rejected landing and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Go-around/rejected landing as noted in the referenced *Task*.
AIA.VII.N.K2	Common errors related to go-around/rejected landing, encompassing:
AIA.VII.N.K2a	a. Failure to recognize a situation where a go-around/rejected landing is necessary
AIA.VII.N.K2b	b. Hazards of delaying a decision to go-around/rejected landing
AIA.VII.N.K2c	c. Improper power application
AIA.VII.N.K2d	d. Failure to control pitch attitude
AIA.VII.N.K2e	e. Failure to compensate for left turning tendencies
AIA.VII.N.K2f	f. Improper trim procedure
AIA.VII.N.K2g	g. Failure to maintain recommended airspeeds
AIA.VII.N.K2h	h. Improper wing flaps or landing gear retraction procedures
AIA.VII.N.K2i	i. Failure to maintain proper track during climb-out
AIA.VII.N.K2j	j. Failure to remain well clear of obstructions and other traffic
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of go-around/rejected landing as noted in the referenced Task.
AIA.VII.N.R2	Instructional risks associated with go-around/rejected landing.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain go-around/rejected landing as noted in the referenced Task.
AIA.VII.N.S2	Analyze and correct simulated common errors related to go-around/rejected landing, to include those stipulated in K2a through K2j above.

Note: The evaluator must select at least two Takeoff and two Landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in either the CAX ACS or the PAR ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.IV.M.R1 = Wind effects.**

Task	***Task O. Power-Off 180º Accuracy Approach and Landing (ASEL, ASES)***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IV.M., Power-Off 180° Accuracy Approach and Landing
Objective	To determine that the applicant understands the elements of a power-off 180° accuracy approach and landing and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Power-off 180° accuracy approach and landing as noted in the referenced *Task*.
AIA.VII.O.K2	Common errors related to power-off 180° accuracy approach and landing, encompassing:
AIA.VII.O.K2a	a. Failure to establish approach and landing configuration at proper time or in proper sequence
AIA.VII.O.K2b	b. Failure to identify the key points in the pattern
AIA.VII.O.K2c	c. Failure to establish and maintain a stabilized approach
AIA.VII.O.K2d	d. Failure to consider the effect of wind and landing surface
AIA.VII.O.K2e	e. Improper use of wing flaps, or trim
AIA.VII.O.K2f	f. Improper procedure during round out and touchdown or diving to touchdown on “spot”
AIA.VII.O.K2g	g. Failure to land within specified limits on the centerline without inappropriate side loads
AIA.VII.O.K2h	h. Failure to hold back elevator pressure after touchdown
AIA.VII.O.K2i	i. Poor directional control after touchdown
AIA.VII.O.K2j	j. Improper use of brakes
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of forward power-off 180° accuracy approach and landing as noted in the referenced Task.
AIA.VII.O.R2	Instructional risks associated with power-off 180° accuracy approach and landing.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain power-off 180° accuracy approach and landing as noted in the referenced Task.
AIA.VII.O.S2	Analyze and correct simulated common errors related to power-off 180° accuracy approach and landing, to include those stipulated in K2a through K2j above.

VIII. Fundamentals of Flight

Note: The evaluator must select at least one Task from Fundamentals of Flight.

Task	***Task A. Straight and Level Flight***
Reference	FAA-H-8083-3, FAA-H-8083-23
Objective	To determine that the applicant understands the elements of straight-and-level flight, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.VIII.A.K1	Purpose of the maneuver.
AIA.VIII.A.K2	Basic elements of the maneuver.
AIA.VIII.A.K3	Desired outcome.
AIA.VIII.A.K4	Flight control and trim use.
AIA.VIII.A.K5	The pilot's visual references when performing the maneuver.
AIA.VIII.A.K6	Common errors related to straight and level flight:
AIA.VIII.A.K6a	a. Failure to cross-check and correctly interpret outside and instrument references
AIA.VIII.A.K6b	b. Application of control movements rather than pressures
AIA.VIII.A.K6c	c. Failure to maintain coordinated flight
AIA.VIII.A.K6d	d. Faulty trim procedure
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.VIII.A.R1	Elements of straight and level flight
AIA.VIII.A.R2	Instructional risks association with straight and level flight, to include:
AIA.VIII.A.R2a	a. Distractions, loss of situational awareness, and/or improper task management
AIA.VIII.A.R2b	b. Collision hazards, to include aircraft, terrain, obstacles, and wires
Skills	The applicant exhibits the ability to:
AIA.VIII.A.S1	Demonstrate and simultaneously explain straight and level flight.
AIA.VIII.A.S2	Analyze and correct simulated common errors related to straight and level flight, to include those stipulated in K6a through K6d above.

Note: The evaluator must select at least one Task from Fundamentals of Flight.

Task	***Task B. Level Turns***
Reference	FAA-H-8083-3
Objective	To determine that the applicant understands the elements of level turns, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.VIII.B.K1	Purpose of the maneuver.
AIA.VIII.B.K2	Basic elements of the maneuver.
AIA.VIII.B.K3	Desired outcome.
AIA.VIII.B.K4	Flight control and trim use.
AIA.VIII.B.K5	The pilot's visual references when performing the maneuver.
AIA.VIII.B.K6	Common errors related to level turns:
AIA.VIII.B.K6a	a. Failure to cross-check and correctly interpret outside and instrument references
AIA.VIII.B.K6b	b. Application of control movements rather than pressures
AIA.VIII.B.K6c	c. Failure to maintain coordinated flight
AIA.VIII.B.K6d	d. Faulty trim procedure
AIA.VIII.B.K6e	e. Failure to clear area prior to initiating turn
AIA.VIII.B.K6f	f. Faulty altitude and bank control
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.VIII.B.R1	Elements of level turns
AIA.VIII.B.R2	Instructional risks associated with level turns, to include:
AIA.VIII.B.R2a	a. Distractions, loss of situational awareness, and/or improper task management
AIA.VIII.B.R2b	b. Collision hazards, to include aircraft, terrain, obstacles, and wires
Skills	The applicant exhibits the ability to:
AIA.VIII.B.S1	Demonstrate and simultaneously explain level turns.
AIA.VIII.B.S2	Analyze and correct simulated common errors related to level turns, to include those stipulated in K6a through K6e above.

Note: The evaluator must select at least one Task from Fundamentals of Flight.

Task	***Task C. Straight Climbs and Climbing Turns***
Reference	FAA-H-8083-3
Objective	To determine that the applicant understands the elements of straight climbs and climbing turns, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.VIII.C.K1	Purpose of the maneuver.
AIA.VIII.C.K2	Basic elements of the maneuver.
AIA.VIII.C.K3	Desired outcome.
AIA.VIII.C.K4	Flight control and trim use.
AIA.VIII.C.K5	The pilot's visual references when performing the maneuver.
AIA.VIII.C.K6	Common errors related to straight climbs and climbing turns:
AIA.VIII.C.K6a	a. Failure to cross-check and correctly interpret outside and instrument references
AIA.VIII.C.K6b	b. Application of control movements rather than pressures
AIA.VIII.C.K6c	c. Failure to maintain coordinated flight
AIA.VIII.C.K6d	d. Faulty trim procedure
AIA.VIII.C.K6e	e. Failure to clear area prior to initiating turn
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.VIII.C.R1	Elements of straight climbs and climbing turns encompassing:
AIA.VIII.C.2	Instructional risks associated with straight climbs and climbing turns, to include:
AIA.VIII.C.R2a	a. Distractions, loss of situational awareness, and/or improper task management
AIA.VIII.C.R2b	b. Collision hazards, to include aircraft, terrain, obstacles, and wires
Skills	The applicant exhibits the ability to:
AIA.VIII.C.S1	Demonstrate and simultaneously explain straight climbs and climbing turns.
AIA.VIII.C.S2	Analyze and correct simulated common errors related to straight climbs and climbing turns, to include those stipulated in K6a through K6d above.

Note: The evaluator must select at least one Task from Fundamentals of Flight.

Task	***Task D. Straight Descents and Descending Turns***
Reference	FAA-H-8083-3
Objective	To determine that the applicant understands the elements of straight descents and descending turns, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.VIII.D.K1	Purpose of the maneuver.
AIA.VIII.D.K2	Basic elements of the maneuver.
AIA.VIII.D.K3	Desired outcome.
AIA.VIII.D.K4	Flight control and trim use.
AIA.VIII.D.K5	The pilot's visual references when performing the maneuver.
AIA.VIII.D.K6	Common errors related to straight descents and descending turns:
AIA.VIII.D.K6a	a. Failure to cross-check and correctly interpret outside and instrument references
AIA.VIII.D.K6b	b. Application of control movements rather than pressures
AIA.VIII.D.K6c	c. Failure to maintain coordinated flight
AIA.VIII.D.K6d	d. Faulty trim procedure
AIA.VIII.D.K6e	e. Failure to clear area prior to initiating turn
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.VIII.D.R1	Elements of straight descents and descending turns
AIA.VIII.D.R2	Instructional risks associated with straight descents and descending turns, to include:
AIA.VIII.D.R2a	a. Distractions, loss of situational awareness, and/or improper task management
AIA.VIII.D.R2b	b. Collision hazards, to included aircraft, terrain, obstacles, and wires
Skills	The applicant exhibits the ability to:
AIA.VIII.D.S1	Demonstrate and simultaneously explain straight descents and descending turns.
AIA.VIII.D.S2	Analyze and correct simulated common errors related to straight descents and descending turns, to include those stipulated in K6a through K6f above.

IX. Performance Maneuvers

Note: The evaluator must select at least Task A or B and Task C or D from Area of Operation IX, Performance Maneuvers.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.V.A.K6 = Overbanking tendencies.**

Task	***Task A. Steep Turns***
Foundational ACS	Refer to the Commercial Pilot ACS, Task V.A., Steep Turns
Objective	To determine that the applicant understands the elements of steep turns and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Steep turns as noted in the referenced Task.
AIA.IX.A.K2	Common errors related to steep turns encompassing:
AIA.IX.A.K2a	a. Improper planning for each phase of the maneuver
AIA.IX.A.K2b	b. Improper pitch, bank, and power coordination during entry or completion
AIA.IX.A.K2c	c. Improper procedure in correcting altitude deviations
AIA.IX.A.K2d	d. Uncoordinated use of flight controls
AIA.IX.A.K2e	e. Loss of orientation and/or situational awareness
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of steep turns as noted in the referenced Task.
AIA.IX.A.R2	Instructional risks associated with steep turns.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain steep turns as noted in the referenced Task.
AIA.IX.A.S2	Analyze and correct simulated common errors related to steep turns, to include those stipulated in K2a through K2d above.

Note: The evaluator must select at least Task A or B and Task C or D from Area of Operation IX Performance Maneuvers.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.V.B.R6 = Low altitude maneuvering.**

Task	***Task B. Steep Spirals***
Foundational ACS	Refer to the Commercial Pilot ACS, Task V.B., Steep Spiral
Objective	To determine that the applicant understands the elements of steep spirals and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Steep spirals as noted in the referenced Task.
AIA.IX.B.K2	Common errors related to steep spirals encompassing:
AIA.IX.B.K2a	a. Improper planning for each phase of the maneuver
AIA.IX.B.K2b	b. Improper pitch, bank, yaw, and power coordination during entry or completion
AIA.IX.B.K2c	c. Failure to maintain constant airspeed and radius
AIA.IX.B.K2d	d. Uncoordinated use of flight controls
AIA.IX.B.K2e	e. Loss of orientation and/or situational awareness
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of steep spirals as noted in the referenced Task.
AIA.IX.B.R2	Instructional risks associated with steep spirals.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain steep spirals as noted in the referenced Task.
AIA.IX.B.S2	Analyze and correct simulated common errors related to steep spirals, to include those stipulated in K2a through K2d above.

Note: The evaluator must select at least Task A or B and Task C or D from Area of Operation IX, Performance Maneuvers.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.V.C.R3 = Energy management.**

Task	***Task C. Chandelles***
Foundational ACS	Refer to the Commercial Pilot ACS, Task V.C., Chandelles
Objective	To determine that the applicant understands the elements of chandelles and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Chandelles as noted in the referenced Task.
AIA.IX.C.K2	Common errors related to chandelles encompassing:
AIA.IX.C.K2a	a. Improper planning for each phase of the maneuver, to include poor timing of pitch and bank attitude changes
AIA.IX.C.K2b	b. Improper pitch, bank, yaw, and power coordination during entry or completion
AIA.IX.C.K2c	c. Failure to achieve maximum performance
AIA.IX.C.K2d	d. Uncoordinated use of flight controls
AIA.IX.C.K2e	e. Loss of orientation and/or situational awareness
AIA.IX.C.K2f	f. Over-reliance on flight instruments
AIA.IX.C.K2g	g. Stalling the aircraft during the maneuver
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of chandelles as noted in the referenced Task.
AIA.IX.C.R2	Instructional risks associated with chandelles.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain chandelles as noted in the referenced Task.
AIA.IX.C.S2	Analyze and correct simulated common errors related to chandelles, to include those stipulated in K2a through K2g above.

Note: The evaluator must select at least Task A or B and Task C or D from Area of Operation IX, Performance Maneuvers.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.V.D.K1 = Aircraft coordination.**

Task	***Task D. Lazy Eights***
Foundational ACS	Refer to the Commercial Pilot ACS, Task V.D., Lazy Eights
Objective	To determine that the applicant understands the elements of lazy eights and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Lazy eights as noted in the referenced Task.
AIA.IX.D.K2	Common errors related to lazy eights encompassing:
AIA.IX.D.K2a	a. Improper planning for each phase of the maneuver, to include poor selection of reference points
AIA.IX.D.K2b	b. Improper pitch, bank, yaw, and power coordination during entry or completion
AIA.IX.D.K2c	c. Failure to execute symmetrical loops
AIA.IX.D.K2d	d. Uncoordinated use of flight controls
AIA.IX.D.K2e	e. Loss of orientation and/or situational awareness
AIA.IX.D.K2f	f. Over-reliance on flight instruments
AIA.IX.D.K2g	g. Inconsistent airspeed and altitude at key points
AIA.IX.D.K2h	h. Excessive deviation from reference points
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of lazy eights as noted in the referenced Task.
AIA.IX.D.R2	Instructional risks associated with lazy eights.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain lazy eights as noted in the referenced Task.
AIA.IX.D.S2	Analyze and correct common errors related to lazy eights, to include those stipulated in K2a through K2g above.

X. Ground Reference Maneuvers

Note: The evaluator must select both Tasks A and B from Area of Operation X, Ground Reference Maneuvers.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.PA.V.B.S2 = Select a suitable ground reference.**

Task	***Task A. Ground Reference Maneuvers***
Foundational ACS	Refer to the Private Pilot ACS, Task V.B., Ground Reference Maneuvers
Objective	To determine that the applicant understands the elements of ground reference maneuvers and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining
*	Ground reference maneuvers as noted in the referenced Task.
AIA.X.A.K2	Common errors related to ground reference maneuvers encompassing:
AIA.X.A.K2a	a. Improper planning for each phase of the maneuver
AIA.X.A.K2b	b. Selection of ground reference with no suitable emergency landing area within gliding distance
AIA.X.A.K2c	c. Faulty entry procedure
AIA.X.A.K2d	d. Improper ground track
AIA.X.A.K2e	e. Failure to maintain selected altitude or airspeed
AIA.X.A.K2f	f. Improper correction for wind drift
AIA.X.A.K2g	g. Uncoordinated use of flight controls
AIA.X.A.K2h	h. Loss of orientation and/or situational awareness
AIA.X.A.K2i	i. Failure to properly divide attention
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of ground reference maneuvers as noted in the referenced Task.
AIA.X.A.R2	Instructional risks associated with ground reference maneuvers.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain ground reference maneuvers as noted in the referenced Task.
AIA.X.A.S2	Analyze and correct simulated common errors related to ground reference maneuvers, to include those stipulated in K2a through K2g above.

Note: The evaluator must select at least Task D and one other Task from Area of Operation X, Ground Reference Maneuvers.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the PAR or CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.V.E.R4 = CFIT avoidance.**

Task	***Task B. Eights on Pylons***
Foundational ACS	Refer to the Commercial Pilot ACS, Task V.E., Eights on Pylons
Objective	To determine that the applicant understands the elements of eights on pylons and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining
*	Eights on pylons as noted in the referenced Task.
AIA.X.B.K2	Common errors related to eights on pylons encompassing:
AIA.X.B.K2a	a. Improper planning for each phase of the maneuver
AIA.X.B.K2b	b. Selection of pylons with no suitable emergency landing area within gliding distance
AIA.X.B.K2c	c. Faulty entry procedure
AIA.X.B.K2d	d. Improper “line-of-sight” reference
AIA.X.B.K2e	e. Application of rudder alone to maintain “line-of-sight” on the pylon
AIA.X.B.K2f	f. Improper correction for wind drift
AIA.X.B.K2g	g. Uncoordinated use of flight controls
AIA.X.B.K2h	h. Loss of orientation and/or situational awareness
AIA.X.B.K2i	i. Failure to properly divide attention
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of eights on pylons as noted in the referenced Task.
AIA.X.B.R2	Instructional risks associated with eights on pylons.
Skills	The applicant exhibits the ability to:
*	Demonstrate and simultaneously explain eights on pylons as noted in the referenced Task.
AIA.X.B.S2	Analyze and correct simulated common errors related to eights on pylons, to include those stipulated in K2a through K2j above.

XI. Slow flight, Stalls, and Spins

Note: The evaluator must select Task A, at least one proficiency stall (Task B or C), one demonstration stall (Task D, E, F or G), and Task H from Area of Operation XI, Slow Flight, Stalls, and Spins.

The following Task refers to the description contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.VII.A.K2 = Use of slow flight in normal operations.**

Task	***Task A. Maneuvering During Slow Flight***
Foundational ACS	Refer to the Commercial Pilot ACS, Task VII, A., Maneuvering During Slow Flight
Reference	FAA-H-8083-3; FAA-H-8083-25; POH/AFM
Objective	To determine that the applicant understands the elements associated with maneuvering during slow flight, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Maneuvering During Slow Flight as noted in the referenced *Task*.
AIA.XI.A.K2	Common errors related to maneuvering during slow flight encompassing:
AIA.XI.A.K2a	a. Failure to establish specified gear and flap configuration prior to entry
AIA.XI.A.K2b	b. Improper entry
AIA.XI.A.K2c	c. Improper pitch, heading, yaw, and bank control during straight-ahead flight
AIA.XI.A.K2d	d. Improper pitch, heading, yaw, and bank control during turning flight
AIA.XI.A.K2e	e. Rough and/or uncoordinated use of flight controls
AIA.XI.A.K2f	f. Failure to maintain coordinated flight
AIA.XI.A.K2g	g. Failure to establish and maintain the specified airspeed and altitude
AIA.XI.A.K2h	h. Unintentional stall
AIA.XI.A.K2i	i. Improper correction for left-turning tendencies
AIA.XI.A.K2j	j. Improper trim technique
AIA.XI.A.K2k	k. Inappropriate removal of hand from throttle(s)
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of maneuvering during slow flight as noted in the referenced *Task*.
AIA.XI.A.R2	Instructional risks associated with maneuvering during slow flight.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain maneuvering during slow flight as noted in the referenced *Task*.
AIA.XI.A.S2	Analyze and correct simulated common errors related to maneuvering during slow flight, to include those stipulated in K2a through K2k above.

Note: The evaluator must select Task A, at least one proficiency stall (Task B or C), one demonstration stall (Task D, E, F or G), and Task H from Area of Operation XI, Slow Flight, Stalls, and Spins.

Task	***Task B. Power-Off Stalls (Proficiency)***
Foundational ACS	Refer to the Private Pilot ACS, Task VII, B., and Commercial Pilot ACS, Task VII, B., Power-Off Stalls
Reference	FAA-H-8083-3; FAA-H-8083-9; FAA-H-8083-25; POH/AFM
Objective	To determine that the applicant understands the elements of power-off stalls, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Power-Off Stalls as noted in the referenced Tasks
AIA.XI.B.K2	Common errors related to power-off stalls, encompassing:
AIA.XI.B.K2a	a. Failure to establish the specified landing gear and flap configuration prior to entry
AIA.XI.B.K2b	b. Improper entry
AIA.XI.B.K2c	c. Improper pitch, heading, yaw, and bank control during straight-ahead stalls
AIA.XI.B.K2d	d. Improper pitch, yaw, and bank control during turning stalls
AIA.XI.B.K2e	e. Rough and/or uncoordinated use of flight controls
AIA.XI.B.K2f	f. Failure to maintain coordinated flight
AIA.XI.B.K2g	g. Failure to recognize the first indications of a stall
AIA.XI.B.K2h	h. Failure to achieve a stall
AIA.XI.B.K2i	i. Poor stall recognition and delayed recovery
AIA.XI.B.K2j	j. Excessive altitude loss or excessive airspeed during recovery
AIA.XI.B.K2k	k. Secondary stall during recovery
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of Power-Off Stalls as noted in the referenced Tasks.
AIA.XI.B.R2	Instructional risks associated with power-off stalls.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain impending and full power-off stalls as noted in the referenced Tasks.
AIA.XI.B.S2	Analyze and correct simulated common errors related to power-off stalls, in descending flight (straight or turning), with selected landing gear and flap configurations, to include those stipulated in K2a through K2k above.

Note: The evaluator must select Task A, at least one proficiency stall (Task B or C), one demonstration stall (Task D, E, F or H), and Tasks G and I from Area of Operation XI, Slow Flight, Stalls, and Spins.

Task	***Task C. Power-On Stalls (Proficiency)***
Foundational ACS	Refer to the Private Pilot ACS, Task VII, C., and Commercial Pilot ACS, Task VII, C., Power-On Stalls
Reference	FAA-H-8083-3; FAA-H-8083-9; FAA-H-8083-25; POH/AFM
Objective	To determine that the applicant understands the elements of power-on stalls, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Power-On Stalls as noted in the referenced Tasks.
AIA.XI.C.K2	Common errors related to power-on stalls, encompassing:
AIA.XI.C.K2a	a. Failure to establish the specified landing gear and flap configuration prior to entry
AIA.XI.C.K2b	b. Improper entry
AIA.XI.C.K2c	c. Improper pitch, heading, yaw, and bank control during straight-ahead stalls
AIA.XI.C.K2d	d. Improper pitch, yaw, and bank control during turning stalls
AIA.XI.C.K2e	e. Rough and/or uncoordinated use of flight controls
AIA.XI.C.K2f	f. Failure to maintain coordinated flight
AIA.XI.C.K2g	g. Failure to recognize the first indications of a stall
AIA.XI.C.K2h	h. Failure to achieve a stall
AIA.XI.C.K2i	i. Poor stall recognition and delayed recovery
AIA.XI.C.K2k	j. Excessive altitude loss or excessive airspeed during recovery
AIA.XI.C.K2k	k. Secondary stall during recovery
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of Power-On Stalls as noted in the referenced Tasks.
AIA.XI.C.R2	Instructional risks associated with power-on stalls.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain impending and full power-on stalls as noted in the referenced Tasks.
AIA.XI.C.S2	Analyze and correct simulated common errors related to power-on stalls, in climbing flight (straight or turning), with selected landing gear and flap configurations, to include those stipulated in K2a through K2k above.

Note: The evaluator must select Task A, at least one proficiency stall (Task B or C), one demonstration stall (Task D, E, F or G), and Task H from Area of Operation XI, Slow Flight, Stalls, and Spins.

Task	***Task D. Cross-Controlled Stalls (Demonstration)***
Reference	FAA-H-8083-3; FAA-H-8083-9; FAA-H-8083-25; POH/AFM
Objective	To determine that the applicant understands the elements of cross-controlled stalls, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.XI.D.K1	Aerodynamics of cross-controlled stalls.
AIA.XI.D.K2	Flight situations where unintentional cross-controlled stalls may occur.
AIA.XI.D.K3	Recognition of cross-controlled stalls.
AIA.XI.D.K4	Entry procedure and minimum entry altitude.
AIA.XI.D.K5	Recovery procedure.
AIA.XI.D.K6	Common errors related to cross-controlled stalls, encompassing:
AIA.XI.D.K6a	a. Failure to establish selected configuration prior to entry
AIA.XI.D.K6b	b. Failure to establish a cross-controlled turn and stall condition that will adequately demonstrate the hazards of a cross-controlled stall
AIA.XI.D.K6c	c. Improper or inadequate demonstration of the recognition and recovery from a cross-controlled stall
AIA.XI.D.K6d	d. Failure to present simulated student instruction that emphasizes the hazards of a cross-controlled condition in a gliding or reduced airspeed condition
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.XI.D.R1	Failure to present simulated instruction that demonstrates and emphasizes the hazards of a cross-controlled stall.
AIA.XI.D.R2	Instructional risks associated with cross-controlled stalls to include.
AIA.XI.D.R2a	a. Disorientation, loss of situational awareness, and/or improper task management
Skills	The applicant demonstrates the ability to:
AIA.XI.D.S1	Demonstrate and simultaneously explain a cross-controlled stall in a specified configuration.
AIA.XI.D.S2	Demonstrate and simultaneously explain proper stall recovery techniques promptly after a cross-controlled stall has occurred.
AIA.XI.D.S3	Analyze and correct simulated common errors related to cross-controlled stalls, to include those stipulated in K6a through K6d above.

Note: The evaluator must select Task A, at least one proficiency stall (Task B or C), one demonstration stall (Task D, E, F or G), and Task H from Area of Operation XI, Slow Flight, Stalls, and Spins.

Task	***Task E. Elevator Trim Stalls (Demonstration)***
Foundational ACS	FAA-H-8083-3; FAA-H-8083-9; POH/AFM
Objective	To determine that the applicant understand the elements of elevator trim stalls and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.XI.E.K1	Aerodynamics of elevator trim stalls.
AIA.XI.E.K2	Flight situations where elevator trim stalls could occur.
AIA.XI.E.K3	Recognition of elevator trim stalls.
AIA.XI.E.K4	Entry procedure and minimum entry altitude.
AIA.XI.E.K5	Recovery procedure.
AIA.XI.E.K6	Common errors related to elevator trim stalls, encompassing:
AIA.XI.E.K6a	a. Failure to present simulated student instruction that adequately emphasizes the hazards of poor correction for propeller and torque effects and up-elevator trim during go-around and other maneuvers
AIA.XI.E.K6b	b. Failure to establish selected configuration prior entry
AIA.XI.E.K6c	c. Improper or inadequate demonstration of the recognition of, and the recovery from an elevator trim stall
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.XI.E.R1	Failure to present simulated instruction that adequately emphasizes the hazards of an elevator trim stall.
AIA.XI.E.R2	Instructional risks associated with elevator trim stalls to include:
AIA.XI.E.R2a	a. Disorientation, loss of situational awareness, and /or improper task management
Skills	The applicant demonstrates the ability to:
AIA.XI.E.S1	Demonstrate and simultaneously explain elevator trim stalls in a specified configuration.
AIA.XI.E.S2	Demonstrate and simultaneously explain proper stall recovery techniques promptly after an elevator trim stall has occurred.
AIA.XI.E.S3	Analyze and correct simulated common errors related to elevator trim stalls, to include those stipulated in K6a through K6c above.

Note: The evaluator must select Task A, at least one proficiency stall (Task B or C), one demonstration stall (Task D, E, F or G), and Tasks H from Area of Operation XI, Slow Flight, Stalls, and Spins.

Task	b. ***Task F. Secondary Stalls (Demonstration)***
Reference	FAA-H-8083-3; FAA-H-8083-9; FAA-H-8083-25; POH/AFM
Objective	To determine that the applicant understands the elements of secondary stalls, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.XI.F.K1	Aerodynamics of secondary stalls.
AIA.XI.F.K2	Flight situations where secondary stalls may occur.
AIA.XI.F.K3	Recognition of a secondary stall.
AIA.XI.F.K4	Entry procedure and minimum entry altitude.
AIA.XI.F.K5	Recovery procedure.
AIA.XI.F.K6	Common errors related to secondary stalls, encompassing:
AIA.XI.F.K6a	a. Failure to establish selected configuration prior to entry
AIA.XI.F.K6b	b. Improper or inadequate demonstration of the recognition of and recovery from a secondary stall
AIA.XI.F.K6c	c. Failure to present simulated student instruction that adequately emphasizes the hazards of poor procedure in recovering from a primary stall
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.XI.F.R1	Failure to present simulated instruction that adequately demonstrates and emphasizes the hazards of a secondary stall.
AIA.XI.F.R2	Instructional risks associated with a secondary stall to include:
AIA.XI.F.R2a	a. Disorientation, loss of situational awareness, and/or improper task management
Skills	The applicant demonstrates the ability to:
AIA.XI.F.S1	Demonstrate and simultaneously explain secondary stalls in a specified configuration.
AIA.XI.F.S2	Demonstrate and simultaneously explain proper stall recovery techniques after a secondary stall has occurred.
AIA.XI.F.S3	Analyze and correct simulated common errors related to secondary stalls, to include those stipulated in K6a through K6c above.

Note: The evaluator must select Task A, at least one proficiency stall (Task B or C), one demonstration stall (Task D, E, F or G), and Tasks H from Area of Operation XI, Slow Flight, Stalls, and Spins.

Task	***Task G. Accelerated Maneuver Stalls (Demonstration)***
Reference	FAA-H-8083-3; FAA-H-8083-25; POH/AFM
Objective	To determine that the applicant understands the elements of accelerated maneuver stalls and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
AIA.XI.G.K1	Aerodynamics of accelerated maneuver stalls.
AIA.XI.G.K2	Flight situations where accelerated maneuver stalls may occur.
AIA.XI.G.K3	Recognition of an accelerated maneuver stall.
AIA.XI.G.K4	Entry procedure and minimum entry altitude.
AIA.XI.G.K5	Recovery procedure.
AIA.XI.G.K6	Common errors related to accelerated maneuver stalls, encompassing:
AIA.XI.G.K6a	a. Failure to establish proper configuration prior to entry
AIA.XI.G.K6b	b. Improper or inadequate demonstration of the recognition and recovery from a accelerated maneuver stall
AIA.XI.G.K6c	c. Failure to present simulated student instruction that adequately emphasizes the hazards of poor procedures in recovering from an accelerated stall
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.XI.G.R1	Failure to present simulated instruction that adequately demonstrates and emphasizes the hazards of an accelerated maneuver stall.
AIA.XI.G.R2	Instructional risks associated with an accelerated maneuver stall to include:
AIA.XI.G.R2a	a. Disorientation, loss of situational awareness, and/or improper task management
Skills	The applicant demonstrates the ability to:
AIA.XI.G.S1	Demonstrate and simultaneously explain accelerated maneuver stall.
AIA.XI.G.S2	Demonstrate and simultaneously explain proper stall recovery techniques promptly after an accelerated stall has occurred.
AIA.IX.G.S3	Analyze and correct simulated common errors related to accelerated maneuver stalls, to include those stipulated in K6a through K6c above.

Note: The evaluator must select Task A, at least one proficiency stall (Task B or C), one demonstration stall (Task D, E, F or G), and Tasks H from Area of Operation XI, Slow Flight, Stalls, and Spins.

Task	***Task H. Spin Awareness and Spins*** PTS XI.G
Foundational ACS	Refer to the Commercial Pilot ACS, Task VII E., Spin Awareness
Reference	FAA-H-8083-3; FAA-H-8083-25; POH/AFM
Objective	To determine that the applicant understands the elements of spins, and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction. **NOTE**: At the discretion of the examiner, a logbook record attesting applicant instructional competency in spin entries, spins, and spin recoveries may be accepted in lieu of this Task. The flight instructor who conducted the spin instruction must certify the logbook record.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Spin awareness as noted in the referenced Task.
AIA.XI.H.K2	Anxiety factors associated with spin instruction.
AIA.XI.H.K4	Airplanes approved for the spin maneuver based on airworthiness category and type certificate.
AIA.XI.H.K5	Flight situations where unintentional spins may occur.
AIA.XI.H.K6	Entry procedure and minimum entry altitude for intentional spins.
AIA.XI.H.K7	Control procedure to maintain a stabilized spin.
AIA.XI.H.K8	Orientation during a spin, to include which instrument(s) are reliable for determining the direction of spin
AIA.XI.H.K9	Recovery procedure and minimum recovery altitude for intentional spins.
AIA.XI.H.K10	Common errors related to performing spins, encompassing:
AIA.XI.H.K10a	a. Failure to establish proper configuration prior to spin entry
AIA.XI.H.K10b	b. Failure to achieve and maintain a full stall during spin entry
AIA.XI.H.K10c	c. Failure to close throttle when a spin entry is achieved
AIA.XI.H.K10d	d. Failure to recognize the indications of an imminent, unintentional spin
AIA.XI.H.K10e	e. Improper use of flight controls during spin entry, rotation, or recovery
AIA.XI.H.K10f	f. Disorientation during a spin
AIA.XI.H.K10g	g. Failure to distinguish between a spiral dive and a spin
AIA.XI.H.K10h	h. Excessive speed or accelerated stall during recovery
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
AIA.XI.H.R1	Failure to provide adequate instruction on spin awareness as noted in the referenced Task.
AIA.XI.H.R2	Instructional risks associated with performing spins.
Skills	The applicant demonstrates the ability to:
AIA.XI.H.S1	Explain spin awareness as noted in the referenced task.
AIA.XI.H.S2	Demonstrate and simultaneously explain proper intentional spin entry and recovery procedures, if requested by the evaluator.
AIA.XI.H.S3	Analyze and correct simulated common errors related to spins, to include those stipulated in K10a through K10h above.

XII. Basic Instrument Maneuvers

Note: The evaluator must select at least one Task from Area of Operation XII, Basic Instrument Maneuvers.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the PAR ACS document as indicated:

*Referenced Task Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.PA.VIII.A.K1 = Flight instrument function and operation.**

Task	***Task A. Straight-and-Level Flight***
Foundational ACS	Refer to the Private Pilot ACS, Task VIII.A., Straight-and-Level Flight
Objective	To determine that the applicant understands the elements of attitude instrument flying during straight-and-level flight and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Straight and level flight solely referring to the instruments as noted in the referenced Task.
AIA.XII.A.K2	Common errors related to straight and level flight solely referring to the instruments, encompassing:
AIA.XII.A.K2a	a. “Fixation,” “omission,” and “emphasis” errors during instrument cross-check
AIA.XII.A.K2b	b. Improper instrument interpretation
AIA.XII.A.K2c	c. Improper control applications
AIA.XII.A.K2d	d. Failure to establish proper pitch, bank, or power adjustments during altitude, heading, or airspeed corrections
AIA.XII.A.K2e	e. Faulty trim procedure
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of straight and level flight solely referring to the instruments as noted in the referenced Task.
AIA.XII.A.R2	Instructional risks associated with straight and level flight solely referring to the instruments.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain straight and level flight solely referring to the instruments as noted in the referenced *Task*.
AIA.XII.A.S2	Analyze and correct simulated common errors related to straight and level flight solely referring to the instruments, to include those stipulated in K2a through K2e above.

Note: The evaluator must select at least one Task from Area of Operation XII, Basic Instrument Maneuvers..

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the PAR ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.PA.VIII.B.R6 = Situational awareness.**

Task	***Task B. Constant Airspeed Climbs***
Foundational ACS	Refer to the Private Pilot ACS, Task VIII.B., Constant Airspeed Climbs
Objective	To determine that the applicant understands the elements of attitude instrument flying during constant airspeed climbs and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Constant airspeed climbs solely referring to the instruments as noted in the referenced Task.
AIA.XII.B.K2	Common errors related to constant airspeed climbs solely referring to the instruments, encompassing:
AIA.XII.B.K2a	a. “Fixation,” “omission,” and “emphasis” errors during instrument cross-check.
AIA.XII.B.K2b	b. Improper instrument interpretation
AIA.XII.B.K2c	c. Improper control applications
AIA.XII.B.K2d	d. Failure to establish proper pitch, bank, or power adjustments during altitude, heading, or airspeed changes
AIA.XII.B.K2e	e. Faulty trim procedure
AIA.XII.B.K2f	f. Improper entry or level-off procedure
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of constant airspeed climbs solely referring to the instruments as noted in the referenced Task.
AIA.XII.B.R2	Instructional risks associated with constant airspeed climbs solely referring to the instruments.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain constant airspeed climbs solely referring to the instruments as noted in the referenced Task.
AIA.XII.B.S2	Analyze and correct simulated common errors related to constant airspeed climbs solely referring to the instruments, to include those stipulated in K2a through K2f above.

Note: The evaluator must select at least one Task from Area of Operation XII, Basic Instrument Maneuvers.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the PAR ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.PA.VIII.C.R2 = Good cockpit management.**

Task	***Task C. Constant Airspeed Descents***
Foundational ACS	Refer to the Private Pilot ACS, Task VIII.C., Constant Airspeed Descents
Objective	To determine that the applicant understands the elements of attitude instrument flying during constant airspeed descents and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Constant airspeed descents solely referring to the instruments as noted in the referenced Task.
AIA.XII.C.K2	Common errors related to constant airspeed descents solely referring to the instruments, encompassing:
AIA.XII.C.K2a	a. “Fixation,” “omission,” and “emphasis” errors during instrument cross-check
AIA.XII.C.K2b	b. Improper instrument interpretation
AIA.XII.C.K2c	c. Improper control applications
AIA.XII.C.K2d	d. Failure to establish proper pitch, bank, or power adjustments during altitude, heading, or airspeed changes
AIA.XII.C.K2e	e. Faulty trim procedure
AIA.XII.C.K2f	f. Improper entry or level-off procedure
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of constant airspeed descents solely referring to the instruments as noted in the referenced Task.
AIA.XII.C.R2	Instructional risks associated with constant airspeed descents solely referring to the instruments.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain constant airspeed descents solely referring to the instruments as noted in referenced Task.
AIA.XII.C.S2	Analyze and correct common errors related to constant airspeed descents solely referring to the instruments, to include those stipulated in K2a through K2f above.

Note: The evaluator must select at least one Task from Area of Operation XII, Basic Instrument Maneuvers.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the PAR ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.PA.VIII.D.R2 = Good cockpit management.**

Task	***Task D. Turns to Headings***
Foundational ACS	Refer to the Private Pilot ACS, Task VIII.D., Turns to Headings
Objective	To determine that the applicant understands the elements of attitude instrument flying during turns to headings and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Turns to headings solely referring to the instruments as noted in the referenced *Task*.
AIA.XII.D.K2	Common errors related to turns to headings solely referring to the instruments, encompassing:
AIA.XII.D.K2a	a. “Fixation,” “omission,” and “emphasis” errors during instrument cross-check
AIA.XII.D.K2b	b. Improper instrument interpretation
AIA.XII.D.K2c	c. Improper control applications
AIA.XII.D.K2d	d. Failure to establish proper pitch, bank, or power adjustments during altitude, heading, or airspeed changes
AIA.XII.D.K2e	e. Faulty trim procedure
AIA.XII.D.K2f	f. Improper entry or level-off procedure
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of turns to headings solely referring to the instruments as noted in the referenced Task.
AIA.XII.D.R2	Instructional risks associated with turns to headings solely referring to the instruments.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain turns to headings solely referring to the instruments as noted in the referenced *Task*.
AIA.XII.D.S2	Analyze and correct simulated common errors related to turns to headings solely referring to the instruments, to include those stipulated in K2a through K2f above.

Note: The evaluator must select at least one Task from Area of Operation XII, Basic Instrument Maneuvers.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the PAR ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.PA.VIII.E.K7 = Hazards of inappropriate control response.**

Task	***Task E. Recovery from Unusual Flight Attitudes***
Foundational ACS	Refer to the Private Pilot ACS, Task VIII.E., Recovery from Unusual Flight Attitudes
Objective	To determine that the applicant understands the elements of attitude instrument flying during unusual attitudes and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Recovery from unusual flight attitudes solely referring to the instruments as noted in the referenced Task.
AIA.XII.E.K2	Common errors related to recovery from unusual flight attitudes solely referring to the instruments, encompassing:
AIA.XII.E.K2a	a. Failure to recognize an unusual flight attitude
AIA.XII.E.K2b	b. Consequences of attempting to recover from an unusual flight attitude by “feel” rather than by instrument indications
AIA.XII.E.K2c	c. Inappropriate control applications during recovery
AIA.XII.E.K2d	d. Failure to recognize from instrument indications when the airplane is passing through a level flight attitude
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of recovery from unusual flight attitudes solely referring to the instruments as noted in the referenced *Task*.
AIA.XII.E.R2	Instructional risks associated with recovery from unusual flight attitudes solely referring to the instruments.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain recovery from unusual flight attitudes solely referring to the instruments as noted in the referenced *Task*.
AIA.XII.E.S2	Analyze and correct common errors related to recovery from unusual flight attitudes solely referring to the instruments, to include those stipulated in K2a through K2d above.

XIII. Emergency Procedures

Note: The evaluator must select at least Tasks A and B from Area of Operation XIII, Emergency Procedures,

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.VIII.B.R1 = Wind.**

Task	***Task A. Emergency Descent***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IX.A., Emergency Descent
Objective	To determine that the applicant understands the elements of emergency descent and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Emergency descent as noted in the referenced Task.
AIA.XIII.A.K2	Common errors related to emergency descent, encompassing:
AIA.XIII.A.K2a	a. Failure to recognize need for an emergency descent
AIA.XIII.A.K2b	b. Failure to use the emergency checklist
AIA.XIII.A.K2c	c. Failure to clear the area before initiating the emergency descent
AIA.XIII.A.K2d	d. Exceeding V_{FE} or V_{NE}, as appropriate to configuration
AIA.XIII.A.K2e	e. Improper recovery from an emergency descent
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of emergency descent as noted in the referenced Task.
AIA.XIII.A.R2	Instructional risks associated with emergency descent.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain emergency descent as noted in the referenced Task.
AIA.XIII.A.S2	Analyze and correct simulated common errors related to emergency descent, to include those stipulated in K2a through K2e above.

Note: The evaluator must select at least Tasks A and B from Area of Operation XIII, Emergency Procedures.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.VIII.A.K5 = Energy management.**

Task	***Task B. Emergency Approach and Landing (Simulated)*** P
Foundational ACS	Refer to the Commercial Pilot ACS, Task IX.B., Emergency Approach and Landing (Simulated)
Objective	To determine that the applicant understands the elements of power failure at altitude and associated emergency approach and landing procedures; and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Power failure at altitude as noted in the referenced *Task*.
AIA.XIII.B.K2	Common errors related to power failure at altitude, encompassing:
AIA.XIII.B.K2a	a. Failure to establish “best glide” airspeed
AIA.XIII.B.K2b	b. Improper configuration
AIA.XIII.B.K2c	c. Poor selection of an emergency landing area
AIA.XIII.B.K2d	d. Failure to fly the most suitable pattern for existing wind speed, direction, and other conditions
AIA.XIII.B.K2e	e. Undershooting or overshooting selected emergency landing area
AIA.XIII.B.K2f	f. Failure to accomplish the emergency checklist
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of power failure at altitude as noted in the referenced Task.
AIA.XIII.B.R2	Instructional risks associated with power failure at altitude.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain power failure at altitude, as noted in the referenced Task.
AIA.XIII.B.S2	Analyze and correct simulated common errors related to power failure at altitude, to include those stipulated in K2a through K2f above.

Note: The evaluator must select at least Tasks A and C from Area of Operation XIII, Emergency Procedures.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, i.e. AIA.CA.VIII.C.R3 = Maintenance.

Task	***Task C. Systems and Equipment Malfunctions***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IX.C., Systems and Equipment Malfunctions
Objective	To determine that the applicant understands the elements of systems and equipment malfunctions and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Systems and equipment malfunctions as noted in the referenced Task.
AIA.XIII.C.K2	Common errors related to equipment and systems malfunctions, encompassing:
AIA.XIII.C.K2a	a. Failure to understand aircraft systems
AIA.XIII.C.K2b	b. Lack of familiarity with emergency section of the POH/AFM
AIA.XIII.C.K2c	c. Failure to memorize immediate action items
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of emergency descent as noted in the referenced Task.
AIA.XIII.C.R2	Instructional risks associated with emergency descent.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain emergency descent as noted in the referenced Task**.**
AIA.XIII.C.S2	Analyze and correct simulated common errors related to emergency descent, to include those stipulated in K2a through K2c above.

Note: The evaluator must select at least Tasks A and B from Area of Operation XIII, Emergency Procedures.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.VIII.D.K2 = Climate extremes (hot/cold).**

Task	***Task D. Emergency Equipment and Survival Gear***
Foundational ACS	Refer to the Commercial Pilot ACS, Task IX.D., Emergency Equipment and Survival Gear
Objective	To determine that the applicant understands the elements of emergency equipment and survival gear and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Emergency equipment and survival gear as noted in the referenced Task.
AIA.XIII.D.K2	Common errors related to emergency equipment and survival gear, encompassing:
AIA.XIII.D.K2a	a. Failure to plan for environmental changes on cross-country flights
AIA.XIII.D.K2b	b. Lack of familiarity with installed emergency equipment
AIA.XIII.D.K2c	c. Lack of familiarity with survival gear
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of emergency equipment and survival gear as noted in the referenced Task.
AIA.XIII.D.R2	Instructional risks associated with emergency equipment and survival gear.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain emergency equipment and survival gear as noted in the referenced Task.
AIA.XIII.D.S2	Analyze and correct simulated common errors related to emergency equipment and survival gear, to include those stipulated in K2a through K2c above.

XIV. Multiengine Operations (to be developed)

Note: The evaluator must select Task A and, for ASES applicants, Task B from Postflight Procedures XV.

Task	***Task A.***
Foundational ACS	
Objective	
Knowledge	
Risk Management	
Skills	

Task	***Task B.***
Foundational ACS	
Objective	
Knowledge	
Risk Management	
Skills	

XV. Postflight Procedures

Note: The evaluator must select at least Tasks A and for ASES Applicants, Task B.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.XI.A.K3 = Aircraft lighting.**

Task	***Task A. After Landing, Parking and Securing***
Foundational ACS	Refer to the Commercial Pilot ACS, Task XI.A., After Landing, Parking and Securing.
Objective	To determine that the applicant understands the elements of after landing, parking, and securing procedures and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Parking and securing as noted in the referenced Task.
AIA.XV.A.K2	Common errors related to parking and securing, encompassing:
AIA.XV.A.K2a	a. Failure to follow recommended procedures
AIA.XV.A.K2b	b. Poor planning, improper procedure, or faulty performance of postflight procedures
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of parking and securing as noted in the referenced Task.
AIA.XV.A.R2	Instructional risks associated with parking and securing.
Skills	The applicant demonstrates the ability to:
*	Demonstrate and simultaneously explain parking and securing as noted in the referenced Task.
AIA.XV.A.S2	Analyze and correct simulated common errors related to parking and securing, to include those stipulated in K2a through K2b above.

Note: The evaluator must select at least Tasks A and for ASES Applicants, Task B.

For each of the following Tasks included in this Area of Operation, refer to the descriptions contained in the CAX ACS document as indicated:

*Referenced *Task* Knowledge, Skill and Risk Management elements when noted will be preceded by an AIA for Instructor Airplane, **i.e. AIA.CA.XI.B.R3 = Propeller safety.**

Task	***Task B. Seaplane Post-Landing Procedures (ASES, AMES)***
Foundational ACS	Refer to the Commercial Pilot ACS, Task XI.B., Seaplane Post-Landing Procedures (ASES, AMES)
Objective	To determine that the applicant understands the elements of anchoring, docking, mooring, and ramping/beaching and demonstrates the ability to apply that knowledge in delivering ground and/or flight instruction.
Knowledge	The applicant demonstrates instructional knowledge by describing and explaining:
*	Seaplane post-landing procedures as noted in the referenced Task.
AIA.XV.B.K2	Common errors related to seaplane post-landing procedures, encompassing:
AIA.XV.B.K2a	a. Failure to follow recommended procedures
AIA.XV.B.K2b	b. Poor planning, improper procedure, or faulty performance of postflight procedures
AIA.XV.B.K2c	c. Consequences of failure to use anchor, docking, or mooring lines of adequate length and strength to ensure seaplane security
Risk Management	The applicant demonstrates the ability to teach and manage the risks arising from:
*	Elements of seaplane post-landing procedures as noted in the referenced Task.
AIA.XV.B.R2	Instructional risks associated with seaplane post-landing procedures.
Skills	The applicant demonstrates the ability to:
	Demonstrate and simultaneously explain seaplane post-landing procedures as noted in the referenced Task.
AIA.XV.B.S2	Analyze and correct common errors related to seaplane post-landing procedures, to include those stipulated in K2a through K2c above.
AIA.XV.B.S3	Demonstrate and simultaneously explain seaplane post-landing procedures as noted in the referenced Task

Section 3: Flight Instructor – Instrument Airplane and Helicopter

Completion Standards

A. Knowledge Test

(1) Pass the appropriate Knowledge Test.

B. Practical Test

(1) To determine that the instructor-applicant can:

(a) Demonstrate instructional competence in the *Task*s;

(b) Facilitate the learning of subject material;

(c) Explain and demonstrate the maneuvers;

(d) Exemplify risk management skills;

(e) Promote professionalism; and

(f) Analyze and correct common student errors found in the Flight Instructor ACS.

C. ACS System Reference Matrix

- [To be developed and published in conjunction with the Flight Instructor ACS.]

Areas of Operation

- [To be developed and published in conjunction with the Flight Instructor ACS.]

Section 4: Flight Instructor – Rotorcraft Helicopter

Completion Standards

A. Knowledge Test

(1) Pass the appropriate Knowledge Test.

B. Practical Test

(1) To determine that the instructor-applicant can:

(a) Demonstrate instructional competence in the *Task*s;

(b) Facilitate the learning of subject material;

(c) Explain and demonstrate the maneuvers;

(d) Exemplify risk management skills;

(e) Promote professionalism; and

(f) Analyze and correct common student errors found in the Commercial Pilot – Rotorcraft (Helicopter and Gyroplane).

C. ACS System Reference Matrix

[To be developed and published in conjunction with the Private Pilot ACS for Rotorcraft and the Commercial Pilot ACS for Rotorcraft.]

Areas of Operation

[To be developed and published in conjunction with the Private Pilot ACS for Rotorcraft and the Commercial Pilot ACS for Rotorcraft.]

Section 5: Flight Instructor – Glider

Completion Standards

A. Knowledge Test

(1) Pass the appropriate Knowledge Test.

B. Practical Test

(1) To determine that the instructor-applicant can:

(a) Demonstrate instructional competence in the *Task*s;

(b) Facilitate the learning of subject material;

(c) Explain and demonstrate the maneuvers;

(d) Exemplify risk management skills;

(e) Promote professionalism; and

(f) Analyze and correct common student errors found in the Commercial Pilot – Glider ACS, and the Areas of Operation in this ACS:

I. Fundamentals of Instructing
II. Technical Subject Areas (ACS System Reference)
III. Preflight Preparation
IV. Preflight Lesson on a Maneuver to be Performed in Flight
V. Fundamentals of Flight
VI. Slow Flight, Stalls, and Spins

C. ACS System Reference Matrix

[To be developed and published in conjunction with the Private Pilot ACS for Glider and the Commercial Pilot ACS for Glider.]

Areas of Operation

[To be developed and published in conjunction with the Private Pilot ACS for Glider and the Commercial Pilot ACS for Glider.]

Section 6: Flight Instructor – Sport Pilot

Completion Standards

A. Knowledge Test

(1) Pass the appropriate Knowledge Test.

B. Practical Test

(1) To determine that the instructor-applicant can:

(a) Demonstrate instructional competence in the *Task*s;

(b) Facilitate the learning of subject material;

(c) Explain and demonstrate the maneuvers;

(d) Exemplify risk management skills;

(e) Promote professionalism; an

(f) Analyze and correct common student errors found in the Sport Pilot ACS (appropriate exceptions/additions for category and class), and the following Areas of Operation in this ACS:

I. Fundamentals of Instructing
II. Technical Subject Areas (ACS System Reference)
IV. Preflight Lesson on a Maneuver to be Performed in Flight

C. ACS System Reference Matrix

[To be developed and published in conjunction with the Sport Pilot ACS.]

Areas of Operation

[To be developed and published in conjunction with the Sport Pilot ACS.]

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. The instructor-applicant 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 Tests for Instructor Certificates and Ratings

Code	Title	Questions	Time
FOI	Fundamentals of Instructing	50	1.5
MCI	Military Competency Instructor	125	3.0

Ground Instructor

Code	Title	Questions	Time
BGI	Basic Ground Instructor	80	2.5
AGI	Advanced Ground Instructor	100	2.5
IGI	Instrument Ground Instructor	50	2.5

Airplane

FIA	Flight Instructor – Airplane	100	2.5
AFA	Flight Instructor – Airplane-Added Rating	25	1.0
FII	Flight Instructor – Instrument Airplane	50	2.5
AIF	Flight Instructor – Instrument – Airplane – Added Rating	25	1.0

Helicopter

FRH	Flight Instructor – Rotorcraft Helicopter	100	2.5
HFA	Flight Instructor – Helicopter-Added Rating	25	1.0
FIH	Flight Instructor – Instrument Helicopter	50	2.5
HIF	Flight Instructor – Instrument – Helicopter – Added Rating	25	1.0

Gyroplane

FRG	Flight Instructor – Gyroplane	100	2.5
GFA	Flight Instructor – Gyroplane– Added Rating	25	1.0

Glider

FIG	Flight Instructor – Glider	100	2.5
AFG	Flight Instructor – Glider– Added Rating	25	1.0

Sport Pilot

SIA	Flight Instructor – Sport Airplane	70	2.5
SIB	Flight Instructor – Sport Balloon	70	2.5
SIG	Flight Instructor – Sport Glider	70	2.5
SIL	Flight Instructor – Sport Lighter-Than-Air (Airship)	70	2.5
SIP	Flight Instructor – Sport Powered Parachute	70	2.5
SIW	Flight Instructor – Sport Weight-Shift-Control	70	2.5
SIY	Flight Instructor – Sport Gyroplane	70	2.5

Knowledge Test Blueprint

(Placeholder)

English Language Proficiency

In accordance with the requirements of 14 CFR Section 61.153(b) 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 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. [back]

Knowledge Test Requirements

In order to take the Instructor 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:

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 official residential address

Section 61.49 acceptable forms of retest authorization for **all** Instructor 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 AFS-760.*

Acceptable forms of authorization for PCP only:

— Confirmation of Verification Letter issued by the 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.

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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.) [back]

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

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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 one year.

Testing Procedures for Applicants Requesting Special Accommodations

An applicant with learning or reading disability may request approval from 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 the Airman Testing Standards Branch (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 applicant receives a printed Airman Knowledge Test Report documenting the score with the testing center's raised, embossed seal. The applicant must retain the original Airman Knowledge Test Report. 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 Airman Knowledge Test Report to the evaluator, who is required to assess the noted areas of deficiency during the oral portion of the practical test.

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

To obtain a duplicate Airman Knowledge Test Report 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, AFS-760
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 (AFS-760) web page.

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FAA Knowledge Test Question Coding

Each *Task* in the Airman Certification Standard includes an Airman Certification Standards (ACS) code. This ACS code will soon be displayed on the airman test report to indicate what *Task* element was proven deficient on the Knowledge Exam. Instructors can then provide remedial training in the deficient areas and evaluators can re-test this element during the practical exam.

The ACS coding consists of 4 elements. For example: this code is deciphered as follows:

AIA.I.B.K6:

AIA = Applicable ACS Applicable ACS and Section denoting Aircraft category (Instructor, Airplane, which is Section 2 of this document)
I = Area of Operation (Technical Subject Areas)
B = Task (14 CFR and Publications)
K6 = Task Element Knowledge 6 (Flight information publications (e.g., Aeronautical Information Manual (AIM) and Chart Supplements U.S. (formerly Airport/Facility Directory)).

Knowledge test questions are mapped to the ACS codes, which will soon replace the system of “Learning Statement Codes.” After this transition occurs, the airman knowledge test report 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. [back]

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 sections 61.39 and 61.65, respectively.

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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, 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.

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Evaluator Responsibilities

An Evaluator is:

- Aviation safety inspector (ASI)
- Pilot examiner (other than administrative pilot examiners) or
- Chief instructor, assistant chief instructor or check instructor of pilot school holding examining authority
- CFII conducting 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 each Task in the appropriate ACS. This responsibility also includes verifying the experience requirements specified for a certificate or rating.

At the initial stage of the practical test, the evaluator must also determine that the applicant meets FAA Aviation English Language Proficiency (AELP) 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 AC 60-28, English Language Skill Standards required by 14 CFR parts 61, 63, and 65 (current version) when evaluating the applicant's ability to meet the standard. If, at any point during the practical test, the applicant does not meet the AELP standards, the evaluator must issue a Notice of Disapproval, FAA form 8060-5, with "NOT FAA AELP" in the comments. If there is any doubt, the evaluator should contact the local Flight Standards District Office (FSDO) for assistance.

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 *Task*s.

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 *Task*s/elements as appropriate to testing scenarios.

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

- At least one knowledge element;
- At least one risk management element;
- All skill elements unless otherwise noted; 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 may use questions during flight to test knowledge and risk management elements not evident in the demonstrated skills. To the greatest extent practicable, evaluators shall 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 sub-elements (such as AIA.II.B.S1c Advisory Circulars), the evaluator may select either the primary element (such as S1) or an appropriate sub-element (such as S1c). If the broader primary element is selected, the evaluator must develop questions only from material covered in the references listed for the Task.

[back]

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. [back]

Satisfactory

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;
- Demonstrate competence in crew resource management in aircraft certificated for more than one required pilot crew member, 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

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 shall list the Area 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.

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 those Areas of Operation and the associated Tasks satisfactorily performed. Though not required, the evaluator has discretion to reevaluate any Task, including those previously passed, during the retest.

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.

[back]

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 (Printed or Electronic)
- ☐ Computer and Plotter
- ☐ Flight Plan Form
- ☐ Flight Plan Form and Flight Logs (printed or electronic)
- ☐ Chart Supplements U.S. (formerly Airport Facility Directory) Airport Diagrams and Appropriate Publications
- ☐ Current AIM

Personal Records

- ☐ Identification—Photo/Signature ID
- ☐ Pilot Certificate
- ☐ Current Medical Certificate
- ☐ Completed FAA Form 8710-1, Airman Certificate and/or Rating Application with Instructor's Signature
- ☐ 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

(Placeholder)

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.

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 and inadvertent loss of control.

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 airplane, the applicant should demonstrate the CRM principles described as 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 [back]

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 cockpit.

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."

. [back]

Aeronautical Decision Making, Risk Management, CRM and SRM

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.

[back]

Multiengine Considerations

On multiengine practical tests, where the failure of the most critical engine after liftoff is required, the evaluator must consider local atmospheric conditions, terrain, and type of aircraft used. The evaluator must not simulate failure of an engine until attaining at least $V_{SSE}/V_{XSE}/V_{YSE}$ and an altitude not lower than 400 feet AGL.

For multiengine practical tests conducted in the airplane, the evaluator will set zero thrust after the applicant has simulated feathering the propeller following a simulated engine failure. The applicant must demonstrate feathering one propeller in flight unless the manufacturer prohibits this action. 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 in that program.

The applicant must also demonstrate at least one landing with a simulated feathered propeller with the engine set to zero thrust.

[back]

VII. Emergency Procedures- Powerplant Failure—Multiengine Airplane

In a multiengine airplane or FSTD equipped with propellers (including turboprop), the applicant must demonstrate feathering one propeller and engine shutdown unless:

- The practical test is for a type rating, and
- The airplane used for the practical test was not certificated with inflight unfeathering capability.

In this situation, the applicant may perform a simulated powerplant failure. In all other cases, the applicant must demonstrate the ability to safely feather and unfeather the propeller while airborne.

For safety reasons, when the practical test is conducted in the airplane, the applicant shall perform Tasks that require feathering or shutdown only under conditions and at a position and altitude (i.e., no lower than 3,000 feet AGL) where it is possible to make a safe landing on an established airport if there is difficulty in unfeathering the propeller or restarting the engine. If it is not possible to unfeather the propeller or restart the engine while airborne, the applicant and the evaluator should treat the situation as an emergency.

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

Engine failure (simulated) shall be accomplished before reaching 50 percent of the calculated $V_{MC.}$

Single-Engine Considerations

VII. Emergency Procedures- Powerplant Failure—Single-Engine Airplane

For safety reasons, the evaluator will not request a simulated powerplant failure in a single engine airplane unless it is possible to safely complete a landing.

High Performance Aircraft Considerations

In some high performance airplanes, the power setting may have to be reduced below the ACS guidelines power setting to prevent excessively high pitch attitudes (greater than 30° nose up.

Risk Management for the Instructor

The Airman Certification Standards (ACS) approach presents Tasks in terms of Knowledge, Risk Management and Skill elements. Risk management requires the pilot to identify hazards related to a flight maneuver, assess the risk, and then develop and use mitigation strategies to manage the risk. Because it is not possible to anticipate and list every possible risk, risk management also requires the skill to identify and manage a previously unknown risk by correlating evidence of non-specific or undefined hazards, assessing the risk, and applying appropriate mitigation strategies. By applying these principles, the instructor is both mentally and physically prepared for unexpected event, reducing the startled response and maintaining control of the aircraft.

Risk Management requirements for the instructor are greater than those defined for a particular airman certificate or rating. The applicant must also demonstrate:

- Instructional knowledge of hazards and risk management strategies associated with a particular *Task*
- Instructional skill to transfer that knowledge to a pilot-in-training (PIT) in both ground and flight lessons.
- Ability to recognize, assess and mitigate the risk inherent in giving flight instruction to a PIT who is manipulating the controls. This skill requires the instructor to correctly decide when intervention is required to ensure the safe outcome of the maneuver.

The instructor applicant will therefore be evaluated on three aspects of the Risk Management elements listed for each assigned flight Task:

1. **Knowledge**: Demonstrate declarative and procedural understanding of the Risk Management elements associated with the Task being evaluated.
2. **Instructional Risk Management**: Demonstrate the ability to recognize and mitigate the risks associated with providing flight instruction to a simulated PIT (evaluator).
3. **Skill**: Demonstrate the ability to teach a simulated PIT (evaluator) the Risk Management elements associated with the Task being evaluated.

Some flight instructional risks are common to almost every Task, while others are Task-specific.

Examples of risks commonly associated with providing flight instruction include, but are not limited to:

a. Maintaining active collision avoidance while simultaneously providing instruction.
b. Maintaining a “sterile cockpit” at appropriate times.
c. Ensuring a positive exchange of flight controls.
d. Maintaining awareness of the actions, cognitive state, and physiological state of the pilot in training.
e. Maintaining vigilance regarding oversight of the pilot in training.
f. Monitoring coordination of flight controls by the pilot in training.
g. Maintaining continuous awareness of the dynamic state and navigation position of the aircraft.

h. Maintaining overall situational awareness while executing instructional responsibilities.
i. Recognizing and mitigating pilot-in-training anxiety.
j. Correcting pilot-in-training “hazardous attitudes.”
k. Maintaining due diligence for unexpected events which may occur in the training environment.
l. Intervening in a timely fashion.

The instructor applicant will be expected to demonstrate knowledge and skill with respect to such common risks noted in Task G in the Fundamentals of Instructing evaluation. In addition, throughout the flight portion of the practical test, the applicant will be expected to maintain safety of flight by applying principles of instructional risk management from the beginning of preflight procedures through the conclusion of postflight procedures. Accordingly, the applicant’s instructional ability to recognize and mitigate the common instructional risks listed as examples above shall continuously be evaluated during the flight portion of the practical test. Because these common risks are not Task-specific, deficient recognition or mitigation of these risks by the applicant will be identified in a Notice of Disapproval with Section ACS codes, e.g. AIA.IRM.Sa through AIA.IRM.Sk corresponding to list above for Instructor, Airplane.

It is important to understand, however, that this ACS does not presume to anticipate and list every possible instructional risk. Rather, it broadly defines instructional risk management elements to provide a framework for the mastery and evaluation of this critical competency.

[back]

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

Aircraft Requirements and Limitations

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.

Multiengine practical tests require normal engine shutdowns and restarts in the air, to include propeller feathering and unfeathering. The AFM must not prohibit these procedures, but low power settings for cooling periods prior to the actual shutdown in accordance with the AFM are acceptable and encouraged. For a type rating in an airplane not certificated with inflight unfeathering capability, a simulated powerplant failure is acceptable.

If the multiengine airplane used for the practical test does not publish a V_{MC}, then the "Limited to Centerline Thrust" limitation will be added to the certificate issued from this check, unless the applicant has already demonstrated competence in a multiengine airplane with a published V_{MC}.

Any equipment inoperative in an aircraft with a minimum equipment list (MEL) shall be placarded in accordance with the approved MEL procedures. The applicant shall describe the procedures accomplished, the resulting operational restrictions, and the documentation for the inoperative item(s).

Equipment Requirements and 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 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 Area 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 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 oral and flight portions of the practical test.

If the practical test is conducted in an aircraft, the applicant is required by 14 CFR 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.

Operational Requirements and Limitations

[Reserved]

[back]

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

Use of FSTDs

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 FSTDs 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 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 qualification performance standard (QPS) for a specific FTD qualification level (part 1).*

The FAA National Simulator Program (NSP) qualifies Level A-D FFSs and Level 4 – 7[4] FTDs. In addition, each operational rule part identifies additional requirements for the approval and use of FSTDs in a training program[5]. 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. [back]

Use of ATDs

[4]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 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.

[5] 14 CFR part 121, section 121.407; part 135, section 135.335; part 141, section 141.41; and part 142, section 142.59.

14 CFR 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).

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 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). The LOA will be 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.

> *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 for the specific basic or advanced qualification level.*
>
> *Basic Aviation Training Device (BATD)—provides an adequate training platform for both procedural and operational performance* Task*s 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* Task*s 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* Task*s required for instrument experience and the instrument proficiency check.*

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 instructor practical test is not permitted. An AATD, however, may be used for an instructor proficiency check. [back]

Credit for Time in an FSTD

Section 61.109 specifies the minimum aeronautical experience requirements for a person applying for a private pilot certificate. Paragraphs (a) and (b) specify the time requirements for a private pilot certificate in a single-engine airplane and a multiengine airplane, respectively[6]. These paragraphs include specific experience requirements that must be completed in an airplane. 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 part 142, section 61.109(k)(1)[7]. For those pilots that received training through a part 142 program, section 61.109(k)(2).

Credit for Time in an ATD

Section 61.109 specifies the minimum aeronautical experience requirements for a person applying for a private pilot certificate Paragraphs (a) and (b) specify the time requirements for a private pilot certificate in a single-engine airplane and a multiengine airplane, respectively[8]. These paragraphs include specific experience requirements that must be completed in an airplane. Paragraph (k) of this section specifies the amount of credit a pilot can take towards the private pilot certificate aeronautical experience requirements.

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

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

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

In order to credit the time, the ATD must be FAA-approved and the 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 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 time in a BATD or an AATD towards the aeronautical experience requirements for the private pilot certificate 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 AC 61-136A, see Appendix 4.

Instrument Experience

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 an airplane, an FSTD, or an ATD. Refer to the subparagraphs of section 61.57(c) to determine the experience needed, which varies depending upon whether an airplane, FSTD, ATD, or combination of airplane and training devices is used.

Instrument Proficiency Check

If a person fails to meet the experience requirements of section 61.57(c), a pilot may only establish instrument currency through an instrument proficiency check as described in 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 *Task*s. A BATD cannot be used for an instrument proficiency check. [back]

Use of an FSTD on a Practical Test

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. 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 part 141 or part 142 of this chapter; or under 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 parts 121 or 135, qualified personnel and designees authorized to conduct such tests in FSTDs for part 141 pilot school graduates, or appropriately authorized part 142 Training Center Evaluators (TCE). [back]

In addition, section 61.64(b) states if an airplane is not used during the practical test for a type rating for a turbojet airplane (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 an airplane, 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 an airplane, 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 pneumatics systems. However, when the same emergency condition is addressed in a FSTD, all Task elements must be accomplished as would be expected under actual circumstances.

Similarly, safety of flight precautions taken in the airplane for the accomplishment of a specific maneuver or procedure (such as limiting altitude in an approach to stall or setting maximum airspeed for an engine failure expected to result in a rejected takeoff) need not be taken when a 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 shall 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 71	Designation of Class A, B, C, D and E Airspace Areas; Air Traffic Service Rotes; and Reporting Points
14 CFR part 91	General Operating and Flight Rules
14 CFR part 93	Special Air Traffic Rules
AC 00-6	Reporting of Aircraft Accidents and Incidents
AC 00-45	Aviation Weather
AC 60-28	English Language Skill Standards Required by 14 CFR parts 61, 63 and 65
AC 61-67	Stall and Spin Awareness Training
AC 91-73	Parts 91 and 135 Single Pilot, Flight School Procedures During Taxi Operations
AIM	Aeronautical Information Manual
Chart Supplements U.S.	Chart Supplements U.S. (previously Airport/Facility Directory or A/FD)
FAA-H-8083-1	Aircraft Weight and Balance Handbook
FAA-H-8083-2	Risk Management Handbook
FAA-H-8083-3	Airplane Flying Handbook
FAA-H-8083-6	Advanced Avionics Handbook
FAA-H-8083-15	Instrument Flying Handbook
FAA-H-8083-23	Seaplane, Skiplane, and Float/Ski Equipped Helicopter Operations Handbook
FAA-H-8083-25	Pilot's Handbook of Aeronautical Knowledge
FAA-P-8740-19	Flying Light Twins Safely
POH/AFM	Pilot's Operating Handbook/FAA-Approved Airplane Flight Manual
Other	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.

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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
AD	Airworthiness Directive
ADF	Automatic Direction Finder
ADM	Aeronautical Decision-Making
AFS	Flight Standards Service
AELP	Aviation English Language Proficiency
AFM	Airplane Flight Manual
AFS	Flight Standards Service
AGL	Above Ground Level
AIM	Aeronautical Information Manual
AKTR	Airman Knowledge Test Report
ALD	Alternative Lighting Devices
AMEL	Airplane Multiengine Land
AMES	Airplane Multiengine Sea
AOA	Angle of Attack
AOO	Area of Operation
ASEL	Airplane Single Engine Land
ASES	Airplane Single Engine Sea
ASI	Aviation Safety Inspector
ATC	Air Traffic Control
ATD	Aviation Training Device
ATP	Airline Transport Pilot
BATD	Basic Aviation Training Device
CDI	Course Deviation Indicator
CFIT	Controlled Flight Into Terrain
CFR	Code of Federal Regulations
CG	Center of Gravity
CP	Completion Phase
CRM	Crew Resource Management
CTP	Certification Training Program
DA	Decision Altitude
DH	Decision Height
DME	Distance Measuring Equipment

DP	Departure Procedures
DPE	Designated Pilot Examiner
ELT	Emergency Locator Transmitter
FAA	Federal Aviation Administration
FADEC	Full Authority Digital Engine Control
FFS	Full Flight Simulator
FMS	Flight Management System
FSB	Flight Standardization Board
FSDO	Flight Standards District Office
FSTD	Flight Simulation Training Device
FTD	Flight Training Device
GBAS	Ground Based Augmentation System
GNSS	Global Navigation Satellite System
GLS	Ground Landing System
GPS	Global Positioning System
HAT	Height Above Threshold (Touchdown)
HSI	Horizontal Situation Indicator
IA	Inspection Authorization
IAP	Instrument Approach Procedure
IFO	International Field Office
IFR	Instrument Flight Rules
IFU	International Field Unit
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IPC	Instrument Rating Airplane Canadian Conversion
IPC	Instrument Proficiency Check
IR	Instrument Rating
IRA	Instrument Rating Airplane
KOEL	Kinds of Operation Equipment List
LAHSO	Land and Hold Short Operations
LDA	Localizer-Type Directional Aid
LOA	Letter of Authorization
LOC	ILS Localizer
LPV	Localizer Performance Vertical
MAP	Missed Approach Point
MDA	Minimum Descent Altitude
MEL	Minimum Equipment List
MFD	Multi-functional Displays
NAS	National Airspace System
NOD	Notice of Disapproval

NOTAMs	Notices to Airmen
NSP	National Simulator Program
NTSB	National Transportation Safety Board
PA	Private Airplane
PAR	Private Pilot Airplane
PAT	Private Pilot Airplane/Recreational Pilot – Transition
PCP	Private Pilot Canadian Conversion
PFD	Primary Flight Display
PIC	Pilot-in-Command
POA	Plan of Action
POH	Pilot's Operating Handbook
PTS	Practical Test Standards
QPS	Qualification Performance Standard
RAIM	Receiver Autonomous Integrity Monitoring
RMP	Risk Management Process
RNAV	Area Navigation
RNP	Required Navigation Performance
SAE	Specialty Aircraft Examiner
SFRA	Special Flight Rules Area
SIAP	Standard Instrument Approach Procedure
SMS	Safety Management System
SOP	Standard Operating Procedures
SPRM	Single-Pilot Resource Management
SRM	Safety Risk Management
STAR	Standard Terminal Arrival
SUA	Special Use Airspace
TAEA	Track Advisory Environmental Assessment
TAF	Terminal Forecast
TAS	True Airspeed
TCH	Threshold Crossing Height
TEM	Threat and Error Management
TFR	Temporary Flight Restrictions
UTC	Coordinated Universal Time
V_A	Maneuvering speed
VDP	Visual Descent Point
V_{FE}	Maximum flap extended speed
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
V_{MC}	Minimum Control Speed with the Critical Engine Inoperative
V_{NE}	Never exceed speed

VOR	Very High Frequency Omnidirectional Range
V_s	Stall Speed
V_X	Best Angle of Climb Speed
V_Y	Best Rate of Climb Speed
V_{SSE}	Safe, intentional one-engine-inoperative speed. Originally known as safe single-engine speed
V_{XSE}	Best angle of climb speed with one engine inoperative
V_{YSE}	Best rate of climb speed with one engine inoperative
V_{SO}	Stalling Speed or the Minimum Steady Flight Speed in the Landing Configuration

Recommendations on Instructor ACS, Development, Prototype, and Guidance

INSTRUCTOR ACS DEVELOPMENT

The Instructor Subgroup conducted two "Tabletop" Prototype exercises since the last ARAC meeting.
The first took place in the Orlando, FL Flight Standards District in March 2018 and the second occurred in the Scottsdale, AZ Flight Standards District at the end of April 2018.

Designated Pilot Examiners (DPE) who conduct initial flight instructor practical tests from both districts were invited to review the draft Instructor Airman Certification Standards and meet with members of the ACS Working Group at the respective Flight Standards District Office to provide feedback.

The objective was to evaluate the draft Instructor ACS for the following prior to testing the document operationally with applicants (aka, a full prototype):

1. Is the document usable in its current form for its intended purpose?
2. Can an experienced DPE understand and adapt to the different format used by the Instructor ACS?
3. Can an experienced DPE utilize the document to conduct a CFI-Initial practical test?
4. Are there topic areas that are not adequately addressed in the current Instructor ACS?

The results in both cases indicated that the Instructor ACS format is understandable and usable for preparing an initial CFI practical test plan of action.

The DPEs offered many suggestions regarding preparing individuals to become flight instructors, latitude for task selection for an Instructor practical test, and minor content inputs. One particularly cogent suggestion was a desire to integrate the Fundamentals of Instructing (FOI) evaluation into each of the tasks in which an applicant would be expected to demonstrate instructional knowledge and skills.

The participating DPEs were excited to be a part of the process and willingly expended their personal time to be involved.

RECOMMENDATIONS

- The ACS WG's Instructor ACS Subgroup should:
    - Evaluate and incorporate some of the DPE recommendations in the next draft. These include the idea of embedding the FOI into each task in which an applicant would be expected to demonstrate instructional knowledge and skills.
    - Begin work needed to conduct a full prototype (control group involving actual practical tests) by the September-December 2018 timeframe.

INSTRUCTOR GUIDANCE

The ACS WG's Instructor ACS Subgroup has started a project to develop an additional chapter for the *Aviation Instructor Handbook* (FAA-H-8083-9) to focus on instructional risk management.

RECOMMENDATIONS

- Review the revised Aviation Instructor Handbook for consistency with the Instructor ACS.
- Incorporate the new chapter on instructional risk management
- Publish the next revision to the Aviation Instructor Handbook (FAA-H-8083-9) by December 2018.

Recommendations to Align Training Regulations with AMT ACS

May 21, 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 recommendation to the Aviation Rulemaking Advisory Committee (ARAC) for consideration and implementation. The recommendations, once implemented, will help align training regulation and guidance with the airman certification standards.

The ARAC working group was tasked with developing recommended testing standards, training guidance, test management, and reference materials for the aircraft mechanic certificate with airframe and powerplant (A&P) ratings. The Aviation Maintenance Technician (AMT) Airman Certification Standards (ACS) will replace current practical test standards (PTS) and clearly define minimum knowledge, risk management and skill requirements for A&P mechanics. Once completed, it will provide the framework for the Knowledge Exam (written), oral and practical mechanic tests; and subsequently, a guide for revising handbooks, oral questions, practical projects and the knowledge test bank.

14 Code of Federal Regulations (CFR) part 147 governs certification requirements for aviation maintenance technician schools (AMTS). Completion of an AMTS program is one way to satisfy experience requirements for an A&P certificate (see § 65.77). In the absence of a comprehensive testing standard, training standards (i.e., curriculum requirements) provided in part 147 has effectively provided the framework for the skill and knowledge required of an A&P mechanic. While we understand and appreciate how we got to this point, it is the working group's opinion that the standard is misplaced.

Title 14 CFR part 65 sets forth the knowledge, experience and skill requirements for a mechanic certificate (see §65.75, §65.77 and §65.79). Requisite knowledge and skill is verified through written, oral and practical tests (see §65.75(b) and §65.79). The AMT ACS is the guidance that sets forth specifics on what a candidate must know, consider and do to successfully pass those tests. Part 65 is therefore the impetus for testing *and* training. In contrast, part 147 should be reserved for dictating AMTS certification and operating requirements, not mechanic knowledge and skill standards.

The working group therefore makes the following recommendations:

1. **Revise part 65 to provide the baseline standard for mechanic knowledge and skill requirements**

Incorporating general knowledge and skill elements in part 65 would ensure that testing and training standards fall directly out of the regulation.Until formal rulemaking can take place, the AMT ACS would provide the requisite specificity. The standard would be "enforceable" through part 65, which requires applicants to pass an agency developed and controlled mechanic test.

2. **Remove any reference to curriculum requirements or subject areas from part 147**

As stated above, part 65 is the impetus for testing *and* training. The inclusion of required curriculum or subject headings in part 147 creates a separate, inflexible, and inconsistent standard that training organizations will be forced to reconcile for decades to come.

3. **Reference the AMT ACS in AMTS operations specifications to ensure that training and testing are directly correlated**

Utilizing the AMT ACS as the basis for curriculum ensures that the agency can enforce AMTS adherence to the standard, requires schools to adjust their curriculum as mechanic knowledge and skill requirements evolve, and utilizes less government resources to maintain and update separate training specifications.

If the agency elects to dictate any specific curriculum requirements through the part 147 operation specification, it should directly mirror the subject areas provided for in the AMT ACS (see attachment 1). The agency should also ensure there is a mechanism available to update AMTS operations specifications as the AMT ACS periodically evolves.

4. **Utilize the ARAC Airman Certification System Working Group as the driver for changes to training requirements**

The AMT ACS will be periodically reviewed and updated, ensuring it is in line with mechanic knowledge and skill requirements as technology evolves. The working group could serve as the vehicle to ensure that training and testing keeps up with ever-evolving safety considerations.

We thank you for your consideration of these recommendations and encourage the committee to accept and forward to the FAA for consideration and action.

Sincerely,

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

Jackie Spanitz
AMT ACS Subgroup Co-chair
General Manager
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AMT ACS Subgroup Co-chair
Human Factors Scientist/Designated Pilot
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Attachment 1 AMT ACS subjects

Attachment 1
AMT ACS (FAA-S-ACS-1) Subjects

General
Fundamentals of Electricity and Electronics
Aircraft Drawings
Weight and Balance
Fluid Lines and Fittings
Aircraft Materials, Hardware, and Processes
Ground Operations and Servicing
Cleaning and Corrosion Control
Mathematics
Regulations, Maintenance Forms, Records, and Publications
Physics for Aviation
Inspection Concepts and Techniques
Human Factors

Airframe Structures
Metallic Structures
Non-Metallic Structures
Aircraft Finishes
Flight Controls
Airframe Inspection

Airframe Systems
Landing Gear Systems
Hydraulic and Pneumatic Systems
Environmental Systems
Aircraft Instrument Systems
Communication and Navigation Systems
Aircraft Fuel Systems
Aircraft Electrical Systems
Ice and Rain Control Systems
Airframe Fire Protection Systems
Rotorcraft Fundamentals

Powerplant Theory and Maintenance
Reciprocating Engines
Turbine Engines
Engine Inspection

Powerplant Systems and Components
Engine Instrument Systems
Engine Fire Protection Systems
Engine Electrical Systems
Lubrication Systems
Ignition and Starting Systems
Fuel Metering Systems
Engine Fuel Systems
Engine Induction Systems
Engine Cooling Systems
Engine Exhaust and Reverser Systems
Propellers