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Instrument Rating – Airplane

Airman Certification Standards

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Introduction

Airman Certification Standards Concept

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

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

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

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

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

Using the ACS

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

The abbreviation(s) within parentheses immediately following a Task refer to the category and/or class airplane 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:

IR.I.C.K4:

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

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

However, for knowledge tests taken before this system comes on line, only the LSC code (e.g., "PLT058") will be displayed on the AKTR. The LSC codes link to references and broad subject areas. By contrast, each ACS code represents a unique Task element in the ACS. Because of this fundamental difference, there is no one-to-one correlation between Learning Statement (PLT) codes and ACS codes.

Because all active knowledge test questions for the Instrument Rating Airplane (IRA) knowledge test now align with the corresponding ACS, evaluators can use LSC codes in conjunction with this ACS for targeting retesting of missed knowledge subject areas. The evaluator should look up the LSC code(s) on the applicant's AKTR in the Learning Statement Reference Guide available using the following link: Learning Statement Reference Guide. After noting the subject area(s), the evaluator can use the corresponding Area(s) of Operation/Task(s) in the ACS to narrow the scope of material for retesting, and to evaluate the applicant's understanding of that material in the context of the appropriate ACS Area(s) of Operation and Task(s).

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

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

The applicant must pass the IRA knowledge test before taking the instrument rating 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.

Evaluators conduct the practical test in accordance with the current ACS and FAA regulations, and the FAA encourages applicants and instructors to use the ACS when preparing for knowledge tests and practical tests. The FAA will revise the ACS as circumstances require. However, if an applicant is entitled to credit for Areas of Operation previously passed as indicated on a Notice of Disapproval or Letter of Discontinuance, evaluators should continue using the ACS effective on the test cycle start date.

I. Preflight Preparation

Task	***A. Pilot Qualifications***
References	14 CFR part 61; FAA-H-8083-2, FAA-H-8083-15, AC 68-1
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with the requirements to act as PIC under instrument flight rules.
Knowledge	The applicant demonstrates understanding of:
IR.I.A.K1	Certification requirements, recency of experience, and recordkeeping.
IR.I.A.K2	Privileges and limitations.
IR.I.A.K3	Part 68 BasicMed Privileges and Limitations.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IR.I.A.R1	Failure to distinguish proficiency versus currency.
IR.I.A.R2	Failure to set personal minimums.
IR.I.A.R3	Failure to ensure fitness for flight and physiological factors that might affect the pilot's ability to fly under instrument conditions.
IR.I.A.R4	Flying unfamiliar airplanes, or operating with unfamiliar flight display systems and avionics.
Skills	The applicant demonstrates the ability to:
IR.I.A.S1	Apply requirements to act as PIC under Instrument Flight Rules (IFR) in a scenario given by the evaluator.

I. Preflight Preparation

Task	***B. Weather Information***
References	14 CFR part 91; FAA-H-8083-25, AC 00-6; AC 00-45, AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with obtaining, understanding, and applying weather information for a flight under IFR.
Knowledge	The applicant demonstrates understanding of:
IR.I.B.K1	Sources of weather data (e.g., National Weather Service, Flight Service) for flight planning purposes.
IR.I.B.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.
IR.I.B.K3	Meteorology applicable to the departure, en route, alternate, and destination for flights conducted under Instrument Flight Rules (IFR) to include expected climate and hazardous conditions such as:
IR.I.B.K3a	a. Atmospheric composition and stability
IR.I.B.K3b	b. Wind (e.g., crosswind, tailwind, windshear, mountain wave, etc.)
IR.I.B.K3c	c. Temperature
IR.I.B.K3d	d. Moisture/precipitation
IR.I.B.K3e	e. Weather system formation, including air masses and fronts
IR.I.B.K3f	f. Clouds
IR.I.B.K3g	g. Turbulence
IR.I.B.K3h	h. Thunderstorms and microbursts
IR.I.B.K3i	i. Icing and freezing level information
IR.I.B.K3j	j. Fog/mist
IR.I.B.K3k	k. Frost
IR.I.B.K3l	l. Obstructions to visibility (e.g., smoke, haze, volcanic ash, etc.)
IR.I.B.K4	Flight deck displays of digital weather and aeronautical information.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IR.I.B.R1	Factors involved in making the go/no-go and continue/divert decisions, to include:
IR.I.B.R1a	a. Circumstances that would make diversion prudent
IR.I.B.R1b	b. Personal Weather Minimums
IR.I.B.R1c	c. Hazardous weather conditions to include known or forecast icing or turbulence aloft
IR.I.B.R2	Limitations of:
IR.I.B.R2a	a. Onboard weather equipment
IR.I.B.R2b	b. Aviation weather reports and forecasts
IR.I.B.R2c	c. Inflight weather resources
Skills	The applicant demonstrates the ability to:
IR.I.B.S1	Use available aviation weather resources to obtain an adequate weather briefing.
IR.I.B.S2	Analyze the implications of at least three of the conditions listed in K3a through K3l above, using actual weather or weather conditions in a scenario provided by the evaluator.
IR.I.B.S3	Correlate weather information to make a competent go/no-go decision.
IR.I.B.S4	Determine whether an alternate airport is required, and, if required, whether the selected alternate airport meets regulatory requirements.

I. Preflight Preparation

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

II. Preflight Procedures

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

II. Preflight Procedures

Task	***B. Airplane Flight Instruments and Navigation Equipment***
References	14 CFR parts 61, 91; FAA-H-8083-15; AIM
Objective	To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with managing instruments appropriate for an IFR flight.
Knowledge	The applicant demonstrates understanding of:
IR.II.B.K1	Operation of their airplane's applicable flight instrument system(s) including:
IR.II.B.K1a	a. Pitot-static instrument system: altimeter, airspeed indicator, vertical speed indicator
IR.II.B.K1b	b. Gyroscopic/electric/vacuum instrument system: attitude indicator, heading indicator, turn-and-slip indicator/turn coordinator
IR.II.B.K1c	c. Electrical systems, electronic flight instrument displays (PFD, MFD), transponder, and ADS-B
IR.II.B.K1d	d. Magnetic compass
IR.II.B.K2	Operation of their airplane's applicable navigation system(s) including:
IR.II.B.K2a	a. VOR, DME, ILS, marker beacon receiver/indicators
IR.II.B.K2b	b. RNAV, GPS, Wide Area Augmentation System (WAAS), FMS, autopilot
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
IR.II.B.R1	Failure to monitor and manage automated systems.
IR.II.B.R2	The difference between approved and non-approved navigation devices.
IR.II.B.R3	Common failure modes of flight and navigation instruments.
IR.II.B.R4	The limitations of electronic flight bags.
IR.II.B.R5	Failure to ensure currency of navigation databases.
Skills	The applicant demonstrates the ability to:
IR.II.B.S1	Operate and manage installed instruments and navigation equipment.