ACs, ADs, NOTAMs, and the NTSB

Session Time: One, 50-minute sessions

DESIRED RESULTS

ESSENTIAL UNDERSTANDINGS

The regulatory environment consists of both regulatory and advisory publications, including the Federal Aviation Regulations (FARs), Aeronautical Information Manual (AIM), advisory circulars (ACs), airworthiness directives (ADs), Notices to Airmen (NOTAMs), and NTSB Part 830.

The Federal Aviation Administration (FAA) and National Transportation Safety Board (NTSB) produce additional documents with which pilots must also familiarize themselves.

ESSENTIAL QUESTIONS

1. Where do pilots find the rules and regulations that govern aviation in the United States?

LEARNING GOALS

Students Will Know

- The purpose of FAA advisory circulars (ACs), airworthiness directives (ADs), and Notices to Airmen (NOTAMs).
- The regulations outlining procedures for reporting aircraft incidents and accidents.

Students Will Be Able To

- *Identify* the types of information contained in FAA advisory circulars, airworthiness directives, Notices to Airmen, and NTSB Part 830. [DOK-L1]
- *Classify* a sample document as either an AC, AD, NOTAM, or part of NTSB Part 830. [DOK-L2]

ASSESSMENT EVIDENCE

Warm-up
Students will review a list of events that could affect a flight or aircraft performance, then attempt to identify the type of FAA publication that might relate to each event.

Formative Assessment
Working individually, students will examine and identify four publication excerpts, one each from advisory circulars, airworthiness directives, NOTAMs, and NTSB Part 830.

Summative Assessment
Students will work individually to complete a 3-2-1 exercise relating to the material presented in this lesson.

LESSON PREPARATION

MATERIALS/RESOURCES

- ACs, ADs, NOTAMs, and the NTSB Presentation
- ACs, ADs, NOTAMs, and the NTSB Student Activity 1 **(optional)**
- ACs, ADs, NOTAMs, and the NTSB Student Activity 2
- ACs, ADs, NOTAMs, and the NTSB Student Activity 3 **(optional)**
- ACs, ADs, NOTAMs, and the NTSB Student Activity 4
- ACs, ADs, NOTAMs, and the NTSB Teacher Notes 1
- ACs, ADs, NOTAMs, and the NTSB Teacher Notes 2
- ACs, ADs, NOTAMs, and the NTSB Teacher Notes 3
- ACs, ADs, NOTAMs, and the NTSB Teacher Notes 4
- **Laptop or other web-ready device (per student or group)**

LESSON SUMMARY

Lesson 1: Aeronautical Information Manual
Lesson 2: ACs, ADs, NOTAMs, and the NTSB

The lesson begins with a brief warm-up exercise in which students are presented with a number of events that could cause a flight not to go as planned. Students are asked to speculate on which FAA publication(s) could pertain to each event, after which one event—and the publication that relates to it—is explained and discussed in greater detail.

Next, students will briefly review ADs, ACs, NOTAMs, and NTSB Part 830 (which they learned about in lesson 9.A.1). Students will next participate in a small-group activity to explore actual advisory circulars, airworthiness directives, NOTAMs, and paragraphs from NTSB Part 830.

The next part of the lesson explains in detail the structure and purpose of the various publications, as well as how and where to find them. Students will demonstrate comprehension by locating specific excerpts from the various publications and answering questions about them in a formative assessment. Immediately following this assessment, students will participate in another activity in which they are given specific examples from actual FAA publications and asked to identify the source and answer questions about those examples.

Finally, students will answer a series of FAA-type Knowledge Test questions, and then complete a 3-2-1 summative assessment that asks them to recall specific knowledge they have gained, identify lesson material they still do not understand, and cite an example of something they would like to learn more about.

BACKGROUND

Aviation is a complex subject, and pilots must have a firm working knowledge of different subject areas to enhance safety. The FAA provides dozens of publications and advisories aimed at educating the pilot population and keeping aviators fully informed about the changing nature of the operating environment. This lesson focuses on four of these publications and their role in fostering aviation safety.

Advisory circulars, airworthiness directives, Notices to Airmen, and NTSB Part 830 are each published for a specific purpose.

- Advisory circulars (ACs), are, as the name implies, advisory and not regulatory. They are published by the FAA to inform pilots and the aviation community of non-regulatory, but important information.
- Airworthiness directives (ADs) on the other hand, are regulatory and published by the FAA. They identify specific unsafe aircraft conditions and inform the aviation community of mandatory regulatory actions that, once complied with, allow the aircraft to be operated safely.

- Notices to Airmen (NOTAMs) contain time-sensitive information that alerts pilots to potential hazards at an airport, in the national airspace system, or relating to IFR operations. NOTAMs are classified into five categories, explained later in this lesson.
- NTSB Part 830 is a set of rules regarding the reporting and notification of aircraft accidents or incidents. It also contains information about the preservation of the contents of an aircraft involved in an accident or incident.

MISCONCEPTIONS

Students may think there is only one source for regulations. However, there are multiple sources of regulatory and advisory information that pilots must be aware of and follow. Students may also assume that all publications contain mandatory rules and regulations, but in fact some (e.g., ACs) are only advisory.

Finally, some students may not understand the relationship between NOTAMs and temporary flight restrictions (TFRs). A TFR is a specific type of NOTAM that defines an area restricted to air travel due to a hazardous condition, a special event, or a general warning for the entire FAA airspace. So, while all TFRs are NOTAMs, not all NOTAMs are TFRs.

DIFFERENTIATION

To support struggling learners in the **EXPLORE** and **EXPLAIN** sections of the lesson plan, have students create a graphic organizer by folding a piece of paper into fourths, then placing the headings ACs, ADs, NOTAMs, and NTSB Part 830 at the top of each square. Students should be encouraged to take notes on these four categories as they move through the lesson and to use their notes during the Formative Assessment, as well as other activities.

To promote collaboration and to challenge students to think more deeply in the **EXTEND** and **EVALUATE** sections of the lesson plan, ask students to compare and contrast the four publications during discussions that follow the activities. What features of these publications make them similar to one another or unique?

LEARNING PLAN

ENGAGE

Teacher Material: ACs, ADs, NOTAMs, and the NTSB Presentation

Session 1

Slides 1-3: Introduce the topic and learning objectives of the lesson.

Slide 4-6: Conduct the **Warm-Up**.

Warm-Up

Slide 4: Have students review the list of six events that could affect a flight, and then speculate as a class on which type of FAA publication would pertain to each event.

Here are the answers:

TFR—*NOTAM*
Wind shear—*NOTAM*
Magneto failure—*Airworthiness Directives (ADs)*
Loss of control accident—*NTSB Part 830*
Runway closure—*NOTAM*
Specialty aircraft training program—*Advisory Circular*

Slide 5: Select TFR as an example event, and explain why a TFR would be published as a NOTAM and not in any other publication.

- TFRs are short term; they may only apply for a few hours or days.
  TFRs are distributed in real time to pilots via weather briefings, online updates, or through ATC.
  TFRs have an immediate effect on flights by prohibiting or severely limiting the airspace in which a pilot may fly.

Slide 6: The other types of publication are inappropriate for the distribution of TFRs, as explained below.

- Advisory circulars (ACs) are printed publications that serve as guides to pilots, but are not intended to disseminate urgent information to pilots for a specific flight. They are advisory, not mandatory.
- Airworthiness directives (ADs) are notices to aircraft owners about repairs or inspections that must be made to their aircraft in order to remain in compliance with airworthiness standards. They are not intended to provide information about conditions that could affect a specific flight.
- NTSB Part 830 sets out the rules and procedures for reporting aircraft accidents and incidents.

EXPLORE

Teacher Materials: ACs, ADs, NOTAMs, and the NTSB Presentation; ACs, ADs, NOTAMs, and the NTSB Teacher Notes 1
Student Materials: ACs, ADs, NOTAMs, and the NTSB Student Activity 1, **laptop or other web-ready device**

Slides 7-8: It has been a few lessons since students were exposed to these publications, and even then, in only a cursory, generalized fashion. By way of review, remind students of the information below.

- Advisory circulars (ACs) are FAA publications that give guidance to pilots and operators on a wide range of topics. ACs are usually short (just a few pages, like a magazine article), but may extend into full-size books. Examples of the diverse and varied types of information contained within the advisory circular system are AC 91-36D (VFR Flight Near Noise Sensitive Areas) and AC 91-87 (Ejection Seat Training Program). While AC 91-36D is applicable to all pilots flying VFR near cities and towns, AC 91-87 would only be of interest to military pilots flying aircraft equipped with ejection seats. The advisory circular program was developed to serve the needs of a wide variety of pilot and operational requirements, and pilots frequently refer to ACs when questions arise or a new type of training is being undertaken.
- Airworthiness directives (ADs) are publications sent to aircraft owners advising them when, as a result of recently obtained information, their aircraft must undergo a special inspection or have unexpected repairs or maintenance performed. ADs are often issued after an accident or incident where a particular aircraft make and model's design or maintenance has been found to be faulty. In such cases, all owners of similar aircraft are required to comply with the airworthiness directive to minimize the risk of a similar accident or incident occurring in the future.
- A NOTAM, or Notice to Airmen, publishes updated news and information critical to the safety of flight. NOTAMs are generally short term, specifying a condition that may be present for just a few hours or days. For example, if a runway is closing for a day to make repairs, that information is distributed to pilots in the form of a NOTAM. Pilots are required to review and understand all NOTAMs that could apply to their flight.
- The NTSB Part 830 is a collection of rules and procedures for reporting aircraft accidents or incidents, as well as requirements for the preservation of aircraft wreckage in the event of a crash. Part 830 is managed by the National Transportation Safety Board and, though it is not part of the Federal Aviation Regulations, pilots are still required to comply with its procedures.

Slide 9: Distribute **ACs, ADs, NOTAMs, and the NTSB Student Activity 1**, a jigsaw activity. Divide students into multiple home groups of four students each. Each student in each home group will be a designated expert in one of the following publications:

1.
Advisory circulars

2.
Airworthiness directives

3.
NOTAMs

4.
NTSB 830

Instruct students to gather into expert groups, with all advisory circular experts meeting in one group, airworthiness directives experts in another, on so on. The members of each expert group will read through and analyze the sample excerpt from their designated publication. After 5 minutes, experts will disperse into their respective home groups and each will provide an oral report on the excerpt they studied to their home group. Other students in the home groups may ask the experts questions pertaining to their publication. Students in each home group will answer the Student Activity 1 questions, and discuss their answers in class. Answers to questions can be found in **ACs, ADs, NOTAMs, and the NTSB Teacher Notes 1**.

Teaching Tips

Note: **ACs, ADs, NOTAMs, and the NTSB Student Activity 1** may be considered an optional activity if instructional time is short.

EXPLAIN

Teacher Materials: ACs, ADs, NOTAMs, and the NTSB Presentation; ACs, ADs, NOTAMs, and the NTSB Teacher Notes 2
Student Materials: ACs, ADs, NOTAMs, and the NTSB Student Activity 2; **laptop or other web-ready device**

Slide 10: A complete list of advisory circulars may be found on the FAA website or may be ordered from the Government Printing Office. When accessing online, note the search field near the top of the page. Pilots and other users can enter just about any aviation topic into this field and find a related advisory circular that gives specific guidance for or details about that topic. Recall that ACs are not regulatory or binding in and of themselves, but rather explanatory of other regulations or procedures. Often, they provide information on how a pilot can comply with a regulation.

Teaching Tips

Go to the following web page and enter "student pilot" in the search field:
https://www.faa.gov/regulations_policies/advisory_circulars/

Scroll through the list of advisory circulars to locate the one titled "BasicMed" (number 68-1A). Open the link, then open the PDF file (AC 68-1A) at the bottom left of the screen. Scroll through several pages of this AC to give students an idea of the structure and content of an advisory circular. Note that this AC is only 34 pages long and deals with a single topic, BasicMed. All ACs follow this same basic format.

Slide 11: A complete list of airworthiness directives may be found here:

- https://www.faa.gov/regulations_policies/airworthiness_directives/

This searchable database enables pilots and operators to easily locate all airworthiness directives that apply to their aircraft, and also provides the opportunity to automatically receive updated ADs as they come available. Airworthiness directives are notices to correct potential safety issues in aircraft and are mandatory; owners must comply, however, some ADs allow operations to continue under specified conditions.

Teaching Tips

Go to the following web page and spend a few moments exploring: https://www.faa.gov/regulations_policies/airworthiness_directives/

Note that ADs can be searched by tabs: "Emergency ADs," "ADs Issued in last 60 Days," and "All Current ADs by Make/Model."

Click on "All ADs by Make/Model," then click on the "T"; click "Textron Aviation Inc.," then scroll to "172N" and note the complete list of ADs for a Cessna 172N model, commonly used in flight training and by private pilots. Scroll down to "Vacuum Pumps (AD 2006-03-08)" and open the PDF link at the bottom-left of the screen. Read aloud the "Summary" section at the beginning of the document. This will give students a clear example of the format and content of many ADs.

Slide 12: Recall that NOTAMs are publications that alert pilots to potential hazards to flight or to airspace or regulatory changes of which pilots need to be aware. NOTAMs are among the most important advisories used by pilots on a daily basis and are typically received as part of a weather briefing prior to flights. NOTAMs can also be found on the following FAA website:

- https://notams.aim.faa.gov/notamSearch/nsapp.html#/

Just as with ADs and ACs, NOTAMs are searchable in a variety of categories, including location, flight path, latitude and longitude, and "NOTAMs around me."

Five categories of NOTAMs are available to pilots:

1. NOTAM D—Distant, available through weather reports and briefings and via flight service stations.
2. Flight Data Center (FDC) NOTAMs—Regulatory NOTAMs such as TFRs and changes to instrument departure, en route, or approach procedures.
3. Pointer NOTAMs—Highlight or point out other NOTAMs, such as an FDC NOTAM, and assist pilots in cross-referencing information that may not be available when searched by airport or navigational aid.
4. Special Activity Airspace NOTAMs—Issued when special activity airspace is activated. Remember that pilots are responsible for checking published SAA scheduled times.
5.

Military NOTAMs—Relate to military navigational aids (navaids) or airports that are part of the National Airspace System (NAS).

Teaching Tips

To provide students with a sample of what a NOTAM looks like, go to the following webpage: https://notams.aim.faa.gov/notamSearch/nsapp.html#/

Using the default "Location" filter, enter "KFDK" (Frederick Municipal Airport) in the search field. Choose any NOTAM listed and read it aloud to the class. Note how all NOTAMs begin with an exclamation point (!): that is the code that tells the reader that the text that follows is a NOTAM.

Slide 13: Pilots need to be familiar with the procedures and requirements for reporting aircraft accidents, incidents, and overdue aircraft to the National Transportation Safety Board (NTSB). NTSB Part 830 sets forth those requirements, and may be accessed here:

- https://www.ecfr.gov/cgi-bin/text-idx?SID=28feadb85466bea54478787a817faebf&mc=true&node=pt49.7.830&rgn=div5

Part 830 begins by defining accident and incident.

- An aircraft accident is an occurrence in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. Aircraft colliding in flight or sustaining major damage in landing are examples of accidents. Accidents occur between the time any person boards the aircraft with the intention of flight and the time all such persons have disembarked. Notification to NTSB must be made immediately.
- An aircraft incident, on the other hand, is an occurrence other than an accident, which affects or could affect the safety of operations. Flaps failing to retract after takeoff, or the loss of elevator or aileron control in flight or during the takeoff roll are examples of incidents. For example, if a pilot pulled back on the elevator control during takeoff and the control cable broke, preventing the aircraft from pitching up for takeoff, that would be a reportable incident. Written reports of incidents are only required if requested by the NTSB.

Aircraft wreckage must be preserved by the pilot or operator to enable NTSB to conduct an effective investigation. Wreckage may not be moved by anybody except to prevent further damage.

NTSB Part 830 contains the following subparts:

- Subpart A—General
- Subpart B—Initial Notification of Aircraft Accidents, Incidents, and Overdue Aircraft
- Subpart C—Preservation of Aircraft Wreckage, Mail, Cargo, and Records
- Subpart D—Reporting of Aircraft Accidents, Incidents, and Overdue Aircraft

NTSB Part 830 is important because, even though it is not part of the FARs, pilots are still required to comply with the procedures following an aircraft accident or incident.

Slide 14: Complete the **Formative Assessment**.

Formative Assessment

Distribute **ACs, ADs, NOTAMs, and the NTSB Student Activity 2**. Instruct students to use FAA websites to locate an advisory circular, airworthiness directive, NOTAM, and excerpt from NTSB 830 and answer

questions about those publications. Answers to the questions may be found in **ACs, ADs, NOTAMs, and the NTSB Teacher Notes 2**.

[DOK-L1; *identify*]

EXTEND

Teacher Materials: ACs, ADs, NOTAMs, and the NTSB Presentation; ACs, ADs, NOTAMs, and the NTSB Teacher Notes 3
Student Materials: ACs, ADs, NOTAMs, and the NTSB Student Activity 3, **laptop or other web-ready device**

Slide 15: Distribute **ACs, ADs, NOTAMs, and the NTSB Student Activity 3**, which contains four publication excerpts, one each from advisory circulars, airworthiness directives, NOTAMs, and NTSB Part 830. Instruct students to work individually, reading the excerpts and identifying the type of publication from which each excerpt was drawn; students should also answer the questions pertaining to the excerpts. Answers to questions can be found in **ACs, ADs, NOTAMs, and the NTSB Teacher Notes 3**. If time permits, lead a class discussion of the answers.

[DOK-L2; *classify*]

Teaching Tips

Note: **ACs, ADs, NOTAMs, and the NTSB Student Activity 3** may be considered an optional activity if instructional time is short.

EVALUATE

Teacher Materials: ACs, ADs, NOTAMs, and the NTSB Presentation; ACs, ADs, NOTAMs, and the NTSB Teacher Notes 4
Student Materials: ACs, ADs, NOTAMs, and the NTSB Student Activity 4, **laptop or other web-ready device**

Slide 16-35: Sample FAA Knowledge Test questions. This is a good time to remind students that they are working toward passing the FAA Private Pilot Knowledge Test, and these questions are similar to those on that test. Some questions may cover material related to this lesson but which was covered in detail in an earlier lesson.

Slide 36: Conduct the **Summative Assessment**.

Summative Assessment

Distribute ACs, ADs, NOTAMs, and the NTSB Student Activity 4, and instruct students to complete the exercise, in which they relate things they have learned, things they still don't understand, and things they want to know more about. Answers will vary by student, but suggestions for modifying the activity and /or prompting students to think more deeply may be found in ACs, ADs, NOTAMs, and the NTSB Teacher Notes 4.

[DOK-L1; *identify*]

Summative Assessment Scoring Rubric

- Follows assignment instructions
- Responses show evidence of one or more of the following:

- Ability to differentiate types of FAA information
- Ability to identify what types of information can be found in which publications
- Comprehension of the information provided through FAA publications

- Contributions show understanding of the concepts covered in the lesson
- Contributions show in-depth thinking including analysis or synthesis of lesson objectives

Points	Performance Levels
9-10	Clearly lists 3 important facts learned from different publications; lists 2 things related to the lesson that are unclear; Describes a topic related to the lesson that they would like to know more about.
7-8	Sufficiently lists 3 facts from different publications; lists 2 things related to the lesson that are unclear though some topics were covered in the lesson; Describes a topic related to the lesson that they would like to know more about.
5-6	Lists partially related facts from the publications; list 2 things that are unclear even though some topics are covered or unrelated to the lesson; Describes a topic partially related to the lesson that they would like to know more about.
0-4	Lists facts not always related to the lesson or the publications; list 2 things partially related to the lesson that are unclear; Describes a topic related to the lesson that they would like to know more about.

STANDARDS ALIGNMENT

COMMON CORE STATE STANDARDS

- **RST.11-12.2** - Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- **RST.11-12.4** - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.
- **RST.11-12.9** - Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
- **WHST.11-12.6** - Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
- **WHST.11-12.7** - Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- **WHST.11-12.8** - Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
- **WHST.11-12.9** - Draw evidence from informational texts to support analysis, reflection, and research

FAA AIRMAN CERTIFICATION STANDARDS

PRIVATE PILOT

I. Preflight Preparation

Task B. Airworthiness Requirements

- Knowledge - The applicant demonstrates understanding of:
    - **PA.I.B.K1** - General airworthiness requirements and compliance for airplanes, including:
        - **PA.I.B.K1c** - Airworthiness Directives and Special Airworthiness Information Bulletins

Task E. National Airspace System

- Knowledge - The applicant demonstrates understanding of:
    - **PA.I.E.K3** - Special use airspace (SUA), special flight rules areas (SFRA), temporary flight restrictions (TFR), and other airspace areas.

II. Preflight Procedures

Task D. Taxiing (ASEL, AMEL)

- Knowledge - The applicant demonstrates understanding of:
    - **PA.II.D.K1** - The applicant demonstrates understanding of current airport aeronautical references and information resources such as the Chart Supplement, airport diagram, and NOTAMS

III. Airport and Seaplane Base Operations

Task A. Communications, Light Signals, and Runway Lighting Systems

- Knowledge - The applicant demonstrates understanding of:
    - **PA.III.A.K8** - The applicant demonstrates understanding of National Transportation Safety Board (NTSB) accident/incident reporting.

REFERENCES

https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.list/parenttopicid/11

https://www.faa.gov/regulations_policies/airworthiness_directives/

https://notams.aim.faa.gov/notamSearch/nsapp.html#/

https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title49/49cfr830_main_02.tpl

https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1028991

https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAD.nsf/AOCADSearch/7F1FD0E0DBB0168B8625698B00765395?OpenDocument

https://drive.google.com/open?id=1_qfSbeEmEHhDuJrM4AFLqAaz5skkmUC3

http://www.faraim.org/faa/far/49CFR/subtitleB/part830/index.html