

include developing and standardizing regulations, national directives, policy, procedures, and advisory material for continued operational safety, type certification, design approval, and for authorization and oversight of Designated Representatives of the Administrator for civil aeronautical products. The current Production and Airworthiness Division responsibilities include developing and issuing regulations, national directives, policy, and procedures for continued operational safety, production and airworthiness certification and approvals, and certain Designated Representatives of the Administrator. Those combined responsibilities will remain intact in the newly established Design, Manufacturing, and Airworthiness Division.

Policy Documents: All Aircraft Engineering Division and Production and Airworthiness Division previously issued Advisory Circulars, Orders, Notices, and guidance will remain in effect until revised, changed, or deleted. The documents will be reviewed and modified according to priority.

Additional Information: Please contact the Engineering, Manufacturing, and Airworthiness Division (AIR-100) by phone on 202-285-6348 or by email at 9-AVS-AIR100@faa.gov. For a further breakdown of the Division and physical addresses view http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/air/hq/.

Issued in Washington, DC, on January 23, 2014.

Frank P. Paskiewicz,

Deputy Director, Aircraft Certification Service.

[FR Doc. 2014-01718 Filed 1-28-14; 8:45 am]

BILLING CODE 4910-13-P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Aviation Rulemaking Advisory Committee (ARAC); New Task Assignment for the ARAC: Establishment of Airman Certification System Working Group

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice.

SUMMARY: The FAA assigned the ARAC a new task arising from recommendations of the ARAC Airman Testing Standards and Training Working Group (ATSTWG). The ATSTWG recommended ways to ensure that the FAA's airman testing and training materials better support

reduction of fatal general aviation accidents. The FAA and the Aviation Industry jointly seek to improve airman training and testing by establishing an integrated, holistic airman certification system that clearly aligns testing with certification standards, guidance, and reference materials, and maintains that alignment. The new task is to establish an Airman Certification System Working Group (ACSWG) that will provide expert assistance and industry views to the FAA's Flight Standards Service (AFS) on the development, modification, and continued alignment of the major components of the airman certification system.

This action item informs the public of the new ARAC's task and solicits membership for the new ACSWG.

FOR FURTHER INFORMATION CONTACT: Van L. Kerns, Manager, Regulatory Support Division, FAA Flight Standards Service, AFS 600, FAA Mike Monroney Aeronautical Center, P.O. Box 25082, Oklahoma City, OK 73125; telephone (405) 954-4431, email van.l.kerns@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA established ARAC to provide advice and recommendations to the FAA Administrator on the FAA's rulemaking activities. ARAC's objectives are to improve the development of the FAA's regulations by providing information, advice, and recommendations related to aviation issues.

On September 21, 2011, the FAA chartered the Airman Testing Standards and Training Aviation Rulemaking Committee (ARC) for the U.S. aviation community to develop recommendations for more effective training and testing in the areas of aeronautical knowledge and flight proficiency required for safer operation in today's National Airspace System (NAS). The FAA's charge to the ARC was to help ensure that FAA's technical information related to existing standards for airman knowledge and skill tests, computer testing supplements, knowledge test guides, practical test standards and training handbooks incorporates the most current, relevant, and effective approaches to training and testing. The FAA specifically tasked the ARC with providing recommendations on a process for ongoing stakeholder participation in developing the content of these materials, and methodologies for developing better test item bank questions.

On August 30, 2012, the ARAC accepted the FAA's assignment of a new

task in response to several of the ARC's recommendations. ARAC established the ATSTWG to address the private pilot, flight instructor, and instrument rating training and testing materials by developing an integrated Airman Certification Standards (ACS) document for each one. The FAA also tasked the ATSTWG to develop a detailed proposal to realign and, as appropriate, streamline and consolidate existing FAA guidance material (e.g., handbooks) with each integrated ACS documents; and to propose methodologies to ensure that knowledge test item bank questions are consistent with both the ACS documents and the test question development principles set forth in the ARC's recommendations.

On September 30, 2013, the ARAC submitted to the FAA the ATSTWG's final report and recommendations to improve airman training and testing by establishing an integrated, holistic airman certification system that clearly aligns testing with certification standards, guidance, and reference materials, and maintains that alignment. The ATSTWG recommended specific steps the FAA should take to adopt the proposed Airman Certification System approach, and steps for its ongoing management. One of these steps is for the FAA to establish an ACSWG to assist the agency in ensuring that the content of its ACS, guidance, and knowledge testing materials is relevant and current; and to ensure that all components of the airman certification system are maintained in alignment.

The Task

On December 2013, the ARAC discussed the proposed actions for this tasking. This notice advises the public that the FAA has assigned, and the ARAC has accepted, a new task to establish the ACSWG. The FAA has specifically tasked the ACSWG to support the FAA's goal to enhance general aviation safety and reduce the fatal general aviation accident rate by providing a means for the aviation industry to provide expert assistance and industry views to the FAA's Flight Standards Service (AFS) on the development, modification, and continued alignment of the major components of the airman certification system, which include:

1. The ACS for airman certificates and ratings (i.e. 8081-series documents);
2. Associated training guidance material (e.g., H-series handbooks);
3. Test management (e.g., test question development, test question boarding, test composition/test "mapping," and CT-8080-series figures); and

4. Reference materials, to include AFS directives and Aviation Safety Inspector guidance; FAA Orders, Advisory Circulars (ACs), and other documents pertaining to the airman certification system.

The ACSWG is expected to develop a report describing its work on each of the listed elements. Any disagreements should be documented, including the rationale for each position and the reasons for the disagreement.

In developing this report, the ACSWG shall familiarize itself with:

1. A report to the FAA from the Airman Testing Standards and Training Aviation Rulemaking Committee: Recommendations to Enhance Airman Knowledge Test Content and Its Processes and Methodologies for Training and Testing (www.faa.gov/aircraft/draft_docs/arc);

2. A report from the Airman Testing Standards and Training Working Group to the Aviation Rulemaking Advisory Committee;

3. Aeronautical knowledge standards set forth in 14 CFR part 61, Certification: Pilots, Flight Instructors, and Ground Instructors;

4. Flight proficiency standards set forth in 14 CFR part 61, Certification: Pilots, Flight Instructors, and Ground Instructors;

5. FAA Airman Knowledge Test Guide (FAA-G-8082-17E);

6. Current Practical Test Standards documents for Private Pilot Airplane (FAA-S-8081-14B); Flight Instructor Airplane (FAA-S-8081-6C); and Instrument Rating for Airplane, Helicopter, and Powered Lift (FAA-S-8081-4E); and

7. Current FAA guidance materials, to include the Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25A); the Airplane Flying Handbook (FAA-H-8083-3A); the Aviation Instructor's Handbook (FAA-H-8083-9A); the Instrument Flying Handbook (FAA-H-8083-15A); and the Instrument Procedures Handbook (FAA-H-8083-1A).

Schedule

The report must be forwarded to the ARAC for review and approval no later than December 31, 2015.

ARAC Acceptance of New Task

The ARAC has accepted the task and will assign it to the ARAC ACSWG. The ACSWG serves as staff to ARAC and assists in the analysis of the assigned new task. ARAC must review and approve the ACSWG's report. If ARAC accepts the ACSWG's written report, it will transmit it to the FAA.

Working Group Activity

The ACSWG must comply with the procedures adopted by ARAC. As part of the procedures, the ACSWG must:

1. Recommend a work plan for completion of the task, including the rationale supporting such a plan, for consideration at the next ARAC meeting held following publication of this notice.

2. Provide a status report at each meeting of the ARAC.

3. Draft the report and required analyses and/or any other related materials or documents.

4. Present the final report to the ARAC for review and approval.

Participation in the ARAC Working Group

The ACSWG will be comprised of aviation professionals with experience and expertise in airman training and testing, and technical experts having an interest in the assigned new task. The FAA would like a wide range of members, to include individuals with experience in the part 61, part 121, part 135, part 141, and part 142 communities, to ensure that all appropriate aspects of airman testing and training, including best practices, are considered in the development of its report.

If you wish to become a member of the ACSWG, please write the person listed under the caption **FOR FURTHER INFORMATION CONTACT** expressing such desire. Describe your interest in the new task and state the expertise you would bring to the ACSWG. We must receive all requests by February 28, 2014.

The ARAC and the FAA will review the requests and advise you whether your request is approved.

If you are chosen for membership on the ACSWG, you must actively participate by attending all meetings and providing written comments when requested to do so. You must devote the resources necessary to support the ACSWG in meeting any assigned deadlines. You must keep your management chain, and those you may represent, advised of the ACSWG's activities and decisions to ensure the proposed technical solutions do not conflict with your sponsoring organization's position, when the subject is presented to ARAC for approval. Once the ACSWG has begun deliberations, members will not be added or substituted without the approval of the FAA and the ACSWG Chair.

The Secretary of Transportation determined the formation and use of ARAC is necessary and in the public

interest in connection with the performance of duties imposed on the FAA by law. ARAC meetings are open to the public. However, ARAC Working Group meetings are not open to the public, except to the extent individuals with an interest and expertise are selected to attend. The FAA will make no public announcement of the Working Group's meetings.

Issued in Washington, DC, on January 24, 2014.

Lirio Liu,

Designated Federal Officer, Aviation Rulemaking Advisory Committee.

[FR Doc. 2014-01673 Filed 1-28-14; 8:45 am]

BILLING CODE 4910-13-P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[Summary Notice No. PE-2013-60]

Petition for Exemption; Summary of Petition Received

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of petition for exemption received.

SUMMARY: This notice contains a summary of a petition seeking relief from specified requirements of 14 CFR. The purpose of this notice is to improve the public's awareness of, and participation in, this aspect of FAA's regulatory activities. Neither publication of this notice nor the inclusion or omission of information in the summary is intended to affect the legal status of the petition or its final disposition.

DATES: Comments on this petition must identify the petition docket number and must be received on or before February 18, 2014.

ADDRESSES: You may send comments identified by Docket Number FAA-2013-0885 using any of the following methods:

- *Government-wide rulemaking Web site:* Go to <http://www.regulations.gov> and follow the instructions for sending your comments electronically.

- *Mail:* Send comments to the Docket Management Facility; U.S. Department of Transportation, 1200 New Jersey Avenue SE., West Building Ground Floor, Room W12-140, Washington, DC 20590.

- *Fax:* Fax comments to the Docket Management Facility at 202-493-2251.

- *Hand Delivery:* Bring comments to the Docket Management Facility in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue SE., Washington, DC, between 9



U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, DC 20591

OCT 7 2016

Mr. Todd Sigler
Senior Manager, Regulatory & Rulemaking Strategies
The Boeing Company
P.O. Box 3707, MC 07-30
Seattle, WA 98124-2207

Dear Mr. Sigler:

This is in response to your letters transmitting to the Federal Aviation Administration (FAA) the following recommendation reports:

- Airman Certification System Working Group's recommendation report, submitted to the Aviation Rulemaking Advisory Committee (ARAC) and approved on March 23, 2016. (The original tasking notice was issued on January 24, 2014 (79 FR 4800, January 29, 2014).)
- Materials Flammability Working Group's recommendation report, submitted to the Transport Airplane and Engine (TAE) Subcommittee, who approved on November 4, 2015 and submitted to the ARAC and approved on December 17, 2015. (The original tasking notice was issued on January 14, 2015 (80 FR 2772, January 20, 2015).)
- Rotorcraft Occupant Protection Working Group interim costs and benefits recommendation report, submitted to the ARAC and approved on March 23, 2016. (The original tasking notice, task 2, issued on October 30, 2015 (80 FR 68599, November 5, 2015).)

I wish to thank the working group members who continue to provide resources to develop, review, and approve the recommendations. The industry-wide cooperation and engagement achieved through your leadership was necessary to produce the innovative recommendations presented in the report.

I also wish to thank the TAE Subcommittee members and the ARAC members who reviewed and approved the recommendation reports. The recommendation reports and the other official documents were placed on the FAA's Committee Database Website.

Finally, I apologize for the tardiness of this letter. Due to the loss of our long-term focal point for committee matters, the tracking of these letters was dropped while we waited to bring on a replacement.

The FAA considers this submittal of the recommendation reports from the Airman Certification System Working Group, the Materials Flammability Working Group, and the Rotorcraft Occupant Protection Working Group as completion of the original tasking notices.

Sincerely,



Lirio Liu
Director, Office of Rulemaking



Aviation Rulemaking Advisory
Committee

Airman Certification System
Working Group

Interim Recommendation Report

March 1, 2016

EXECUTIVE SUMMARY

The following recommendations comprise the interim report of the Airman Certification System working group (ACS WG) to the Federal Aviation Administration (FAA). Formal recommendations for the following were submitted to the FAA's Airman Testing Standards branch (AFS-630) -

- Airline Transport Pilot (ATP) Airman Certification Standards
- Private Pilot Airplane (PAR) FAA Knowledge Exam
- Commercial Airman Certification Standards
- Instrument Procedures Handbook (FAA-H-8083-16)
- Instrument Flying Handbook (FAA-H-8083-15C)
- Advanced Avionics Handbook (FAA-H-8083-6)
- Aircraft Weight and Balance Handbook (FAA-H-8083-1A)
- Helicopter Flying Handbook (FAA-H-8083-21A)
- Airplane Flying Handbook (FAA-H-8083-3B)
- Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B)
- FAA Guidance Documents priorities and future development efforts
- Commercial Airman Knowledge Testing Supplement (CT-8080-1D)
- Instructor Airman Knowledge Testing Supplement (CT-8080-5G)
- Private, Sport, Recreational Pilot Airman Knowledge Testing Supplement (CT-8080-2G)
- New Student Pilot Application Requirements
 - Advisory Circular 61-65, Certification: Pilots and Flight and Ground Instructors
 - CFI Knowledge Exam test item bank
 - Student Pilot Guide (FAA-H-8083-27A)
 - Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B)
- Harmonization of 8083-15, 8083-16, and 8083-6 Handbooks
- Implementation Recommendations
- Aviation Instructor's Handbook (FAA-H-8083-9A)

This report also contains a formal recommendation from the working group chair and sub-group leads to the ARAC executive committee, for transition from the current practical test standards (PTS) to new Airman Certification Standards (ACS) for Private Pilot Airplane and Instrument Rating Airplane.

The working group and its leadership strongly feel that once all components of the new airman certification system are in place, the safety of aviation will markedly be improved.



March 1, 2016

Todd D. Sigler
 Chairman, Aviation Rulemaking Advisory Committee
 Federal Aviation Administration
 800 Independence Avenue, SW
 Washington, DC 20591



Dear Mr. Sigler,

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 FAA and the Aviation Industry jointly seek 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 drafted and finalized all of the major components of the system for the private pilot certificate (airplane category) and the instrument rating (airplane category). The new airman certification standards (ACS) have been drafted, vetted and finalized; test questions reviewed and edited as necessary; and guidance materials have been updated and aligned to the new standards.

With all of the necessary components of the new system in place, we strongly recommend the FAA transition from the current Practical Test Standards (PTS) to ACS for the Private certificate and instrument rating on June 15, 2016. We are confident that, by doing so, the safety of aviation will markedly improve.

Sincerely,

David Oord
 ACSWG Chair
 Vice President, Regulatory Affairs
 Aircraft Owners and Pilots Association

Eric Crump
 ACSWG Subgroup Lead
 Aerospace Program Director
 Polk State College

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

Jackie Spanitz
 ACSWG Subgroup Lead
 Curriculum Director
 Aviation Supplies & Academics, Inc.



February 27, 2015

Robert L. Newell
FAA Branch Manager, Airmen Testing Standards
Systems Training Annex Bldg. 26
FAA Mike Monroney Aeronautical Center
6500 S. MacArthur Blvd.
Oklahoma City, OK 73169



Dear Mr. Newell,

Oh behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following documents for the Airline Transport Pilot (ATP) Airman Certification Standards (ACS).

In addition to the ATP ACS, we are also including the ATP Tracking Matrix, which details the changes made when transitioning from the current Practical Test Standards (PTS), FAA-S-8081-5F Changes 1-7, to this new ACS format.

We thank you and the agency for this opportunity to provide input into the new standards, part of the joint effort to improve the certification processes and system – resulting in testing and training that is more relevant and meaningful for today's aviator and flight technologies. We are confident, that from this effort and partnership, the safety of aviation will be improved.

Please let us know if we can provide anything further.

Sincerely,

David Oord
ACSWG Chair
Vice President, Regulatory Affairs
Aircraft Owners and Pilots Association

Jackie Spanitz
ACSWG Subgroup Lead
Curriculum Director
Aviation Supplies & Academics, Inc.

Enclosed:

ATP ACS Draft (150226 ATP ACS_WG.docs)

ATP PTS to ACS Tracking Matrix (150226 ATP PTS to ACS Tracking Matrix.xlsx)



March 1, 2015

Robert L. Newell
FAA Branch Manager, Airmen Testing Standards
Systems Training Annex Bldg. 26
FAA Mike Monroney Aeronautical Center
6500 S. MacArthur Blvd.
Oklahoma City, OK 73169



Dear Mr. Newell,

Oh behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following recommendations for the Private Pilot Airplane (PAR) FAA Knowledge Exam.

During the summer of 2014, the ACS working group (WG) was tasked with applying an ACS code to every question in a public sample of test data.

The WG reviewed the FAA's release of the sample exam with the ACS codes and would like to offer the following recommendations for your consideration. These may be particularly useful as the Aviation Exam Board (AEB) continues the exercise of coding questions on the official FAA form tests as well as the public sample test and the overall ACS process evolves.

Thank you for this opportunity to provide input and please let us know if we can provide anything further.

Sincerely,

David Oord
ACSWG Chair
Vice President, Regulatory Affairs
Aircraft Owners and Pilots Association

Jackie Spanitz
ACSWG Subgroup Lead
Curriculum Director
Aviation Supplies & Academics, Inc.



Aviation Rulemaking Advisory Committee
Airman Certification System Working Group
Publications and Documentation ACS Subgroup

PAR Sample Exam with ACS Codes – January 29, 2015

Description: ARAC ACS WG – Publication/Documentation Subgroup Recommendations
Date: March 1, 2015

Overview

The FAA posted a new Private Pilot Sample Exam to include ACS codes on the AFS630 website:
http://www.faa.gov/training_testing/testing/test_questions/media/PARSampleExam.pdf

The ACS WG understands this Sample Exam represents the ACS coding methodology the FAA will use to code all questions in the Private Pilot Airplane item bank. The FAA Sample Exam is the basis on which the training industry will align to ensure training and testing remain correlated. It is also assumed this Sample Exam is representative of the form tests currently being issued, as well as how the FAA will move forward as they transition to the new test development program. To this end, we offer the following feedback and recommendations for your consideration in your continued refinement and review of the form tests and the public sample exam.

Test Map

The sample exam has a different “weighting” of subjects from past tests – and is not consistent with the recommendations made by the previous ARAC (final report Appendix I). The Private ACS has evolved since the ARAC final report (area of operations are not the same as they were when the ARAC recommendations were made) but this map review is still a good way to see how the test seems to be currently weighted:

Subject	PAR Sample Exam	ARAC Recommendation
Preflight (PA.I....)	41*	32
Preflight Procedures (PA.II...)	4	
Airport Operations (PA.III...)	5	5
Takeoffs, Landings, Go Arouns (PA.IV...)	0	4
Performance Maneuvers (PA.V...)	0	2
Navigation (PA.VI...)	6	5
Slow Flight & Stalls (PA.VII...)	0	4
Basic Instrument Maneuvers (PA.VIII...)	0	
Emergency Operations (PA.IX...)	4	5
Multiengine Operations (PA.X...)	0	
Night Operation (PA.XI...)	0	2
Postflight Procedures (PA.XII...)	0	1
Total	60 questions, 2 hours	60 questions, 2 hours



*The Sample Exam does not appear to include any (0) questions on the subject of Aircraft Systems (to include things like engines, ignition and electrical systems, fuel induction systems, carburetor ice, aviation fuel, propellers, torque, preflight inspection procedures).

Recommendations

In light of the FAA's current goals of acquiring and implementing a new test development software and program, the ACS WG recommends the Sample Exam be reviewed to ensure it is:

- Accurately representing the "weighting" of subjects for the forms tests being issued.
- Review tests to ensure all intended subjects are included on the test.

Test Questions and ACS Code Assignment

Some of the questions in the PAR do not appear to have the correct ACS code assigned to them. This code is the only way for instructors and evaluators to know-what-the-applicant-didn't-know (as demonstrated on the FAA Knowledge Exam) so they may provide the correct retraining and retesting required by regulations.

The table below also includes comments and recommendations for the questions themselves, consistent with the ACS test development philosophies and approach.

Question	ACS Code Assigned	Recommended ACS Code
When executing an emergency approach to land in a single-engine airplane, it is important to maintain a constant glide speed because variations in glide speed A -- increase the chances of shock cooling the engine. B -- assure the proper descent angle is maintained until entering the flare. C -- nullify all attempts at accuracy in judgment of gliding distance and landing spot.	PA.IX.A.K1	PA.IX.B.K1 This question deals with emergency approach, not emergency descent.
(Refer to Figure 8.) What is the effect of a temperature increase from 35 to 50F on the density altitude if the pressure altitude remains at 3,000 feet MSL? A -- 1,000-foot increase. B -- 1,100-foot decrease. C -- 1,300-foot increase.	PA.VI.A.K4	PA.I.F.K1 This question deals with preflight preparation, not navigation.



Question	ACS Code Assigned	Recommended ACS Code
(Refer to Figure 36.) Determine the approximate manifold pressure setting with 2,450 RPM to achieve 65 percent maximum continuous power at 6,500 feet with a temperature of 36F higher than standard. A -- 19.8" Hg. B -- 20.8" Hg. C -- 21.0" Hg.	PA.VI.A.K13	PA.I.F.K1 This question deals with preflight preparations/performance and limitations, not navigation/pilotage and dead reckoning.
The width of a Federal Airway from either side of the centerline is A -- 4 nautical miles. B -- 6 nautical miles. C -- 8 nautical miles.	PA.I.D.K8	PA.I.E.K1 This question deals with airspace, not cross-country flight planning. Also: Recommend removal of the question. The 4 NM width is only valid for the first 51 nm on the airway therefore all of the answers may be correct.
(Refer to Figure 38.) Determine the total distance required to land. OAT 32 degrees F Pressure altitude 8,000 ft Weight, 2,600 lb Headwind component, 20 kts Obstacle, 50 ft A -- 850 feet. B -- 1,400 feet. C -- 1,750 feet.	PA.I.F.K1 14 questions of this nature	PA.I.F.S3 The WG recommends questions of this nature be coded as a Skill not Knowledge task element.
What information is contained in the Notices to Airman Publication (NTAP)? A -- Current NOTAM(D) and FDC NOTAMs. B -- All current NOTAMs. C -- Current FDC NOTAMs.	Ok	The correct answer is A; however, the AIM states "This part contains selected FDC NOTAMs that are expected to be in effect on the effective date of the publication" – suggest revising or removing this question.

Question	ACS Code Assigned	Recommended ACS Code
<p>How far will an aircraft travel in 7.5 minutes with a ground speed of 114 knots?</p> <p>A -- 14.25 NM. B -- 15.00 NM. C -- 14.50 NM.</p>	Ok	<p>Answer A is correct but the distracter C is only .25 NM difference. If using a traditional E6B the difference between the two choices is not enough. It is not relevant if the test taker can be accurate to .25 NM. The questions should be removed or the distracter modified to a higher or lower value. The distracter 15 NM should be the final choice if it is the highest number. Best practices in test writing state that if you have number, dates etc. that they be listed in ascending order.</p>
<p>(Refer to Figure 21, area 3; and Figure 29.) The VOR is tuned to Elizabeth City VOR, and the aircraft is positioned over Shawboro. Which VOR indication is correct?</p> <p>A -- 2. B -- 5. C -- 9.</p>	PA.VI.B.K2	<p>PA.VI.B.K1</p> <p>This question deals with ground-based navigation, not GPS/satellite.</p>
<p>When the course deviation indicator (CDI) needle is centered during an omnireceiver check using a VOR test signal (VOT), the omnibearing selector (OBS) and the TO/FROM indicator should read</p> <p>A -- 180 FROM, only if the pilot is due north of the VOT. B -- 0 TO or 180 FROM, regardless of the pilot's position from the VOT. C -- 0 FROM or 180 TO, regardless of the pilot's position from the VOT.</p>	PA.I.G.K1g	<p>PA.VI.B.K1</p> <p>This question deals with navigation systems not preflight preparation/operation of systems</p>
<p>When making routine transponder code changes, pilots should avoid inadvertent selection of which code?</p> <p>A -- 7200. B -- 7400. C -- 7600.</p>	PA.IX.A.K12	<p>PA.III.A.K5</p> <p>This question deals with communications not Emergency Descents.</p>

Question	ACS Code Assigned	Recommended ACS Code
Unless otherwise authorized, if flying a transponder equipped aircraft, a pilot should squawk which VFR code? A – 1200. B – 7600. C – 7700.	PA.IX.A.K12	PA.III.A.K5 This question deals with communications not Emergency Descents.
When activated, an emergency locator transmitter (ELT) transmits on A -- 118.0 and 118.8 MHz. B -- 121.5 and 406 MHz. C -- 123.0 and 119.0 MHz.	PA.IX.A.K10	PA.IX.D.K6 This question deals with emergency equipment and survival gear not Emergency Descents.

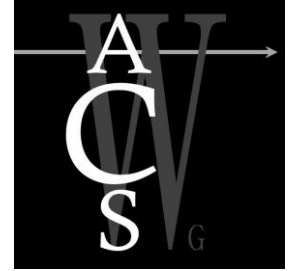
Recommendations

In light of the FAA's current goals of acquiring and implementing a new test development software and program, the ACS WG recommends the Sample Exam be reviewed to ensure:

- The assigned ACS code accurately represents the Area of Operation and Task which defines the question intent; in first selecting the Area of Operation and Task, test writers may then determine a new task element is necessary (or needs to be moved from the Task where it currently is).
- Review questions identified for additional edits before using in iteration on the form tests.

March 3, 2015

Robert L. Newell
 FAA Branch Manager, Airmen Testing Standards
 Systems Training Annex Bldg. 26
 FAA Mike Monroney Aeronautical Center
 6500 S. MacArthur Blvd.
 Oklahoma City, OK 73169



Dear Mr. Newell,

Oh behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following recommendations for the Commercial Airman Certification Standards.

Commercial Airman Certification Standards Overview

The FAA is in the process of validating the Commercial ACS the Working Group (WG) submitted November, 2014. This document did not include feedback specific to the Appendix 1: Flight Simulation Device Level chart; at the time the Commercial ACS was finalized, the new ruling on applicability and use of Flight Simulation Training Devices (FSTDs) in training and testing (Part 60) had not been rendered. The FAA review team asked for input from the WG to better understand how this chart is currently being used within the industry for training and testing.

Recommendations

The WG believes a Flight Simulation Training Device Chart is an important element for the Commercial and all the ACS. It should be updated to reflect the new policy (14 CFR part 60) and readily available to instructors, examiners, flight schools, and training centers. This information will be used to determine whether a given device can be used for training, checking, and testing on specific tasks and maneuvers at all certification levels.

The WG recommends the FAA develop the Task vs. FSTD Level for each ACS, and define what tasks would be appropriate to test using an FSTD.

Thank you for this opportunity and please let us know if we can provide anything further.

Sincerely,

David Oord
 ACSWG Chair
 Vice President, Regulatory Affairs
 Aircraft Owners and Pilots Association

Jackie Spanitz
 ACSWG Subgroup Lead
 Curriculum Director
 Aviation Supplies & Academics, Inc.

March 6, 2015



Robert L. Newell
 FAA Branch Manager, Airmen Testing Standards
 Systems Training Annex Bldg. 26
 FAA Mike Monroney Aeronautical Center
 6500 S. MacArthur Blvd.
 Oklahoma City, OK 73169

Brian Strack
 USAF Liaison, Flight Technologies and Procedures
 Registry Bldg. 26
 FAA Mike Monroney Aeronautical Center
 6500 S. MacArthur Blvd.
 Oklahoma City, OK 73169

Dear Mr. Newell and Mr. Strack,

On behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following recommendations and offer congratulations on a job well done in creating the new edition of the FAA *Instrument Procedures Handbook* (FAA-H-8083-16).

The new edition of this important training guidance was completed and in FAA coordination/review when the working group (WG) was assigned this task. It is in the industry's best interest to release this 2014 edition as soon as the FAA coordination process is complete, implementing the recommendations that can only be accomplished without further delay in releasing this new edition. We understand some recommendations may not be implemented prior to release of this 2014 edition, but will be considered for future revisions to this book.

This handbook is currently published through the AFS-400 office. We believe future revisions should be done in collaboration with the AFS-630 office. Doing so will ensure consistent, coherent information without duplication in other FAA publications (such as the *Instrument Flying Handbook*, FAA-H-8083-15 and the *Advanced Avionics Handbook*, FAA-H-8083-6). Currently, these publications provide information on some of the same topics, but with variations in terms, descriptions, and depth of coverage. A single document may be unwieldy and overwhelming for a pilot in training – and may be overlooked by VFR or advanced pilots needing the information but not actively training. However, consolidating key topics to avoid redundancy between publications would result in a single resource for a given topic, with consistent language and descriptions for a given technology and/or procedure – not only eliminating redundancy in FAA workload, but also consistency within the aviation training community.

The ACSWG and its members welcome the opportunity to provide feedback for future editions of the *Instrument Procedures Handbook* to continue to streamline FAA publications affecting training and testing. Thank you for this opportunity and please let us know if we can provide anything further.

Sincerely,

David Oord
 ACSWG Chair
 Vice President, Regulatory Affairs
 Aircraft Owners and Pilots Association

Jackie Spanitz
 ACSWG Subgroup Lead
 Curriculum Director
 Aviation Supplies & Academics, Inc.





Aviation Rulemaking Advisory Committee
Airman Certification System Working Group
Publications and Documentation ACS Subgroup

Instrument Procedures Handbook (FAA-H-8083-16, 2014 Edition)

Description: ARAC ACS WG – Publication/Documentation Subgroup Recommendations
Date: March 6, 2015

Recommendation

Content – Overall

- Cover, change part number to FAA-H-8083-16A so readers immediately know this is a new edition.
- Title page, change release date from “2014” to “2015” – even if completed in 2014, effective date should correlate with the release date.
- Change the chapter order: Emergency Procedures (currently Appendix A) should be Chapter 5, to follow Approaches – renumbering the rest of the chapter accordingly. Instrument emergencies are some of the most misunderstood and dangerous situations in aviation. Moving this information in context will place more emphasis on learning the emergency procedures which would further manage risk.
- Keep the instrument books (FAA-H-8083-15, FAA-H-8083-16, FAA-H-8083-6) smaller and separate, but eliminate redundant information between them.

When first issued as FAA-H-8261-1A in 2007, the current version of this handbook could be viewed as a useful but not essential description of the TERPS process, procedure development, and other aspects of the construction of National Airspace System (NAS) procedures. However, this handbook is becoming increasingly essential in describing a NAS that is becoming more complex all the time, especially with the implementation of The NextGen modernization program. Subjects such as performance-based navigation (PBN), required navigation performance (RNP) and other elements of NextGen will become increasingly a part of pilot training and certification standards. It is especially useful and applicable to single-pilot operation of high-performance general aviation aircraft used for transportation purposes and crewed operation of larger business and air carrier aircraft, since the use of advanced instrument procedures, such as PBN/RNP, is migrating slowly into smaller general aviation aircraft. Accordingly, the *Instrument Procedures Handbook* should be retained as a standalone document and not merged with the *Instrument Flying Handbook* (FAA-H-8083-15).

It may be desirable to develop a “two-tier” approach to these handbooks. The basic text for training and certification for the instrument rating may be the *Instrument Flying Handbook*. The *Instrument Procedures Handbook* would be added as a reference text for the Airline Transport Pilot (ATP) certificate and aircraft type ratings. The *Instrument Procedures Handbook* could also be used as the reference text for certain NextGen pilot approvals such as RVSM and what is likely to be separate approvals for some automatic dependent surveillance broadcast



(ADS-B) applications such as in-trail spacing. There is too much material required for all of these ratings and approvals to place them in a single handbook that would be manageable and convenient to use.

Handbook Redundancy

8083-15B	8083-16	8083-6
National Airspace System	DP's	Intro to Advance Avionics
ATC System	En Route Operations	Electronic Flight Instruments
Aerodynamic Factor	Arrivals	Navigation
Flight Instruments	Approaches	Automated Flight Control
Airplane Attitude Instrument Flying	Improvement Plans	Information Systems
Airplane Basic Flight Maneuvers	Airborne Navigation Databases	
Helicopter Attitude Instrument Flying	Helicopter Instrument Procedures	
Navigation System	Emergency Procedures	
IFR Flight		
Emergency Operations		

Absorb 8083-6 into 8083-15B as an appendix.

- Review the Performance-based Operations Aviation Rulemaking Committee/Commercial Aviation Safety Team Flight Deck Automation Working Group (FDAWG) Final report for recommendations that could be brought into this document. Also, more in-depth coverage of NextGen technologies should be included with a focus on how to keep up with the changes.
- Introduction to RNAV and RNP: *IPH* needs a chapter that introduces the concepts and terminology related to RNAV and RNP. The current edition drops terminology and details about these important concepts into the middle of sections devoted to departures, en route, etc. But the terminology and concepts are confusing, and trying to define and explain them in all the separate discussions of, for example, DPs and IAPs, breaks up the flow and leads to clumsy diversions.

See, for example, the discussion of **Required Navigation Performance** on p. 2-34. It appears in a chapter about enroute operations, but the topic is really about different types of RNP levels and related topics that apply to all phases of flight.

- Add clarification on touchdown zone elevation, threshold elevation, height above threshold/touchdown, etc. Some company OpSpecs require specific altitudes above TDZE and this designation has been omitted from some recent IAPs complicating things. Training docs need to

reflect current, correct terms, use and definitions. Reference for further information: <http://www.pilotsofamerica.com/forum/showthread.php?t=53814&referrerid=3196>

- Increase use of lists to break up text-heavy descriptions: Substitute throughout bulleted/numbered lists for paragraphs that include long sequences of sentences that describe specific criteria. Providing such details in lists would make it easier for readers to grasp important information. For example: Pg. 1-14

...Unless specified otherwise, required obstacle clearance for all departures, including diverse, is based on the pilot crossing the departure end of the runway (DER) at least 35 feet above the DER elevation, climbing to 400 feet above the DER elevation before making the initial turn, and maintaining a minimum climb gradient of 200 feet per nautical mile (FPNM), unless required to level off by a crossing restriction[,] until the minimum IFR altitude is reached. Following ODP assessment, a SID may still be established for the purposes of ATC flow management, system enhancement, or noise abatement.

...Unless specified otherwise, required obstacle clearance for all departures, including diverse, is based on the pilot:

- Crossing the departure end of the runway (DER) at least 35 feet above the DER elevation
- Climbing to 400 feet above the DER elevation before making the initial turn
- Maintaining a minimum climb gradient of 200 feet per nautical mile (FPNM), unless required to level off by a crossing restriction, until the minimum IFR altitude is reached

Content – Specific Suggestions

Chapter 1: Departure Procedures

P. 1-3

Surface Movement Guidance Control System (SMGCS): This section includes important information for airline crews and others who operate at airports that serve air carriers. But placing it before the general discussions of **Airport Signs, Lighting, and Markings, Runway Hotspots, Taxi and Movement Operations Change**, and similar sections of interest to all pilots, especially GA aviators, gets into the trees before we have a chance to admire the forest.

(The same comment applies to the detailed discussion of TERPS criteria on p. 1-17. Wouldn't those technical details, including the math, work better as a sidebar or appendix? At present, they bring the description of departure procedures to a screeching halt before we've even learned about the **Categories of DPs.**)

Back to moving around on the airport. The topics related to taxiing would flow better and be much easier to digest if details that pertain to air carriers and operations at high-density airports followed the general discussion.



This general point is worth keeping in mind throughout the *IPH*. I understand the statement in the Preface about the handbook's purpose (see below). But taking a hard look at how each chapter is organized could help separate content aimed at typical GA pilots and aspiring ATPs from that which Part 135 and 121 operators learn about in their required training. Putting details about such topics as SMGCS after more general guidance would also make each chapter more readable and accessible to pilots in training and typical IFR pilots.

This handbook...is designed as a technical reference for all pilots who operate under instrument flight rules (IFR) in the National Airspace System (NAS). It expands and updates information contained in the FAA-H-8083-15B, Instrument Flying Handbook, and introduces advanced information for IFR operations. Instrument flight instructors, instrument pilots, and instrument students will also find this handbook a valuable resource since it is used as a reference for the Airline Transport Pilot and Instrument Knowledge Tests and for the Practical Test Standards.

P. 1-29

The discussion of DPs organized by equipment requirements reads like a non-sequitur. It's introduced without a heading or marker to make this important information stand out. I'd move it to an appropriate place under **Categories of Departure Procedures** (p. 1-22), perhaps immediately following the introductory paragraph (which, by the way, is another place where a bulleted list would be helpful):

There are two basic types of DPs:

Obstacle departure procedures (ODP) developed to assist pilots in obstruction avoidance. ODP are printed as text descriptions or as charts.

Standard instrument departures (SID) developed to communicate ATC clearances. SIDs are always charted.

DPs are also categorized by equipment requirements as follows:

Non-RNAV DP—established for aircraft equipped with conventional avionics using ground-based NAVAIDs. These DPs may also be designed using dead reckoning navigation. Some flight management systems (FMS) are certified to fly a non-RNAV DP if the FMS unit accepts inputs from conventional avionics sources, such as DME, VOR, and localizer (LOC). These inputs include radio tuning and may be applied to a navigation solution one at a time or in combination. Some FMS provide for the detection and isolation of faulty navigation information.

RNAV DP—established for aircraft equipped with RNAV avionics (e.g., GPS, VOR/DME, DME/DME).

P. 1-30–1-31

The graphics that describe ICAO flight plan codes are out of place and not especially useful here. Given that as of October 1, 2015, all flight plans must be filed using the ICAO format, the *IPH* should include a useful guide to filing that format, with special emphasis on the information that typical GA pilots need to understand about the RNAV and ADS-B equipment that many are using or preparing to install. The codes for RVSM, RNP, etc. are, once again, for the jet set (who don't typically file their own flight plans), and they're not the primary audience for this handbook.

In fact, the new *IPH* should include a section about preflight planning that discusses, at least generally, the emerging world of web-based weather briefings and flight plan filing. Given the FAA's recent announcements about forthcoming changes to Flight Services (see this [link](#)), this information with, at a minimum, references to documents such as AC 00-45G *Aviation Weather Services* and *Flight Services* (JO 7110.10X) seems in order.

P. 1-36

The section **SID Altitudes** does not include discussion of *climb via* clearances, *top altitudes*, etc. The relatively new *climb via* clearances still cause confusion among pilots and some air traffic controllers. These clearances are being issued at all airports with SIDs, and to all aircraft—even single-engine piston airplanes—flying those procedures. The new *IPH* should incorporate and, as needed, expanded guidance about *climb via* clearances and reference other official sources.

P. 1-43

The section **VFR Departures** also does not specifically address a point of confusion among many IFR pilots who depart under VFR and pick up a clearance in the air. When ATC issues an IFR clearance (which typically includes the question, “Can you maintain your own obstacle and terrain clearance until reaching...?”), many pilots are confused about when they can enter clouds or operate in less than basic VMC. ATC won't assign a heading or clear an aircraft to a fix or route until the aircraft is identified and at or above a minimum IFR/vectoring altitude. But when ATC issues a clearance, the pilot is now operating under IFR and may enter clouds or fly in less than VMC, provided the pilot can safely avoid obstacles and terrain until reaching the minimum altitude at which ATC may begin to provide services. This section could also discuss filing a “departure fix” that isn't the departure airport, such as a VOR or other waypoint, provided the pilot can safely fly to that fix under VFR and arrive at an altitude that works for ATC. (See, for example, [Picking Up an IFR Clearance Enroute](#) at my blog.)

Chapter 2: Enroute Operations

P. 2-2

The discussion of the three strata of airways does not mention T-routes and Q-routes. T-routes should be introduced here as a complement to the description of Victor Airways. These topics don't show up until p. 2-14, and then without a distinct introduction/heading that would make them easy to spot. The sections that do describe T-routes, for example, are a muddle that's hard to...navigate.

Chapter 3: Arrivals

Again, I advocate discussing general information about this topic that applies to all operations putting the details appropriate to high-performance, high-altitude fliers into sections dedicated to the jet-setters.

Chapter 4: Approaches

The discussion of weather sources (p. 4-2–4-8) repeats information from chapter 1. This discussion could be consolidated and made easier to find and understand if it were placed in new chapter dedicated to preflight planning/briefing and weather-related matters. Only the approach-specific details should appear in chapter 4.



Chapter 5: Improvement Plans

This chapter doesn't discuss FAA's plans to decommission many VORs and to establish a minimum operational network (MON). This plan (discussed at my blog, [here](#)) hasn't been disseminated to pilots, and many aviators are under the mistaken impression that FAA plans to shut down the entire network of VORs, leaving no backup to GPS or for pilots who do not have an IFR-approved GPS. Key points that should be noted include:

- The VOR MON Program will implement the [[minimum operational network of VORs](#)] by decommissioning 30-50% of the VORs in the NAS by 2025 (although the current plan retains all VORs in the designated mountainous region of the U.S.—roughly the western third of the country).
- The reduction will begin gradually over the first five years during which time the bulk of the procedural/airway/airspace work will be assessed. Then the plan is to accelerate the process, with 20-25 VORs shut down each year.
- Only FAA owned/operated VORs will be considered for shutdown.
- DMEs and TACANs will generally be retained.
- Many of the remaining VORs will be enhanced to supply increased service volume. VOR standard service volume (SSV) will become 77 NM radius at 5000 ft. AGL.
- Increase support for direct navigation between VORs without airways.
- Retain sufficient ILSs, LOCs, and VORs to support “safe-landing” at a suitable destination with a GPS-independent approach (ILS, LOC or VOR) within 100 NM of any location within CONUS.
- Provide seamless VOR coverage at and above 5000 ft AGL.
- More than 5,000 instrument approaches may be affected by the reduction in operational VORs.
- Nearly 1,300 SIDs, STARs, and ODPs may be affected by the reduction in operational VORs.
- FAA is considering how to refer to and chart DME-only facilities.

Chapter 6: Airborne Navigation Databases

P. 6-14

The section **Users Role** (see below) appears to be outdated by a change in 14 CFR Part 43 published in November 2012 (see notice in the Federal Register, [here](#)); viz.

SUMMARY: This action amends the maintenance regulations by removing from the preventive maintenance category the task of updating databases used in self-contained, front-panel or pedestal-mounted navigation equipment...

Users Role

Like paper charts, airborne navigation databases are subject to revision. According to Title 14 of the Code of Federal Regulations (14 CFR) Part 91, section 91.503, the end user (operator) is ultimately responsible for ensuring that data meets the quality requirements for its intended



application. Updating data in an aeronautical database is considered to be maintenance and all Part 91 operators may update databases in accordance with 14 CFR Part 91, section 43.3(g). Parts 121, 125, and 135 operators must update databases in accordance with their approved maintenance program. For Part 135 helicopter operators, this includes maintenance by the pilot in accordance with 14 CFR Part 43, section 43.3(h).

Production – Overall

- Suggest revising styles and typeface to be consistent with other FAA handbooks (FAA-H-8083-4 is an ideal example – 8083-25, 8083-15, 8083-9A, and 8083-31/32 are also consistent with the recommended styles). In the 8083-16, the body text is sans-serif (probably Myriad); suggest changing to serif (Times Roman) and revising subheadings from just sans-serif to Helvetica for easier readability and to be consistent with other FAA handbooks.
- “[Figure XX]” and mentions of Figure XX in line text should be italicized
- Captions: boldface sans serif Figure number and italic serif caption text. Figure number and caption text should be the same size.
- Better differentiation of headers, especially level two and three (level 3 appears on page 1-11). Make subheads boldface
- V-speeds need to be found and subscripted
- Consistent space between titles and text for Preface, Acknowledgements, Notice, Table of Contents, Emergency Procedures (Appendix A), Acronyms (Appendix B), Glossary, and Index.
- Consistent spacing after paragraphs/headers/figures
- Consistent line-height and size to body text
- Consistent spacing before and after bulleted/numbered lists
- Columns should be all aligned at the top
- Red body text should be black
- Figures should never split paragraphs
- Decrease leading of figure caption text (line height appears to be equal to body text, text size is significantly smaller)
- Don’t break up bullets that are 2-3 lines long.
- REVIEW THROUGHOUT THE BOOK TO MAKE SURE FIGURE PLACEMENT IS CORRECT. Typically, text where figures are referenced precedes the figure.

Production – Specific Suggestions

iv: Too much space between paragraphs, space after title is much larger than on page iii

v: space after title not consistent with previous pages

Vii: Bold chapter number and include chapter title in the Table of Contents:

1-1: Justify first paragraph.

1-2: More space between caption and text

1-8: Insert space “Reminder:You may”

1-10: widowed line at top of right-hand column, could be kept with paragraph on left-hand column. Figure 1-10 splits paragraph.



1-11: Should a new paragraph begin after “1-10]”? Ragged line in the first sentence of the paragraph before “Adequate Visual Reference”

1-12: Move Figure 1-12 to top of column to avoid 2 lines of text above it.

1-17: Italicized paragraph? Missing “NOTE:”? And, 4th line of second paragraph is not justified.

1-18: keep 2nd bullet paragraph together (enough space to reflow to left-hand column)

1-20: Add space between last two paragraphs in right column.

1-23: Add space between last two paragraphs in right column.

1-28: too much space before bulleted list, keep 2nd bullet together (don't break across columns)

1-29: widowed first line at end of page, push to next page

1-33: too much space before bulleted list

1-36: align rules above/below with numbers, correctly stack 7000 over 4600. Move last line in left column to top to right column to avoid a widow.

1-37: Widowed line at end of page, push to next page

1-38: Red text? Widowed line at top of right-hand column, push one more line from left-hand column over. Second paragraph in right column should be justified.

1-43: reflow a line to the end of the right-hand column

2-4: Bullets for the two indented bullets under “Vertically—” should also be indented or deleted.

2-5: Figures 2-10–12 split paragraph (two widowed lines at end of page). Move some of these figures to the next page so text comes before the figures.

2-8: fix widow at top of right column

2-9: fix widowed line at top of right-hand column

2-11: fix widowed line at top of left-hand column/columns should be aligned at top

2-13: Second paragraph isn't justified. This will probably cut a line and bring the widow from page 2-14.

2-14: fix widowed line at top of left-hand column, move a bullet from p2-16 up to end of page?

2-16: strange paragraph breaking here. Move 1 or 2 bullets back to 2-14 to reflow paragraphs better

2-17: First paragraph, delete space between “FL180” and period.

2-18: Figures 2-34 and 35 are splitting paragraph

2-21: fix widowed line at top of right-hand column

2-23: The second through fifth paragraphs should be justified.

2-25: Sixth line of NOTE paragraph in the right column isn't justified.

2-28: fix widowed line at bottom of left-hand column

2-29: ragged paragraph

2-38: Third line in last paragraph in right column is not justified.

2-39: fix widowed line at the top of right-hand column? First line of paragraph in right column is not justified.

2-40: something is happening at the bottom of the right-hand column, justify second to last line.

2-41: fix widow following “Minimum Vectoring Altitudes (MVA)”

2-43: remove space before quote mark in 29.92 “ Hg (multiple instances on page). Second paragraph in right column should be justified.

2-44: remove space before quote mark in 29.92 “ Hg

2-46: Figure 2-69 splits paragraph. This figure should probably be moved, to next page, it’s referenced in the first paragraph of “Communication Failure”

2-50: Figure 2-72 splits paragraph causing a widow at the top of right-hand column. It seems like Figures 2-68 thru 2-73 are not placed correctly with the referenced text.

2-52: Too much space before bulleted list

3-6: No space after “LNAV/VNAV Equipment” 1st paragraph before “NOTE:”, Figure 3-5 interrupts paragraph, columns not equal length. Justify the first paragraph. Move some of the first two paragraphs to the previous page so the text reference is with the figures?

3-8: columns not aligned

3-10: columns not quite aligned on baseline

3-13: insert space: Figure 3-11: “Cessna 32G,

3-16: columns not quite aligned on baseline

3-19: fix widow at end of page

3-20: fix widow at end of page

3-21: fix widow at top of right-hand column. Second line in left column is not justified.

3-26: “Figure 3-27” should be “Figure 2-23”

4-1: Third line is not justified.

4-5: fix widow at top of page

4-8: Subscript V-Speeds in 1st paragraph of “Airspeed Categories”, fix split bullet. Left column, 3 lines above “Aircraft Approach Categories” subhead, delete the hyphen after “all”? Or should it be “all-engine”, no space?

4-9: Align top of right column to top of figure.

4-11: fix split bullet

4-15: fix split bullet at bottom of left-hand column

4-19: More space between numbers and stroke above/below (see page 1-36), add space after last paragraph before “Minimum Descent Altitude (MDA), Decision Altitude (DA), And Decision Height (DH)” subhead

4-20: Push red subhead to next page/keep with text. Move Figure 4-10 to next page, closer to referenced text.

4-22: fix widow at the end of right-hand column

4-23: fix widow at top of page. Red text? Figure 4-11b is cut off, and the caption has an extra period. Add space between second and third paragraphs in right column.

4-25: Red text? Paragraph under “Wide Area Augmentation System” should be justified.

4-26: Red text? Fix widow at top of page

4-31: Red text? 3rd paragraph after “Baro-NAV” there is a return before the period, then Figures 4-17

- and 4-18 are splitting text. Justify second paragraph in right column.
- 4-33: Red text? Ragged lines last two paragraphs. Top align two columns.
- 4-34: Red text? Fix ragged lines
- 4-35: If “Airport/Runway Information” is a level 1 subhead, add space below it. If it’s a level 2 subhead, change to black.
- 4-39: No space between 2nd and 3rd paragraph on right-hand column
- 4-40: Body text size is not consistent? No space between last two paragraphs on left-hand side. Figure 4-21 is interrupting paragraph. Add space between last two paragraphs in right column.
- 4-43: delete space in [Figure 4-30]. Delete space in [Figure 2-26]. Delete space between Figure 4-27 and comma. Justify first line of last paragraph in left column. Justify fifth line from bottom of second paragraph in right column.
- 4-49: delete spaces in [Figure 4-31] and [Figure 4-32]
- 4-50: Widowed “protected airspace.” Inconsistent line-height to body paragraphs?
- 4-53: Columns not aligned at top
- 4-54: Widowed “minimum altitude information.” Remove space before em dash in second bullet. Justify two-line paragraph above bullets in right column.
- 4-55: No space before subhead “Approach Clearance”. Subhead “Vectors to Final Approach Course” not kept with following text.
- 5-56: Add space between last two paragraphs in left column.
- 4-57: figure interrupts paragraph, no caption or number (are we sure it’s in the correct spot?), fix widow at top of right-hand column, add space between last paragraphs at bottom of right-hand column. Delete line space between third from last and second from last paragraphs in right column, “... follow, in sight. In” and “the event pilots ...”
- 4-58: first line of last paragraph should flow to the next page
- 4-60: Red text? “REFERENCE—” is not a correct way to cite, these should be searched for and removed. Right-hand column not aligned with top. Delete space in [Figure 4-37]. Justify the last two paragraphs in right column.
- 4-61: Red text? Insert space in the last line “Operations:Two-way”. Justify text on this page.
- 4-63: the last paragraph on the page should be flowed. Justify red text. Delete space in [Figure 4-39]
- 4-64: No space after NOTE paragraph, not enough space between text and page number (should be reflowed), “CAT II and III Approaches” header not kept with text. Delete spaces in [Figure 4-41] and [Figure 4-42]
- 4-65: delete spaces in [Figure 4-43], [Figure 4-44], [Figure 4-45] and [Figure 4-46]. Align columns at the top. Justify the second line in the second to last paragraph on page 4-65.
- 4-66: columns not aligned, big space after first paragraph on left-hand column. Remove spaces in [Figure 4-47], [Figure 4-48], [Figure 4-49], and [Figure 4-50]
- 4-69: Red text? Remove spaces in [Figure 4-51], [Figure 4-52], [Figure 4-53], [Figure 4-54]
- 4-71: Text should be below figure, but in this case, reflowed to the next page (no text)
- 4-72: Remove spaces in [Figure 4-55], and [Figure 4-56]
- 4-75: Delete space in [Figure 4-57]
- 4-76: Keep “Airport Surveillance Radar (ASR)” header with text. Delete space in [Figure 4-58]

4-78: Too much space before bullet list, remove space is [Figure 4-59], [Figure 4-60], [Figure 4-61], [Figure 4-62], and [Figure 4-63]

4-80: Figure 4-51 bad resolution? Move the figure to the right to align with the caption.

4-81: Figure 4-52 bad resolution?

4-84: Fix space between figure and caption.

4-86: Fix spaces between figures and captions

5-2: Last line in left column should be justified.

5-5: Fix widow at top of right column, bring text from page 5-3.

5-7: Figure 5-11 splits paragraph, move two lines at bottom of left column to above the figure.

5-8: Double-check that reference to page 4-20 at bottom of right column is still correct after changes are made to Chapter 4. The subhead referenced will maybe move since it's at the bottom of the page.

5-9: Figure 5-16 splits end of paragraph, "[Figure 5-16]" should be kept with paragraph before Figure. Reflow first bullet to next page. Top align columns.

5-10: widowed "Flight Bags;" should be kept with first bullet. Third line in right paragraph should be justified.

6-3: Red header and text should start on next page

6-5: "altitudes (MORAs)." should not be widowed in next column

6-6 thru 6-9: Text and Figures 6-5 thru 6-25 should be reformatted to avoid little blocks of type, text references should come before figures. Recommend keeping text flowing in larger blocks and figures grouped, similar to the right column on page 6-6.

6-7: Widows at the tops of both body columns, keep all bullet text together. Figures 6-12 and 6-13 split paragraphs

6-8: widowed lines should be kept together. Figures 6-18 and 6-20 split paragraphs

6-9: Figure 6-25 splits paragraph, single line on bottom of left-hand column

6-13: one more line of text should be allowed on bottom of left hand column to allow a third line to flow at bottom of right-hand column

6-15: Second paragraph in left column, use em dashes without spaces on either side instead of the spaces and en dashes, in three spots.

6-16: align columns at top

7-4: V_{MINI} should change to V_{MINI} in 3 spots.

7-5: dash should be an em dash in bottom paragraph of left hand corner, no spaces before or after "(RVR) - one"

7-8: Widowed line at top of left column, add space before next paragraph. Missing period at the end of "Helicopter IFR Takeoff Minimums" paragraph.

7-10: Sixth line in right paragraph should be justified.

7-13: V-speeds need to be subscript

7-14: V-speeds need to be subscript

7-17: too much space before bulleted list, don't split bullet, flow paragraph to end of left-hand column. Subscript V-speeds.

A-1: Change page layout to 2-column format.

A-2: too much space before bulleted list (see A-5 for correct spacing)

A-4: too much space before numbered and bulleted list (see A-5 for correct spacing)

A-6: fix widow

B-1: Change page layout to 2-column format with a hanging indent if listing wraps to second line.

B-2: Delete line space between "ATD" and "ATIS"

B-4: Avoid single line at top of page.

B-5: Delete line space between "MCA" and "MDA"

B-6: Delete extra space above "O", match space above "P"

B-7: Delete extra space above "S"

B-8: Subscript V-speeds

G-1: Use consistent space between title and start of text, match throughout the book.

G-1 thru G-11: Change the period at the end of the blue lead-in text to blue.

G-3: Widowed line at bottom of left-hand column. There is enough space at bottom of G-2 to keep last two lines of "Cockpit Display of Traffic Information (CDTI)" definition on the page (this would allow "Database Record" to fit without breaking on page G-3. Avoid breaking definitions from one page to the next. OK to break definitions from one column to the next.

G-4: too much space at end of right column, more than enough room for "Gateway Fix" definition at end of page

G-5: Widowed line should be reflowed to top of right-hand column, too much empty space at end of right column

G-6: Reflow "Minimum Reception Altitude (MRA)" to next page

G-7: Push "Pilot Briefing Information" to next page

G-9: Push "Standard Service Volume" to next column and "Synthetic Vision System (SVS)" to next page

I-2: Push "Helicopter Instrument approaches" to next page to keep with second level lines.

I-4: Push "Tower en route control (TEC)" to next page to keep 2nd level index line with it

March 20, 2015

Robert L. Newell
 FAA Branch Manager, Airmen Testing Standards
 Systems Training Annex Bldg. 26
 FAA Mike Monroney Aeronautical Center
 6500 S. MacArthur Blvd.
 Oklahoma City, OK 73169



Dear Mr. Newell,

On behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following recommendations for the *Instrument Flying Handbook* (FAA-H-8083-15C) and *Advanced Avionics Handbook* (FAA-H-8083-6). We hope these recommendations will be useful to the FAA in preparation of the Statement of Work for new editions of these important training guidance documents.

The *Instrument Procedures Handbook* (FAA-H-8083-16) is currently published through the AFS-400 office. We believe future revisions of all three of these books should be done in collaboration with the AFS-630 office. Doing so will ensure consistent, coherent information without duplication between FAA publications. Currently, these publications provide information on some of the same topics, but with variations in terms, descriptions, and depth of coverage. A single document may be unwieldy and overwhelming for a pilot in training – and may be overlooked by VFR or advanced pilots needing the information but not actively training. However, consolidating key topics to avoid redundancy between publications would result in a single resource for a given topic, with consistent language and descriptions for a given technology and/or procedure – not only eliminating redundancy in FAA workload, but also consistency within the aviation training community.

The ACSWG and its members welcome the opportunity to provide feedback for future editions of the *Instrument Flying Handbook* and *Advanced Avionics Handbook* to continue to streamline FAA publications affecting training and testing. Thank you for this opportunity and please let us know if we can provide anything further.

Sincerely,

David Oord
 ACSWG Chair
 Vice President, Regulatory Affairs
 Aircraft Owners and Pilots Association

Jackie Spanitz
 ACSWG Subgroup Lead
 Curriculum Director
 Aviation Supplies & Academics, Inc.



Aviation Rulemaking Advisory Committee
Airman Certification System Working Group
Publications and Documentation ACS Subgroup

Instrument Flying Handbook (FAA-H-8083-15B), Advanced Avionics Handbook (FAA-H-8083-6)

Description: ARAC ACS WG – Publication/Documentation Subgroup Recommendations
Date: March 17, 2015

Recommendation

Overall: Both Books

- Incorporate current Errata (FAA-H-8083-15B 7/2/14, FAA-H-8083-6 05/2013)
- Add publishing schedule to AFS630 website (i.e. cycle for review and/or next edition).
- Throughout this handbook, the use of risk management techniques should be integrated with discussion of individual tasks, procedures and techniques, where appropriate.
- A proposal for the April 2015 Aeronautical Chart Form meeting includes a document that describes a suggested change in how VORs are depicted on charts, and the text also includes more details about how the national airspace system (NAS) and navigation will change under performance-based navigation (PBN), which is an enhanced version of today's area navigation (RNAV) concept. The following paragraph provides background for consideration when writing the next edition of the 8083-15 handbook:

The VOR MON program (AJM-324) is discontinuing the service of approximately half of the VOR facilities in the NAS. In parallel, the PBN Policy and Support Group (AJV-14) is planning to implement a new PBN Route Structure, which will provide "Structure where necessary and Point-to-Point where structure is not needed." The PBNRS will generally remove most Victor Airways and Jet Routes east of the Western Mountainous region of the CONUS. Q-Routes will be published where needed, particularly in high traffic density airspace east of Chicago to New York, Atlanta, etc. T-Routes will provide structure primarily around Metroplex areas, special use airspace, and for terrain avoidance in mountainous terrain areas. The rest of the NAS will likely fly point-to-point using RNAV.

The document then describes how VORs that are part of the MON but which are not points along named airways might appear on aeronautical charts. As this new strategy is implemented, many of the VORs retained for the MON will not have any VOR Airways associated with them, but pilots will need to use them to navigate VOR-to-VOR. Therefore a charting scheme is needed. The VOR MON Concept of Operations includes a proposed scheme for charting the MON VORs which is depicted in the figure below. The approach is to use feeder routes showing the MEA, course, and distance to each adjacent MON VOR.



Here's the figure:



- Handbook will need to be updated to reflect use of *MON*, used to distinguish VORs that are part of the MON and not associated with airways from other nav aids. The use of a three-letter abbreviation may cause confusion when printed near a VOR symbol that is also associated with a three-letter identifier.
- Keep the books (FAA-H-8083-15, FAA-H-8083-16, FAA-H-8083-6) separate, but eliminate redundant information between them. It may be desirable to develop a “two-tier” approach to the instrument handbooks (FAA-H-8083-15 and FAA-H-8083-16). The basic text for training and certification for the instrument rating may be the *Instrument Flying Handbook*. The *Instrument Procedures Handbook* would be added as a reference text for the Airline Transport Pilot (ATP) certificate and aircraft type ratings. The *Instrument Procedures Handbook* could also be used as the reference text for certain NextGen pilot approvals such as RVSM and what is likely to be separate approvals for some automatic dependent surveillance broadcast (ADS-B) applications such as in-trail spacing. There is too much material required for all of these ratings and approvals to place them in a single handbook that would be manageable and convenient to use.

8083-15B	8083-16	8083-6
National Airspace System	DP's	Intro to Advance Avionics
ATC System	En Route Operations	Electronic Flight Instruments
Aerodynamic Factor	Arrivals	Navigation
Flight Instruments	Approaches	Automated Flight Control
Airplane Attitude Instrument Flying	Improvement Plans	Information Systems
Airplane Basic Flight Maneuvers	Airborne Navigation Databases	
Helicopter Attitude Instrument Flying	Helicopter Instrument Procedures	
Navigation System	Emergency Procedures	
IFR Flight		
Emergency Operations		

Absorb
8083-6 into
8083-15B
as an
appendix.



Instrument Flying Handbook (FAA-H-8083-15B)

- Pg vii, left column, 1st para – expand on different benefits of rating in multiple paragraphs.
- Pg vii, left column, 3rd para – rewrite to clarify current ground-based and satellite-based navigation systems; remove references to ADF, LORAN, INS, MLS
- Pg viii, left column, 3rd (full) para, update as needed to reflect current training devices.
- Pg viii, right column, 3rd para, update for current regs and change PTS to ACS. Include comment about meeting recency with training devices
- Pg viii, right column, 4th para, last sentence, remove “flying an approved flight training device” (sim time doesn’t count for flight time)
- Pg 1-2, Airspace Classification: this whole section on airspace is just a rehash of the AIM and PHAK. It would be better if it was written with a slant towards why this knowledge is important to the instrument rated pilot. Right column, last sentence on the page is where text is relevant to IFR and not a rehash.
- Pg 1-2, right column, #6, this should include that flight in IMC is allowed in G without a flight plan.
- Pg 1-4, left column, para below #2 (starting with “Restricted areas...”) through to Federal Airways – rehash of material in AIM and PHAK.
- Pg 1-4, right column, last para: include mention victor airways based on ground-based VORs.
- Pg 1-5, left column, 2nd para, include mention it’s called “Tango”
- Pg 1-5, left column, last para, move para: this is not about federal airways.
- Pg 1-5, right column, top para: move para, this is not about federal airways.
- Pg 1-5, right column, Other Routing – move to planning routes.
- Pg 1-6, left column, top para: same as previous. Also, very limited. Most pilots will never use this.
- Pg 1-6, left column, 2nd para, this is not needed by beginners. create a chapter for high altitude and put it there
- Pg 1-6, left column, red heading: the header should relate to the NAS, not to charts
- Pg 1-6, left column, IFR Enroute Charts, delete 1st sentence: none of these terms have been defined. Phases of IFR flight have not been defined.
- Pg 1-8, Figure 1-4, typo in caption: “attitude” should be “altitude”
- Pg 1-9, Figure 1-5, typo in caption: “attitude” should be “altitude”
- Page 1-3, Airspace Classification Chart – The line “Entry Requirements” for Class E should read “None” and the asterisk will then be accurate.
- Pg 1-10, right column, remove “and Transcribed Weather Broadcast (TWEB)”
- Pg 2-2, Communication Equipment: this section should be moved to Avionics Handbook (8083-6), as VFR pilots need to know this too.
- Pg 2-2, Communication Equipment, remove subheading “Navigation/Communication Equipment” – this section only covers Communications (and red heading already addresses this)

- Pg 2-2, Figure 2-1, update with several examples of different cockpits. Highlight the COMM
- Pg 2-2, right column, top para, update for current FSS.
- Pg 2-2, right column, 2nd para, change 1st sentence to read “An audio panel allows a pilot to adjust the volume of the intercom and to manage the audio portion of communications and navigation equipment in the aircraft. [Figure 2-2]
- Pg 2-3, left column, para below Figure 2-3, this is not accurate. These days, VFR pilots need to know this. Move to Avionics Handbook Explaining the basic idea of audio panels is good.
- Pg 2-4, left column, Communication Procedures, This should focus on differences between VFR and basic IFR communications. Don't repeat PHAK.
- Pg 2-4, left column, change 2nd red subheading from “Communication Facilities” to “ATC Facilities”
- Pg 2-4, left column, Flight Service Stations (FSS): update for the computer age. Emphasize differences with IFR vs VFR flight plans.
- Pg 2-4, left column, remove/rewrite “EFAS” (going away October 2015)
- Pg 2-5, left column, top para: this is not about communications – delete para.
- Pg 2-5, left column, 2nd para, update to current system
- Pg 2-5, right column, top para: In a different section/chapter for advanced IFR, include digital methods of receiving clearance
- Pg 2-7, left column, Tower En Route Control (TEC): this is not a facility; move out of this section.
- Pg 2-12, right column, Approach Control Facility: this should be with Tower and ARTCC.
- Pg 2-13, left column, Control Sequence, This would be good earlier in the section on Communication procedures
- Pg 2-13, right column, add www.1800wxbrief.com wherever “1800-WX-BRIEF” is discussed – online flight planning and briefings are more prevalent than phone calls.
- Pg 2-15, remove “EFAS” (2 occurrences this page)
- *Page 3-1* – Last paragraph in Introduction should also reference Single-Pilot Resource Management (SRM).
- Chapter 4 – Aerodynamics chapter is redundant with information in FAA-H-8083-25 8083-3; it may not be necessary to have in both books – consider removing from FAA-H-8083-15, and instead refer readers to FAA-H-8083-25 to study aerodynamics, important for flight in IMC. The focus here should be on IFR related issues: effect of weather (humidity, icing, rain water) on wings, etc; translating cockpit information into knowing aircraft's aerodynamic performance; Standard rate turns, coordinated turns, and turning tendencies; the relationship between pitch, power and performance, i.e. airspeed and Vertical speed, and heading.
- Chapter 5 – Flight Instruments chapter: Need to keep general information here and details in advanced avionics handbook or 8083-25 (PHAK); Take out the duplication of details from PHAK; Info on old mechanical instruments need to focus on interpretation, system errors, and failure modes, just like for advanced avionics; This chapter is about a lot more than flight instruments. Needs a better name

- Pg 5-3, right column, Pilot/Static Instruments: rename for mechanical altimeter or write it so its general theory related to both mechanical altimeter or air data computer (preferred), with the details in the avionics handbook (8083-6).
- Pg 5-4, right column, Altimeter Errors: most of this section applies to both mechanical and ADC. Make this clear.
- Pg 5-5, right column, ICAO Cold Temperature Error Table: remove; already covered in 8083-25.
- Pg 5-7, right column, Reduced Vertical Separation Minimum (RVSM), 1st sentence, “31,000”: shouldn't this be FL290? RVSM is old news now. Move entire RVSM section to a chapter on advanced topics.
- Pg 5-8, left column, Vertical Speed Indicator (VSI): Make general and include both mechanical and ADC. Show different methods to display. Discuss the differences in flying an instantaneous vs damped VSI.
- Pg 5-8, right column, Dynamic Pressure Type Instruments: make general and include mechanical and ADC. A lot of this is about airspeed in general and needs to stay. Include overview of different display method.
- Pg 5-10, left column, Mach Number: Move to advanced chapter.
- Pg 5-10, right column, Magnetism: The header should be direction-seeking instruments, and magnetism a sub header under it.
- Pg 5-10, right column, Magnetism, 2nd para: dip (vertical component of flux) is an important characteristic. This is a characteristic of the magnet, not the lines of flux; change sentence to read “Lines of magnetic flux have two important characteristics: any magnet that is free to rotate aligns with them, and an electrical current is induced into any electrical conductor that moves through the lines of flux. Most direction...”
- Pg 5-10, right column, 2nd para from bottom: reg requires a 'magnetic direction indicator', not an old fashion compass. A wet compass is not required
- Pg 5-10, right column, bottom para “Magnetic Compass Overview”: this whole section is word-for-word identical to the 8083-25 (PHAK).
- Pg 5-11, Figure 5-16: it would be good to include the confusion of which way to turn with this type compass
- Pg 5-11, right column, bottom para: this is not in PHAK. But there is a whole section on deviation and pilots don't need to know this level of detail. Pilots need to know to not put metal objects near the compass and the problem it causes if they do.
- Pg 5-12, left column, Magnetic Compass Errors: this again is direct copy from PHAK
- Pg 5-12, right column, 2nd para starting with “Flying in Washing...”: there needs to be discussion of change in variation with time. This example (identical to PHAK), as of 2015, is off by almost 1 degree in DC and 2 degrees for LA.
- Pg 5-12, Figure 5-17: add date to image; Never heard of a 'dip pole'. Why not 'magnetic south pole'?
- Pg 5-13, right column, line above “Northerly Turning Error”: end of duplication from PHAK. If we are going to repeat the PHAK, then also include a discussion of magnetic Dip

- Pg 5-13, right column, Northerly Turning Error: this needs a summary of what is magnetic dip. It also needs techniques for using a magnetic compass. The mnemonic OSUN or (UNOS) and that the error decreases to zero on headings of east/west. Include critical angle of bank and problems with exceeding critical angle of bank
- Pg 5-13, right column, Northerly Turning Error, delete last sentence. How to do compass turns is covered elsewhere. This rule of thumb example is only good for a heading of exactly north, but that is not stated.
- Pg 5-14, left column, last sentence: include error is max on east/west and decreases to zero on north/south headings
- Pg 5-15, left column, the Vertical Card Magnetic Compass: include this type of compass is still subject to dip errors.
- Pg 5-15, left column, The Flux Gate Compass System: move section to advanced avionics handbook
- Pg 5-15, left column, The Flux Gate Compass System, 1st para, last sentence, change to read "... a magnet aligns with these lines and an electrical current is induced, or generated, in a wire that moves through them."
- Pg 5-16, left column, 3rd line from top, change to "... referred to as a Horizontal Situation Indicator (HSI)."
- Pg 5-16, right column, 2nd para: same as phak through here
- Pg 5-16, Figure 5-26: this is considered a navigation instrument not a flight instrument. Move.
- Pg 5-16, right column, Gyroscopic Systems, 1st para, change "rigidity" to "rigidity in space"; change "rigid" to "rigid in space"
- Pg 5-16, right column, Gyroscopic Systems, 2nd para, 1st sentence, change to "rigidity in space"; 2nd sentence, change "rigid" to "fixed"; 3rd sentence, change "such as turn indicators" to "such as rate of turn indicators"
- Pg 5-17, left column, Power Sources: This discussion is NOT the same as PHAK. The PHAK has other relevant information on exactly the same topic.
- Pg 5-17, left column, Venturi Tube Systems: these are out-of-date; they should just be mentioned as a lead in to more modern systems.
- Pg 5-17, right column, Wet-Type Vacuum Pump: include advantages of using and failure mode. Many still in use on light aircraft.
- Pg 5-17, right column, bottom para, change subheading to "Electrically-Driven Systems"; change "electric rate indicators" to "electrically-driven gyros in rate indicators"
- Pg 5-19, right column, Heading Indicators, 1st para, 1st sentence, remove "used as backup instrument"; for free gyros, the mag compass is essential to set the heading. It is only backup in enroute navigation. Introduce the term free gyro.
- Pg 5-20, left column, top para, change to "Rigidity in space..."
- Pg 5-20, left column, 2nd para, change "Older directional gyros" to "Early directional gyros"; The ones being described in previous paragraph qualify as 'older'. the ones in this paragraph are antiques.

- Pg 5-20, left column, 3rd para, 2nd sentence: this is only true on north/south headings going to zero on east/west headings; needs to include effects of friction on precession and indicated heading.
- Pg 5-20, right column, top para, last sentence, change to “This instrument should be checked and adjusted about every 15 minutes to ensure it agrees with the magnetic compass.”
- Pg 5-20, right column, Turn Indicators, 1st sentence, change to “... turn-and-slip indicator additionally operate on precession.”
- Pg 5-20, right column, Turn-and-Slip Indicators: this instrument is an antique. write less about it and more about turn coordinator. focus on what the information means so it applies to mechanical and advanced displays. Are advanced displays turn and slip or turn coordinators?
- Pg 5-20, right column, Turn-and-Slip Indicators, 2nd para, “force of inertia caused”: this doesn't make sense from a technical point of view
- Pg 5-20, right column, bottom para, last sentence (In a turn made with a bank angle...): not accurate. PHAK has a better description. Focus on higher level knowledge for instrument pilot.
- Pg 5-21, left column, 1st full para (The inclinometer does not...): wrong; this section is about gyro instruments, and the inclinometer is not a gyro instrument. Discuss it elsewhere
- Pg 5-21, left column, 3rd full para (The dial of these...): starting with 4th sentence: this is what's important – earlier sentences aren't necessary.
- Pg 5-21, right column, bottom para, “relationship between the bank angle and the rate of yaw”: not the way to present this. this is the same instrument as on the turn and bank, Combine the information in one place.
- Pg 5-22, left column, Flight Support Systems, remove “to new technologies”: no longer new; over 20 years old
- Pg 5-22, right column, 2nd para: this is misleading. AHRS technology isn't the same as ring LASER gyro. this section should be in advanced avionics handbook
- Pg 5-22, right column, 3rd para, last sentence, change “satellite signal reception” to “use GPS information to improve the accuracy of the inertial sensors.”
- Pg 5-22, Figure 5-36: use an example from an IFR training aircraft
- Pg 5-23, left column, 1st para: many acronyms not defined.
- Pg 5-23, left column, Horizontal Situation Indicator (HSI): update and generalize for electro-mechanical or electronic
- Pg 5-23, left column, Horizontal Situation Indicator (HSI), 2nd para, “VOR/Localizer(VOR/LOC)” – update.
- Pg 5-24, left column, 5th para (One of the first widely...): drop discussion of antiques.
- Pg 5-24, left column, bottom para, “VOR/Localizer(VOR/LOC)” – update.
- Pg 5-25, left column, Integrated Flight Control System: put details in avionics handbook.
- Pg 5-26, Figure 5-43: this system has two servos. Only one shown. Labels would improve clarity.
- Pg 5-26, left column, Flight Management System (FMS): nice history. better in avionics handbook. This is about air transport/corporate FMS. Need to address flight training aircraft Navigation management system

- Pg 5-26, left column, 2nd para, “Loran”: LORAN was never used by airlines and never for long range navigation. It was only used in GA aircraft, and in the late 80's early 90s.
- Pg 5-26, right column, top para, change to “The concept of a master navigation system employed...”
- Pg 5-27, left column, bottom para, 1st line, remove “has”; update whole paragraph.
- Pg 5-27, right column change “Practical Test Standards (PTS)” to “Practical Test Standards (PTS) and/or Airman Certification Standards (ACS)” (or depending on timing of new edition, replace PTS with ACS.
- Pg 5-28, left column, Advanced Technology Systems: move to avionics handbook; the surveillance system doesn’t belong here.
- Pg 5-29, left column, Safety System: poor word choice for header.
- Pg 5-29, left column, Safety System, 1st para, “commonly referred to as a radar altimeter”: “radar” is a misnomer and should not be used.
- Pg 5-29, right column, 1st line and 2nd para: change “radar altimeter” to “radio altimeter”
- Pg 5-29, right column, Traffic Advisory System: not a flight instrument. Rename chapter.
- Pg 5-30, Figure 5-48: not a useful figure.
- Pg 5-30, left column, Traffic Alert System: delete; TIS makes these obsolete.
- Pg 5-30, right column, Traffic Avoidance System: make clear what size aircraft use TCAS and TCAS II.
- Pg 5-34, left column, Ground Proximity Warning System (GPWS): update to EGPWS
- Pg 5-36, left column, Required Navigation Instrument System Inspection: this header title makes no sense, There is nothing in this chapter about navigation equipment.
- Pg 5-36, Figure 5-60, not a civilian HUD. Use a corporate aircraft HUD picture
- Pg 6-1: This is arguably the most important chapter in this book! Integrate the round dial and electronic display and emphasize common concepts, and minimize teaching to a specific product. Some electronic products have analog presentations for selected information. To have a figure with a mechanical display on the left and the same an electronic display on the right makes more sense. Details about the avionics should be in Avionics Handbook (8083-6).
- Pg 6-2, left column, Learning Methods: these are not 'learning methods'. They are methods for interpreting displayed information that pilots will use forever. Both have their place and should be better integrated.
- Pg 6-2, right column, Control Instruments: this is the same regardless of display system. Yet the information is different between part 1 and part 2
- Pg 6-2, right column, Performance Instruments: expand. this uses a term to define itself! this is a much deeper and important concept than shown.

- Pg 6-2, right column, Navigation Instruments: missing power instruments. they are part of concept
- Pg 6-2, right column, Procedural Steps in Using Control and Performance, #1: add power instruments.
- Pg 6-5, right column, Altimeter: there needs to be a discussion of instrument interpretation. when the altimeter is changing - what does that mean with respect to overall performance?
- Pg 6-6, right column, Airspeed Indicator: need better discussion of power and airspeed
- Pg 6-7, right column, Heading Indicator: the level of headers for this whole chapter need to be fixed
- Pg 6-8, left column, top para, last line: add slip indication.
- Pg 6-15, same general comments apply as to Chapter 6, section 1; Use different products, not just a G1000.
- Pg 6-19, right column, Navigation Instruments, this isn't technically accurate. Focus here on interpreting the course indicator. the details of the system and sensors should go somewhere else. The coverage in part 1 is more appropriate.
- Pg 6-20, Figure 6-27: this type of figure, with a PFD/MFD with lots of flags with text is not productive. It is cluttered with flags not relevant to the topic at hand. Keep the figures focused on supporting the concepts.
- Pg 6-21, Attitude Instrument Flying – Primary and Supporting Method, 1st para: this paragraph is much better than its counterpart in part 1. Supports why part 1 and part 2 should be merged.
- Pg 6-23, Figure 6-32: good example of focused figure with mechanical and electronic representation. Only issue is there is actually no trend vector shown in figure.
- Pg 6-27, Figures 6-38 and 6-39: labels are incorrect.
- Pg 6-28, left column change “Practical Test Standards (PTS)” to “Practical Test Standards (PTS) and/or Airman Certification Standards (ACS)” (or depending on timing of new edition, replace PTS with ACS.
- Pg 7-1, integrate part 1 and part 2 similar to chapter 6. The information in part 1 applies equally to electronic displays. Need to be sure descriptions are inclusive of retrofit electronic panels often used for instrument training
- Pg 7-8, left column, 2nd para, 1st sentence: this should be in chapter 5 describing flight instruments.
- Pg 7-21, right column, 2nd para: practice climbing and descending turns as well as level turns.
- Pg 7-22, left column, 1st para and 1-5: include in describing dip errors in chapter 5
- Pg 7-22, left column, 2nd para, last sentence: include what happens with excessive bank angle.
- Pg 7-22, left column, 4th para (2nd from bottom): expand on the last sentence.

- Pg 7-26, right column, Unusual Attitudes and Recoveries: update to emphasize loss of control (LOC) and angle of attack.
- Pg 7-26, figure 7-39: this outside view is not nose-high. It is a level right turn.
- Pg 7-28, Figure 7-40: this view is a shallow nose down pitch.
- Pg 7-30, left column, last line (#5), "... adjusting the outbound leg..." – there is no outbound leg defined in this exercise.
- Pg 7-30, Figure 7-41: confusing perspective.
- Pg 7-33, 2nd para, partial panel applies to both mechanical and electronic displays. move partial panel to chapter 11
- Pg 7-34, left column, 1st para, 3rd sentence ("For training purposes...") Not True! Precise instrument flight needs to account for this! Somewhere, need to cover that the pitch bars cannot be adjusted and how this effects interpreting the display information.
- Pg 7-34, right column, bottom para, 2nd sentence, remove "increase situational awareness" (makes it easier to see. But that doesn't mean increased SA. In fact, the horizon overlaid on the airspeed can cause confusion and reduce SA regarding airspeed.) Last sentence, change to read "Most attitude indicators on light aircraft span the entire width of the PFD screen."
- Pg 7-36, right column, VSI Tape, vsi tape is just one way to display vsi information. need to generalize
- Pg 7-43, right column, add new common error addressing chasing the airspeed tape on an electronic display to expand on discussion from pg 7-37, common errors associated with reading heading and altitude in an electronic display.
- Pg 7-43, right column, #1: choice of words. Chevron is not adjustable.
- Pg 7-44, left column change "Practical Test Standards (PTS)" to "Practical Test Standards (PTS) and/or Airman Certification Standards (ACS)" (or depending on timing of new edition, replace PTS with ACS.
- Pg 7-53, right column change "Practical Test Standards (PTS)" to "Practical Test Standards (PTS) and/or Airman Certification Standards (ACS)" (or depending on timing of new edition, replace PTS with ACS.
- Pg 7-58, left column, Autopilot Usage: is this the right place for autopilot? 1st sentence, "installed behind the MFD screen" -- this sounds system specific?
- Pg 7-58, left column, bottom para: need to address retrofit avionics installations aircraft
- Pg 9-1: In general, the chapter needs to be updated to delate LORAN and MLS, and add GBAS, and expand on RNP and WAAS. Present VOR as backup to GPS. There are numerous technical errors or outdated material on virtually every page of chapter. Separate the navigation display (e.g. CDI, HSI, RMI) from the sensor (e.g. VOR, GPS, LOC, GPS). Add Highway in the Sky display, The aircraft equipment probably fits better in Avionics Handbook. Focus here on the overall navigation system

and how to use it. update all descriptions based on marker beacon and middle marker to not refer to them .

- Pg 9-2: Basic Radio Principles: this is important. do not edit it out.
- Pg 9-2, left column, Ground Wave, 2nd para: example today is NDB. Older Omega and LORAN used ground waves but have been decommissioned.
- Pg 9-2, right column, para above “Space Wave” Sky waves are not used for navigation and their occur in the frequency range used by NDBs, especially at night, and can cause errors when using an NDB.
- Pg 9-2, right column, Space Wave, 1st para, change 2nd and 3rd sentences to read “Most navigation systems, **except for NDBs**, operate with signals propagating as space waves, **including VOR, localizer, glideslope, DME and GPS**. Frequencies above 100 MHz have nearly no ground or sky wave components. They are space waves, **and** (except for global positioning system (GPS)) the navigation...”
- Pg 9-2, right column, Space Wave, 2nd para, 2nd sentence, change to “Space waves reflect off **metallic** objects and may be blocked if **an** object is between the transmitter and the receiver.
- Pg 9-3, left column, Disturbances to Radio Wave Reception: P static is just one of many things that disrupt radio wave reception. A general discussion here would be good. Change 1st sentence “Precipitation static (P static) distorts...”; 2nd sentence delete “and LORAN (long range navigation)” and replace “are” with “is”.
- Pg 9-3, left column, Traditional Navigation Systems, change to “Ground-Based Navigation Systems”
- Pg 9-3, right column, NDB Components: update. Never seen an NDB with voice in lower 48. Don't mix up referring to NDB and ADB equipment within the same paragraph. Same para, last sentence, “two letters” three letters. Compass locators have two letters. Include classes of NDBs, similar to VOR. Include continuous listening of NDB, and what good signal sounds like since there is no flag
- Pg 9-3, right column, ADF Components, 1st sentence: obsolete. only one antenna which does both loop and sense.
- Pg 9-5, right column, Tracking: Using an RMI tracking to a waypoint is exactly the same as tracking an NDB. Teach tracking using an RMI independent of the sensor input.
- Pg 9-8, right column, bottom para: Update 1st sentence; 2nd sentence change to “When DME is co-located with...” These statements about distance information are only true if using DME equipment. VOR does not have distance information. Period.
- Pg 9-10, left column, 1st sentence: this is not shown in Figure 9-10.
- Pg 9-10, left column, 1st para, 7th sentence (starting with “Additionally, a VOR needle...”): Almost, not quite. This statement mixes up RMI and movable card ADF display. An RMI performs exactly the same for VOR as NDB signal.
- Pg 9-10, right column, 1st para, sort of. rewrite to accurately describe classes and service volumes.

- Pg 9-10, right column, VOR Components, 2nd para, 1st sentence: true for old stations. Add doppler VORs.
- Pg 9-11, Fig 9-11: add pic of dopplar VOR.
- Pg 9-11, left column, 2nd sentence, change to “Most VORs can be used...”; last sentence is poorly worded.
- Pg 9-11, left column, 2nd para, update to work with stand along NAV units, Nav/COMS, GNS (such as Garmin 530) or PFD/MDS
- Pg 9-11, left column, bottom para and Fig 9-12: The Course deviation indicator can be used for VOR/LOC/GPS/INS. Present the display independent of VOR
- Pg 9-11, right column, 2nd para from bottom, last sentence: center the course needle with a FROM and read the radial. Use a figure where the signal is reliable.
- Pg 9-11, right column, bottom para: figure 9-12and 9-14 indicates neither TO or FROM. The signal is flagged and does not show any information. Figure 15 shows both a TO and a FROM; rewrite para – it doesn’t make sense.
- Pg 9-13, Figure 9-15, instrument bottom left corner: the TO/FROM is backwards on this display
- Pg 9-14, left column, 1st full sentence: not true. It deviates from side side because the aircraft is not exactly on course.
- Pg 9-14, left column, 1st para, last sentence, “because the resultant of the opposing reference and variable signals is small and constantly changing.” true. in layman's terms, the radials are very close together close to the station
- Pg 9-14, left column, 2nd para: in call cases it is a 'CDI needle' or 'course needle'. the CDI refers to the entire device. Paragraph needs to be rewritten accurately.
- Pg 9-15, Figure 9-16, top right box, should say "Intercept the 205 Radial Inbound"; text below image with human profile: this comment refers to a moveable card ADF, not a CDI
- Pg 9-16, left column, VOR Accuracy, 3rd para: more errors not covered here. Scalloping, bending, Need to mention +10 deg full scale deflection, but this is not a requirement.
- Pg 9-16, left column, bottom para, 2nd sentence, change “not exceed” to “be”
- Pg 9-17, left column, top para: update to include this applies only if VORs are needed for navigation on the flight.
- Pg 9-17, left column, DME Components, 1st sentence: and stand alone DMEs; 4th sentence rewrite. ALL aircraft have separate VOR and DME receivers. Author is referring to a DME that is not auto-tuned through the VOR frequency selector “Some aircraft have VOR and DME receivers where each must be tuned...”
- Pg 9-17, right column, 1st sentence, these controls are specific of old panel mounted DMEs. Give general information principle of operation and avoid switchology.

- Pg 9-19, Fig 9-18, text below human profile image, text of this is wrong
- Pg 9-19, right column, last sentence, add range limitations, groundspeed errors
- Pg 9-20, Fig 9-19, top image, the other tracking didn't have approach charts. DME don't need them here either.
- Pg 9-22, left column, 2nd line, remove "LORAN"
- Pg 9-22, right column, VOR/DME RNAV: recommend minimal coverage of VOR/DME. It is obsolete. Should be mentioned at the end of RNAV, rather than extensive coverage at beginning of RNAV.
- Pg 9-23, left column, VOR/DME RNAV Components, remove "VOR/DME"; stay generic
- Pg 9-23, Fig 9-23, this looks like LORAN or GPS receiver, not VOR/DME. Update figure and caption
- Pg 9-25, Fig 9-26, update
- Pg 9-25, text below fig 9-26, update
- Pg 9-25, left column, #3, give specifications since actual number of satellites varies over time
- Pg 9-25, left column, Global Positioning System (GPS), update and delete detailed information that pilots don't need to know.
- Pg 9-25, left column, bottom sentence, update for current regulations.
- Pg 9-25, right column, bottom para, sentence starting "Presently, there are at least 31 Block..." And next sentence ("Recently, the Air Force...") – remove both sentences – this isn't needed for pilots.
- Pg 9-26, left column, 2nd para, last sentence ("In its present form...") – remove – pilots don't need to know this.
- Pg 9-26, left column, Function of GPS subheading: Differentiate between basic principle of operation from WAAS
- Pg 9-26, right column, 3rd para, 1st sentence, change to "The IFR approved GPS receiver..."
- Pg 9-27, left column, GPS Substitution: Add WAAS and GBAS.
- Pg 9-27, GPS Substitution

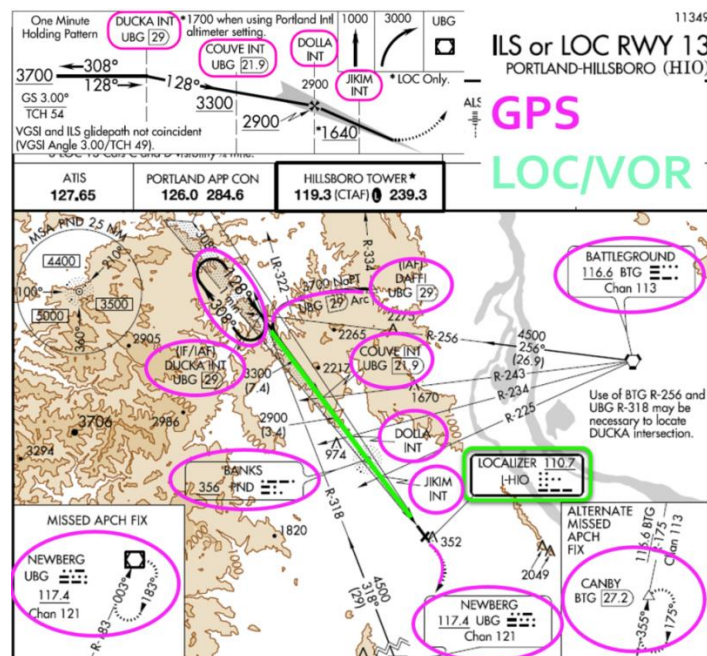
This section makes figuring out when you can use GPS in lieu of ground-based nav aids far too complicated. Fundamentally, you can use an IFR-approved GPS (non-WAAS or WAAS), as a substitute for *any ground-based nav aid* and fly *any segment of a route or procedure* (including DPs, STARs, IAPs—including MAPs—*except for lateral guidance along the final approach segment of an approach that is based on a nav aid such as a VOR, NDB, or localizer*. To make that point, in my presentation about using GPS under IFR, I include a color-coded illustration of the ILS or LOC RWY 13 at KHIO (Hillsboro, OR) that shows when you can use GPS and when you must ensure that your CDI is tuned to and receiving information from the localizer. As you can see, you can:

Fly the transition from DAFI to join the localizer.

Identify the fixes along the final approach course.

Resume navigation with the GPS at the MAP to fly to the MAHP associated with UBG, and then fly the hold.

You must use the localizer (green) for primary lateral guidance *only* when you are tracking the final approach segment.



It's probably wise to keep the detailed description of approved substitutions in the current edition of the *IFH*. It emphasizes specifically that you can substitute an IFR-approved GPS for DME fixes, DME arcs, step-down fixes along a final approach, NDBs, etc. And it notes that the primary restriction on substituting GPS for ground-based nav aids is that you must be able to retrieve a procedure *or* nav aid from the database. But the current presentation makes readers parse the entire list to try to figure out when substituting GPS is approved.

And a statement on p. 9-27 adds to the confusion:

...When using a facility as the active WP, the only acceptable facility is the DME facility that is charted as the one used to establish the DME fix. If this facility is not in the airborne database, it is not authorized for use.

Elsewhere on the same page, the *IFH* says:

To Fly a DME Arc:

1. Verify aircraft GPS system integrity monitoring is functioning properly and indicates satisfactory integrity.
2. Select from the airborne database the facility providing the DME arc as the active GPS WP. The only acceptable facility is the DME facility on which the arc is based. If this facility is not in your airborne database, you are not authorized to perform this operation.

These statements do not appear in AC 90-108, and based on questions I've received from pilots and CFIs, they imply that if, for example, you're flying an approach such as the [ILS or LOC/DME RWY 24 at KHQM](#), you must use the HQM VOR as the active fix while flying the DME arc. These pilots argue that

you can't load the procedure and fly the arc—you must use HQM as the active waypoint until you are established on the final approach segment.

Of course, you can load the approach into, say, a GNS 530 or GTN 750, select one of the fixes (ZEDAT or PUGIC) that defines a point on the transition defined by the DME arc, and fly the magenta line. In other words, the DME arc is just another leg corresponding to a charted transition, and it's included as part of the procedure, like those that begin at ULESS and SOUPY.

It would be silly to try to fly the arc using HQM as the current waypoint while you're on the arc, and then load the approach as you pass LR-067 so that you can get distance information from fixes along the final approach segment.

Now, the section referenced above is preceded by a note:

NOTE: The following provides guidance that is not specific to any particular aircraft GPS system. For specific system guidance, refer to the POH/AFM, or supplement, or contact the system manufacturer.

That implies that if the handbook for the box in your airplane describes loading a conventional procedure that includes legs defined as DME arcs, you can load and fly the procedure as documented in the handbook. But the language in the note and the following text aren't as clear as they could be on this point. Emphasizing the general point as described above and providing examples would help greatly.

- Pg 9-27, Database currency

In the list under "GPS Substitution for ADF or DME," item 3 says: "The database must be current."

That *must* has sparked debate, because it contradicts AIM *Table 1-1-6: GPS Approval Required/Authorized Use*. Notes 2 and 3 in that table make allowances for working with an expired database.

Similar language appears in AC 90-108:

b. RNAV System Database Considerations.

(1) Pilots must ensure their onboard navigation data is current, appropriate for the region of intended operation, and includes the waypoints, NAVAIDs, and fixes for departure, arrival, and alternate airfields.

NOTE: The navigation data should be current for the duration of the flight. If the Aeronautical Information Regulation and Control (AIRAC) cycle will change during flight, operators and pilots should establish procedures to ensure the accuracy of navigation data, including suitability of navigation facilities used to define the routes and procedures for flight. Traditionally, this has been accomplished by verifying electronic data against paper products.

Of course, the AFM or supplements to it provided when new avionics are installed, holds precedence. Some handbooks for avionics have language that says databases *must* be current for IFR operations.

But the language currently in the *IFH* is causing confusion, and it should be clarified and aligned with guidance in other official sources.

- Pg 9-27, right column, To Determine Aircraft Position over a DME Fix, these different procedures can all be generalized into one or two procedures



- Pg 9-27, right column, To Fly a DME Arc, add “Using GPS Navigation” to the subheading
- Pg 9-28, right column, IFR Flight Using GPS, include RAIM or WAAS systems.
- Pg 9-29, left column, 2nd para, 1st sentence, change “conventional” to “ground”
- Pg 9-29, right column, top para: cover performance navigation requirements and RNP and how system adjusts depending on phase and segment of flight.
- Pg 9-30, left column, top para: this section is about the equipment, not how to fly the approach. That should be elsewhere (maybe more appropriate to FAA-H-8083-6).
- Pg 9-31, left column, Departure and Instrument Departure Procedures (DPs): update and move to Procedures.
- Pg 9-31, right column, 1st full para, 4th line, change “hard” to “metallic”
- Pg 9-31, right column, 2nd para from bottom (Selective Availability): leave out.
- Pg 9-32, left column, 2nd subheading DGBS – update for GBAS
- Pg 9-33, right column, LAAS: update
- Pg xiv and 9-34 – remove INS or mention this is specific to corporate and air transports.
- Pg 9-35, left column Instrument Approach Systems, Add LPV.
- Pg 9-35, left column, ILS, update for technical improvements, As into, explain history of markers and compass locator and how they are mostly gone, replaced by DME. Explain that this description is CAT i only. Have a separate sub header to explain back-course and how it differs from a front course. Include substituting waypoints in database for NDB, VOR intersections.
- Pg 9-35, right column, #3 at top of page: mostly decommissioned.
- Pg 9-35, right column, Ground Components: intersections off VORs is common.
- Pg 9-35, right column, bottom para: update explanation for lack of markers and that signal may be normally only usable in one direction.
- *Page 9-35* – A new section/paragraph should be added (in red letters, just before Instrument Approach Systems). The paragraph should be titled “IFR Operation with Minimal or Inoperative Navigation Systems.” The section should emphasize a risk management approach to operation with minimal or inoperative navigation systems, using examples. For example, it might demonstrate to the pilot the hazards of navigating over a route with continuous low IFR conditions if the aircraft only has a single operating nav/com radio. On the other hand, for example, the presence of a portable nav/com radio, portable GPS, and or an ADF receiver could provide mitigation of this risk.
- Pg 9-37, left column, 1st para, 1st sentence, add to read “... in high needle sensitivity compared to VOR. With this course...”
- Pg 9-37, left column, Glideslope, 1st para: poorly worded regarding FAF
- Pg 9-37, right column, Marker Beacons, update for lack of use today
- Pg 9-38, left column, ALS, this section covers more than “ALS” – revise subheading accordingly.

- Pg 9-38, right column, 1st full para, This is for non-precision, not ILS covered here.
- Pg 9-38, right column, 2nd full para: include PAPIs.
- Pg 9-38, right column, bottom para, 2nd sentence, remove “Some receivers have separate function selector switches, but most” – this is obsolete.
- Pg 9-39, right column, top para: not exactly – explain differences.
- Pg 9-39, right column, 2nd para, remove “Though some GPS receivers are tuned separately” – obsolete.
- Pg 9-40, left column, 3rd para, 1st sentence, change “sufficient voltage is received to actuate the needles” to “a reliable signal is being received from the localizer and glideslope transmitters respectively.”
- Pg 9-40, left column, 4th para (starting The OM is identified...), 5th sentence (starting “Marker beacon receiver sensitivity...”): explain setting high/low sensitivity better. most don't understand this.
- Pg 9-40, left column, ILS function 1st para, change 2nd sentence to read “... it is useful for situation awareness to rotate the OBS...”
- Pg 9-40, left column, ILS Function 2nd para, 1st sentence, remove “aircraft”; also, need intro to reverse sensing with localizer.
- Pg 9-41, Figure 9-38 and caption: suggest showing both holding as procedure turn and old fashion PT.
- Pg 9-41, Figure 9-38, block B: comment here applies to HSI, but figure shows both HSI and CDI
- Pg 9-41, Figure 9-38, block A: for HSI, needle sensing is correct.
- Pg xiv and 9-43 – remove MLS
- Pg 9-44, left column, Required Navigation Performance: expand on the first sentence and provide a better introduction. RNP is the description of the required capability of the aircraft's navigation system to fly in a particular airspace/procedure. RNP itself is not a navigation system.
- Pg 9-44, right column, Flight Management System: move FMS. This would be good as the FMS introduction in avionic handbook (FAA-H-8083-6).
- Pg 9-46, left column, Head-Up Display (HUD): this is a display system, not a navigation system. Group with other displays.
- Pg 9-46, left column, Radar Navigation (Ground-Based): change subheading to Navigation by Radar Vectors or Navigation via Surveillance Radar
- *Pg 10-1*: throughout chapter, update and freshen for current procedures.
- *Page 10-2* – A new section (in red letters) should be added (following the section “Sources of Flight Planning Information.”). The new section should be titled “Risk Management During Flight Planning.” The new section should emphasize that pilots should conduct a risk analysis during pre-flight planning. This should include identifying the risks using the standard PAVE checklist method, assessing the likelihood and severity of the identified risks using a risk assessment matrix or other technique, and mitigating moderate and high risks by taking action to reducing the likelihood and/or severity of each risk.

- Pg 10-3, figure 10-1 and associated text: update to ICAO flight plan form (required after October 2015).
- *Page 10-7, En Route Procedures* – I recommend adding a new section entitled “Direct Routing” right before the paragraph “ATC Reports.” The new paragraph should emphasize when it is appropriate and authorized to request and follow a direct route using GPS or another RNAV capability. It should be emphasized that in a non-radar environment, the GPS or RNAV system must be IFR approved. However, in a radar environment, the pilot may request a direct routing and use any means to accurately navigate. This could include a non-IFR approved GPS or RNAV system, providing the pilot realizes that ATC radar is now a primary navigation method and requires the pilot to monitor position and stay on the approved track.
- *Page 10-10, Holding Procedures* – I recommend adding a paragraph describing how protected airspace is incorporated into a hold and emphasizing the need to stay within protected airspace when entering and staying in the hold.
- *Page 10-21* – A new section/paragraph should be added after the section “IAP Minimums.” The new section should be titled “Personal Minimums.” This section should discuss the concept of adding margins to the approach minimums as a means to mitigate identified risks. For example, if the pilot is flying a leg of several hours in turbulent IMC conditions with no autopilot, it might be appropriate to add a margin to the published minimums to accommodate potential fatigue.
- *Pg 10-22, right column, remove “EFAS”*
- *Pg 10-24, left column, remove “EFAS”*
- *Page 10-29* – A new paragraph in the right column following the discussion about the navigation log. This paragraph should discuss the need to conduct a risk analysis of the planned flight, as I recommended in comment 5. This new paragraph should refer back to this revised section.
- *Pg 11-1*: Needs a new outline of topics and reworking. This chapter should focus on how to manage different emergencies - the decision making, the help available, general how-to techniques, how to minimize risk and have a safe outcome. Include both human factors of dealing with emergencies, and technical methods. Much of this is somewhat covered elsewhere. Too much G1000-based. Electronic cockpit system details should be more in Avionics Handbook (FAA-H-8083-6). P-static is included under unforecast weather - which is not appropriate. A section on navigation-system failure, regardless of the exact cause, would be more appropriate. P-static being one cause of nav (and comm) failure. Section on p-static in earlier chapter should be combined with this info.
- *Page 11-2* – A new section/paragraph should be added after the “Introduction” section and titled (in red letters) “On-going Risk Management During the Flight.” This section should emphasize the need to continue active risk management as the flight progresses. The pilot must continue to identify, assess, and mitigate new hazards and risks and immediately take action to reduce the likelihood and/or severity of emerging risks. Examples should be included for each of the four major categories represented by the PAVE checklist.

- Pg B-1, left column change “Practical Test Standards” to “Practical Test Standards and/or Airman Certification Standards” (or depending on timing of new edition, replace PTS with ACS).
- Pg B-3, right column change “Practical Test Standards (PTS)” to “Practical Test Standards (PTS) and/or Airman Certification Standards (ACS)” (or depending on timing of new edition, replace PTS with ACS. (2 occurrences this page)
- Pg G-6, remove “EFAS” and En route Flight Advisory Service terms.
- *Pg G-19*, remove Transcribed Weather Broadcast (TWEB) and TWEB terms.



Advanced Avionics Handbook (FAA-H-8083-6)

General

- Better outline chapters with more level of headers and shorter paragraphs to emphasize topics and sub topics.
- Layout chapters in three parts: 1) basic information application to VFR or IFR: 2) IFR features: 3) advanced high-end features
- “Chapter Summary” should be changed to “Chapter Conclusion” throughout book
- Include a more nuanced handling of Situation Awareness (SA). Saying something will ‘enhance situation awareness’ really is just a marketing phrase. Include the levels of SA and factors in automation that enhance and degrade SA. Include as relevant: vigilance, complacency, mode awareness, information overload, clutter, workload, attention tunneling, out-of-the-loop syndrome and misplaced salience.
- Include risk management beyond the ‘common errors’ and ‘catch errors’ in text.
- Include new technology. Minimize old technology. Add Enhanced vision systems, Synthetic vision systems, and Electronic Flight Bags.
- Use this handbook to provide more details on how equipment works, (e.g. magnetometer, ADC and AHRS) and on the main differences between GPS TSO-C129, -C145, and -C196 capabilities. Either make this in addition to IFH Chapter 5-22 to 5-34 or instead. But don’t make it less, and don’t repeat the same information.
- Combine the navigation chapter with the AFH Chapter 6,7 Section II

Specific Book Recommendations

- Pg 1-1, This chapter is all about FMS/autopilot and nothing about PFD/MFD, navigation, or information. An introduction needs to be a balanced introduction for the entire book.
- Pg 1-2, left column – top paragraph is a run-on paragraph.
- Pg 1-3, left column, 1st para, remove reference to sidebars (there aren’t any in the book)
- Pg 1-3, left column, 2nd para, In reading the introduction, it is not clear what this Learning series, Awareness series and Risk series is. Good idea, but poor execution. Having read the book, I now know what it is referring to.
- Pg 2-1, This could be combined with the Instrument Flying Handbook on attitude flying. The information here seems like just a teaser. For example, instead of just mentioning the trend indicator for rate of turn, explain how to read it.
- Pg 2-2, right column, top paragraph: This assumed level of knowledge of the reader seems disjointed. Here it assumes the reader is familiar with primary and supporting flight instruments which means an instrument rating with electromechanical gauges. Going forward, there should be no assumption of experience with electro-mechanical displays.
- Pg 2-2, right column, common errors: This is too short. There are other common errors worth mentioning.
- Pg 2-3, left column, 4th sentence: Isn't this more a negative transfer of learning from conventional gauges, rather than negative human factors?



- Pg 2-4, left column, 2nd para, Stormscope/Strikefinder: Change to update to current weather and traffic products
- Pg 2-4, left column, 3rd para: Add synthetic vision systems and enhanced vision systems
- Pg 2-4, left column, Other Flight Status Information, 1st para: (1) displaying data on MFD should be expanded on. (2) Not being distracted by all the data should be discussed
- Pg 2-4, right column, making entries in the PFD: The common error of too much head down time while making entries should be discussed and methods to mitigate discussed
- Pg 2-4, right column, Failures and the Primary Flight Display 1st para: This just isn't in depth or specific enough to be very useful.
- Pg 2-4, right column, bottom para: Many different ideas in this paragraph. Develop each idea
- Pg 2-6, Awareness: Using Standby Instruments, last sentence: this doesn't make sense. A vacuum failure in a TAA aircraft would disable the backup instruments, not the PFD. Is the author equating a PFD failure to a vacuum failure in an aircraft with electromechanical instruments?
- Pg 3-1: suggest start with basics for VFR Pilot, then cover IFR features for light aircraft (GPS Navigation System), and finally a section for high-end capability (INS, DME/DME, and FMS)
- Pg 3-1: Delete LORAN and Doppler. Make it clear INS, DME/DME, are on air transport aircraft, and GA will be using GPS, WAAS, VOR, and LOC/GS
- Pg 3-2, left column, top para: Break up paragraphs and use sub headers to emphasize key points
- Pg 3-2, left column, remove “and LORAN-C. Older RNAV units made use of VOR and DME information to compute positions within range of the nav aids. Newer”
- Pg 3-2, left column, 4th sentence, I have yet to see a GA navigation system with DME equipment installed. What I do see are confused pilots who think they have DME, but its really GPS distance: Therefore, flight management system (FMS) is the best descriptor of the current navigation systems which integrate GPS, VHF VOR and localizer. GPS units which also integrating VOR (and DME, optionally) to allow point-to-point navigation outside established flight routes. **You will learn to use** the FMS data entry controls to program a flight route, review the planned route, track and make modifications to the planned route while en route, plan and execute a descent, and fly an approach procedure that is based solely on RNAV signals.
- Pg 3-2, left column, 4th sentence, highlighted section above: Poorly written – where will the reader learn? This is a recurring issue throughout text.
- Pg 3-2, left column, Area Navigation (RNAV) Basics: concepts are still good, update for current generation of navigation systems. Include touch screen
- Pg 3-2, right column, top para, rewrite to read “In this way, RNAV overcomes a fundamental limitation of ground-based navaid point-to-point navigation techniques, which require navigating between electronic navigation transmitters on the ground.”
- Pg 3-2, right column, 2nd para, rewrite 1st sentence to “An aircraft using VOR for navigation guidance is positioned at Point A as shown in the diagram at the top of *Figure 3-1*, and the pilot wishes to navigate directly to Point B.”
- Pg 3-2, right column, 3rd para – break to new paragraph where new idea starts: The national airspace system...”

- Pg 3-2, right column, last para, last sentence, change to “... a GPS navigation system also contains...”
- Pg 3-3, left column, change subheading to “Stand alone FMS/RNAV/Autopilot Interface: Display and Controls”
- Pg 3-3, left column, 1st sentence, remove “Every”; this is over-simplified; the system has one or more user interface(s) with display, etc. Much of the avionics these days is not accessible to the pilot.
- Pg 3-4, right column, bottom para, remove “usually called”
- Pg 3-6, left column, FMS/RNAV Approval for IFR Operations, section is way out of date. Remove 2nd para completely.
- Pg 3-6, left column, Navigation Database Currency: most of the stuff under this header does not deal with a current database. the info in this section on alternates, & NOTAMs could be moved under appropriate sections in instrument procedures handbook
- Pg 3-6, right column, GPS Signal Availability, 4th sentence, change “Many” to “All non-WAAS IFR” and after “units” add “certified under TSO-C129”
- Pg 3-6, right column, GPS Signal Availability, 5-6-7th sentences: Not the place for how WAAS works. Move/combine to where other navigation systems are explained
- Pg 3-7, left column, Alternate Airports, 4th sentence, The AIM has a good table on this that could be repeated here.
- Pg 3-7, Aircraft Equipment Suffixes, last sentence: remember who the reader is. Deferred items are not something a low time pilot knows about. But the concept is sound and should be included in text at the appropriate level
- Pg 3-7, left column, Suitability of an RNAV Unit for VFR flight, 1st sentence, replace “receiver is” with “system is”
- Pg 3-7, right column, top line: this issue of too much head-down time should be expanded on for all levels of flight, not just VFR
- Pg 3-7, right column, Programming the Flight Route, include systems that allow input of airways or point to point input.
- Pg 3-7, Figure 3-8, Clearance block, “12L3” is probably meant to be “121.3”
- Pg 3-8, left column, Entering En Route Waypoints, this section is confusing.
- Pg 3-9, left column, Risk: taking off without a flight plan: could the different risks be grouped together and discussed in more detail along with mitigation?
- Pg 3-9, right column, 2nd para, change parenthetical, “Remember the” to “There is an”
- Pg 3-9, right column, last sentence: this should include the 4 things to check, then expand on them.
- Pg 3-11, right column, 2nd para starting with “On the great circle route...” don't bring in examples of other locations. Stick to the example at hand.
- Pg 3-12, left column, 2nd para, 2nd sentence, change “instrument” to “indicator”
- Pg 3-12, left column, change subheading to “Common error: Displaying the data from the wrong navigation source”

- Pg 3-12, right column, sentence starting with “Some installations compound” and following sentence: This problem is in the older TSO-129, and then, only in KLN devices, so don't' spend time on it. This quirk is an example of knowing your equipment inside and out.
- Pg 3-12, right column, change sentence starting with “Typically, that is not a problem...” to read “That is not a problem if the pilot is ready to switch to the ILS. However, the error arises if the aircraft is still tracking GPS or upon missed approach, when the pilot selects another frequency to follow a VOR missed approach routing.”
- Pg 3-20, left column, Elements of Descent Planning Calculations – combine with Airplane Flying Handbook (FAA-H-8083-3) on how to fly descents (don't need it in both places).
- Pg 3-25, left column, Intercept and Track Course – combine this section with Instrument Flying Handbook (don't need it in both places).
- Pg 3-28, Holding – the level of subheadings need to be better established so it's obvious to the reader the hierarchy of these sections.
- Pg 3-30, GPS and RNAV (GPS) approaches – combine with the Instrument Procedures Handbook (FAA-H-8083-16); doesn't need to be in both places.
- Pg 3-35, red headings on this page should be subheadings under “Approaches”
- Pg 3-35, left column, LNAV/VNAV, delete parenthetical (shift to using WAAS in same paragraph as discussing non-WAAS is confusing).
- Pg 3-35, right column, GPS or RNAV (GPS) Approach Waypoints – is this a subheading of “LPV” – subheading styles are confusing to hierarchy.
- Pg 3-36, left column, Terminal Mode, update. Be clear this is description is for non-precision, not LPV. Can combine with description of how GPS approach works. A diagram of changing course sensitivity would be helpful. An advanced section could go into RNP course sensitivity.
- Pg 3-36, right column, Vectored Approaches, 1st sentence, “conventional” is poor word choice – clarify.
- Pg 3-38, left column, Course Reversals: up date for current systems. Consider how to give time to older units without too much text on them.
- Pg 3-42, left column, Ground-Based Radio Navigation (remove “Radio” – no longer used in reference to ground-based navigation); 1st para under this heading, add (define) skills to end of last sentence.
- Pg 3-42, right column, top line, “Displaying” is not a pilot skill – better word choice?
- Pg 3-44, this fits better as an introduction. It does not really summarize the material in the chapter
- Pg 4-2, left column, 1st sentence “you will learn...” -- where will you learn? In this chapter?
- Pg 4-2, right column, bottom para, starting with “Figure 4-1...” – new idea, start new paragraph.
- Pg 4-4, right column, Flight Director subheading, [Figure 4-5] – also include a picture with V bars.
- Pg 4-6, left column, bottom para, should include the GPSS allows AP to automatically change course when next leg becomes active
- Pg 4-7, right column, para starting You should note that, last sentence: unless ... It won't fly to fuel starvation if the pilot does his/her job!

- Pg 4-7, Maintain Altitude, include adjusting altitude hold as pressure changes along the route (below FL180)
- Pg 4-8, left column, para ahead of subheading “Climbs and Descents” add explanation how systems without auto trim are handled.
- Pg 4-8, right column, Catching Errors: Armed Modes Help Prevent Forgotten Mode Changes” – this section is confusing.
- Pg 4-10, left column, Common Error: Failure to Arm the Altitude Mode; add other common errors with respect to auto pilots.
- Pg 4-11, left column, Power Management: this needs more emphasis as a serious risk for loss of control and a potential error
- Pg 4-11, right column, Essential Skills: all these 'essential skills' should have "Essential Skills for XXX" to aid learning
- Pg 4-14, left column, Deciding when to use the FD/Autopilot, 1st para: Include Autopilot/FD use requirements on RNP procedures
- Pg 4-15, left column, Positive Exchange of Controls, 1st para: this needs to be explicitly tied into the discussion of AP. Such as how does this exchange of control change when the aircraft if on AP?
- Pg 4-16, change “Chapter Summary” to “Chapter Conclusion”
- Pg 5-1, Add traffic information system to chapter; Add enhanced vision system to chapter; Add taxi charts; Discuss information overload
- Pg 5-6, left column, #1 at bottom of page: needs a more nuanced discussion of SA.
- Pg 5-6, right column, Early Systems: There is no history of other systems. What is the advantage of including this one?
- Pg 5-8, left column, TAWS A and TAWS: include equipment requirements such as radio altimeter
- Pg 5-10, Onboard Weather Radar Systems: explain both radar system in the last 10 years and the new systems coming out circa 2015
- Pg 5-10, Figure 5-12: this is the wrong type of aircraft for this picture. It needs to be a high performance aircraft.
- Pg 5-10, right column, Ground Weather Surveillance Radar: include information on aircraft systems that can receive this information.
- Pg 5-12, left column, Lightning, 1st sentence, change by adding “... this is indicative of lightning if lightning detection equipment is installed or available via datalink.”
- Pg 5-12, left column, Lightning 2nd para: needs updating
- Pg 5-12, right column, top para, include the timeliness of lightning displays
- Pg 5-15, left column, Advanced Traffic Data Systems Based on ADS: update for current system status.

March 24, 2015

Robert L. Newell
 FAA Branch Manager, Airman Testing Standards
 Systems Training Annex Bldg. 26
 FAA Mike Monroney Aeronautical Center
 6500 S. MacArthur Blvd.
 Oklahoma City, OK 73169



Dear Mr. Newell,

On behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following recommendations for the ***Aircraft Weight and Balance Handbook (FAA-H-8083-1A)***. We hope these recommendations will be useful to the FAA in future development efforts for new editions and prioritizing training guidance documents.

Recommendation

The previous committee (Airman Testing Standards and Training Working Group) offered this recommendation: **Add any pertinent information in the *Aircraft Weight and Balance Handbook (FAA-H-8083-1A)* not already covered in the *Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25)* and the *Aviation Maintenance Technician General Handbook (FAA-H-8083-30)* and eliminate the *Weight and Balance Handbook* altogether.**

The ACSWG agrees with this recommendation – a separate handbook is not necessary on this subject. Aircraft weight and balance should be consolidated into other appropriate FAA reference documents and FAA-H-8083-1A canceled. In addition, we offer the following input:

- Absorb Chapter 6 into the *Helicopter Flying Handbook (FAA-8083-21)*; most of the information is already covered here.
- Chapter 7: Large Aircraft would be most appropriate in the FAA-H-8083-30; it is not relevant to the typical FAA-H-8083-25 reader.
- Add new/more information on risk management of weight and balance and center of gravity concepts.

The ACSWG and its members welcome the opportunity to provide feedback on streamlining FAA publications affecting training and testing. Thank you for this opportunity and please let us know if we can provide anything further.

Sincerely,

David Oord
 ACSWG Chair
 Vice President, Regulatory Affairs
 Aircraft Owners and Pilots Association

Jackie Spanitz
 ACSWG Subgroup Lead
 Curriculum Director
 Aviation Supplies & Academics, Inc.



April 30, 2015

Robert L. Newell
 FAA Branch Manager, Airman Testing Standards
 Systems Training Annex Bldg. 26
 FAA Mike Monroney Aeronautical Center
 6500 S. MacArthur Blvd.
 Oklahoma City, OK 73169



Dear Mr. Newell,

On behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following recommendations for the **Helicopter Flying Handbook (FAA-H-8083-21A)**. We hope these recommendations will be useful to the FAA in future development efforts in preparation for releasing the new Change 1 file as well as for new editions and prioritizing training guidance documents.

The WG reviewed the 8083-21A file to include Change 1 via this file:

[https://s3.amazonaws.com/FAA/Helicopter+Flying+Handbook+Change+1+\(Draft\).pdf](https://s3.amazonaws.com/FAA/Helicopter+Flying+Handbook+Change+1+(Draft).pdf)

The ACSWG and its members welcome the opportunity to provide feedback on streamlining FAA publications affecting training and testing. Thank you for this opportunity and please let us know if we can provide anything further.

Sincerely,

David Oord
 ACSWG Chair
 Vice President, Regulatory Affairs
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Jackie Spanitz
 ACSWG Subgroup Lead
 Curriculum Director
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Incl: 150429 8083_21A Tracking Matrix.xlsx

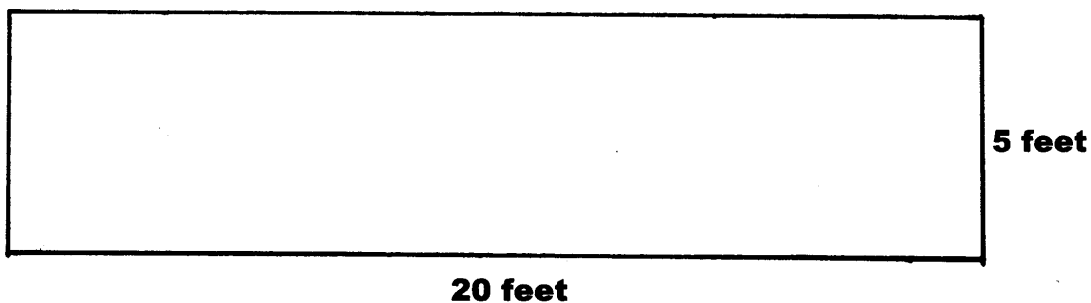


Recommendation

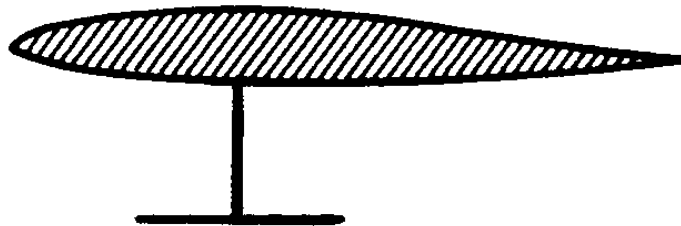
Specific recommendations are detailed in the accompanying matrix document. In addition to those, this document includes the following recommendations:

Preliminary Discussion to Chapter 2 – many new helicopter students have a limited physics background. Therefore, I have found it useful to cover some very basic concepts before proceeding to more advanced ideas.

Gravity acting on the mass (the amount of matter) of an object creates a force called weight. The rotor blade below weighs 100 lbs. It is 20 feet long (span) and is 5 feet wide (chord). Accordingly, its surface area is 100 square feet.



The blade is perfectly balanced on a pinpoint stand, as you can see from looking at it from the end (the “airfoil” view).



The goal is for the blade to defy gravity and stay exactly where it is when we remove the stand. If we do nothing before removing the stand, the blade will simply fall to the ground. Can we exert a force (a push or pull) opposite gravity that equals the 100 lb. weight of the blade? Yes, for example, electromagnetic force could be used. In helicopters, however, we use aerodynamic force (AF) to oppose weight and to maneuver.

Every object in the atmosphere is surrounded by a gas that exerts a static force of 2,116 lbs per square foot (a force times a unit area, called “pressure”) at sea level. However, that pressure is exerted equally all over the blade (top and bottom) and therefore does not create any useful force on the blade. We need only create a difference of a single pound of static pressure differential per square foot of blade surface to have a force equal to the blade’s weight (100lbs of upward pressure opposite 100lbs downward weight).

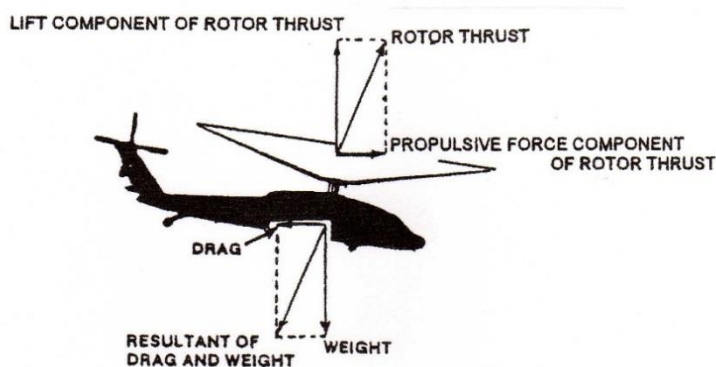
Total pressure consists of static pressure and, if the air is moving, dynamic pressure (a pressure in the direction of the air movement). As we will see below, if dynamic pressure is increased the static pressure will decrease. Due to the design of the airfoil, the velocity of the air passing over the upper surface will be greater than that of the lower surface, leading to higher dynamic pressure on the upper surface than on the lower surface. The higher dynamic pressure on the upper surface lowers the static pressure on the upper surface. The static pressure on the bottom will now be greater than the static pressure on the top. The blade will experience an upward force. With just the right amount of air passing over the blade the upward force will equal one pound per square foot.

This upward force is equal to, and acts opposite the blade's weight of 100 lbs. So if we now remove the stand, the blade will defy gravity and remain in its position (ignoring rearward drag for the moment).

The force created by air moving over an object (or moving an object through the air) is called "aerodynamic force". Aero means air. Dynamic means moving or motion. Accordingly, by moving the air over an airfoil we can change the static pressures on the top and bottom thereby generating a useful force. An "aerodynamic force".

The portion of the aerodynamic force that is usually measured perpendicular to the air flowing around the airfoil is called lift and is used to oppose weight. Drag is the portion of AF that is measured as the resistance created by an object passing through the air (or having the air passed over it). Drag acts in a streamwise direction with the wind passing over the airfoil and retards forward movement.

On page 2-2, "Forces Acting on the Aircraft" are described as forward thrust from a prop or rotor, drag, weight and lift opposing weight. This is good for fixed-wing pilots getting an additional helicopter rating because it is the same as used for airplanes, but is somewhat incorrect and confusing when applied to helicopters. When discussing the entire rotor system (and not just an airfoil segment), most current texts simply define all the aerodynamic force that is perpendicular to the tip-path plane as "Thrust". This is because the rotor thrust is used for both propulsion and as a force opposite weight (lift), because lift is not produced separately by wings. As shown below, the main rotor total thrust is divided into thrust used for lift ($T_{vertical}$) and thrust used for propulsion ($T_{horizontal}$). This type of diagram is more correct and seems to make more sense to the students. Of course, when discussing individual airfoil sections, the standard Bernoulli analysis is used.



On page 2-3, in sections on "Bernoulli's Principle" and "Venturi Flow", the concepts of mass flow continuity and Bernoulli are conflated and confusing; perhaps they are best viewed

separately. The continuity of mass flow will cause the air to move faster through the venturi. Bernoulli ($P_{\text{total}} = P_{\text{dynamic}} + P_{\text{static}}$) states that the increase in velocity will increase the streamwise dynamic pressure. Since the total pressure in the tube must remain constant, the static pressure on the sides of the venturi will decrease. Figure 2-4 states only, "Pressure decreased" at the venturi, but it is the static pressure decrease we are interested in (and the dynamic pressure actually increases). This should be made clear by labeling it "Static pressure decrease."

Also, if the term "energy" is used, it should be defined the first time it is used. Specifically in this case the "energy" referred to are the dynamic pressure (the kinetic energy of the air—more velocity, more kinetic energy) and static air pressure (potential energy). These will change among themselves, but the total pressure energy remains constant inside the tube.

Perhaps a presentation using actual numbers would be helpful in getting from the abstract to the practical. The diagram below shows plates of one square foot in the dynamic flow and on the sides of the tube indicating static pressure, with corresponding pressure readings (these numbers are approximate and should be checked for accuracy). At point 2 it is easier to visualize the static pressure reduction on the top of the airfoil as compared to the bottom of the airfoil which is depicted as outside of the tube and therefore at ambient static pressure. This is good as a basic introduction to the concept, even though with actual blades it is not as simple as this because the bottom static pressure is influenced by blade design and blade angle, among other things. However, the basic idea is that it is the static pressure differential between the top and bottom multiplied by the surface area of the blade that generates the aerodynamic force.

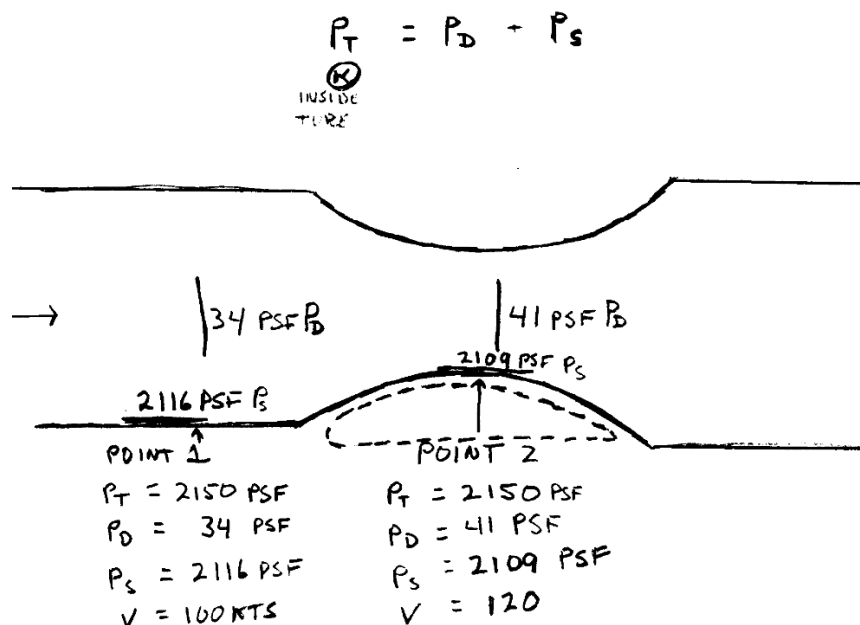


Figure 2-9 on page 2-6 appears to be a fixed wing drag chart adapted for helicopter use by adding a profile drag line. It stops as if the aircraft has a stall speed. An actual typical

helicopter drag chart is shown below. Note that the chart goes to zero fuselage speed, but that there is high induced drag associated with the high blade pitch angles at a hover.

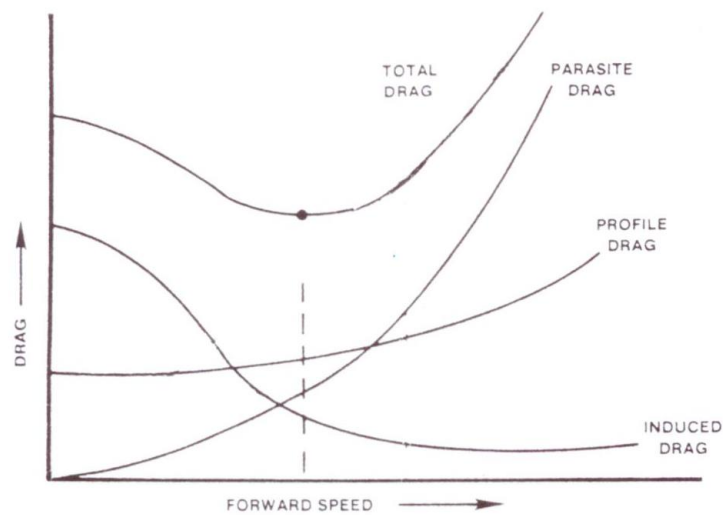
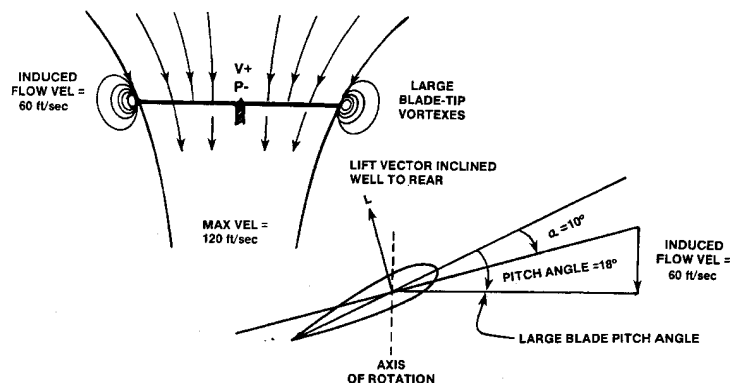
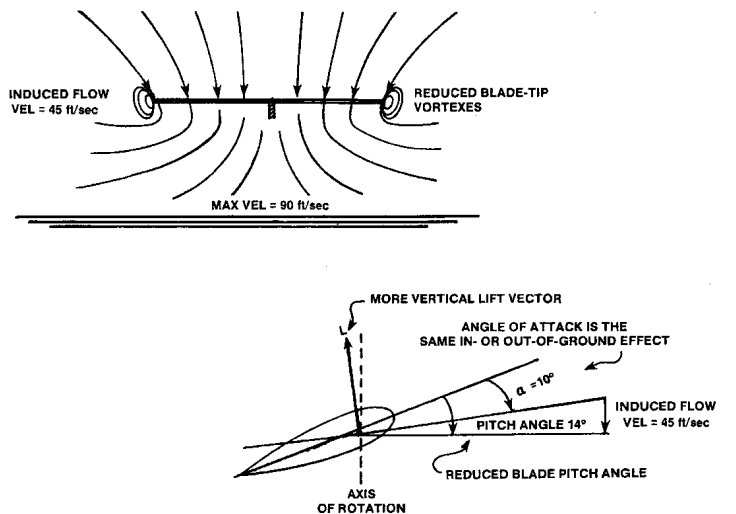


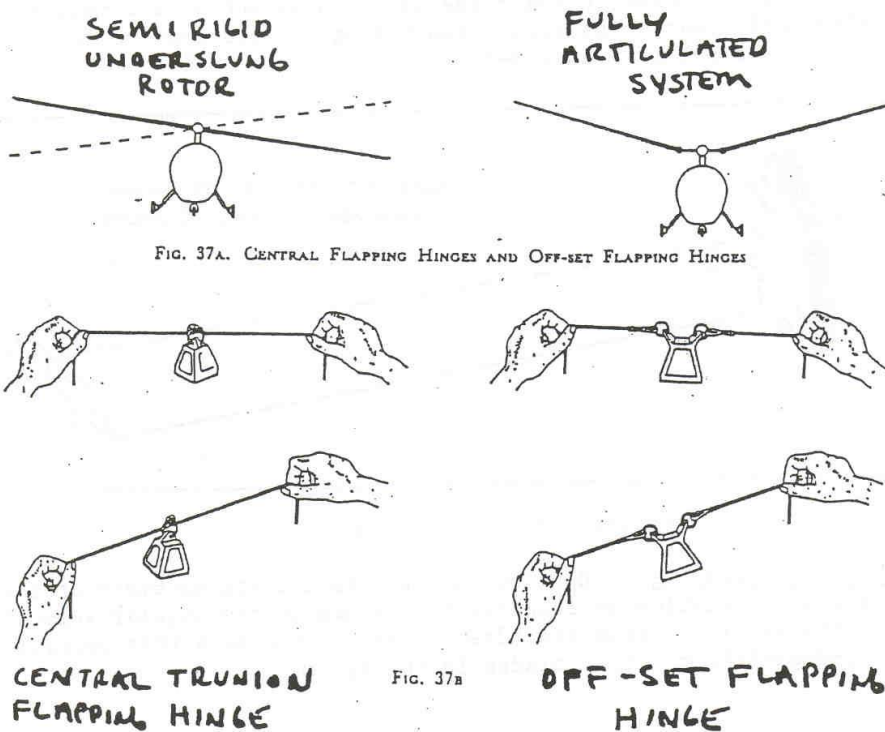
Figure 2-20 on page 2-11 “In ground effect” and Figure 2-21 “Out of ground effect” on page 2-12 are overly complicated - perhaps the below figures are less so. High induced velocities (measured at the rotor) and large vortices require a blade pitch angle of 18 degrees to achieve an effective angle of attack of 10 degrees.



The figure below shows reduced induced flow and lessening of vortices when in ground effect thereby allowing an effective angle of attack of 10 degrees at a pitch angle of only 14 degrees



On page 2-14 "Pendular Action", there is a difference in the amount of pendular action between a semirigid system and a fully articulated system. Because of the hard connection (offset) of the latter, the centrifugal force pulling out on the blades is transferred to the fuselage, and the fuselage tends to follow the rotor attitude. The semirigid system is a true pendulum, with thrust required to create a moment around the fuselage CG to allow for control of the fuselage. This comes into play later when mast bumping is discussed. The diagram below illustrates this and is from "The Helicopter" by John Fay, 3rd ed., 1979.



On page 2-22, “Transverse Flow Effect” is correct, but the vibration associated with ETL is further explained by Mr. Ray Prouty in “Even More Helicopter Aerodynamics”, Rotor & Wing, Phillips Business Information, Inc., 1993, p. 35:

Vibration

Another effect that can be traced to upwash is the vibration felt when starting into forward flight for hover. While going through the so-called “transition regime,” the upwash over the front of the disc send the blade-tip vortices that are generated in this region up rather than down.... Further back, they fall under the influence of the downwash over the rear of the rotor, where they come down and pass through the rotor disc.

When the following blades strike these little whirlpools of air, they are subjected to large transient changes in local angle of attack. This in turn produces sudden changes in air loading, leading to “transition vibration.”

Of course, the transition vibration is worse when decelerating from forward flight to hover. For a considerable period of this maneuver, the flow up through the rearward-tilted rotor disc cancels out the normal downwash of the rear of the disc, and many tip vortices stay around long enough to be struck by the following blades....

At speeds above the transition speed, the vibration is less. The upwash is lower and the rotor plane is tilted forward with respect to the flight path, so that vortices tend to go below the rotor.

The Prouty diagram below differs with Figures 2-37 and 2-38 in that it shows an upflow where the helicopter is moving through the forward limit of its hover pattern downwash, which he terms “ground roll-up” or “ground vortex”. (See “Helicopter Aerodynamics”, Rotor & Wing, Phillips Business Information, Inc., 1985, Figure 9-9, p. 52.) This is sometimes visible to the pilot when taking off from unprepared sites by papers and other light objects being moved up in front of the rotor and then being caught in the induced flow and traveling through the rotor system. Depending on the object, the blades may be damaged.

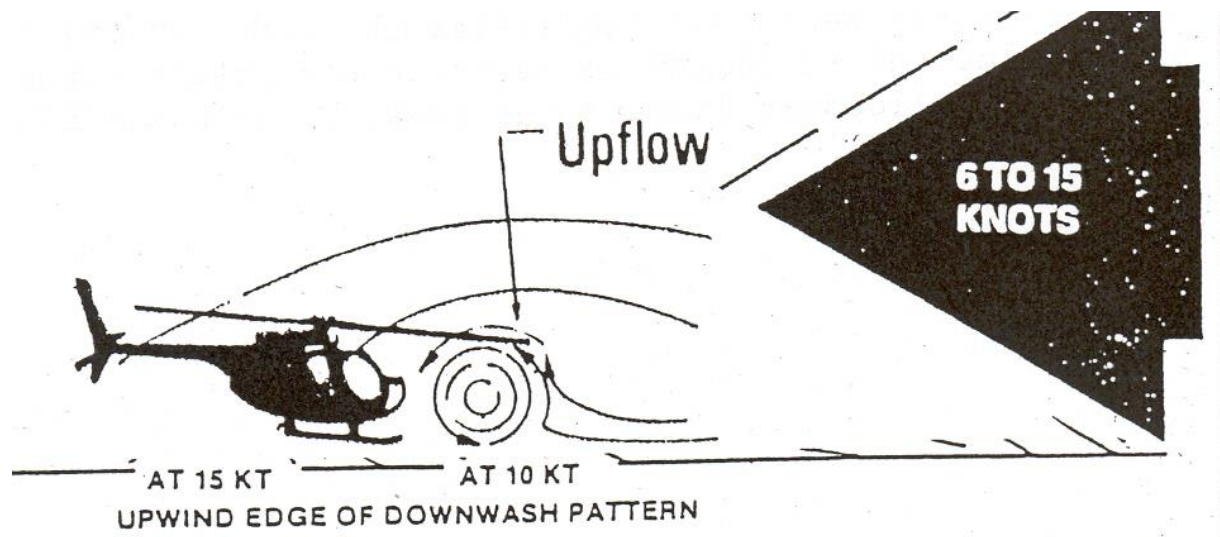
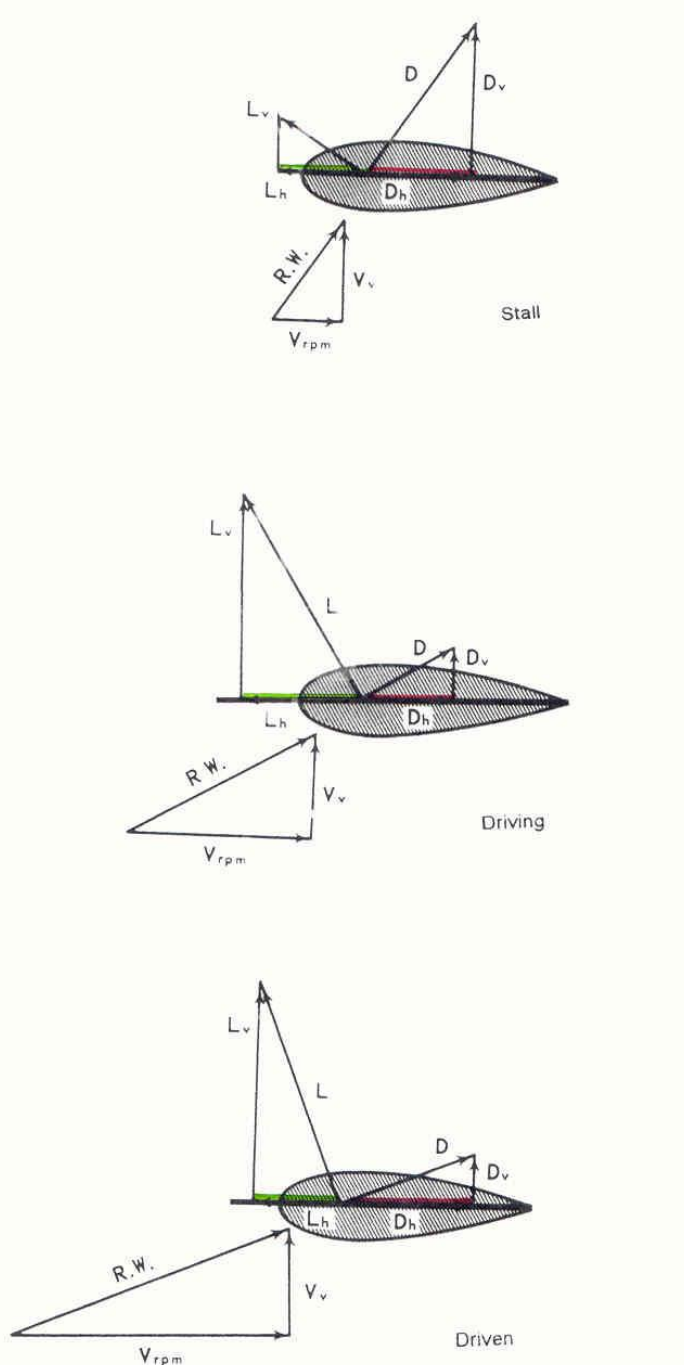
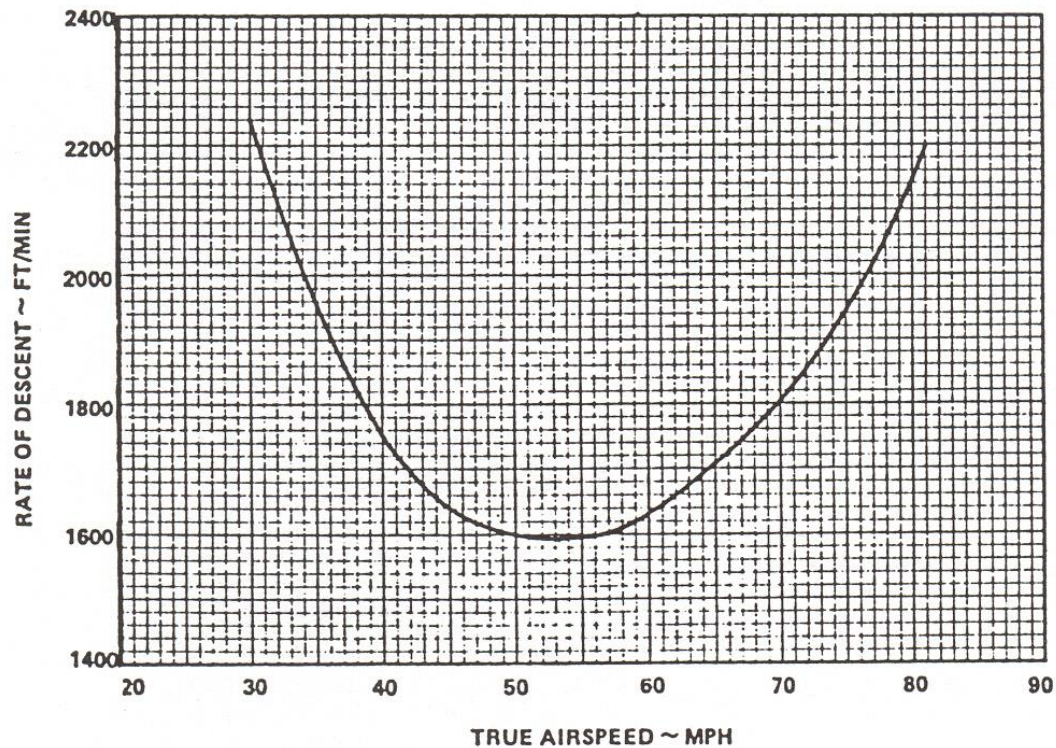


Figure 2-47 on page 2-26 is busy and complicated for new students. The figure below is less so. It is based upon a diagram by Professor H.H. Hurt, Jr. of the University of Southern California. It shows the blade regions with the horizontal lift as a blade propulsive force vs. drag for each region. Note that only in the “driving” (autorotative) region does the forward propulsive force (green) exceed that of drag (red).



In Chapter 7, page 7-2, “Autorotation Performance”. The chapter lacks an autorotative curve. The chart should be added in Chapter 7 or Chapter 11 “Autorotation.”

A review of the relationship between airspeed (or horizontal speed) and vertical speed in autorotation would be helpful. During autorotation gravity provides the source of energy powering the rotor by causing upflow up through the rotor during descent. This is the same as saying that potential energy is being traded for kinetic energy to turn the rotor as the aircraft descends.



Autorotation, 471 Rotor rpm

The S-300 curve above shows the various combinations of horizontal and vertical speeds that will supply the required energy to keep the rotor turning at a constant 471 RPM. For example, an airspeed of 54 MPH with a corresponding vertical speed of 1,600 FPM will provide enough kinetic energy to maintain the rotor at a 471 RPM. The rotor does not care if the air is coming from the front or the bottom so long as the total is sufficient to maintain the RPM. Any point on the curve will maintain rotor speed. However, the pilot does care because if he or she, for example, glides at 30 knots the corresponding rate of descent will be over 2,200 FPM. Since there is little airspeed for a deceleration (or "flare") to reduce the rate of descent before touchdown, the collective pitch application (increasing blade pitch and giving a final temporary increase in lift before the blades slow down) may be insufficient to arrest the rate of descent.

Students who fully comprehend this relationship will understand why training autorotations are usually limited to airspeeds between the minimum rate of descent airspeed and the

maximum range airspeed (usually about 25% faster than the minimum rate of descent airspeed).

An example of the curve would be useful to ensure that the student understands the consequences of not maintaining the target airspeed when executing an autorotation. Simply put, they should know why airspeed is the most significant factor affecting the rate of descent.

It is possible to view an autorotation as a series of energy trades.

The potential energy gained by virtue of the aircraft's altitude is traded for dynamic pressure (kinetic energy of the air as the helicopter moves downward) to power the rotor.

Then the airspeed is traded in the deceleration to stop altitude loss and bring the rate of descent to zero. (In powered flight this is called a "zoom" or "cyclic climb" – trading airspeed for altitude. In autorotation, it should be a progressive deceleration so as to stop the descent, but not climb.) Although the primary purpose of the deceleration is to stop the rate of descent, it also slows the forward speed and increases RPM. Excessive flaring in order to achieve a "zero ground run autorotation" should be avoided. Following the flare the aircraft must be leveled for touchdown so as to avoid striking the tail rotor. An extreme nose high attitude makes the leveling process difficult, so in training there sometimes is a requirement for a specific amount of ground slide after touchdown in order to help preclude tail strikes.

In the final stage of the deceleration (but before leveling), a small collective pitch application ("initial pitch") is made to assist in slowing the aircraft's forward speed. Following the leveling process the remaining collective pitch travel is used to "cushion" the touchdown. This collective pitch pull at the bottom of the autorotation is also an energy trade. The rotor blades' kinetic energy is used to create a burst of lift to allow the aircraft to settle gently to the ground. In fact, this is the only time during flight operations that rotor angular velocity (RPM) is allowed to slow down and depart from the bottom of the green arc.

Third, with either a straight-in or 180° autorotation, the final portion is the same. At no lower than 100 feet the aircraft must conform with the following requirements:

- Rotor RPM - in the green
- Airspeed – at target airspeed
- Trim ball – centered
- Engine running and available – if needed to terminate the practice autorotation and go around
- Landing area assured – alignment and distance
- Normal rate of autorotational descent for target airspeed

The autorotation should not be continued if all six of the requirements are not met at the 100 feet "gate".

High density altitudes present a particular problem for autorotation training, especially during the flare-and-touchdown phase, due to the decreased aerodynamic efficiency of the rotor blades. Some operators prohibit their aircraft from conducting “touchdown” autorotations if the density altitude is above a certain altitude. A “termination with power” (bringing engine power back to the rotor system as the aircraft is being leveled for touchdown) is not a touchdown maneuver, but also can be difficult to accomplish in high density altitude conditions. Accordingly, it seems that they should be subject to the same constraints as the full touchdown autorotations.

High density altitude is not a problem for autorotative glides at altitude or what are known as “power recoveries” where the power is normally added prior to 300 feet AGL (while the aircraft is still gliding) and a go-around is completed.

July 2, 2015

Robert L. Newell
FAA Branch Manager, Airman Testing Standards
Systems Training Annex Bldg. 26
FAA Mike Monroney Aeronautical Center
6500 S. MacArthur Blvd.
Oklahoma City, OK 73169



Dear Mr. Newell,

On behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following recommendations for the **FAA Guidance Documents**. These recommendations support of 14 CFR Part 61 knowledge requirements (see Appendix 1) and continue from those made from the committees that preceded the ACSWG (see appendix 2).

We hope these recommendations will be useful to the FAA in establishing priorities and with future development efforts.

The ACSWG and its members welcome the opportunity to provide feedback on streamlining FAA publications affecting training and testing. Thank you for this opportunity and please let us know if we can provide anything further.

Sincerely,

David Oord
ACSWG Chair
Vice President, Regulatory Affairs
Aircraft Owners and Pilots Association

Jackie Spanitz
ACSWG Subgroup Lead
Curriculum Director
Aviation Supplies & Academics, Inc.

Recommendation

The ARAC ACS WG offers the following vision and recommendations to AFS630 to support the transition from Practical Test Standards (PTS) to Airman Certification Standards (ACS). The recommendations focus on these primary objectives:

- Move from product management towards data management via content QMS processes and hyperlinks within the ACS.
- Align training and testing guidance content and organization to the ACS.

Conduct of Airman Knowledge Test Guides (Order 8080.6G)

- Short-term and Long-term: continue to maintain and revise as needed (about every 2 years).

Knowledge Test Guides (FAA-G-8082-XX)

- Short-term: Update annually each June to account for transition from PTS to ACS.
- Long-term: cancel each title as the corresponding ACS is released; i.e. Recreational and Private Pilot Knowledge Test Guide (FAA-G-8082-17I) will be canceled with the release of FAA-S-8081-ACS-PA. The ACS incorporates all the information currently in the Test Guides.

Learning Statements Reference Guide

- Short-term: Update pg 1 with information on the ACS and ACS codes, effective with release of initial ACS. Maintain LSC codes without further changes to transition applicants, instructors and examiners to the new ACS code system.
- Long-term: cancel 24-months after the final ACS is release, to support airman test reports effective for 24 months. The Learning Statement Codes will be phased out with the implementation of the Airman Certification System codes.

Knowledge Testing Authorization Requirements Matrix

- Short-term: Update pg 1 with information on the ACS and noting this matrix will be phased out with the implementation of the ACS. Maintain remaining test document without additional changes – any future changes will be accounted for in ACS.
- Long-term: cancel once the final ACS is release. The ACS incorporates all the information currently in the matrix.

Computer Testing Supplements (CT-8080-XX)

- Short-Term: documents include outdated information, un-used figures, and require corrections (see Appendix 3). Release new editions by June 2016 as follows:
 1. Correct errors, cancel and/or remove figures not being used. Do not add figures until unused figures are first removed. See Corrections identified in Appendix 3.
 2. Do not add figures to the supplement until corresponding questions are developed and validated (figures can be displayed onscreen during validation process).
 3. Add “Parallel” questions to the public data for every figure being used on the test to ensure training and testing are correlated for a true validation process (i.e. questions cannot be accurately validated if they weren’t first part of a training curriculum).
 4. Figures and associated questions are identified to the public when removed from testing to ensure training and testing remains correlated



- Long-Term: Once new FAA Knowledge Exam testing system is implemented, move all applicable figures to on-screen graphics and combine remaining figures into a single document referenced for all tests.

Handbooks (FAA-H-8083-XX)

The University Aviation Association (UAA) conducted a survey of its membership to determine which FAA handbooks were used where and by whom (See Appendix 4). The following recommendations are consistent with these survey results.

- Short-Term:
 - Update handbooks to support introduction of ACS:
 - Supporting Private, Commercial, ATP ACS: FAA-H-8083-25B, FAA-H-8083-3B, FAA-H-8083-2A (AFS630 currently processing ARAC ACS WG recommendations for these new editions)
 - Supporting Instrument ACS: FAA-H-8083-15C, FAA-H-8083-16A, FAA-H-8083-6A
 - Publish AFS630 handbook inventory with planned update schedule so documents are on a regular and predictable schedule, which is communicated to the training communities.
 - Follow defined QMS to solicit input from the stakeholder WG prior to establishing Statement of Work associated with a given revision and ensure quality control to help alleviate errors.
 - Collect input from reader (via email afs630comments@faa.gov or other portal) for each given title – provide collected input to stakeholder WG when soliciting input.
 - Include an Executive Summary identifying changes for new editions (or Updates, Erratas, Changes) of a given title.
 - Provide at minimum PDFs (and ideally html) for each FAA title on the AFS630 website.
- Long-Term:
 - Add hyperlinks to ACS References to guide readers to the specific information. This will allow the information to remain in context, yet support the trend towards data and information management
 - Consolidate guidance documents to alleviate redundancy and potential conflicts of information (as varying between publications):
 - Skill-specific handbooks should remain stand-alone documents, organization and content aligned with the ACS, and reviewed every 2 years for possible updates and/or new editions:
 - Airplane Flying Handbook FAA-H-8083-3
 - Helicopter Flying Handbook FAA-H-8083-21; add Helicopter Air Ambulance and Part 133 External Load information.
 - Glider Flying Handbook FAA-H-8083-13
 - Balloon Flying Handbook FAA-H-8083-11
 - Powered Parachute Flying Handbook FAA-H-8083-29
 - Weight-Shift Control Handbook FAA-H-8083-5
 - Seaplane, Skiplane, and Float/Ski Equipped Helicopter Operations Handbook FAA-H-8083-23
 - Certificate-specific handbooks should remain stand-alone documents, organization and content aligned with the ACS, and reviewed every 2 years for possible updates and/or new editions:
 - Aviation Maintenance Technician – General FAA-H-8083-30



- Aviation Maintenance Technician – Powerplant FAA-H-8083-31
 - Aviation Maintenance Technician – Airframe FAA-H-8083-32
 - Parachute Rigger Handbook FAA-H-8083-17
 - Flight Navigator Handbook FAA-H-8083-18 [Note: only 1-3 applicants prepare this certificate annually – allocate resources accordingly]
 - Aviation Instructor’s Handbook FAA-H-8083-9; incorporate applicable information from FAA-H-8083-4
- Knowledge-specific handbooks should continue to support the knowledge requirements as defined by 14 CFR Part 61 (see Appendix 1). The following handbooks should remain stand-alone documents, organization and content aligned with the ACS, and reviewed every 2 years for possible updates and/or new editions:
 - Pilot’s Handbook of Aeronautical Knowledge FAA-H-8083-25
 - Instrument Flying Handbook FAA-H-8083-15
 - Discontinue the following Handbooks – moving information to other documents as noted:
 - Helicopter Instructor Handbook FAA-H-8083-4: move unique information to FAA-H-8083-21 and FAA-H-8083-9 as applicable.
 - Plane Sense FAA-H-8083-19: move unique information to FAA-H-8083-25 and FAA-H-8083-30 as applicable.
 - Instrument Procedures Handbook FAA-H-8083-16: move unique information to FAA-H-8083-15
 - Aircraft Weight and Balance Handbook FAA-H-8083-1: move unique information to FAA-H-8083-25 and FAA-H-8083-30 as applicable.
 - Risk Management Handbook FAA-H-8083-2: implement risk management techniques to existing skill, knowledge, and certificate-based documents so risk management is taught in context.
 - Student Pilot Guide FAA-H-8083-27: move unique information to FAA-H-8083-25 and ACS Appendices.
 - Advanced Avionics Handbook FAA-H-8083-6: move unique information into existing navigation chapters of FAA-H-8083-25 and FAA-H-8083-15.
 - New Handbooks needed to support applicants, instructors, evaluators:
 - Airship Flying Handbook (alternately, add Section to Balloon Flying Handbook FAA-H-8083-11)
 - Gyroplane Flying Handbook (previously included as Section in Rotorcraft Flying Handbook – was left out with introduction of Helicopter Flying Handbook)
 - Aircraft Dispatcher Handbook

Appendix 1: 14 CFR Part 61 Knowledge Requirements

Certificate/Rating	Knowledge Requirements
Instrument Rating (14 CFR 61.65)	(1) Federal Aviation Regulations of this chapter that apply to flight operations under IFR; (2) Appropriate information that applies to flight operations under IFR in the “Aeronautical Information Manual;” (3) Air traffic control system and procedures for instrument flight operations; (4) IFR navigation and approaches by use of navigation systems; (5) Use of IFR en route and instrument approach procedure charts; (6) Procurement and use of aviation weather reports and forecasts and the elements of forecasting weather trends based on that information and personal observation of weather conditions; (7) Safe and efficient operation of aircraft under instrument flight rules and conditions; (8) Recognition of critical weather situations and windshear avoidance; (9) Aeronautical decision making and judgment; and (10) Crew resource management, including crew communication and coordination.
Private Pilot (14 CFR 61.105)	(1) Applicable Federal Aviation Regulations of this chapter that relate to private pilot privileges, limitations, and flight operations; (2) Accident reporting requirements of the National Transportation Safety Board; (3) Use of the applicable portions of the “Aeronautical Information Manual” and FAA advisory circulars; (4) Use of aeronautical charts for VFR navigation using pilotage, dead reckoning, and navigation systems; (5) Radio communication procedures; (6) Recognition of critical weather situations from the ground and in flight, windshear avoidance, and the procurement and use of aeronautical weather reports and forecasts; (7) Safe and efficient operation of aircraft, including collision avoidance, and recognition and avoidance of wake turbulence; (8) Effects of density altitude on takeoff and climb performance; (9) Weight and balance computations; (10) Principles of aerodynamics, powerplants, and aircraft systems; (11) Stall awareness, spin entry, spins, and spin recovery techniques for the airplane and glider category ratings; (12) Aeronautical decision making and judgment; and (13) Preflight action that includes— (i) How to obtain information on runway lengths at airports of intended use, data on takeoff and landing distances, weather reports and forecasts, and fuel requirements; and (ii) How to plan for alternatives if the planned flight cannot be completed or delays are encountered.
Commercial Pilot (14 CFR 61.125)	(1) Applicable Federal Aviation Regulations of this chapter that relate to commercial pilot privileges, limitations, and flight operations; (2) Accident reporting requirements of the National Transportation Safety Board; (3) Basic aerodynamics and the principles of flight; (4) Meteorology to include recognition of critical weather situations, windshear recognition and avoidance, and the use of aeronautical weather reports and forecasts; (5) Safe and efficient operation of aircraft; (6) Weight and balance computations; (7) Use of performance charts; (8) Significance and effects of exceeding aircraft performance limitations; (9) Use of aeronautical charts and a magnetic compass for pilotage and dead reckoning; (10) Use of air navigation facilities; (11) Aeronautical decision making and judgment; (12) Principles and functions of aircraft systems; (13) Maneuvers, procedures, and emergency operations appropriate to the aircraft; (14) Night and high-altitude operations; (15) Procedures for operating within the National Airspace System; and (16) Procedures for flight and ground training for lighter-than-air ratings.
ATP (14 CFR 61.155)	(1) Applicable Federal Aviation Regulations of this chapter that relate to airline transport pilot privileges, limitations, and flight operations; (2) Meteorology, including knowledge of and effects of fronts, frontal characteristics, cloud formations, icing, and upper-air data; (3) General system of weather and NOTAM collection, dissemination, interpretation, and use; (4) Interpretation and use of weather charts, maps, forecasts, sequence reports, abbreviations, and symbols; (5) National Weather Service functions as they pertain to operations in the National Airspace System; (6) Windshear and microburst awareness, identification, and avoidance;

	<p>(7) Principles of air navigation under instrument meteorological conditions in the National Airspace System;</p> <p>(8) Air traffic control procedures and pilot responsibilities as they relate to en route operations, terminal area and radar operations, and instrument departure and approach procedures;</p> <p>(9) Aircraft loading, weight and balance, use of charts, graphs, tables, formulas, and computations, and their effect on aircraft performance;</p> <p>(10) Aerodynamics relating to an aircraft's flight characteristics and performance in normal and abnormal flight regimes;</p> <p>(11) Human factors;</p> <p>(12) Aeronautical decision making and judgment;</p> <p>(13) Crew resource management to include crew communication and coordination; and</p> <p>(14) After July 31, 2014, for airplane category multiengine class rating or airplane type rating, the content of the airline transport pilot certification training program in §61.156.</p>
CFI (14 CFR 61.185)	<p>(i) The learning process;</p> <p>(ii) Elements of effective teaching;</p> <p>(iii) Student evaluation and testing;</p> <p>(iv) Course development;</p> <p>(v) Lesson planning; and</p> <p>(vi) Classroom training techniques.</p> <p>(2) The aeronautical knowledge areas for a recreational, private, and commercial pilot certificate applicable to the aircraft category for which flight instructor privileges are sought; and</p> <p>(3) The aeronautical knowledge areas for the instrument rating applicable to the category for which instrument flight instructor privileges are sought.</p>
Sport Pilots (14 CFR 61.309)	<p>(a) Applicable regulations of this chapter that relate to sport pilot privileges, limits, and flight operations.</p> <p>(b) Accident reporting requirements of the National Transportation Safety Board.</p> <p>(c) Use of the applicable portions of the aeronautical information manual and FAA advisory circulars.</p> <p>(d) Use of aeronautical charts for VFR navigation using pilotage, dead reckoning, and navigation systems, as appropriate.</p> <p>(e) Recognition of critical weather situations from the ground and in flight, windshear avoidance, and the procurement and use of aeronautical weather reports and forecasts.</p> <p>(f) Safe and efficient operation of aircraft, including collision avoidance, and recognition and avoidance of wake turbulence.</p> <p>(g) Effects of density altitude on takeoff and climb performance.</p> <p>(h) Weight and balance computations.</p> <p>(i) Principles of aerodynamics, powerplants, and aircraft systems.</p> <p>(j) Stall awareness, spin entry, spins, and spin recovery techniques, as applicable.</p> <p>(k) Aeronautical decision making and risk management.</p> <p>(l) Preflight actions that include—</p> <p>(1) How to get information on runway lengths at airports of intended use, data on takeoff and landing distances, weather reports and forecasts, and fuel requirements; and</p> <p>(2) How to plan for alternatives if the planned flight cannot be completed or if you encounter delays.</p>

Appendix 2: History

The Airman Testing Standards and Training Aviation Rulemaking Committee (ARC) submitted a final report in April 2012. Among the 9 recommendations was included:

- The ARC recommends the FAA establish and continuously communicate a schedule for publishing standards, handbooks, and knowledge test questions by June 30, 2013.

Excerpt from the Final ARC Reports:

Stakeholder Role in the Development and Review of Key Handbooks Used for Airman Training

The inventory of handbooks is the baseline for guiding day-to-day training in the GA industry. The FAA currently reviews handbooks every 3 years per FAA Order 1320.1E. However, in-house FAA resources allocated to this task have consistently declined over the last 15 years, and corresponding costs have increased. This has resulted in large delays in the review and production process associated with handbook development, with handbooks now revised every 3 to 30 years, depending on the subject. This delayed development and unpredictable release schedule for new editions has a direct effect on training innovations, as FAA handbooks define the standards on which all curriculums are based. Private industries are reluctant to invest in training innovations because “pending” FAA standards may nullify the investment with unanticipated changes. Therefore, the aviation industry responds with new training innovations only after pending FAA documents are released.

Handbook review begins with establishing a set of requirements for the requested changes. As an example, the FAA recently decided to amend the Pilot’s Handbook of Aeronautical Knowledge to include separate chapters related to loss-of-control and runway safety. The FAA then either undertakes the development of new text or contracts the development to the aviation industry. Following the development of new draft text, the updated handbook is coordinated per FAA Order 8900.1 by the Technical Information and Communications Programs Branch (AFS-140), which incorporates comments from key offices and collects senior-level endorsements, and the new handbook is published. The ARC believes the aviation industry must stay involved and, more importantly, be informed when changes to documents are released so these changes can be implemented in training curriculums. In the case of the runway safety and loss-of-control addition, industry only learned about this change through the ARC. Without a policy in place to notify the intended reader, it is difficult, if not impossible to ensure applicants, instructors, and training providers include the requirements or new topics as the FAA intended.

Additionally, to address the timeline for the FAA’s internal review of the handbook, the ARC believes the FAA should review how each office conducts its internal handbook review, including its priority among other documents subject to internal coordination. Although FAA Order 1320.1E requires policy and procedures be reviewed every 3 years, many of the FAA handbooks are long overdue for revision. The industry segments with knowledge of current training practices and equipment in use can help with prioritization, along with other agencies such as NASA, the National Transportation Safety Board (NTSB), and other branches within the FAA.

The ARC evolved into the Airman Testing Standards and Training Working Group to the ARAC (ATST WG). One of the tasks assigned to this group included:

The ATST WG formulated recommendations to align and, where appropriate, consolidate FAA handbooks (FAA-H-8083-XX series) and computer testing supplements (FAA-CT-8080-XX series) with the ACS, as well as recommendations for updating these materials and coordinating, distributing, and communicating changes with/to stakeholders in a timely fashion.

The ATST WG Final Report was submitted September 2013 and included these recommendations specific to Guidance Documents:

The FAA’s guidance material provides an essential link between the statutory certification requirements for airman certificates and ratings, the proficiency standards described in documents such as the ACS, and the knowledge test questions. For this reason, the FAA’s tasking to the ATST WG included the request for a proposal to align and, as appropriate, streamline and consolidate existing FAA guidance material with the newly-developed ACS documents.

For the purposes of this endeavor, the ATST WG focused primarily on the range of guidance material developed and maintained by the FAA Flight Standards Service’s Regulatory Support Division (AFS-600). These include the FAA-H-8083-XX series handbooks and the FAA-CT-8080-XX series computer testing supplements. The Handbooks/CTS Recommended Changes Matrix included in Appendix G to this report summarizes the ATST WG’s document-specific recommendations with respect to substantive changes, possible consolidation, and sequence for revision. The ATST WG recommends that the Test Guide (FAA-G) series and Learning Statement Reference Guide be discontinued with the adoption of the ACS, as the information in these publications is incorporated into the ACS approach.

Recognizing that the airman testing and training system uses a wide range of additional reference material, the ATST WG also developed a tracking document/matrix (see Appendix Q) to assist the FAA in updating the agency’s internal guidance (e.g., Order 8900.1) and reference materials (e.g., Advisory Circulars) managed outside AFS-600. The PTS-to-ACS References Matrix lists those areas of FAA Order 8900.1, Flight Standards Information Management System, as well as other internal guidance documents where references to the PTS should be changed to ACS. The Reference Documents Tracking Matrix lists documents such as the Airport/Facility Directory and FAA Advisory Circulars that, in the opinion of the ATST WG, should be incorporated into the FAA-H series handbooks rather than retained as separate knowledge test reference material. (See Appendix H.)



To avoid the fragmentation and misalignment that bedevil the airman certification system today, the ATST WG believes it is essential for the FAA to develop a systemic, comprehensive change management mechanism that aligns both the guidance material housed in AFS-600 and the range of internal and external reference material with the terminology and content of the foundational ACS documents. The comprehensive QMS process recommended in Section 4 of this report is the recommended mechanism for the kind of robust change management system this task requires, and it should include a guidance management component that encompasses handbook changes and ensures alignment with the ACS, FAA reference documents, and regulatory changes.

The guidance management material component of the QMS process should provide a means to accomplish the following goals.

5.1 Updates

To ensure the proper management of updates to FAA-H-8083-XX series handbooks and FAACT- 8080-XX series computer testing supplements, the FAA's integrated QMS process should document the means to:

- Obtain and incorporate input from a broad range of internal and external stakeholders to ensure that the FAA-H-8083-XX series handbooks, the FAA-CT-8080-XX series computer testing supplements, and reference materials provide information that aligns with the ACS and support the airman's acquisition of the ACS elements to be assessed via the knowledge test.

o To facilitate this work, the ATST WG recommends that the FAA consider making proposed handbook and computer testing supplement series changes electronically available up to 12 months in advance of a new edition, with a provision for stakeholders to upload suggestions and recommendations for adjudication.

- Provide a systematic and controlled means of releasing mid-cycle information at defined regular intervals. This system should clearly distinguish between non-safety-related corrections (e.g., typos) and substantive updates or additions to existing material. For instance, the ATST WG recommends:

o A periodically scheduled release of errata to disseminate non-safety-related corrections.

o The use of the existing Information for Operators (InFO)/Safety Alert for Operators (SAFO) mechanisms to disseminate off-cycle safety-related corrections, additions, updates, or amendments.

- Provide a systematic and controlled means of incorporating and integrating new safety-related information into the handbook and computer testing supplement series documents at each regularly scheduled update. The current method of simply adding information as a new chapter, an appendix, or an addendum (vice integrating it into the appropriate part of the document) creates instability in the training environment, and it does not offer an educationally sound presentation to the applicant.

- Create and maintain a bibliography of advisory circulars (AC) and other reference documents not otherwise accounted for or cited in the handbook content.

- Create and maintain a single source "library" of figures (e.g., in the FAA-CT-8080-XX series computer testing supplements) referenced in the testing process to reduce redundancy and increase cost-savings.

5.2 Coordination

To ensure that both FAA policy divisions and external stakeholders have an opportunity to review and comment on proposed changes, the FAA's integrated QMS process should provide a systematic means of coordinating errata, updates, and other new information with the appropriate internal and external stakeholders.

5.3 Distribution

To facilitate efficient distribution of new and updated materials, the FAA's integrated QMS process should stipulate:

- Release of each FAA-H-8083-XX series handbook in both PDF and HTML form, with hyperlinked table of contents, figures, index tags, to enable distribution in eBook format.

- A publicly-accessible library of high-resolution images and illustrations, ideally organized by handbook and chapter, for public use in safety presentations, handouts, etc.

5.4 Communication

To ensure that stakeholders are informed of changes, updates, and new materials in a timely and predictable way, the FAA's integrated QMS process should provide for:

- Use of mechanisms such as SPANS, FAAST Blast, and other such tools to inform stakeholders when InFOs or SAFOs pertinent to the airman certification system are published, released, and/or effective. The FAA should also use these tools to inform stakeholders when current editions are canceled.

- A standardized set of data for each title, to include (a) date last updated; (b) current edition; (c) next edition expected; (d) InFO/SAFO updates; (e) how to submit feedback.

- Standardized periods of extension (vice "pending" notations) when handbook revisions are behind schedule. The term "pending" creates instability: Because it does not provide clear information on when stakeholders can expect updates, training providers suspend curricula and delay training changes pending release of new FAA guidance.

- Removal of obsolete terms, technologies, and associated sample questions from the public data. Retention of this material communicates incorrect information to applicants, training providers and other stakeholders, who waste time and effort to train / learn material that is no longer relevant to safe operation in today's NAS.

The ATST WG evolved into the ARAC Airman Certification System Working Group (ARAC ACS WG) – the committee in process today. This group was tasked with formalizing the recommendations previously made by the ARC and ATST WG with regards to the FAA Guidance Documents supporting the Airman Certification Standards.



Appendix 3: Computer Testing Supplement (CT-8080-XX) Corrections

Private/Recreational/Sport Pilot CT-8080-2F – Corrections Needed

- Legend 2-19, Figures 18, 19 – suggest changing “2012” to “20XX” in all instances (so applicants aren’t distracted by “outdated” references).
- Figures 21, 60 – adjust sectional scaling to use full page consistent with other full-page sectional excerpt figures (so plotters can be used to be “close enough” for real-life practice correlated to testing and result in the correct answers). Applicants/instructors have also requested the ability to use a Compass (math tool) during the FAA Knowledge Exam (add this tool to list of acceptable test tools in AC 60-11 and Order 8080.6) – so they can more easily use the scales provided on the Sectional image in the CT-8080 (if they aren’t using a plotter).
- All Sectional excerpts – add note to caption “Not to scale; not for navigation; use associated scale.”
- Figure 7 (also used on cover) – wrong bank indication; move the A tag to be right of the center tick to indicate a right turn (consistent with the rest of the instrument indications)
- Figure 12 – METAR KLAX, remove the 2nd “SCT007”
- Figure 15 – update TAF to current format (figure is showing old 24-hour format, needs to be updated to reflect current 30-hour format)
- Figure 17 – update name of report, top left corner (of rotated image) – change “FD” to “FB”
- Figure 18 – (1) add A, B, C call-outs to work better with the questions; (2) South Texas and South Oklahoma have an extra symbol depicted which doesn’t mean anything – it’s a barb going down with a left tick – not associated with the rest of the symbol and both should be removed.
- Figure 19 – use different (updated) chart that includes depictions for severe weather, echoes, and cell movement – the one in the –F edition doesn’t have these things depicted which means none of those test questions can be used.
- Figure 20 – legend in middle of figure, 2nd line from bottom should be “100/070” (currently backwards)
- Figure 22 – left of the “1” – the excerpt needs to move to the right so “117.1” is fully legible (it’s needed for some questions).
- Figure 29 – return to depictions from previous (CT-8080-2E) edition where the number set at the OBS (top of the indicator) is in a larger font and the reciprocal to the OBS setting (at the bottom of the indicator) is in a smaller font.
- Figure 31 – fixed cards don’t use N, S, E W tags – refer to the CT-8080-2E figures for correct versions (remove N, S, E W from the compass roses in all 8 images).
- Figure 36 – All 3 tables, correct “RMP” to “RPM”.
- Figure 41 – scale in bottom left corner is off by about 10 degrees; i.e. 59 deg F = 5 deg C in the chart but should be 15 deg C.
- Figure 49 – this new image comes from an A/FD but the associated test questions are about airport markings. This A/FD image doesn’t include depictions for chevrons, displaced thresholds, etc. but the test questions are asking about these things. Suggest either replacing or revising this figure with reference to the –E version to include the necessary airport symbols. This would allow more flexibility for new test questions too – addressing the need for more testing on surface (airport) movement.

Instrument CT-8080-3E + Addendum A – Corrections Needed:

- Throughout the Testing Supplement, approach chart figures are in the old format which has not been used since about 2008. The new chart format which has been used since then is closer to the look of the Jeppesen charts. (The approach charts in Addendum A are in the new format.) Suggest removing all approach charts in the obsolete format and replacing with the new versions. If a new edition can’t be created now, cancel figures no longer being used.
- Throughout the Testing Supplement, en route charts use obsolete symbols for mandatory reporting points at VORs or NDBs. This changed in 2011. The previous symbol was a solid triangle in the center of the navaid; the new symbol has the navaid symbol itself fully



shaded. Suggest updating all en route charts where a mandatory reporting point is shown at a navaid to the new format. If a new edition can't be created now, cancel figures no longer being used.

- Figure 8 – out of date.
- Figure 18 – out of date.
- Figure 36A: cancel or replace. Depicts old-fashioned RNAV plate, but the minimums for the approach that exist today are GLS, LNAV/VNAV and LNAV – not straight-in and circling.
- Figure 49 – “6100” in MSA circle (plan form view, bottom right quadrant) is not legible but this number is used in a test question. Remove question until this figure can be fixed.
- Figure 93 – Class C and Class D airspace is depicted with the same upper ceiling. But Class C is generally the surface to 4,000 ft AGL and Class D is generally the surface to 2,500 feet AGL. Better to depict these airspaces at different altitudes so they don't look the same.

Commercial CT-8080-1C Corrections Needed:

- Figure 9 – notes 1 and 2 need clarification on whether they must be applied in sequence.
- Figures 16, 20 – remove ADF, RMI questions from test.
- Figures 21, 22, 23 – remove time and angle to station questions from test.
- Figures 25, 26, 27, 28, 29, 30 – update to current approach plate layout.
- Figure 35 – bottom chart, bottom right figure “200” should be “400”

CFI CT-8080-5F Corrections Needed:

- Figure 19, bottom scale (on right side of page when holding book upright) “Bank angle (degrees)” should be “Angle of attack (degrees)”
- Add Addendum A Figures 57, 58

ATP CT-8080-7C Corrections Needed

There are a number of Computer Testing Supplement (CT-8080-7C + Addendums A, B, C) figures not being used on the ATP and Aircraft Dispatcher tests (ADX, ATP, ATA, ARA, ATH, ARH, ACP, FNX, ATM, ATS) yet are required by the ODAs to provide to all applicants. The current ATP supplement (Effective Dates: CT-8080-7C 2005 + Addendums A July 2011, B May 2012, and C April 2014) is 592 pages and includes 46 Legends (4 are used directly in questions) and 534 Figures (280 are used directly in questions). This results in increased cost for everyone involved with the test; the original CT-8080-7C was \$24.00; the current book to include Addendums A, B, and C is now \$36.00. Costs are expected to increase as the volume of issued ATP tests continue to decline. As such, it is important to take action now to try to contain any unnecessary inflation.

Based on proprietary (ASA) data, we have determined the following figures are **not being used**. The FAA should confirm these with the official form tests and validated questions: Legends 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42A; Figures 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 65, 76, 78, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 92, 93, 95A, 113A, 113B, 113C, 132, 133, 161A, 163A, 166, 166A, 167A, 170, 170A, 173A, 178A, 189, 189A, 191A, 198, 209, 209A, 212A, 213, 213A, 219, 220, 221, 222, 229, 230, 232, 233, 234, 237, 238, 239, 240, 243, 244, 245, 246, 247, 248, 250, 254, 255, 255A, 255B, 256, 257, 257B, 258, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 275, 276, 277, 278, 280, 281, 282, 283, 284, 285, 286, 288, 289, 290, 291, 292, 294, 296, 300, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 319, 320, 322, 323, 324, 325, 326, 328, 333, 334, 335, 337, 338, 339, 341, 343, 344, 345, 346, 347, 349, 350, 351, 352, 355, 356, 357, 358, 359, 360, 361, 362, 364, 365, 366, 367, 368, 369, 370, 371, 372, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 396, 397, 400, 403, 404, 418, 419, 420, 423, 424, 425, 426, 427, 430, 431, 432, 433, 434, 435, 436, 437, 441, 442, 443, 444, 445, 446, 447, 448, 449, 453, 454, 455, 456, 458, 462, 463, 464, 467, 468, 473, 474, 476, 477, 478, 479, 480, 482, 483, 484, 485, 486, 487, 488

AMT CT-8080-4F Corrections Needed:

- Add Addendum A Figures
- General (Appendix 1) Figure 16, missing line near “9” – see 4E
- Airframe (Appendix 3) Figure 20, top Gear warning visual “G” should be “R”; bottom Gear warning visual “G” should be “A”.

IA CT-8080-8D Corrections Needed:

- Implement “pencil corrections” issued to ODAs.



September 9, 2015

Robert L. Newell
FAA Branch Manager, Airman Testing Standards
Systems Training Annex Bldg. 26
FAA Mike Monroney Aeronautical Center
6500 S. MacArthur Blvd.
Oklahoma City, OK 73169



Dear Mr. Newell,

On behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following recommendations for the new editions of the Commercial (CT-8080-1D) and Instructor (CT-8080-5G) Airman Knowledge Testing Supplement.

These recommendations are consistent with the recommendations made for the FAA Guidance Documents Vision submitted July 2, 2015.

We hope these recommendations will be useful to the FAA as you gear up to release these new editions to support airman testing and the release of the Airman Certification Standards.

The ACSWG and its members welcome the opportunity to provide feedback and thank you for this opportunity and please let us know if we can provide anything further.

Sincerely,

David Oord
ACSWG Chair
Vice President, Regulatory Affairs
Aircraft Owners and Pilots Association

Jackie Spanitz
ACSWG Subgroup Lead
Curriculum Director
Aviation Supplies & Academics, Inc.

Recommendation

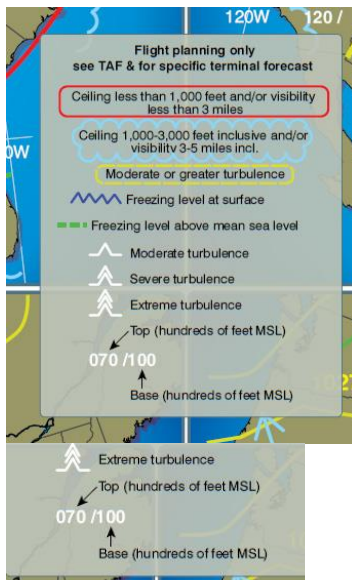
Computer Testing Supplements (CT-8080-XX)

- Short-Term: Release new editions effective June 2016 as follows:
 5. Correct errors, cancel and/or remove figures not being used. See Corrections identified below.
 6. Do not add figures to the supplement until corresponding questions are developed and validated (figures can be displayed onscreen during validation process).
 7. Add “Parallel” questions to the public data for every figure being used on the test to ensure training and testing are correlated for a true validation process (i.e. questions cannot be accurately validated if they weren’t first part of a training curriculum).
 8. Figures and associated questions are identified to the public when removed from testing to ensure training and testing remains correlated
- Long-Term: Once new FAA Knowledge Exam testing system is implemented, move all applicable figures to on-screen graphics and combine remaining figures into a single document referenced for all tests.

Instructor Computer Testing Supplement (CT-8080-1D) Corrections

- Rework the cover to match fonts, and style of the Commercial cover, which would also have it tie in with the books done previously.
- Save the PDF so the text is black only. For printing CMYK text is not good.
- Add bleed to the cover.
- Change the cover image, sectional and airport directory images to high resolution.
- Pg 3, change “2015” to “2016”.
- Pg 5, Preface – add to bottom of list “FAA-CT-8080-5G supercedes FAA-CT-8080-5F, Computer Testing Supplement for Commercial Pilot, dated 2014.” (to be consistent with Commercial supplement)
- Figure 4: bad break on 1st line; might look better:
 ... BKNO
 018-TOP...
 So the “018” is kept together
- Figure 5: this is old TAF format; 121720Z 121818 should be 1218/1318 per AC 00-45G page 7-31
- Figure 7: caption, change “FD” to “FB”
- Figures 10, 11, 12: Suggest replacing Weather Depiction Charts with today’s tools (Ceiling & Visibility Chart or C&V and satellite vis/fog; rewriting associated questions to test applicants on determining ceiling, visibility and fog forecasts using data found at www.aviationweather.gov.
- Figure 14: showing top of the turbulence at a lower MSL than at the bottom (see AC00-45G pg 8-9 for correct depiction):





- Figure 14: update the prog charts (SIGWX) to reflect new 2-panel layout that went into effect September 2 2015: www.aviationweather.gov (these are ultimately being phased out, replaced by National Digital Forecast Display: <http://digital.weather.gov>. One of the many advantages of these new tools is “no more symbols to remember” – long-term, suggest removing this figure and/or replacing it with a NDFD and modifying questions to focus on “what information is needed to make the go/no go/continue decision – getting away from the “what is this symbol” and moving towards the decision-making associated with the weather; i.e. change questions and figures to focus on what information do you need, not what reports/forecasts symbols do you need to memorize). If short term the plan is to keep the charts, update to the current 2-panel layout.
- Figure 18, caption should be Stall Speed vs Load Factor; ***Load factor or “G” units scale should be on the right side of the chart.
- Figure 19, caption should be Angle of Attack vs Lift
- Figure 21: the CT-8080-5E has 4 wing examples; the -5F went up to 16 examples – a 117’ wing span is a B737-900 – is this really necessary for this test/applicant? Suggest returning to the -5E (4 examples of typical training aircraft).
- Figure 26: caption, add “a” to read “... for a particular altitude.”
- Figure 39: “Sea-level – pressure altitude” – remove hyphen in “sea-level” so it’s just “Sea level”
- Figure 41: remove ADF indicators (fixed dial) – ADF/NDB no longer included on FAA Knowledge Exams. Otherwise, modify caption to include “Not used on U.S. FAA Knowledge Exams.”
- Figure 41 – if you decide to keep this figure, remove N, S, E, W – fixed cards don’t show directionals like this.
- Figure 43: remove RMI indicators – RMI no longer included on FAA Knowledge Exams. Otherwise, modify caption to include “Not used on U.S. FAA Knowledge Exams.” Not necessary for today’s or tomorrow’s pilots.

- Figures 41 and 43 – suggest replacing ADF and RMI figures with Figures 65 and 66 from CT-8080-2F – replacing the RMI and ADF/NDB questions with airport markings and signs questions (currently no airport markings/signs in CFI supplement).
- Figure 57, heading at top, change “Range of C. of G. behind Datum” to “Range of CG behind Datum”

Commercial Computer Testing Supplement (CT-8080-5G) Corrections

- Add bleed to the cover.
- Most of the sectionals are high resolution except for pages 56 and 57 (make these high resolution as well for best printing).
- Cover, replace ADF depicted in top right corner with VOR (i.e. “Radio Compass” instrument should be VOR) – since NDB/ADB questions are no longer on FAA Knowledge Exams.
- Pg 3, change “2015” to “2016”.
- Figure 1, Caption should be Drag vs Velocity or change Velocity on chart label to Speed
- Figure 3, Caption would be clearer if it read Degrees Angle of Attack; Title of figure should be Angle of Attack vs Lift
- Figure 3a, Label should be “Glide Distance” not “ground distance,”; Zero Wind, not zero wing
- Figure 4, Caption should be Stall Speed vs Load Factor; ***Load factor or “G” units scale should be on the right side of the chart.
- Figure 5, I’m not sure what question this graph is for, but there are much better V-G diagrams and the idea should be to emphasize Va in these charts as well. The title of the graph and axis names should match (Velocity vs Load Factor).
- Pg 6, Figure 7 – is it necessary to keep the blank page? Maybe add to bottom of previous or following page to eliminate the unnecessary page.
- Figure 9, Caption should be Time, Fuel, Distance to Climb
- Figure 9 – “Notes” – sample question requires Note 2 be applied before Note 1 for the correct answer to result – either re-arrange Notes so they appear in sequential order (by the method they should be applied) – or rewrite question. Example question:
(Refer to Figure 9.) Using a normal climb, how much fuel would be used from engine start to 10,000 feet pressure altitude?
Aircraft weight 3,500 lb
Airport pressure altitude 4,000 ft
Temperature 21°C

To answer:

1. Locate the section for 3,500 pounds weight. Read across the 4,000-foot PA line to the entry under fuel used, 11 pounds.
2. Read across the 10,000-foot PA line to the entry under fuel used, 31 pounds.
3. Calculate the fuel required to climb:
 $31 - 11 = 20$ lbs
4. Apply Note #2 before adding the fuel in Note 1. (A temperature of 21°C is +14°C, with respect to the standard atmosphere at 4,000 feet.)
 $20 \times 1.14 = 22.8$ lbs



5. Apply Note #1:

22.8 lbs + 12.0 lbs start and taxi = 34.8 lbs total.

- Figure 10, Caption should be Time, Fuel, Distance to Climb; should there be an airspeed in the header as there is in Figure 9?
- Figure 11, suggest adding a header consistent with Figure 12.
- Figure 13, caption should be Time, Fuel, Distance to Climb
- Figure 14, caption should be Time, Fuel, Distance to Climb
- Figures 16, 18, 19 remove ADF indicators – ADF/NDB no longer included on FAA Knowledge Exams. Otherwise, modify caption to include “Not used on U.S. FAA Knowledge Exams.”
Figures 18, 19: Suggest a more modern name if it going to stay in the test bank. I assume this is Radio Magnetic Indicator (RMI) with ADF Indicator? Or is this a fixed card ADF? Hard to tell.
- Figure 17, HSI at top of page, lowercase as follows:
 - Course Arrow, “Window” (window)
 - Rotating Compass Card, “System” and “Rotates” (system, rotates)
 - Heading Marker, “Knob” (knob)
- Figure 20 remove RMI indicators – RMI no longer included on FAA Knowledge Exams. Otherwise, modify caption to include “Not used on U.S. FAA Knowledge Exams.”
- Figures 21, 22, 23, 24 – remove, time to station bearing change questions no longer applicable nor necessary for today’s or tomorrow’s pilots.
- Figure 32, Example and Table above graph, replace em or en dash with hyphen in “Lift-off” (2 times)
- Figure 37: All the other "loading graph" illustrations have grid lines contained within the area to be measured, with no need for "white boxes" underneath all the applied text callouts. In this one only, the grid lines extend way beyond the "x/y" area, which makes it necessary to put white boxes under all the text that's placed on the graph, giving this one a different and messy appearance compared to the others. A more realistic chart would be helpful. Top chart axis label should be Moment/1000 inch pounds (the way it is written is not a typical use in aviation) as in Figure 38.
- Figure 38, top graph, label on the left, remove 4 periods so it just reads “Load Weight in Pounds” (to match other graphs like this)
- Figure 41, label on left side of both graphs: The "H" with subscript "P" is not consistently displayed (between the left and right graph). Use one or the other, not both... Which is correct? Is it "H" with a subscripted capital "P", or is it supposed to be "H" with a lowercase "p"...? Also, is the black vertical label between the graphs supposed to go with right graph? If so, move closer to the right graph so it's not assumed to be a label for the left graph.
- Figure 45, label along right side of page (or bottom of graph) – “obstacle” is missing – change to read “Total takeoff distance to clear 50 ft-100 ft obstacle”
- Figure 45, label along right side of page (or bottom of graph) – “obstacle” is missing – change to read “Total takeoff distance to clear 50 ft-100 ft obstacle”
- Figure 47 deleted – this was removed in previous (1C) edition – remove page and renumber figures accordingly (or just remove the blank page – not necessary).

September 28, 2015

Robert L. Newell
 FAA Branch Manager, Airman Testing Standards
 Systems Training Annex Bldg. 26
 FAA Mike Monroney Aeronautical Center
 6500 S. MacArthur Blvd.
 Oklahoma City, OK 73169



Dear Mr. Newell,

On behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following recommendations for the new edition of the Private (CT-8080-2G) Airman Knowledge Testing Supplement.

Consistent with the recommendations made for the FAA Guidance Documents Vision submitted July 2, 2015, we request the FAA include a production schedule for all FAA Supplements (CT-8080s) as well as a projected timeline for the next revision (i.e. how long do you anticipate this CT-8080-2G edition to remain in effect). Doing so will allow the training community to plan for and update material to ensure training and testing remain correlated.

We hope these recommendations will be useful to the FAA as you gear up to release these new editions to support airman testing and the release of the Airman Certification Standards..

The ACSWG and its members welcome the opportunity to provide feedback and thank you for this opportunity and please let us know if we can provide anything further.

Sincerely,

David Oord
 ACSWG Chair
 Vice President, Regulatory Affairs
 Aircraft Owners and Pilots Association

Jackie Spanitz
 ACSWG Subgroup Lead
 Curriculum Director
 Aviation Supplies & Academics, Inc.

Recommendation

Computer Testing Supplements (CT-8080-XX)

- Short-Term: Release new editions effective June 2016 as follows:
 9. Correct errors, cancel and/or remove figures not being used. See Corrections identified below.
 10. Do not add figures to the supplement until corresponding questions are developed and validated (figures can be displayed onscreen during validation process).
 11. Add “Parallel” questions to the public data for every figure being used on the test to ensure training and testing are correlated for a true validation process (i.e. questions cannot be accurately validated if they weren’t first part of a training curriculum).
 12. Figures and associated questions are identified to the public when removed from testing to ensure training and testing remains correlated
- Long-Term: Once new FAA Knowledge Exam testing system is implemented, move all applicable figures to on-screen graphics and combine remaining figures into a single document referenced for all tests.

Private Computer Testing Supplement (CT-8080-2G) Corrections

- General comment throughout: Be more consistent about the figure sizing, sometimes they are overly large for no necessary reason and there are some that run rotated on the page that could be smaller to fit right-reading without rotating the book. Where possible, put more than one on a page when they are small.
- Rework the cover to match fonts, and style of the Commercial (and -2F) cover, which would also have it tie in with the books done previously. The -2F style is better than the new -2G and 1D look.
- Save the PDF so the text is black only. For printing CMYK text is not good.
- Add bleed to the cover.
- Throughout the scanned images (sectionals and airport directory images) need to be high resolution. They were much better in 2F so it might be that the 2G PDF settings changed the image resolution, maybe just for the proof or on-screen viewing.
- Pg 3, change “2015” to “2016”.
- Pg 5, Preface – add to bottom of list “FAA-CT-8080-2G supercedes FAA-CT-8080-2F, Airman Knowledge Testing Supplement for Sport Pilot, Recreational Pilot, and Private Pilot dated 2013.” (to be consistent with Commercial supplement)
- Figure 1. Lift Vector; It appears the chord line was removed. Chord line should be depicted as seen in -2F.
- Figure 15: this is old TAF format; KMEM 121720Z 121818 should be 1218/1318 (update KOKC too) per AC 00-45G page 7-31
- Figure 18: Suggest replacing Weather Depiction Chart with today’s tools (Ceiling & Visibility Chart or C&V and satellite vis/fog; rewriting associated questions to test applicants on determining ceiling, visibility and fog forecasts using data found at www.aviationweather.gov.
- Pg 21, remove blank page (can note Figure 19 removed in Contents list and pages before or after this blank page).
- Figure 20: update the prog charts (SIGWX) to reflect new 2-panel layout (that excludes the surface forecast) that went into effect September 2015: www.aviationweather.gov:



Effective September 1, 2015, www.AviationWeather.gov users will see changes on the [Prog Charts page](#). The current 4-panel Low Level SFC-240 chart will be replaced with a 2-panel chart. The new 2-panel chart will be the same as the top two panels in the current chart, depicting the freezing level and areas of IFR, MVFR, and moderate or greater turbulence. The bottom two panels of the chart will be removed. In lieu of these bottom two panels, an enhanced surface chart that includes fronts, pressure, precipitation type, precipitation intensity, and weather type, will be displayed. The green precipitation polygons will be replaced by shaded precipitation areas using the National Digital Forecast Database (NDFD) weather grid.

(these are ultimately being phased out, replaced by National Digital Forecast Display: <http://digital.weather.gov>. One of the many advantages of these new tools is “no more symbols to remember” – long-term, suggest removing this figure and/or replacing it with a NDFD and modifying questions to focus on “what information is needed to make the go/no go/continue decision – getting away from the “what is this symbol” and moving towards the decision-making associated with the weather; i.e. change questions and figures to focus on what information do you need, not what reports/forecasts symbols do you need to memorize). If short term the plan is to keep the charts, update to the current 2-panel layout.

- Figure 29. VOR; uses a single arrow showing the selected radial. Most receivers also have a smaller secondary arrow pointing at the reciprocal. Suggest adding another arrow on the reciprocal radial as seen in figure below.



- Figure 30, 31: remove ADF indicators – ADF/NDB no longer included on FAA Knowledge Exams. Otherwise, modify caption to include “Not used on U.S. FAA Knowledge Exams.”
- Figure 49: test questions currently reference runways 32, 25, 14, 7 – update test questions to reflect new image (Runways 35, 17, 30, 12). This new format is not a reflection of what pilots would likely come across; suggest reverting back to an actual airport diagram like in -2E to include the necessary airport symbols.
- Figure 49: Typo – Itiernant Ramp (Rammp should be Ramp)
- Figure 52: update to ICAO flight plan form going into effect in 2016.

October 5, 2015

Robert L. Newell
 FAA Branch Manager, Airman Testing Standards
 Systems Training Annex Bldg. 26
 FAA Mike Monroney Aeronautical Center
 6500 S. MacArthur Blvd.
 Oklahoma City, OK 73169



Dear Mr. Newell,

On behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following recommendations for the new edition of the Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B).

Please note this file replaces what we provided September 30, 2015 – with some additional recommendations.

Consistent with the recommendations made for the FAA Guidance Documents Vision submitted July 2, 2015, we request the FAA include a production schedule for all FAA Handbooks (FAA-H-8083 documents) as well as a projected timeline for the next revision (i.e. how long do you anticipate this FAA-H-8083-25B edition to remain in effect). Doing so will allow the training community to plan for and update material to ensure training and testing remain correlated, as well as provide feedback in a timely way to help with continued development of this title.

We hope these recommendations will be useful to the FAA as you gear up to release these new editions to support airman testing and the release of the Airman Certification Standards.

The ACSWG and its members welcome the opportunity to provide feedback and thank you for this opportunity and please let us know if we can provide anything further.

Sincerely,

David Oord
 ACSWG Chair
 Vice President, Regulatory Affairs
 Aircraft Owners and Pilots Association

Jackie Spanitz
 ACSWG Subgroup Lead
 Curriculum Director
 Aviation Supplies & Academics, Inc.

Recommendations

Based on Draft Edition:

- Title Page, change “2015” to “2016” (projected release date is 02/2016)
- 1-9, left column, Aviation Safety Inspectors (ASI) – “3,700 inspectors” – this is the same number as the 8083-25A edition; is this still correct?
- 1-9, right column, 2nd line at top “The FAASTeam has replaced the Aviation Safety Program (ASP),” – update section as needed.
- 1-10, Figure 1-14, photoshop out “February 11, 2010” from AIM book cover.
- 1-19, left column, 2nd para, “Order forms are provided at the beginning of the manual...” – update sentence – this is no longer true; ordering is done via website.
- 1-10, Figure 1-15, change caption to read “A sample of handbooks available to the public. Most can be downloaded free of charge from the FAA website.”
- 1-12, Figure 1-18, photoshop out “15 Dec 2011” or change “2011” to “20XX”; change caption to read “From left to right, a sectional VFR chart, IFR chart, and A/FD sample page.”
- 1-12, right column, para starting “NOTAM information...” – add NOTAM website url to end of para.
- 1-14, right column, 2nd para, last sentence, change www.aopa.org/whatnew/notams.html to www.aopa.org – url as printed doesn’t work.
- 1-15, left column top line and right column 2nd para, change “We” to “The FAA” (and adjust verb tense accordingly) – I don’t think FAA handbooks use 1st person writing.
- 1-15, right column, add new sentence at top ahead of “Size and weight are other...” to read “Unmanned aircraft systems (UAS) are another aircraft category. UAS come in a variety of shapes and sizes and serve diverse purposes. Regardless of size, the responsibility to fly safely applies equally to manned and unmanned aircraft operations. UAS operators can learn more about this rapidly growing aviation segment by visiting the FAA website.” [could add new figure of a drone]
- 1-16, right column, Privileges, change 1st bullet to read “Operate as a Pilot in Command (PIC) of a light-sport aircraft or aircraft that meets light sport privileges.”
- 1-17, left column, Limitations, 2nd bullet, change “you” to 3rd person “the pilot receives...”
- Vii and 1-18, add a new subheading after Airline Transport Pilot to read:
Unmanned Aircraft Systems
There is a wide variety of UAS models and missions. Many of these require specific FAA authorization including operator certifications. Visit the FAA website to learn more about this rapidly growing aviation segment to ensure UAS operations remain safe and legal.
[could add new figure of a drone to follow existing figure 1-24.]
- 1-18, right column, last line – update url – as printed doesn’t work.
- 1-20, left column, The Student Pilot, 1st para – update whole section to account for Sport Pilots who don’t need medical certificates.
- 1-22, Figure 1-26, remove dates (2011, 2011, 2006) from PTS covers or change all to “20XX”
- 1-22, left column, define acronym “DPE”

- 1-23, left column, 3rd bullet from top, 1st parenthetical, change to read “(Not required for glider, balloon, sport pilot, or light-sport aircraft operations); last parenthetical is out of place (driver’s license...)”
- 2-8, right column, 2nd para, 1st line, change to read “... maximum demonstrated crosswind...”
- 2-9, right column, 2nd bullet point from top, remove “An engine failure gives the nearby airports supreme importance.” – this lacks clarity.
- 2-9, right column, 3rd bullet point from top, doesn’t make sense – shorter than what? What are obstructed fields and why would a pilot want one?
- 2-9, right column, Airspace, add new bullet point to account for busy, complex airspace.
- 2-10, Figure 2-7, change caption to “A PAVE case study.” (this is a case study not a checklist)
- 2-14, right column, The Pilot, 1st para, last line – “(see page 2-6)” – update this page reference, this is no longer correct.
- 3-2, add new subheading after “A Note About Light Sport Aircraft” to read:
Unmanned Aircraft Systems
There is a wide variety of UAS models and missions, with many differences in aerodynamics, operations, limitations, and capabilities. UAS require specific FAA authorization to operate in the National Airspace System (NAS). Visit the FAA website to learn more about this rapidly growing aviation segment to ensure UAS operations remain safe and legal.
[could add new figure of a drone with caption “Visit www.faa.gov to learn more about UAS operations.”]
- 4-8, left column, Press Distribution, 4th line – AOA isn’t defined until Chapter 5 – do we need to clarify here or refer readers to Chapter 5 to learn more about this?
- Chapter 5 – see marked-up PDFs and Comments for all recommended edits.
- 7-27, Fuel Grades and Figure 7-32: 80 octane is dead, for all practical purposes; pilots will be hard pressed to find any. Suggest removing it from the book.
- 13-4, remove “En Route Flight Advisory Service (EFAS)” subheading and paragraph – this service has been cancelled.
- 13-15, WX Depiction charts: replace Weather Depiction Chart with today’s tools (Ceiling & Visibility Chart or C&V and satellite vis/fog; rewriting associated questions to test applicants on determining ceiling, visibility and fog forecasts using data found at www.aviationweather.gov.
- 13-16, Significant Weather Prognostic Charts, update (SIGWX) to reflect new 2-panel layout that went into effect September 2015: www.aviationweather.gov (these are ultimately being phased out, replaced by National Digital Forecast Display: <http://digital.weather.gov>. One of the many advantages of these new tools is “no more symbols to remember” –suggest removing Figure 13-13, 13-14 and/or replacing it with a NDFD and modifying discussion to focus on “what information is needed to make the go/no go/continue decision.
- 15-13, Uncontrolled Airspace, Class G Airspace (or this could be added to Pg 15-10, Class G subheading): add “It is possible for some airports within Class G airspace to have a control tower (Lake City, FL, for example). Be sure to check the Airport/Facility Directory to be familiar with the airport and associated airspace prior to flight.”
- 15-11, add new subheading below Parachute Jumps
Unmanned Aircraft Systems

Most airports are a “no drone zone” unless operators have obtained special FAA authorization. Visit www.faa.gov to stay informed of the rapidly changing rules and procedures associated with UAS, particularly relative to airport operations.

- 16-2 and several places within the chapter: WAC charts are currently proposed to be discontinued – remove from this edition of the book?
- 16-2, Flight Computers, 2nd sentence, change to “In reality, most pilots use a mechanical flight computer called an E6B or electronic flight calculator.
- 16-3, Figure 16-18, caption, change to “... mechanical flight computer (E6B) (B),...”
- 16-21, right column, 2nd para, change 1st sentence to read “Figure 16-27 shows a domestic flight plan form a pilot files with the FSS. The FAA is transitioning to the ICAO flight plan form; visit www.faa.gov for more information. When filing...”
- 16-21, Figure 16-27, change caption to “Domestic flight plan form.”
- 16-22, change subheading “Radio Navigation” to “Ground-Based Navigation”
- Non-directional beacons/ADFs? Can we in good conscience ignore them?
- B-1, add ACS – Airman Certification Standard
- B-5, remove EFAS
- B-9, add PD – Pilot Deviation
- B-12, add V/PD – Vehicle/pedestrian deviation
- B-12, change UAS to read “UAS – uniform accounting system, unmanned aircraft systems
- C-2, C-3, C-4 – is this a page pull-out? Pages are running off margin.
- G-11, remove EFAS and Enroute Flight Advisory Service.
- G-32, add new terms “UAS. See Unmanned aircraft system.” and “Unmanned aircraft system (UAS). An aircraft that is operated without the possibility of direct human intervention from within or on the aircraft and associated elements (including communication links and components that control the unmanned aircraft) that are required for the pilot in command to operate safely and efficiently in the national airspace system.”
- I-7, add Pilot Deviation (pg 14-28)
- I-9, add Unmanned Aircraft System (UAS)
- I-10, “Winds and temperature aloft (FD)” – change FD to FB

January 29, 2016

Robert L. Newell
 FAA Branch Manager, Airman Testing Standards
 Systems Training Annex Bldg. 26
 FAA Mike Monroney Aeronautical Center
 6500 S. MacArthur Blvd.
 Oklahoma City, OK 73169



Dear Mr. Newell,

On behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following recommendations resulting from the new Student Pilot Application Requirements announced in the January 12, 2016 Federal Register.

- AC 61-65 – edit recommendations included in attached PDF.
- CFI Knowledge Exam test item bank – a number of questions should be removed until AEB has opportunity to revise to reflect the rule change – sample questions which are affected:
 - What is the duration of a Student Pilot Certificate
 - A student pilot whose pilot certificate is not endorsed by a flight instructor to make solo cross-country flights is prohibited from flying solo beyond what distance from the point of departure?
 - An application for a student pilot certificate must be submitted in person to any of the following
 - Prior to a first solo flight, the flight instructor is required to endorse the student's
 - A student is required to have his/her pilot certificate endorsed by a flight instructor for each
- Student Pilot Guide (FAA-H-8083-27A)
 - Pg 15-16, questions 6, 7, 8, 9, 10, 11 – modify answers
 - Pg 21, question 2 – modify list (endorsement in logbook, not on certificate)
- FAA-H-8083-25B (new edition in development now)
 - Pg 1-20, 1-21 and Figure 1-25 – distinction between medical certificate, student pilot certificate and
 - Pg 1-23, left column, 3rd bullet point from top – solo endorsement in logbook, not on certificate

The ACSWG and its members welcome the opportunity to provide feedback and thank you for this opportunity and please let us know if we can provide anything further.

Sincerely,

David Oord
 ACSWG Chair
 Vice President, Regulatory Affairs
 Aircraft Owners and Pilots Association

Jackie Spanitz
 ACSWG Subgroup Lead
 Curriculum Director
 Aviation Supplies & Academics, Inc.

January 29, 2016

Robert L. Newell
 FAA Branch Manager, Airman Testing Standards
 Systems Training Annex Bldg. 26
 FAA Mike Monroney Aeronautical Center
 6500 S. MacArthur Blvd.
 Oklahoma City, OK 73169



Dear Mr. Newell,

On behalf of the Aviation Rulemaking Advisory Committee's (ARAC) Airman Certification System Working Group (ACSWG), we submit the following per the request from the face-to-face meeting January 12-13, 2016.

As we stated in our March 2015 review of the 8083-15, 8083-16, and 8083-6: ... We believe future revisions of all three of these books should be done in collaboration with the AFS-630 office. Doing so will ensure consistent, coherent information without duplication between FAA publications. Currently, these publications provide information on some of the same topics, but with variations in terms, descriptions, and depth of coverage. A single document may be unwieldy and overwhelming for a pilot in training – and may be overlooked by VFR or advanced pilots needing the information but not actively training. However, consolidating key topics to avoid redundancy between publications would result in a single resource for a given topic, with consistent language and descriptions for a given technology and/or procedure – not only eliminating redundancy in FAA workload, but also consistency within the aviation training community.... Keep the books separate, but eliminate redundant information between them. It may be desirable to develop a “two-tier” approach to the instrument handbooks (FAA-H-8083-15 and FAA-H-8083-16). The basic text for training and certification for the instrument rating may be the Instrument Flying Handbook. The Instrument Procedures Handbook would be added as a reference text for the Airline Transport Pilot (ATP) certificate and aircraft type ratings. The Instrument Procedures Handbook could also be used as the reference text for certain NextGen pilot approvals such as RVSM and what is likely to be separate approvals for some automatic dependent surveillance broadcast (ADS-B) applications such as in-trail spacing. There is too much material required for all of these ratings and approvals to place them in a single handbook that would be manageable and convenient to use.

Here are the recommended mission statements for the two primary instrument flight guidance documents:

Instrument Flying Handbook (FAA-H-8083-15): This Handbook is designed for use by instrument flight instructors and pilots preparing for instrument rating tests. Instructors may find this handbook a valuable training aid as it includes basic reference material for knowledge testing and instrument flight training.

Instrument Procedures Handbook (FAA-H-8083-16): This Handbook is designed as a technical reference for all pilots who operate under instrument flight rules (IFR) in the National Airspace System (NAS). It expands upon information contained in the Instrument Flying Handbook (FAA-H-8083-15), and introduces advanced information for IFR operations. Instrument flight instructors, instrument pilots, and instrument students will also find this handbook a valuable resource since it is used as a reference for the Airline Transport Pilot Tests. It also provides detailed coverage of instrument charts and procedures including IFR takeoff, departure, en route, arrival, approach, and landing. Safety information covering relevant subjects such as runway incursion, land and hold short operations, controlled flight into terrain, and human factors issues also are included.

The ACSWG and its members welcome the opportunity to provide feedback and thank you for this opportunity and please let us know if we can provide anything further.

Sincerely,

David Oord, ACSWG Chair
 Vice President, Regulatory Affairs
 Aircraft Owners and Pilots Association

Jackie Spanitz, ACSWG Subgroup Lead
 Curriculum Director
 Aviation Supplies & Academics, Inc.



Prototype/Implementation Subgroup

Implementation Recommendations

February 9, 2016

OVERVIEW

The ACS Prototype Subgroup was charged with drafting recommendations for the ACS implementation process. Our recommendations represent broad industry knowledge and experience with airman certification guidance documents, with the added benefit of meaningful and valuable FAA participation.

We believe that moving to complete ACS acceptance is a critical step in improving the quality of pilot certificated by the FAA, not only in improved knowledge and skills, but also in the essential area of risk management. We also believe that moving to complete ACS acceptance is an intricate process with many moving parts. We support a phased release of the ACS concept with continuous data monitoring and quality assurance efforts on the part of FAA and industry to ensure the ACS concept is functional and efficient in accomplishing its stated purpose.

To support a Summer 2016 release of the Private and Instrument ACS documents, we propose the following steps be taken to ensure the appropriate internal and external stakeholders are prepared for the transition.

CORE IMPLEMENTATION CONSIDERATIONS

1. Communicate the reason/need for the change
2. Encourage a desire for supporting the change
3. Share knowledge about what is actually changing
4. Ensure all audiences have the ability to use the ACS
5. Account for reinforcement of the message in an ongoing way

EXTERNAL/PUBLIC STAKEHOLDER OUTREACH RECOMMENDATIONS

1. Applicants
 - 1.1. General/Universal Applicants
 - 1.1.1. FAAST Blast email
 - 1.1.1.1. ACS implementation timeline
 - 1.1.1.2. Link for more information
 - 1.1.2. Print articles in aviation publications
 - 1.1.2.1. Justify the need to switch to ACS
 - 1.1.2.2. Address FAQs and common concerns (check ride length, etc.)
 - 1.1.3. FAAST online course
 - 1.1.3.1. Identify content in the ACS and how to use it
 - 1.1.3.2. Explain differences from PTS (for those using Instrument ACS)
 - 1.1.4. AFS630 Subscription List
 - 1.1.4.1. Publish ACS with effective dates on AFS630 website
 - 1.1.4.2. Send email to AFS630 subscribers notifying new document, identifying which document(s) it replaces.



- 1.2. University/Collegiate Applicants
 - 1.2.1. UAA email blast to member schools
- 1.3. Part 141 Applicants
 - 1.3.1. FAA POI outreach to Chiefs (see Item 4.)
2. Instructors
 - 2.1. FIRC content
 - 2.1.1. Explain why transition to ACS is important
 - 2.1.2. Provide overview of ACS structure and organization
 - 2.1.3. Illustrate how the ACS improves upon the PTS
 - 2.1.4. Explain coding system and how it links to knowledge test reports
 - 2.1.5. Explain how the ACS is used during the practical test
 - 2.1.6. Provide sample lesson plans on how to incorporate risk management concepts
 - 2.1.7. Explain which certificates and ratings have an effective ACS and how to stay apprised of future ACS releases
 - 2.2. FAAST Online Course
 - 2.2.1. Narrate and record the Intro to the ACS PowerPoint presentation that highlights what the ACS is and how it works
 - 2.2.2. Create a short quiz to ensure individuals understand the components and function of the ACS
 - 2.3. DPE Outreach
 - 2.3.1. Phone, email, and meet instructors with whom relationship is established to advise them of the release of the ACS
 - 2.3.2. Offer web links and resources for learning about the ACS
 - 2.3.3. Offer assistance and answer questions for instructors preparing applicants for practical tests
 - 2.3.4. Ensure applicants are familiar with the ACS prior to scheduling the practical test
3. FIRC Providers
 - 3.1. Approved Elective Topic
 - 3.1.1. Already approved in several FIRCS
 - 3.2. Required Course Content
 - 3.2.1. Once ACS is released with an effective date, will be mandatory as a component of course lesson "Regulatory, Policy and Publications Changes and Updates"
 - 3.3. Provider Outreach
 - 3.3.1. Letter from FAA to providers encouraging coverage of ACS ahead of effective/release date; will be component of "Regulatory, Policay and Publications Changes and Updates" once ACS is effective. (Allan Kash)
4. Part 141 Chief Instructors
 - 4.1. POI Outreach
 - 4.1.1. Phone, email, and meet chief flight instructors of assigned pilot schools to advise them of the release of the ACS
 - 4.1.2. Offer web links and resources for learning about the ACS
 - 4.1.3. Provide guidance and require revision to approved training course outlines
 - 4.1.4. Verify training provided to ground and flight instructors, designated check instructors, and assistant chief instructors
 - 4.1.5. Provide guidance and require revision to approved syllabi of annual training for chief instructors (for chief instructors completing required annual training using that method)
 - 4.2. FIRC content (for chiefs completing required annual training using that method)
 - 4.2.1. Explain why transition to ACS is important
 - 4.2.2. Provide overview of ACS structure and organization
 - 4.2.3. Illustrate how the ACS improves upon the PTS

- 4.2.4. Explain coding system and how it links to knowledge test reports
 - 4.2.5. Explain how the ACS is used during a practical test
 - 4.2.6. Provide sample lesson plans on how to incorporate risk management concepts
 - 4.2.7. Explain which certificates and ratings have an effective ACS and how to stay apprised of future ACS releases
 - 4.3. Initial Chief and Assistant Chief Instructor Training and Designation
 - 4.3.1. Develop standardized, online training course similar to FIRC module covering the ACS
 - 4.3.2. Incorporate items listed above for FIRC module
 - 4.3.3. POIs require completion prior to scheduling chief or assistant chief instructor practical test
 - 4.3.4. Test the applicant on the ACS during the chief or assistant chief instructor practical test
 5. Designated Pilot Examiners
 - 5.1. Mandatory Online Learning Module
 - 5.1.1. Purpose of the ACS concept, including benefits to aviation safety
 - 5.1.2. Explain ACS development process (including prototyping)
 - 5.1.3. Compare and contrast the PTS and ACS
 - 5.1.4. Provide POA recommendations for ACS testing
 - 5.2. Initial and Recurrent DPE Training Curricula
 - 5.2.1. Incorporate basic ACS PowerPoint for ACS background
 - 5.2.2. Discuss POA creation for ACS testing
 - 5.3. Designee Branch Outreach
 - 5.3.1. Purpose of the ACS concept, including benefits to aviation safety
 - 5.3.2. Implementation timeline for the ACS
 - 5.3.3. Links for additional information
 - 5.4. FSDO DPE Program Managers
 - 5.4.1. Purpose of the ACS concept, including benefits to aviation safety
 - 5.4.2. Implementation timeline for the ACS
 - 5.4.3. Links for additional information
 - 5.4.4. Incorporate ACS content into annual FSDO outreach/training for DPEs
 6. FAAST Representatives
 - 6.1. FPM Emails
 - 6.1.1. Purpose of the ACS concept, including benefits to aviation safety
 - 6.1.2. Implementation timeline for the ACS
 - 6.1.3. Links for additional information
 - 6.2. Safety Seminar Promotion
 - 6.2.1. Encourage all field reps to mention the ACS in upcoming seminars
 7. Manufacturers
 - 7.1. No further outreach is specifically planned for this group beyond the content in Item 8.
 8. Advocacy Organizations
 - 8.1. Organization Listing
 - 8.1.1. UAA – University Aviation Association
 - 8.1.2. NATA – National Air Transportation Association
 - 8.1.3. FSANA – Flight School Association of North America
 - 8.1.4. SAFE – Society of Aviation and Flight Educators
 - 8.1.5. NAFI – National Association of Flight Instructors
 - 8.1.6. AOPA – Aircraft Owners and Pilots Association
 - 8.1.7. GAMA – General Aviation Manufacturers Association
 - 8.1.8. NBAA – National Business Aircraft Association
 - 8.1.9. EAA – Experimental Aircraft Association



8.2. Recommend that members of each group be designated to reach out to person in charge of communication with membership to email everyone the concise ACS message.

8.2.1. Purpose of the ACS concept, including benefits to aviation safety

8.2.2. Implementation timeline for the ACS

8.2.3. Links for additional information

INTERNAL/FAA STAKEHOLDER OUTREACH RECOMMENDATIONS

Due to the unique and complex structure of the FAA organization, the Prototype/Implementation Subgroup will defer formal communication and outreach planning to the designated Change Management agent working with our group, Christopher Morris (AFS-630). His recommendations can be found in Appendix 1.



Authorized Instructor Subgroup

Aviation Instructor's Handbook (FAA-H-8083-9A)

February 9, 2016

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
1.	Throughout	Many of the photos and graphics should be updated. Any further useful review would have to take place after current comments are incorporated.	
2.	Throughout	From previous ARAC report: Place the "summary of instructor's actions" blurbs in shaded boxes or further separate them out of the other content. These summary sections are good references for applicants and existing CFIs. (FOI: Learning Process).	
3.	Throughout	From previous ARAC report: Add teaching techniques that can be used in the aircraft to address common student errors as identified in the Authorized Instructor ACS -- comparable to the information that is now found in FAA-H-8083-4. Including information in this 8083-9 will increase value and reduce workload for maintaining separate publications.	
4.	Throughout	From previous ARAC report: Incorporate information from Helicopter Instructor's Handbook (FAA-H-8083-4) and cancel this separate document; 2 books are not necessary.	

Chapter 1

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
1.	P1-3¶4	"Consider Derek's dilemma" should reference the caption on p1-1	The casual reader may not read the blurb on p1-1 and consequently totally miss the reference
2.	P1-3¶4 last sentence	Poor example as it does not apply to pre-flight	
3.	P1-4¶2-Security	A CFI must be aware of his student's fear of certain flight regions and ease a student into those situations carefully.	



Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
4.	P1-6¶3-Defense Mech	Why not use stalls? It applies to a much wider % of pilots' understanding	
5.	P1-7¶3-Denial	"For example" should use the same example for all defense mechanisms: Compensation, Projection, Rationalization, etc.	
6.	P1-3¶4	"Consider Derek's dilemma" should reference the caption on p1-1	The casual reader may not read the blurb on p1-1 and consequently totally miss the reference
7.	P1-3¶4 last sentence	Poor example as it does not apply to pre-flight	
8.	P1-4¶2-Security	A CFI must be aware of his student's fear of certain flight regions and ease a student into those situations carefully.	
9.	P1-6¶3-Defense Mech	Why not use stalls? It applies to a much wider % of pilots' understanding	
10.	P1-7¶3-Denial	"For example" should use the same example for all defense mechanisms: Compensation, Projection, Rationalization, etc.	

Chapter 2

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
1.	Page 2-1	Delete: Practical Test Insert: Airmen Certification	Align with ACS wording
2.	Page 2-1	Delete: PTS Insert: ACS	Align with ACS wording
3.	Page 2-3	Delete: Early	Omit comments that make theories sound old and that are not pertinent to theory
4.	Page 2-3 Figure 2-2	Comment: Use an up to date picture that summarizes different theories	
5.	Page 2-3	Delete: Over the past century	Omit comments that make theories sound old and that are not pertinent to theory
6.	Page 2-3	Delete: increasingly large amount of	Reduce wordiness, and increase clarity
7.	Page 2-3	Delete: is a school of psychology that	Reduce wordiness, and increase clarity

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
8.	Page 2-3	Delete: in a 1910 book designed for teachers.	Omit comments that make theories sound old and that are not pertinent to theory
9.	Page 2-3	Delete: than no reinforcement or punishment	Reduce wordiness, and increase clarity
10.	Page 2-3	Delete: Although the popular therapeutic system of behavior modification has emerged from this theory; Insert: Today,	Reduce wordiness, and increase clarity
11.	Page 2-4	Insert: This is the basis of the organizing a lesson methods discussed in Chapter 4.	Relate material to practical material later in book
12.	Page 2-4	Insert: later in this chapter	Relate material to practical material later in book
13.	Page 2-4	Delete: can be traced to the eighteenth century. This theory	Omit comments that make theories sound old and that are not pertinent to theory
14.	Page 2-4	Delete: In the mid-1900s,	Omit comments that make theories sound old and that are not pertinent to theory
15.	Page 2-4	Insert: later in this chapter	Relate material to practical material later in book
16.	Page 2-4	Insert: , and social learning.	The current edition does not include a discussion of social learning. This may need to wait until the complete rewrite of the AIH
17.	Page 2-4	Insert: Constructivism is the basis for several of the training delivery methods covered in Chapter 4.	Relate material to practical material later in book
18.	Page 2-5 Figure 2-4	Comment: Simplify this figure to just the star in the center with the 5 key words	Figure is too complicated
19.	Page 2-5	Delete: categories Insert: levels	Consistent word usage
20.	Page 2-6	Insert: create an SBT lesson, refer to Chapter 4, and for how to	Relate material to practical material later in book
21.	Page 2-7	Insert: an unfavorable	Grammar and clarity
22.	Page 2-7	Insert: adversely	clarity
23.	Page 2-7	Delete: unfavorably	grammar
24.	Page 2-7	Delete: s	Change text about learning stalls to learning 'stall recovery'

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
25.	Page 2-7	Insert: recovery	Change text about learning stalls to learning 'stall recovery'
26.	Page 2-7	Delete: s	Change text about learning stalls to learning 'stall recovery'
27.	Page 2-7	Insert: recovery	Change text about learning stalls to learning 'stall recovery'
28.	Page 2-10	Insert: , or schematic,	clarify
29.	Page 2-11	Delete: : Insert: whether it is	Improve composition and make description an example rather than all inclusive
30.	Page 2-11	Delete: , Insert: or	Improve composition and make description an example rather than all inclusive
31.	Page 2-11	Insert: or on a	Improve composition and make description an example rather than all inclusive
32.	Page 2-12	Delete: The group effort to classify the levels of thinking behaviors thought to be important in the processes of learning mentioned earlier in the chapter led to Bloom's Taxonomy of	Reduce wordiness, and increase clarity
33.	Page 2-12	Delete: . Insert: is	Reword after delete wordiness
34.	Page 2-12	Delete: , Insert: .	Reword after delete wordiness
35.	Page 2-12	Insert: , or levels,	Reword after delete wordiness
36.	Page 2-14	Delete: thinking skills instructional	Reduce wordiness, and increase clarity
37.	Page 2-14	Insert: of the cognitive domain	clarity
38.	Page 2-14	Delete: or Insert: the	clarity
39.	Page 2-14	Insert: s	grammar
40.	Page 2-14	Comment on 'the graph': what graph? This sentence seems to refer to the table in Figure 2-9	
41.	Page 2-14	Delete: the graph Insert: Figure 2-9	Based on comment #40.
42.	Page 2-14	Insert: (Figure 2-9)	Based on comment #40.
43.	Page 2-15	Delete: PTS Insert: ACS	Align with ACS wording

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
44.	Page 2-15	Comment: the levels in the next paragraphs don't match the level of the physical domain just introduced. Need to clarify if this is a different model or if the psychomotor levels are being grouped with different, more practical terms.	
45.	Page 2-17	Insert: actually	Add emphasis
46.	Page 2-17	Delete: them Insert: an aircraft	clarity
47.	Page 2-17	Delete: c Insert: C	consistency
48.	Page 2-17	Delete: c Insert: C	consistency
49.	Page 2-18	Insert:)	Fit typo
50.	Page 2-19	Delete: transparencies Insert: presentations	Update wording
51.	Page 2-27	Insert: , two-seat	Improve composition
52.	Page 2-29	Delete: c Insert: C	consistency
1.	Page 2-29, Motivation	From previous ARAC report: Move Motivation covered in Chapter 2 to Chapter 1 where motivation is first discussed.	
2.	Page 2-31	Delete: PTS Insert: ACS	Align with ACS wording
3.	Page 2-31	Delete: PTS Insert: ACS	Align with ACS wording
4.	Page 2-31	Delete: PTS Insert: ACS	Align with ACS wording
5.	Page 2-31	Delete: PTS Insert: ACS	Align with ACS wording

Chapter 3

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
1.	p. 3-2, para. 1	3d sentence: replace “While” with “Although”	usage
2.	p. 3-2, para. 1	1. Move last sentence to follow 3d sentence 2. Add the following after the new 4th sentence (that was the last sentence before moving it): “Each instructor and learner may have a unique communication style, and bridging the gap between these styles is an important aspect of providing instruction.”	1. flow 2. emphasis of point
3.	p. 3-2, para. 5 (that begins “First, their ability . . .”)	1. After “not possible” add “to achieve” 2. Delete last sentence	1. clarity 2. surplussage
4.	p. 3-2, para. 7 (that begins, “Third, communicators . . .”)	Current: Communicators must constantly strive to have the most current and interesting information possible. In this way, the receiver’s interest can be held. Out-of-date information causes the instructor to lose credibility in the eyes of the receiver. Use of monotonous or uninteresting information runs the risk of losing the receiver’s attention. Revised: Communicators must constantly strive to convey the most current and interesting information available. Doing so holds the receiver’s interest. Out-of-date information causes the instructor to lose credibility, and uninteresting information may cause the receiver’s attention to be lost.	Streamline language

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
5.	p. 3-3, first full para.	Delete "either"	surplussage
6.	p. 3-3, 2d full para.	<p>Current:</p> <p>Most frequently, communicators select the channels of hearing and seeing. For motor skills, the sense of touch is added as the student practices the skill.</p> <p>Revised:</p> <p>Instructors commonly rely on the hearing and seeing channels of communication. However, using all channels may improve the learning process. For teaching motor skills, the sense of touch, or kinesthetic learning, is added as the student practices the skill.</p>	clarity
7.	p. 3-3, 3d full para.	<p>Current:</p> <p>The feedback an instructor is getting from a student need to be constantly monitored in order to modify the symbols, as required, to optimize communication.</p> <p>Revised:</p> <p>An instructor should constantly monitor feedback from the learner in order to identify misunderstandings and tailor the presentation of information to the receiver. Periodically asking the learner to explain her understanding of new information while it is being conveyed is one way to obtain such feedback. The instructor may then modify the symbols he or she uses, as</p>	clarity and make more usable

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
		appropriate, to optimize communication.	
8.	p. 3-4, 4th para. (that begins "Instructors in aviation . . .")	Move entire 4th para. to the 7th para. after the 2d sentence ("What the student knows . . .")	logical flow of ideas
9.	p. 3-4, 7th para ("Third . . .")	Move last sentence ("It is essential to understand . . .") to the 8th para. ("The nature of language . . ."), so that it becomes the first sentence of that para.	logical flow of ideas
10.	p. 3-5, Fig. 3-3	1. Title is misspelled Current: "Cummunication Barriers" Revised: "Communication Barriers" 2. Image is not very clear; the text below the hurdles is hard to read, it should be clearer	1. oops 2. clarity
11.	p. 3-6, 2d para., through p. 3-7	Suggest not using the term "interference" and substituting it with something else, such as "External Factors"	The use of the term "interference" in this section is problematic because the term has a common usage in psychology with respect to learning that is different than the way it is used here. Note that the term "interference" in Fig. 3-3 would also have to be replaced
12.	p. 3-6, 2d para.	Current: Some barriers to effective communication can be controlled by the instructor. Interference, or the prevention of a process or activity from being carried out properly, is composed of factors outside the control of the instructor These factors include physiological, environmental, and psychological interference. To	See comment above; this is an example of how the discussion can be reworded without using the term "interference"

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
		<p>communicate effectively, the instructor should consider the effects of these factors.</p> <p>Revised:</p> <p>Some barriers to effective communication can be controlled by the instructor. Others are external factors outside of the instructor's control that prevent a process or activity from being carried out properly. These factors may include physiological, environmental, and psychological elements. To communicate effectively, the instructor should consider the effects of these factors and mitigate them where possible.</p>	
13.	p. 3-6, 3d para., 1st sentence	Replace "problem" with "condition"	Less pejorative
14.	p. 3-7, 3d para., 3d sentence	Delete "the" in "during the training"	Flow of language
15.	p. 3-7, 8th para.	Replace reference to PTS with ACS	
16.			

Chapter 4

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
1.	P4-2 ¶16	<p>Delete:</p> <p>Current: "The willingness to look for ways to match student learning styles to personal instructional style is another element of effective instruction. "</p>	Recent research is calling into question the efficacy of "Learning Style Assessment" as ineffectual. If that is ineffectual, the instructor has no means of matching the learner's learning style (if, indeed, there is any).

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
2.	P4-3 ¶1	<p>Current: Networking with and observing other instructors to learn new strategies is also helpful</p> <p>Insert highlighted: Networking with and observing other instructors and seeking mentoring from an experienced instructor to learn new strategies is also helpful</p>	Mentoring is another method of connecting with experience to pass on knowledge.
3.	P4-3 ¶ 2	Re: Human Behavior, the average age of aviation students is 34 years old	I think the age may be skewing younger. A current figure from FAA data should be secured
4.	P4-4 ¶ 2	<p>Change: In addition, the Certificated Flight Instructor (CFI)</p> <p>To: In addition, the Authorized Instructor</p>	Since this applies to Sport Pilot and LSA training, CFI isn't inclusive
5.	P4-4 ¶ 10	Delete: Normally	Strengthen the point of the paragraph
6.	P4-5 ¶ Fig 4-3	<p>Edit Figure 4-3 to read:</p> <p>Lesson 1 Obtain Weather Briefing</p> <p>Objective: To develop learner's skill in obtaining a weather briefing</p> <p>Elements:</p> <ul style="list-style-type: none"> • Observe wind and weather conditions from the Weather Channel, radio and/or visually • Call Flight Service for a live weather briefing • Obtain a weather briefing from an approved online source • Discuss the ramifications of the weather conditions on VFR flight 	The text says: "generally contains a description of each lesson . . . [Figure 4-3] but figure 4-3 includes 2 lessons – Flight Planning and Weather Briefing presented as a single lesson. I suggest this one, but any single lesson would work.

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
		<p>Equipment:</p> <ul style="list-style-type: none"> • Weather information form • Sectional chart <p>Instructor's Action:</p> <ul style="list-style-type: none"> • Discuss lesson • Demonstrate obtaining weather information from Flight Service • Demonstrate obtaining weather information from an approved online resource • Discuss briefing with learner • Observe and review learner's briefing <p>Learner's Action:</p> <ul style="list-style-type: none"> • Obtain weather briefing from Flight Service • Obtain weather briefing from approved • Discus with instructor the ramifications of the weather for a VFR flight <p>Completion Standards:</p> <ul style="list-style-type: none"> • Demonstrates ability to obtain complete briefing from Flight Service and correlates this Information with observed weather conditions • Demonstrates ability to evaluate and discuss the effects of weather and NOTAMs obtained with respect to the Go/No Go decision 	
7.	P4-6 ¶ 4 and 5	Multiple occurrences of "PTS". Replace PTS with ACS	Update reference name to ACS

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
8.	P4-6 ¶ Fig. 4-5	Example covers of Practical Test Standards books	Replace images in Fig 4-5 with ACS volumes and Change the caption to Airman Certification Standards
9.	P4-7 ¶2 and 3	Multiple occurrences of “PTS” .	Update reference name to ACS
10.	P4-7 ¶4	If Scenario Based Training (SBT) hasn't been bold headlined previously in the book, it should be at the beginning of this paragraph: Scenario Based Training (SBT)	If this recommendation is adopted, the parenthetical (SBT) in the 1 st para should drop the (SBT); “. . .lead to the adoption of scenario-based training. . .” Should be dropped
11.	P4-7 ¶4	Change: “flight maneuvers and not artificial maneuvers designed only for the test” To read: “flight maneuvers and not artificial maneuvers designed only for teaching that maneuver”	I think the AIH has it backwards – the training was developed then the “how do we test it was derived from that. For the most part we trained maneuvers, not the integration of that skill into practical flight applications.
12.	P4-7 ¶8	“Experienced CFIs have been. . .” Replace CFIs with “Instructors	This handbook now applies to a broader range of instructor categories than Certificate Flight Instructors
13.	P4-9 ¶8	Change “For example, basic map reading is a perishable skill” To “For example, basic chart reading is a perishable skill”	Terminology in aviation is chart, not map.
14.	P4-9 ¶8	Change: “to be aware of there surrounding” To: “to be aware of their surrounding”	Wrong word. Right one is “their”
15.	P4-17 ¶4	Current: Mark’s closest friends bought him a ticket for a playoff game at their alma	Since the scenario is developed in what appears to be Private Pilot training, perhaps we

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
		mater and they paid him to rent an airplane Replace with: Mark and his college fraternity brothers bought tickets for a playoff game at their alma mater. Mark volunteered to fly all of them to the game in an airplane he rented.	shouldn't include a major FAR violation that is not part of the learning objective of the discussion.
16.	P4-18 ¶4	Delete: <i>"Predictions are that more and more learning will take place via e-learning"</i>	By now, I think everyone is well aware that pretty much "e-Anything" is well established.
17.	CONTINUE TO NEXT PAGE Item 19		
18.	CONTINUE TO NEXT PAGE Item 19	I skipped to next page so it would all fit one page.	
19.	P4-18 ¶5 (1 st para top right of page)	Change: "Fixed-base operators (FBOs) who offer instrument training may use personal computer-based aviation training devices (PCATDs) or flight training devices (FTDs) for a portion of the instrument time a pilot needs for the instrument rating" " With: "Flight Schools of all types may offer training using a variety of computer-based desk top Basic Aviation Training Devices (BATDs), stand-alone, personal computer based advanced aviation training devices (AATDs) and even more advance Flight Training Devices (FTDs) for a portion of the time a pilot needs for various certificates and ratings"	To broaden from FBOs to all kinds of flight schools; to use current names of these devices (AFS-800 might want to weigh in on how this is stated); and to expand the training from "instrument" to flight training as they can be used for some primary training as well. Consider my comment a placeholder for the need to use current language) Ref: AC 61.136A
20.	P 4-29	Test Preparation Material: rewrite to reflect purpose of commercially-available test preparation materials. Existing content is derogatory to	

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
		commercial publishers without acknowledging the deficits of the FAA Knowledge Exam (training and testing was not correlated, so applicants needed to prepare for the test to be successful; i.e. training to be a successful pilot did not ensure they would be successful on the FAA Knowledge Exam). This section should be completely rewritten to reflect the FAA goals for the FAA Knowledge Exam (ensure airman knowledge as defined by the ACS) and purpose of commercially available test preparation material (to familiarize applicants with the scope and breadth of the test as it correlates to their training experience).	

Chapter 5

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
1.	Throughout	“student” / “pilot in training” or “learning pilot” or “learner”	<p>The pilot-in-training audience often involves mid-career, highly successful individuals for whom the title “student” might seem demeaning.</p> <p>Kochan Responds to this recommendation: Chapter 5 - If we change the term from student (which I do not find demeaning as I will always be a student of aviation), then will we issue “Learner’s Certificates” instead of Student Pilot Certificates? Whatever term the FAA chooses to use should be consistent. Too bad about those “mid-career, highly successful individuals for whom the title ‘student’ might seem demeaning” as offered in the</p>

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
			comments. "Learner" might be an option as it is the norm in academia today. But, that term might be offensive to some, too
2.	Throughout	Pedagogical terms such as "rubric" and "criterion"	Non-common use pedagogical terms are not particularly helpful to a flight instructor applicant who is not writing a master's thesis or doctoral dissertation in education theory. They only provide irrelevant fodder for knowledge test writers.
3.	5-2 Assessment Terminology, 2 nd & 3 rd pp	Use of "Traditional" and "Authentic" for broad categories of assessment / "Knowledge" and "Skill"	"Authentic" implies that the other (Traditional) is not authentic. "Knowledge" assessment will cover rote and understanding and "Skill" assessment will cover application and correlation.
4.	5-2 Assessment Terminology, 2 nd pp, last sentence	Consequently, the traditional assessment is more likely to be used to judge, or evaluate, the student's progress at the rote and understanding levels of learning. / Consequently, the knowledge assessment will more often be used to assess, the learner's progress at the rote and understanding levels of learning, but when carefully crafted scenario questions are employed, they can assess higher levels of learning.	Replace "Traditional" with "Knowledge" and "Authentic" with "Skill". Encourage use of scenarios in FAA Knowledge tests to go beyond the rote and understanding levels on knowledge tests. Currently many of the FAA knowledge test questions require analysis of information, calculation, and application of principles.
5.	5-2 Assessment Terminology, 4 th pp	"rubric" / "assessment guide"	First thought is that an example needs to be included when the term "rubric" is introduced. Second thought is to eliminate "rubric" and replace it with something everyone

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
			understands without having to Google it.
6.	5-5 Characteristics of a Good Written Assessment, Discrimination	<p>Discrimination is the degree to which a test distinguishes the difference between students. In classroom evaluation, a test must measure small differences in achievement in relation to the objectives of the course. A test constructed to identify the difference in the achievement of students has three features:</p> <ul style="list-style-type: none"> • A wide range of scores • All levels of difficulty • Items that distinguish between students with differing levels of achievement of the course objectives/ <p>/ Discrimination is the degree to which a test distinguishes the difference between students which may be appropriate for assessment of academic achievement. However, minimum standards are far more important in assessments leading to pilot certification. If necessary for classroom evaluation of academic achievement, a test must measure small differences in achievement in relation to the objectives of the course.</p> <ul style="list-style-type: none"> • A wide range of scores • All levels of difficulty • Items that distinguish between students with differing levels of achievement of the course objectives 	<p>Small differences between students is not important in pilot certification. Measurement of each individual learner against the specified certification standards is absolute.</p>
7.	5-5, Authentic Assessment, last sentence	HOTS / remove	Use of pedagogical acronyms like HOTS implies that it's important for a flight instructor to memorize and is fodder for knowledge test writers. The concept is important but

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
			knowing the irrelevant acronym is not.
8.	5-5, Collaborative Assessment title	Collaborative Assessment / Learner Centered Assessment	Make consistent with existing term of Learner Centered Grading.

Chapter 6

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
1.	6-5, How to Use a Training Syllabus, 6 th pp under this heading, sentences 1 & 2.	The flight training syllabus should include special emphasis item that have been determined to be cause factors in aircraft accidents or incidents. For example, the instructor should emphasize collision and wake turbulence avoidance procedures throughout a student's flight training... / The flight training syllabus should include Risk Management instruction unique to each stage, phase, or training element to help the learner identify the risks involved and employ strategies to mitigate them. Throughout out the learner's training scenarios should include increasingly more subtle risks so that the learner becomes more skilled in identifying them and able to develop effective mitigation strategies.	"Special Emphasis" relates to the PTS Special Emphasis section that will be eliminated and those items incorporated into the tasks as appropriate in the ACS (Airmen Certification Standards). Risk Management should be addressed here.
2.	6-9, Scenario-Based Training (SBT), 1 st pp, 2 nd and 3 rd sentences	The goal of SBT is to challenge the student or transitioning pilot with a variety of flight scenarios to improve decision-making skills. These scenarios require the pilot to manage the resources available in the flight deck, exercise sound judgment, and make timely decisions. / The goal of SBT is to challenge the student or transitioning pilot with a variety of flight scenarios to	Risk management terminology to replace judgment .

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		improve risk management skills. These scenarios require the pilot to manage the resources available in the flight deck for risk identification, development of mitigation strategies and employment with sound timely decisions.	
3.	6-9, Scenario-Based Training (SBT), 3 rd pp, 1 st sentence	"...the recent emphasis on SBT..." / "...the current emphasis on SBT..."	No longer "recent".
4.	6-9, Scenario-Based Training (SBT), 3 rd & 4 th pp,	"advanced avionics"	Is this the nom du jour?

Chapter 7

1.	--	--	Generally, I think Chapter 1 is well written
2.	P7-1	The 3 boxes should not overlap as some important information is lost	
3.	P7-1 Special Emphasis Areas	Stall and Spin awareness is ALWAYS appropriate	Remove "(if appropriate)"
4.	P7-1 Responsibilities of All Aviation Instructors	Demanding Adequate should be Demanding Appropriate	This is a higher standard
5.	P7-2¶1-Av Instr Resp	The job of an av instructor is to teach should be "The job of an av instructor is to transfer knowledge"	Transferring knowledge better suggests that the instructor is responsible for understanding what knowledge the student acquires.
6.	P7-2¶4-Helping Students Learn	Last ¶: "uneasiness on the part of the student" should be "on the part of the student and the instructor."	Unfortunately, instructors frequently do not know the objective of the lesson.
7.	P7-2¶5-Providing Adequate Instruction	"No two students are alike, and a particular method of instruction cannot be equally effective for all students" should read "No two students are alike, and a particular	It can but usually will not be.

		method of instruction may not be equally effective for all students”	
8.	P7-2¶5-Providing Adequate Instruction	Last line of column: “is prepared” to “should be prepared”	
9.	P7-2¶5-Providing Adequate Instruction	is prepared to change his or her methods of instruction as the student advances through successive stages of training. Change to “should be prepared to change his or her methods of instruction to meet that student’s particular learning style as well as when that student progresses through successive stages of training.	Should be defines what an instructor should be ready to accomplish and frequently is not what an instructor “is”. An instructor must change his teaching styles to adapt to the student’s learning style, not the other way around.
10	P7-2¶last one on page	“an instructor can meet this responsibility through a careful analysis of and continuing interest in students” should read “As discussed in chapters 1 and 2, an instructor can meet this responsibility by becoming familiar and conversant in the fundamentals of instructing and through a careful analysis of and continuing interest in students”	To include FOI
11	P7-3¶1 st one on page	“Most new instructors tend to adopt the teaching methods used by their own instructors.” Change to “Most new instructors tend to adopt the teaching methods used by their own instructors or the methods by which they themselves best learn.”	Stating what research has suggested.
12	P7-3¶2 – Standards of Performance	“An aviation instructor is responsible for training an applicant to acceptable standards” change to “An aviation instructor is responsible for training an applicant to established standards”	Better choice of words
13	P7-3¶2 – Standards of Performance	REMOVE: When teaching a particular procedure, an instructor might be tempted to point out the consequences of doing it differently, perhaps telling the student that failure to perform the procedure as taught will court disaster. The instructor may believe this “consequence approach” is necessary to ensure the student	Why emphasize the negative just prior to a paragraph “ Emphasizing the Positive ”?

		commits the procedure to memory, but the stated reasons for performing the procedure a certain way must contribute to the learning situation to be effective.	
14	P7-3¶6 – Emphasizing the Positive	“Consider how the following scenarios conducted during the first lesson might influence and impress a new student pilot who has limited or no aviation experience:” change to “Consider how the following negative scenarios conducted during the first lesson might adversely influence and turn off a new student pilot who has limited or no aviation experience:”	More clearly defines improper procedures.
15	P7-4¶3 – Emphasizing the Positive	“In essence, a student’s failure to perform is viewed as an instructor’s inability to transfer the information. Otherwise, the instructor fails to consider himself or herself as part of a broken learning chain. Emphasize the positive because positive instruction results in positive learning.” change to “In essence, a student’s failure to perform can be viewed as an instructor’s inability to transfer the required information. In not doing so , the instructor fails to consider himself or herself as part of a broken learning chain. Emphasize the positive because positive instruction results in positive learning.”	More clearly defines an instructor’s responsibilities and consequences for not satisfying those
16	P7-5¶4 – Flight Instructor Responsibilities	“Flight instructors must provide the most comprehensive ground and flight instruction possible.” change to “Flight instructors must provide the most comprehensive ground and flight instruction to meet established standards. ”	Most comprehensive possible would result in never getting to a checkride.
17	P7-5¶4 – line 4	“encouraging” change to “and encourage”	
18	P7-5¶2 – Flight Instructor Responsibilities	“Flight instructors have the responsibility of producing the safest pilots possible with the overall focus on education and learning. It is also	Better flow; clearer meaning

		important to convey an understanding of why pilots are trained to standards and how they are set.” change to “Flight instructors have the added responsibility of producing the safest safe pilots possible with the overall focus on safety , education and learning. It is also important to convey provide an understanding of why pilots are trained to standards and how they these standards are set.”	
19.	P7-5¶13 – Flight Instructor Responsibilities	REMOVE: Instructors should not introduce the minimum acceptable standards for passing the check ride when introducing lesson tasks. The minimum standards to pass the check ride should be introduced during the “3 hours of preparation” for the check ride. Keep the PTS in the proper perspective, with emphasis on the Practical Test Standard (PTS) increasing later in the training.	PTS is on the way out
20	P7-5¶16 – Physiological Obstacles for Flight Students	“These negative sensations can usually be overcome by understanding the nature of their causes. Remember, a sick student does not learn well.” change to “These negative sensations can usually be overcome by understanding the nature of their causes. Remember, a sick student does not learn well is preoccupied and may not have the mental or physical capacity to learn. ”	Who is to say a sick student does not learn well?
21	P7-5¶18 – Ensuring Student Skill Set	“The instructor determines when a student is ready for his or her first solo flight.” change to “The decision to determine when a student is ready for his or her first solo flight should be a joint decision between student and instructor.”	The decision to solo should be a joint decision
22	P7-5¶19– Ensuring Student Skill Set Last ¶ on page	Will this remain in ACS; I think not.	
23	P7-6 – Safety Practices and	REMOVE: new from “the new FAA Safety Team	It’s not new anymore.

	Accident Prevention		
24	P7-6 - Professionalism	ADD: the Society of Aviation and Flight Educators (SAFE)	It's new.
25	P7-8 – knowledge Test	ADD a comma: When preparing a student or applicant for the private pilot certification or higher grade rating (i.e., commercial or instrument), a test is required to ensure the student has adequate aeronautical knowledge in those subject areas listed in 14 CFR part 61.	
26	P7- 10 – Government – 1 st line on page	As mentioned earlier in the chapter,	I don't believe this is true; I could not find a reference.
27	P7- 11 – 1 st full paragraph	“Most of these publications” change to “Many of these publications”	Times, they are a changing
28	P7- 11 – Electronic Sources	REMOVE first two paragraphs and ADD: Access to the Internet via personal computers, tablets, and smartphones has opened up a vast storehouse of information for the aviation instructor at the FAA website, www.FAA.gov and many, many other websites and apps.	Times, they are a changing, FAST!

Chapter 8

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
17.	8-2	“...and by participation in pilot and flight instructor clinics, including the FAASTeam/SAFE quarterly series of Flight Instructor Open Forums. ”	This ongoing series of quarterly presentations is not promoted well enough. All instructors should be encouraged to participate.
18.	8-3	“...conduct stabilized approaches, maintain desired airspeed on final, emphasize the importance of an aim point on final, i.e. “on spot, on speed,... ”	I am amazed at the amount of pilots that I fly with that have no understanding of the importance of an aim point on final
19.	8-3	“The minimum standards to pass the checkride should not be introduced until the 3 hours of preparation for the checkride.” Delete this sentence.	This sentence intimates that minimum standards are acceptable. In my book they are not! We should always

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			strive for the highest standard possible, and encourage all pilots-in-training to do so as well!
20.	8-4	Rough air, heat , and unexpected abrupt maneuvers tend to increase the chances of airsickness.	High cockpit temperatures can be a major contributor to airsickness. (Ask me how I know...)
21.	8-4	The deficiencies listed below are apparent to others before the individual notices any physical signs of fatigue. CFIs need to be cognizant of these symptoms in themselves as well as in their clients.	An element of risk management for the CFI is the ability to recognize and mitigate those physiological symptoms that could lead to a degradation of the CFIs situational awareness. Much of this section is describing the conditions a CFI needs to be aware of in their clients. It is just as important that they recognize them in themselves.
22.	8-5	The first noticeable effect of dehydration, for some , is fatigue, for others it is irritability , which in turn makes top physical and mental performance difficult, if not impossible.	For me, personally, the first sign of dehydration is irritability with my client. This irritability will make me a less effective instructor. There will be times in a CFIs daily schedule when maintaining proper hydration will be difficult. It is important for CFIs to understand the importance of proper hydration for themselves as well as for their clients. This is another part of situational awareness related to risk management for the CFI
23.	8-6	Students Clients need to know not only what they will learn, but also how they will learn it—that is, how the lesson will proceed and how they will be evaluated, as well as WHY they are learning it.	If the client doesn't understand the "why" of why they are being taught their knowledge might never rise above the rote level.

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		Learning the “why” of a skill leads more quickly to a correlative level of knowledge.	
24.	8-6	<p>Student Performance and Instructor Supervision Phases (insert the following paragraph between paragraphs 2 and 3 of this section. Risk management for the instructor during the demonstration/performance phases of flight training is critical. The instructor has to be prepared to intervene, as necessary, in order to maintain safety of flight, however early or premature intervention will not allow the pilot-in-training to learn to recover from an upset on their own. Instructors must maintain awareness of the dynamic state of the aircraft and not allow the PIT to exceed any published structural or operational limits as well as airspeeds, altitudes and attitudes that are inappropriate and hazardous.</p>	AI.FOI.G.S4g,h
25.	8-7	<p>“...and describe any other pertinent factors that may apply. The instructor should describe the many proprioceptive inputs they are receiving and how they use these to make corrections to control inputs. These inputs include sight (not only what they are looking at, but what they are seeing), sound (the changes in engine sound, airflow over the cockpit, aural stall warnings, etc.) and feel through hands, feet and torso.</p>	<p>If an instructor can describe the proprioceptive and meta-cognitive inputs they are receiving it will give the pilot-in-training a much deeper understanding of all the inputs they can use to successfully conduct a maneuver. So often and instructor might say “I’m looking out the window” but they fail to say what they are looking at, nor how they interpret what they see to correlate with their control input.</p>
26.	8-7	<ul style="list-style-type: none"> • Use outside visual references and monitor the flight instruments: “First I’m clearing the area, looking for traffic. Now as I roll into the turn I am looking at the relationship between the propeller and 	<p>This at least gives an example of a thorough description of the inputs that a pilot might use to fly a constant altitude turn.</p>

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		the horizon. As the bank steepens I am having to add back pressure to the yoke to maintain that relationship. Now I'm looking at the altimeter to confirm that I am maintaining my altitude, and the airspeed indicator to confirm that I am maintaining my airspeed. If my airspeed is decaying I will add a little bit of power, using my hearing to adjust the power while still looking out the window to ensure the pitch attitude is still correct..."	
27.	8-8	<p>When the desired angle of bank is reached, neutralize the ailerons. and trim as appropriate.</p> <ul style="list-style-type: none"> • Lead the roll-out by approximately one-half the number of degrees of the angle of bank. Use coordinated aileron and rudder control pressures. Simultaneously begin releasing the back pressure so aileron, rudder, and elevator pressures are neutralized when the aircraft reaches the wings-level position. 	If the second paragraph is to be accurate "trim as appropriate needs to be deleted from the prior paragraph. If we had "trimmed as appropriate" there would be no back pressure to release. Furthermore, who would trim for bank angles less than 45° or more?
28.	8-8	Upon reaching a wings-level attitude, reduce power and trim to remove control pressures. if necessary.	There is not always a need to trim in a turn. The statement, as written makes the assumption that one has trimmed.
29.	8-9	Flight instructors should always guard the controls and be prepared to take control of the aircraft, however if the instructor continuously follows through on the controls, the pilot-in-training will never truly know if they were doing the flying. Thus, guarding the controls should not be interpreted as "always having the instructors hands and feet on the controls."	Too many inexperienced instructors do not have the confidence to allow their clients to fly the airplane unassisted.
30.	8-9	Flight instructors should not exceed their own ability to perceive a problem, decide upon a course of action, and physically react within their ability to fly the aircraft. They must ensure that the	AI.FOI.G.S4g,h

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		aircraft remains within any published structural or operational limits	
31.	8-9	Nonessential activities include such activities as eating, reading a newspaper, or chatting, or texting.	There has been at least one documented case of a fatal accident that occurred while the instructor was texting.
32.	8-9	It is important the flight instructor not only teach the concept of a sterile cockpit, but also model such behavior during flight instruction. The instructor must determine that fine line between conversation that is essential to teaching and flight safety, and conversation that is distractive.	Self-explanatory
33.	8-10	<ul style="list-style-type: none"> Ask the student to compute true airspeed with a flight computer. 	I suggest deleting this example as so many modern cockpits provide this information in the instrument display
34.	8-10	The early establishment of proper habits of instrument cross-check, instrument interpretation, and aircraft control, correlated with the view out the window, is highly useful to the student.	To re-enforce the concept of integration
35.	8-11	The use of integrated flight instruction provides the student with the ability to control an aircraft in flight for limited periods if outside references are lost. Conversely, if the pilot-in-training is able to correlate instrument indications with outside visual references they will be able to safely fly the airplane if/when any instruments fail.	Self-explanatory
36.	8-14 (alternatively this could be inserted after paragraph 5 of 8-15)	Insert the following between paragraph 5 and 6: 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	This to address those areas of Risk Management as defined in the AI ACS.

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		<p>a previously unknown risk by correlating evidence of non-specific or undefined hazards, assessing the risk, and applying appropriate mitigation strategies.</p> <p>Risk Management requirements for the Instructor are greater than those defined for a particular airman certificate or rating. The CFI must have:</p> <ul style="list-style-type: none"> • 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. <p>In addition to needing to be able to teach all the elements of ADM to pilots-in-training, instructors also need to be cognizant of the many areas of risk that they and their clients are exposed to during the course of flight instruction, along with mitigation strategies to combat those areas of threat. These include, but are not limited to:</p> <ul style="list-style-type: none"> • Maintaining active collision avoidance while simultaneously providing instruction • Maintaining a “sterile cockpit” at appropriate times. • Ensuring a positive exchange of flight controls. 	

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		<ul style="list-style-type: none"> • Maintaining awareness of the actions, cognitive state, and physiological state of the pilot in training. • Complacency regarding oversight of the pilot in training • Failure to monitor coordination of flight controls by the pilot in training. • Allowing instructional responsibilities to distract from situational awareness responsibilities. • Failure to intervene in a timely fashion to maintain safety of flight • Allowing instructional responsibilities to distract from situational awareness responsibilities. • Recognizing and mitigating pilot in training anxiety. • Failure to correct pilot in training “hazardous attitudes.” 	
37.	8-15	To determine if there is a change in the winds aloft forecast and to check recent pilot reports, she contacts Flight Watch AFSS (a flight service station).	Flight Watch has been discontinued
38.	8-15	To determine the severity of the problem, she calculates a new groundspeed and reassesses fuel requirements. In addition, she determines through flight service if the TAFs and FAs have changed, as an unforecast change in winds aloft might indicate a change in the entire forecast and might require a revised alternate.	One of the first indications of an unreliable forecast is winds and temps aloft that are not what were forecast.
39.	8-19	...instructors must be familiar with the components of each aircraft in which they instruct to ensure students understand the operation of the equipment. In addition it behooves the	It is a responsibility of the CFI to stay abreast of, and current with as many of the numerous “apps” that are

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		instructor to be familiar with any and all handheld equipment the client might use so as to be able to instruct the client in the most efficient use of the equipment as well as any potential shortcomings that the equipment might present.	proliferating the “tablet” environment.
40.	8-19	Other valuable flight deck resources include current aeronautical charts and publications, such as the Airport/Facility Directory (A/FD) Even if accessed through a tablet “app”. It is also important for the instructor to stress the importance of current databases in all installed navigational equipment.	It is not uncommon for me to have an applicant show up for a practical test with an installed GPS that has a database that might be more than one year out of currency.
41.	8-19	AFSS can provide updates on weather, answer questions about airport conditions. and may offer direction-finding assistance.	DF steers are almost as archaic as radio ranges.
42.	8-19	by encouraging them to take advantage of services, such as flight following and Flight Watch.	Flight Watch is joining the list of dinosaurs
43.	8-20	Effective workload management ensures that essential operations are accomplished by planning, prioritizing, and sequencing tasks to avoid work overload. A pilot always needs to be able to answer the questions: Where am I? What do I have to do next? How will I achieve it?	Just offering a simple way of explaining a complex concept.
44.	8-20	As workload increases, attention cannot be devoted to several tasks at one time, and the pilot may begin to focus fixate on one item	Makes the statement a little stronger

Chapter 9

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
1.	p. 9-2, para. 7	Current:	Reflects reorganization of material (incorporation of

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
		<p>The principles of risk management and the tools for teaching risk management in the flight training environment are addressed in Chapter 8, Techniques of Flight Instruction.</p> <p>Revised:</p> <p>The principles of risk management and the tools for teaching risk management in the flight training environment are also discussed.</p>	elements from Ch. 8 into Ch. 9)
2.	p. 9-3, 5th full para. ("Risk management is . . .")	<ol style="list-style-type: none"> 1. Replace "simple" with "systematic" 2. Replace "which" with "that" 	Usage
3.	p. 9-3, 6th full para ("A hazard is defined . . .")	<p>In second sentence, change "risks" to "hazards"</p> <p>Add new last sentence:</p> <p>An example of a hazard is line of thunderstorms.</p>	Add concrete examples to flesh out text.
4.	p. 9-3, 7th full para. ("The assessment step . . .")	<p>Add:</p> <p>For example, flying through or in the vicinity of thunderstorms is known to present a heightened risk of severe adverse consequences such as loss of control or an in flight break up.</p>	Add concrete examples to flesh out text.
5.	p. 9-3, 9th full para. ("Effective control measures . . .")	<p>Add:</p> <p>For example, if preflight planning reveals thunderstorms forecast along the proposed route of flight, the pilot could revise the route to give the weather system a wide berth, or decide to stay on the ground until the hazard has passed.</p>	Add concrete examples to flesh out text.

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6.	p. 9-4, after fourth bullet of third full para.	<p>Add the following new, non-bulleted paragraph:</p> <p>These general principles apply to a variety of activities. In aviation, each person involved in the operation of a flight has a duty to apply risk management principles to their activities. Providing flight instruction involves specialized risk management considerations. A flight instructor must effectively teach risk management principles and their practical application. In addition, in order to ensure safe outcomes, a flight instructor must also proactively apply risk management principles while simultaneously providing instruction.</p>	Begin to focus the material on practical application to flight instruction.
7.	p. 9-4, before the heading "Level of Risk"	Add new heading: "Identifying Hazards"	Will add new text below to this heading to address this important topic. Parallels the order in which the material is introduced above.
8.	p. 9-4, below the new heading "Identifying Hazards"	<p>Add the following text from the RM Handbook (FAA-H 8083-2):</p> <p>On page 1-2, the first paragraph and 4 numbered examples below the heading "Recognizing the Hazard"</p>	This discussion fills a gap in the presentation of the material in the AI Handbook.
9.	p. 9-4, below the text added above	<p>Move the following discussion in the AI Handbook to this point:</p> <p>From page 9-6 through 9-8, all text in the discussion of the PAVE Checklist, including the subheading that starts the section.</p> <p>Also, revise the first sentence of the moved text so that it reads:</p>	"PAVE" should logically be discussed here.

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		<p>“The PAVE checklist is a useful tool for identifying hazards.”</p>	
10.	p. 9-4, below the text added above	<p>Move the following discussion in the AI Handbook to this point:</p> <p>On page 9-9, the discussion under “Hazard List for Aviation Technicians” plus that heading. Then, demote the heading to make it a subheading.</p>	Logical organization of material.
11.	p. 9-4, the heading “Level of Risk”	Delete this heading and replace it with “Assessing Risk.” Delete the subheading “Assessing Risk” as it appears below.	Logical organization of material.
12.	p. 9-5, immediately before the heading “Mitigating Risk”	<p>1. Add the discussion in the last paragraph on page 4-3 of the RM Handbook (“Although the matrix . . .”) plus the accompanying figure (figure 4-2 in the RM Handbook).</p> <p>2. After the insert in “1” above, add:</p> <p>Every flight has hazards and some level of risk associated with it. Figure _____ is an example of a Flight Risk Assessment Tool (FRAT) intended to help a pilot identify potential hazards and assess risks presented by a proposed flight. The FAA Safety Team has developed an example FRAT for general aviation pilots and has additional information about the use of such tools on its website.</p>	<p>1. Provides an example of a practical risk assessment matrix that could be used in the real world.</p> <p>2. Directs reader to the use of a FRAT, which corresponds to the example in the figure added.</p>
13.	p. 9-5, immediately prior to the heading “IMSAFE Checklist”	<p>Move the following discussion in the AI Handbook to this point:</p> <p>On page 9-9, the discussion under “Pilot Self-Assessment” plus that heading. Then,</p>	Logical organization of material.

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		demote the foregoing heading to make it a subheading.	
14.	p. 9-5, after the heading "IMSAFE Checklist"	Add the following text as the first sentence of the paragraph: The fitness of a pilot to complete a flight presents a potential hazard that must be assessed and addressed before and during each flight.	Helps transition and emphasizes the point.
15.	p. 9-8, immediately before the heading "Three-P Model for Pilots"	Move the following discussion in the AI Handbook to this point: The entire discussion of Aeronautical Decision Making from page 8-14 through page 8-21.	ADM is more logically presented in Chapter 9 than in Chapter 8. After a discussion of risk management principles, a discussion of ADM here sets up the discussion of the 3P model, which is presented in the text as a model for applying ADM to accomplish risk management. This reorganization also reflects the pairing of ADM and RM in the authorized instructor ACS.
16.	pp. 9-16 and 9-17	Replace "PTS" with "ACS"	
17.	p. 9-16, 1st full para. ("Advanced avionics . . .")	1. In the first sentence, replace "offers" with "offer" 2. Add to the end: The FAA Advanced Avionics Handbook (FAA-H-8083-6) contains information about advanced avionics systems that an instructor can use for his or her own study and as an instructional resource. When using such a resource with a learner, the instructor should emphasize that technical information in a general publication should not	The AA Handbook can be a useful resource

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		supplant information provided by the manufacturers of specific avionics systems.	
18.	p. 9-16, heading "Teaching Decision-Making Skills"	Revise heading to read: "Teaching Risk Management and Decision-Making Skills"	
19.	p. 9-16, after first para. under the heading "Teaching Risk Management and Decision-Making Skills"	<p>Add:</p> <p>Flight instructors must understand the importance of teaching risk management in flight training. Once a pilot leaves an instructor's supervision, the pilot will be responsible for making risk management decisions on their own. Therefore, it is essential that instructors provide training that prepares each learner to independently identify hazards, assess risk, and make sound decisions. Learners should be given opportunities to make decisions on their own. For example, if the preflight weather forecast is marginal, instead of cancelling a flight outright the instructor can ask the learner to evaluate whether the flight should be made. During training flights, instructors should look for opportunities to question learners about potential hazards and prompt them to apply decision making concepts.</p>	
20.	p. 9-16, the para. below the para. added above ("It is important to understand that . . .")	Revise first sentence to read: "Learning system safety in flight operations typically takes place in three phases."	
21.	p. 9-17, after 5th full para. ("Since the scenarios . . .")	Add:	Like other suggestions with respect to Chapter 9, this change is intended to make

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
		<p>When using scenarios in flight training, an instructor should leave sufficient time for a thorough debriefing after a flight takes place.</p> <p>It is also valuable for an instructor to develop scenarios that can be discussed with a learner on the ground. Instructors may develop a library of scenarios based on personal experience, NTSB accident reports, and other sources. Examples of discussion scenarios are contained in Appendix ____.</p>	<p>the AI Handbook more practical.</p> <p>To facilitate this change, add to an Appendix in the AI Handbook the contents of Appendix B to the RM Handbook, which contains examples of risk management discussion scenarios.</p>
22.	p. 9-17, the paragraph immediately prior to the heading “Assessing SRM Skills” (“Teaching decision-making . . .”)	<p>Replace PTS with ACS</p> <p>In the last sentence, replace “a component of the PTS’ with “a component of pilot evaluation.”</p>	
23.	p. 9-17, immediately prior to the heading “Assessing SRM Skills” (“Teaching decision-making . . .”)	<p>Add the following:</p> <p>The Airman Certification Standards being introduced by the FAA on a rolling basis are intended to form the foundation of an integrated and systematic approach to airman certification that emphasizes safety risk management in all aspects of flight operations. Pilots seeking a certificate or rating under the ACS will be evaluated, in part, on their risk management skills.</p>	Emphasize importance of RM in the ACS
24.	p. 9-18, immediately prior to the heading “Chapter Summary”	Insert new heading, “Risk Management in Flight Instruction” and text on Attachment A	Add source material to support instructional risk management concepts incorporated into the AI ACS

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
25.	Throughout	Chapter 9 should be completely rewritten (and reviewed) as it already looks like an addendum and a mishmash of models. It should also be moved to be Chapter 1. Then, the concept of Risk Management is covered and can be considered while the student (“flight instructor to be”) is learning about human behavior and all of the other topics in the publication.	Let’s move Risk Management to the prime location in the document!

Attachment A for Chapter 9

RISK MANAGEMENT IN FLIGHT INSTRUCTION

Risk management is a critical component of aviation safety. The flight instructor is involved with risk management on multiple levels. These levels include managing the risks of a particular phase of flight and also teaching risk management, both in the classroom and in the cockpit. In addition, flight instructors encounter risks while providing in-flight instruction that are not experienced by pilots during personal flight training or other operations. Therefore, instructors must at all times proactively manage the risks inherent in providing in-flight instruction.

Managing in-flight instructional risk involves the ability to recognize hazards and assess and mitigate risk while giving instruction to a pilot-in-training who is manipulating the controls. This skill requires the instructor to correctly decide when intervention is required to ensure a safe outcome. Some in-flight instructional risks are common to almost all phases of flight, while others are confined to specific maneuvers. Examples of hazards commonly associated with providing flight instruction include, but are not limited to:

- Maintain active collision avoidance while simultaneously providing instruction.
- Maintain a sterile cockpit at appropriate times.
- Ensure a positive exchange of flight controls.
- Maintain awareness of the actions, cognitive state, and physiological state of the pilot-in-training.
- Maintain vigilance regarding oversight of the pilot-in-training.
- Monitor coordination of flight controls by the pilot-in-training.
- Intervene in a timely fashion.
- Maintain overall situational awareness while executing instructional responsibilities.
- Recognize and mitigate pilot-in-training anxiety.
- Correct pilot-in-training hazardous attitudes.

- Maintain continuous awareness of the dynamic state of the aircraft so as to be able to immediately intervene if necessary.

It is important to understand that above list is not intended to be exclusive. Instructional risk management requires continuous assessment and decision making. Student pilots can be expected to make perceptual and judgment errors. This is true of students at all levels of experience. For example, while running through engine start procedures, a flight instructor candidate sitting in the right seat may fail to clear the area to the left of the aircraft. Flight instructors must remain vigilant at all times and be prepared to take timely and sufficient action to correct student performance that, in the instructor's judgment, is leading to unacceptable risk.

The Airman Certification Standards will require flight instructor candidates to demonstrate knowledge and skill with respect to common in-flight instructional risks and, on the practical test, demonstrate effective instructional risk management from the beginning of preflight procedures through the conclusion of post flight procedures.

Appendices

Item #	Page Number / Section / Figure	Current Wording / Proposed Revision	Justification / Explanation
1.	Appendix A, B, C, D	Incorporate the Appendices into the body of the publication or provide links to the source documents (such as AC 61-65F).	