Fundamentals of Instruction (FOI)

Reversion History

Version	Date	Changes
1.0	February 2024	Document IOW FAA-S-8081-6D
1.2	April 2024	Document IOW FAA-S-ACS-25

Recommended Study Procedures

Review and Familiarize: Begin by skimming through the entire book to get an overview of its contents. Pay attention to the organization and structure of the lesson plans.

Set Clear Goals: Define your objectives for studying the book. Whether it's improving teaching skills, mastering a specific subject area, or enhancing lesson planning proficiency, having clear goals will guide your study process.
Create a Study Schedule: Allocate dedicated time slots in your schedule for studying the lesson plans. Break down the content into manageable sections and set deadlines for completing each section.

Active Engagement: Engage actively with the material as you read through each lesson plan. Take notes, highlight key points, and reflect on how each plan aligns with your teaching philosophy and classroom context.

Apply and Adapt: Experiment with implementing the lesson plans in your own teaching practice. Adapt them as needed to suit the needs and preferences of your students and the dynamics of your classroom.

Reflect and Evaluate: Take time to reflect on the effectiveness of each lesson plan after implementation. Evaluate what worked well and what could be improved, and incorporate feedback from students and colleagues.

Review and Reinforce: Periodically review the lesson plans to reinforce your learning and refresh your memory. Consider revisiting sections that are particularly relevant to your current teaching objectives.

Seek Feedback and Support: Don't hesitate to seek feedback from peers, mentors, or supervisors on your implementation of the lesson plans. Constructive feedback can help you refine your teaching strategies and improve student outcomes.

Continuous Improvement: Treat the study of lesson plans as an ongoing process of professional development. Stay updated on best practices in teaching and learning, and remain open to incorporating new ideas and approaches into your teaching repertoire

Table of Contents

Task A: Human Behavior & Effective Communication

References: FAA-H-8083-9A

Objective

To introduce to the learner a basic understanding of the knowledge of Human Behavior and Effective Communication and how these impact effective learning

Elements

Schedule

1. Discussion of objectives, elements, and completion standards
2. Introduction
3. Lecture
4. Conclusion
5. Ask and answer questions

Equipment

- Powerpoint
- Markers
- References

IP's Actions

1. Discuss lesson objectives, elements, and completion standards
2. Present lecture
3. Answer questions

SP's Actions

1. Participate in lecture
2. Take notes
3. Ask questions

Completion Standards

The learner will be able to explain the effects of human behavior and effective communication

Human Behavior

Definitions of Human Behavior

- Definitions vary depending upon field of study
- Product both of innate human nature and of individual experience and environment

Overall Definition

- Attempt to explain why humans function the way they do

Science Based Definition

- Product of factors that cause people to act in predictable ways

Needs Definition

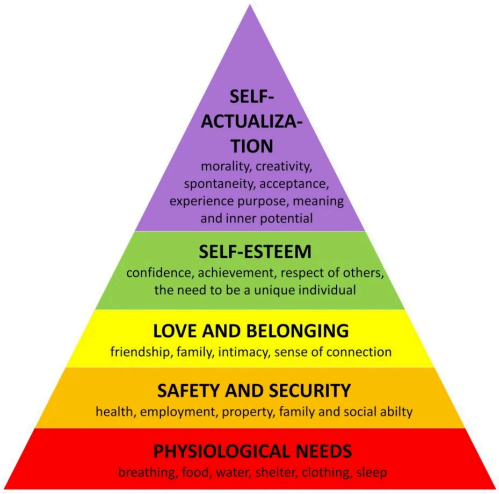
- Result of attempts to satisfy certain needs

Life Course Definition

- This approach emphasizes human development or the successive phases of growth in which human behavior is characterized by a distinct set of physical, physiological, and behavioral features

Human Needs & Motivation

- Human Needs are things all humans require for normal growth and development
- Humans have needs that affect their ability to focus on the task at hand
- Learners tend to show little to no motivation or attention if most of their needs are not met



Physiological

- Biological needs such as food, water, air, etc.
    - E.g A Learner who is hungry will focus on getting food rather than flying the aircraft and listening to the instructor

Security

- If a learner does not feel safe, he/she can not focus
    - E.g A learner is afraid of stalls and is focused on his/her well-being rather than the flight instruction being given

(Social) Belonging

- Involves both giving and receiving love, affection, and the sense of belonging
    - E.g Learners during flight training are in a new environment and are seeking to make new friends, impress his/her instructor, etc.

Esteem

- Feeling good about one's self
    - Internal: a person judges himself or herself worthy by personally defined standards
    - External: Judging themselves by what others think of them

Cognitive and Aesthetic

- If a person can understand what is going on around him/her, they can control the situation or make better informed decisions
    - Cognitive: Need to know and understand
    - Aesthetic: The emotional need of the artist
    - E.g. A learner completing their first solo flight

Self-Actualization

- A person's need to be and do that which the person was "born to do"
    - Personal growth
    - Career development
    - Peak experiences

Defense Mechanisms

- When a person experiences a threat, the "fight or flight" response kicks in
- Defense mechanisms are an unconscious mental process to protect oneself from anxiety, unpleasant emotions, or to provide a refuge from a situation with which the individual cannot currently cope

Compensation

- Counterbalancing perceived weaknesses by emphasizing strength in other areas
    - E.g A learner is emphasizing his/her excellent performance on steep turns to make up for their poor performance on stall recovery

Projection

- When a person places his/her own unacceptable impulses onto someone else
    - E.g “I failed because I had a poor examiner”

Rationalization

- Justifying actions that otherwise would be unacceptable
    - Believe in the plausible and acceptable excuses which seem real and justifiable

Displacement

- Shift from the original object to a more acceptable, less threatening substitute
    - E.g. A learner who is angry at the instructor over a bad grade may take his/her anger and go to the gym instead of risking consequences related to the class

Reaction Formation

- Faking a belief opposite to the true belief because the true belief causes anxiety
    - E.g A student instructed to fly at 3,000 ft is flying at 2,980 ft and thinks its still the same

Fantasy

- Daydreaming about how things should be rather than doing anything about how things are
    - E.g. A learner is thinking about flying an Airbus rather than flying a Cessna 172

Aggression

- Learner is unable to control emotion and places frustration on something or someone else
    - E.g. A learner fails a checkride and becomes physically or verbally aggressive to the examiner

Repression

- Thoughts or feelings a person is not able to cope with are pushed away to be dealt with at a later time
    - E.g. A learner knows he/she is not performing well on a stage check, but has to continue the flight

Student Emotional Reactions

- It is helpful to learn how to analyze learner behavior before and during each flight lesson

Anxiety

- a feeling of worry, nervousness, or unease, often about something that is going to happen, typically something with an uncertain outcome
    - Normal reactions to anxiety: significant because they indicate a need for special instruction to relieve the anxiety
    - Abnormal reactions to anxiety: even more important because they may signify a deep-seated problem
- Anxiety can be countered by reinforcing the learners’ enjoyment of flying and by teaching them to cope with their fears

Impatience

- The impatient learner fails to understand the need for preliminary training and seeks only the ultimate objective without considering the means necessary to reach it
    - Can result from instruction keyed to the pace of a slow learner when it is applied to a motivated, fast learner
    - Correct learner impatience by presenting the necessary preliminary training one step at a time, with clearly stated goals for each step

Worry or Lack of Interest

- Learners who are worried or emotionally upset are not ready to learn and derive little benefit from instruction
    - Significant emotional upsets may be due to personal problems, emotional problems, or a dislike of the training program or the instructor
    - Ensuring the learner understands the objective, competition standards of each lesson as well as their performance is necessary to counteract this

Physical

- Discomfort, illness, and fatigue slow the rate of learning no matter how diligently the learner tries to apply themselves

- **Fatigue:** May not be apparent until serious errors are made
    - **Acute (short-term):** normal occurrence of everyday living, is the tiredness felt after long periods of physical and mental strain, including strenuous muscular effort, immobility, heavy mental workload, strong emotional pressure, monotony, or lack of sleep
        - Inattention
        - Distractibility
        - Errors in timing
        - Neglect of secondary tasks
        - Loss of accuracy and control
        - Lack of awareness of error accumulation
        - Irritability
    - **Chronic (long-term):** Occurs when there is not enough time for a full recovery from repeated episodes of acute fatigue
        - Combination of physiological problems and psychological issues

    - **Dehydration:** Critical loss of water from the body
        - Fatigue is the first sign
        - May be prevalent in summer-time flying or at high altitudes

    - **Heatstroke:** Any inability of the body to control its temperature
        - Carry water and drink oolong the flight, even if the pilot is not thirsty
        - Bring shades for aircraft with canopies
        - Light clothing
        - Keep the aircraft well ventilated

Apathy Due to Flight Instruction

- Learners may become apathetic (show no interest) when they recognize the instructor isn't prepared or seems deficient, contradictory, and insecure
    - Instructors should provide well-planned, appropriate, and accurate instruction
    - Creating the impression of talking down to the learner is one of the fastest ways for an instructor to lose learner confidence and attention

Reactions to Stress

- **Normal:** Respond rapidly and exactly, within the limits of their experience and training
- **Abnormal:**
    - extreme over-cooperation
    - Inappropriate laughter or singing
    - Severe anger
    - Marked changes in mood on different lessons

Flight Instructor Actions Regarding Seriously Abnormal Learners

- Flight instructor have the responsibility to refrain from instructing that learner

- A flight instructor has the personal responsibility of assuring that such a person does not continue flight training or become certificated as a pilot by:
    1. Have another instructor evaluate the learner
    2. Withhold any solo endorsements and/or practical test recommendations

Effective Communication

- Effective communication is an essential element of instruction
- An instructor may hold a high level of technical knowledge, but he/she needs to be able to convey this properly to effectively teach the learner

Basic Elements of Communication

Source

- The source is the sender, speaker, writer, encoder, transmitter, or instructor

- Effectiveness is based on three factors:
    1. **Select proper language:** Effectiveness of communication is dependant on the receivers of the symbols or words being used
        - E.g. Telling the learner that the next lesson will cover stalls and the learner thinks this means engine stalls
    2. **Reveal information about themselves:** Reveal to the reader that the message is important and there is a need to know what is being presented
    3. **Accurate, up-to-date, stimulating material:** Providing the reader with the interesting, accurate, and up-to-date material holds the readers interest and increases instructor credibility

Symbol

- All communication is achieved through symbols such as simple oral, visual, or tactile codes

- Communication with symbols relies upon different perceptions (channels)
    - **Visual:** Learners rely on seeing
    - **Auditory:** Learners prefer listening and speaking
    - **Kinesthetic:** Learners process and store information through physical experience such as touching, manipulating, using, or doing

Receiver

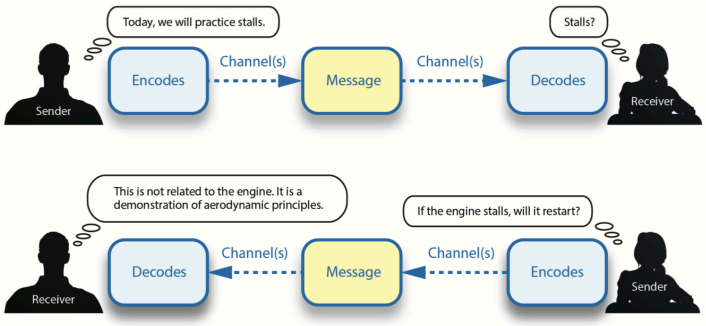
- The individual or individuals to whom the message is directed

- When the receiver reacts with understanding and changes his or her behavior according to the intent of the source, effective communication has taken place
- There are three characteristics of receivers that need to be understood in order to understand the process of communication:
    1. **Abilities:** Background of the receiver
    2. **Attitudes:** attitudes learners exhibit may indicate resistance, willingness, or passive neutrality
        - A varied communicative approach works best in reaching most learners since they have different attitudes
    3. **Experiences:** The learner's knowledge, abilities, and attitudes affect the instructor's communication strategy

Barriers to Effective Communication

Lack of Common Experience

- Lack of common experience between the instructor and the learner is the single greatest barrier to effective communication

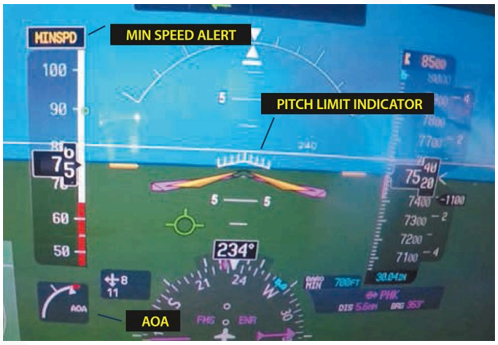


Overuse of Abstractions

- Abstractions are words that are general rather than specific
- stand for ideas that cannot be directly experienced, things that do not call forth mental images in the minds of the learners
    - E.g. pre-flight that aircraft

Confusion Between the Symbol and the Symbolized Object

- when a word is confused with what it is meant to represent
    - E.g. “Takeoff power” vs. “take OFF power”



Interference

- occurs when the message gets disrupted, truncated, or added to somewhere in the communication sequence
- Noise or other factors may affect the communication
    - E.g. “Your flight controls,” “my flight controls,” “Your flight controls”

Developing Communication Skills

- The ability to effectively communicate stems from experience

Role Playing

- Experience in instructional communication is learned from actually doing it
- Offers a non-threatening environment to build up confidence and fluency

Instructional Communication

- Takes place when the instructor explains something to the learner and can subsequently determine that the learner exhibits the desired response
- The aviation instructor should know how and why something is to be done
    - Instructional Enhancement: An instructor never stops learning
        - The better the instructor knows the subject the better he/she can teach it

Listening

- an instructor needs to determine the abilities of the learners and properly communicate
- There are many different techniques instructors can use to listen:

Questioning

- Good questions can determine how well the learner understands what has been taught
- Characteristics of good questions are:
    - Open-ended
    - Adapted to the ability, experience, and stage of training of the learner

Task B: The Learning Process

References: FAA-H-8083-9A

Objective

To determine that the learner exhibits instructional knowledge of the Learning Process

Elements

Schedule

1. Discussion of objectives, elements, and completion standards
2. Introduction
3. Lecture
4. Conclusion
5. Ask and answer questions

Equipment

- Powerpoint
- Markers
- References

IP's Actions

1. Discuss lesson objectives, elements, and completion standards
2. Present lecture
3. Answer questions

SP's Actions

1. Participate in lecture
2. Take notes
3. Ask questions

Completion Standards

The should be able to understand and explain the Learning Process

Learning

What is Learning

- A change in the behavior of the learner as a result of experience
    - The effective instructor understands the subject being taught, the learner, the learning process, and the interrelationships that exist

Learning Theory

- body of principles advocated by psychologists and educators to explain how people acquire skills, knowledge, and attitudes

Classical Conditioning

- learning based on an association made between a neutral environmental stimulus and a natural stimulus
    - E.g.

Operant Conditioning

- Association is made between behavior and the consequences of that behavior
    - E.g.

Social Learning

- Learning by observation
    - E.g.
- Four stages of social learning:
    1. **Attention:** The ability of the observer to pay attention to others around him or her in order to learn
    2. **Retention:** The ability to remember an observed behavior to later repeat that behavior
    3. **Reproduction:** The act of producing a previously observed behavior
    4. **Motivation:** The reason to reproduce an observed behavior

Characteristics of Learning

- To understand how people learn, it is necessary to understand what happens to the individual during the process

Result of Experience

- All learning is by experience, but learning takes place in different forms and in varying degrees of richness and depth
    - Even when observing the same event, two people react differently
        - E.g. If you hypothetically taught a learner to fly in the right seat, they would have a different experience than a learner who is flying in the left seat

Active Process

- effective knowledge transfer, learners need to react and respond, perhaps outwardly, perhaps only inwardly, emotionally, or intellectually

- E.g. Just because a learner is sitting in the classroom during a lecture, that doesn't always mean he/she is learning

Multifaceted

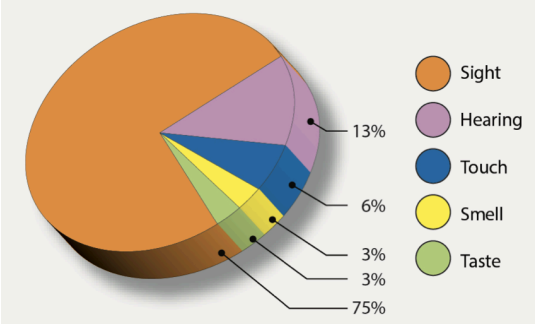
- While learning the subject at hand, individuals may be learning other things as well
  - E.g.

Purposeful

- Each learner is a unique individual whose past experiences affect readiness to learn and understanding of the requirements involved
- To be effective, aviation instructors need to find ways to relate new learning to the learner's goals

Perception

- All learning comes from perceptions
  - Sight
  - Hearing
  - Touch
  - Smell
  - Taste



Factors That Affect Perception

Self-Concept

- A learner's self-image, described in such terms as "confident" or "insecure," has a great influence on the total perceptual process
  - A negative self-concept inhibits the perceptual processes by introducing psychological barriers, which tend to keep the learner from perceiving

Time and Opportunity

- Learning some things depends on other past perceptions and on the availability of time to sense and relate these new things to the earlier perceptions

Element of Threat

- fear adversely affects perception by narrowing the perceptual field
  - learners tend to limit their attention to the threatening object or condition

Physical Organism

- provides individuals with the perceptual apparatus for sensing the world around them
    - Pilots, for example, need to see, hear, feel, and respond adequately while they are in the air

Goals

- Things that are more highly valued and cherished are pursued

Insight

- grouping of perceptions into meaningful wholes
- it is essential to keep each learner constantly receptive to new experiences and to help them understand how each piece relates to all other pieces of the total pattern of the task

Acquiring Knowledge

- Part of an aviation instructor's job is helping learners acquire knowledge
- knowledge refers to information that humans are consciously aware of and can articulate

Memorization

- Memorizing facts and steps has an advantage: it allows learners to get started quickly
- The limitations of memorization become apparent when a learner is asked to solve a problem or provide an explanation of something that is not covered by the newly acquired knowledge
    - For example, when asked whether she would rather have the altimeter mistakenly set too high or too low when flying in mountainous terrain, Beverly may not have an answer

Understanding

- develops when learners begin to organize known facts and steps into coherent groups that come together to form an understanding of how a thing or a process works
    - A more experienced pilot can answer the altimeter question because she or he understands the ramifications of the question

Concept Learning

- Enhances understanding when individuals formulate generalized concepts from particular facts or steps

Laws of Learning

Readiness

- The basic needs of the learner need to be satisfied before he or she is ready or capable of learning

Effect

- behaviors that lead to satisfying outcomes are likely to be repeated whereas behaviors that lead to undesired outcomes are less likely to recur

    - E.g. If an instructor teaches landings on the first lesson, the learner will become inferior and confidence will be weakened

Exercise

- Connections are strengthened with practice and weakened when practice is discontinued
- most meaningful and effective when a skill is learned within the context of a real-world application
    - E.g. A learner who knows the purpose of practice stall recoveries and practices it often, is going to be better at it then a learner who does not know the purpose of stall a stall recovery

Primacy

- what is learned first, often creates a strong, almost unshakable impression
    - E.i. An instructor needs to teach things correctly the first time

Intensity

- Immediate, exciting, or dramatic learning connected to a real situation teaches a learner more than a routine or boring experience
    - E.g. An Instrument student flying through IMC will learn more than an instrument student flying under the “hood”

Recency

- Things most recently learned are best remembered
    - repeating, restating, or reemphasizing important points at the end of a lesson help the learner remember

Domains of Learning

- Provides a framework to help understand the major areas of learning and thinking

Cognitive

- Remembering specific facts (content knowledge) and concepts that help develop intellectual abilities and skills
    - **Rote:** the ability to repeat something which one has been taught, without understanding or being able to apply what has been learned
    - **Understanding:** Comprehend or grasp the nature or meaning of something
    - **Application:** The act of putting something to use that has been learned and understood
    - **Correlation:** Associating what has been learned, understood, and applied with previous or subsequent learning

Affective

- Addresses a learner’s emotions toward the educational experience
    - Receiving
    - Responding
    - Valuing
    - Organization
    - Characterization

    - Education objective level

Psychomotor

- skill based and includes physical movement, coordination, and use of the motor-skill areas
- Development of these skills utilizes repetitive practice and is measured in terms of speed, precision, distance, and techniques
    - Observation
    - Imitation
    - Practice
    - Habit

Acquiring Skill Knowledge

- An aviation instructor also helps a learner acquire skill knowledge, which is knowledge reflected in motor or manual skills and in cognitive or mental skills, that manifests itself in the doing of something

Stages of Acquisition

- Individuals make their way from beginner to expert via three characteristic stages

Cognitive

- Has a basis in factual knowledge
- Since the learner has no prior knowledge of flying, the instructor first introduces him or her to a basic skill

Associative

- The learner no longer performs a series of memorized steps, but is able to assess his or her progress along the way and make adjustments in performance

Automatic Response

- As procedures become automatic, less attention is required to carry them out, so it is possible to do other things simultaneously, or at least do other things more comfortable

Types of Practice

Deliberate

- This practice is aimed at a particular goal
- the learner practices specific areas for improvement and receives specific feedback after practice

Blocked

- Blocked practice is practicing the same drill until the movement becomes automatic
    - enhances current performance, it does not improve either concept learning or retrieval from long-term memory

Random

- Random practice mixes up the skills to be acquired throughout the practice session
    - leads to better retention because by performing a series of separate skills in a random order, the learner starts to recognize the similarities and differences of each skill which makes it more meaningful

Scenario-Based Training (SBT)

- Research and practical experience have demonstrated the usefulness of practicing in realistic scenarios
    - Has a clear set of objectives
    - Is tailored to the needs of the learner
    - Capitalizes on the nuances of the local environment

Errors

- Errors are a natural part of human performance

Slip

- When a person plans to do one thing, but then inadvertently does something else

Mistake

- When a person plans to do the wrong thing and is successful

How to Reduce Errors

- It is impossible to reduce errors, but minimizing them is important
    - Learning and practicing
    - Taking time
    - Checking for errors
    - Using reminders
    - Raising awareness

Memory

- The ability to encode, store, and retrieve information

Sensory

- Receives initial stimuli from the environment and processes them according to what the person perceives as important

Short-Term

- Time limited: 30 seconds
- Capacity limited: 7 bits of information

Long-Term

- Relatively permanent storage of unlimited information
- What is stored in LTM effects a person's perceptions of the world

- Information passed from STM to LTM has some significance to it

Forgetting

- involves a failure in memory retrieval

Retrieval Failure

- The inability to retrieve information
    - Tip-of-the-tongue phenomenon

Fading

- suggests that a person forgets information that is not used for an extended period of time

Interference

- people forget something because a certain experience has overshadowed it, or that the learning of similar things has intervened

Repression and Suppression

- memory is pushed out of reach because the individual does not want to remember the feelings associated with it
- Suppression: conscious
- Repression: Unconscious

Retention of Learning

- Forgetting something doesn't actually mean its lost, it is unavailable for recall
- The instructors problem is to make the learners learning available for recall

Praise Stimulus

- Responses that give a pleasurable return tend to be repeated

Recall is Promoted by Association

- Information or action associated with something to be learned tends to facilitate its later recall by the learner

Favorable Attitudes Aid Retention

- People learn and remember only what they wish to know
- The most effective motivation is based on positive or rewarding objectives

Meaning Repetition Aids Recall

- Active learning is superior to just listening
    - E.i. Just simply going through the motions is not going to be effective

Mnemonics

- Memory enhancing strategy that involves teaching learners to link new information to information they already know

    - Ideas
    - Visual images
    - Associations
    - Pattern of letters

Learning with All Senses is Most Effective

- When several senses respond together, a fuller understanding and greater chance of recall is achieved

Transfer of Learning

- The ability to apply knowledge or procedures learned in one context to new contexts
    - Negative: Knowledge does not aid in the learning of a new skill
    - Positive: Knowledge can be applied in learner a new skill

Task C: The Teaching Process

Reference: *FAA-H-8083-9A*

Objective

To introduce the learner to the teaching process

Elements

Schedule

1. Discussion of objectives, elements, and completion standards
2. Introduction
3. Lecture
4. Conclusion
5. Ask and answer questions

Equipment

- Powerpoint
- Markers
- References

IP's Actions

1. Discuss lesson objectives, elements, and completion standards
2. Present lecture
3. Answer questions

SP's Actions

1. Participate in lecture
2. Take notes
3. Ask questions

Completion Standards

The learner should be able to understand and explain the teaching process

Teaching

What is Teaching

- To instruct or train

Teaching Process

- The teaching process organizes the material an instructor wishes to teach in such a way that the learner can understand it
    1. Preparation
    2. Presentation
    3. Application
    4. Assessment

Essential Teaching Skills

- Good skills all instructors all have:
    1. **Management Skills:** Being able to plan, organize, and carry out a lesson
    2. **Assessment Skills:** Is clear about the purposes of the assessment
    3. **People Skills:** Relates well to people and interact respectfully
    4. **Subject Matter Expertise:** Possesses a high level of expertise, knowledge, or skill in a particular area

Preparation of a Lesson

- A determination of objectives and standards precedes instruction

Training Objectives and Standards

- Standards should contain comprehensive examples of the desired learning outcomes, or behaviors
- The overall objective of an aviation training course is usually well established, and the general standards are included in various rules and related publications

Performance-Based Objectives

- Set measurable, reasonable standards describing the learner's desired performance
    - Description of the skill or behavior
    - Conditions
    - Criteria

Decision-Based Objectives

- Develops pilot judgment and ADM skill

Organization of Material

Introduction

- Sets the stage for everything to come
    - Attention: Purpose is to focus the learners attention on the lesson
        - Story
        - Joke
        - Video
    - Motivation: offers the learners specific reasons why the lesson content is important to know, understand, apply, or perform and thus ensures readiness
        - Examples
    - Overview: A clear, concise presentation of the objective and the key ideas gives the learners a road map of the route to be followed
        - Visual aid

Development

- Delivering the subject matter in a way that helps learners achieve the desired outcomes
    - Past-Present: Subject matter is placed chronologically
        - Used when history is an important consideration
    - Simple-Complex: Helps the instructor lead the learner from simple facts or ideas to an understanding of the phenomena or concepts involved
        - It is okay to omit some information in the beginning to keep the the process simplified
    - Known-Unknown:Using something the learner already knows to lead into new concepts
    - More Frequently Used-Least Used: certain information or concepts are common to all who use the material
        - E.g. Even though some aircraft are equipped with advanced navigation systems, all pilots will need to understand basic navigation skills first

Conclusion

- Effective conclusions retrace the important elements of the lesson and relate them to the objective

Methods of Delivery

- The instructor determines which teaching method best conveys the information and when to use it

Lecture

- the instructor delivers knowledge via lectures to learners who are more or less silent participants
    - Best used for: Conveying a general understanding of a subject

Guided Discussion

- Ensures the learner has correctly received and interpreted subject information
- The learner needs a level of knowledge about the topic to be discussed
- Use of Effective Questions:
    - Challenging

    - Concise, but clear
    - One idea
    - Adapted to learner ability
    - Applies to the subject

Computer-Assisted Learning

- Couples the personal computer (PC) with multimedia software to create a training device
    - Advantages:
        - Learners can progress at a rate which is comfortable for them
        - Conievient
        - Interactive

Demonstration-Performance

- Best used for the mastery of mental or physical skills that require practice
- Principle of learning by doing
    - Explanation: Clear, pertinent to the object, and based on known experience and knowledge of the learner
    - Demonstration: Instructors demonstrates the actions necessary to perform the skill
    - Learner Performance: The learner performs the skill
    - Instructor Supervision: The instructor supervises the learner, coaching him/her as necessary
    - Evaluation: The instructor identifies how well the skill has been mastered

Drill and Practice

- Predicts that connections are strengthened with practice
- The instructor should provide opportunities for the learner to practice while keeping the objective in mind

Problem-Based Learning (PBL)

- A learning environment where lessons involve learners with problems encountered in real life and that ask them to find real-world solutions
- Effective problems are ones that motivate, focus, and initiate learning:
    1. Relate to the real-world
    2. Require learners to make decisions
    3. Open-ended
    4. Are connected to previously learned knowledge as well as new knowledge
    5. Reflect lesson objective(s)
    6. Challenge learners to think critically

High Order Thinking Skills (HOTS)

- Taught from simple-complex and concrete-abstract
- Teaching HOTS includes:
    1. Set up the problem
    2. Determine learning outcomes for the problem
    3. Solve the problem or task
    4. Reflect on problem-solving process

5. Consider additional solutions through guided discovery
6. Reevaluate solution with additional options
7. Reflect on this solution and why it could be the best solution
8. Consider what “best” means (Is it situational?)

Types of PBL

- PBL Includes:
    1. Decision to find a solution
    2. A possible solution
    3. An explanation for the reasons of the solution
    4. A reflection of the solution

Scenario-Based Training

- Uses a highly structured script of real-world experiences to address aviation training objectives in an operational environment

Collaborative Problem-Solving Method

- The instructor provides a problem to a group who then solves it

Case Study Method

- Contains a story relative to the learner that forces him or her to deal with situations encountered in real life
    - NTSB accident reports: By removing the probable cause, the flight instructor can use the description as a case study and allow the learners to discuss probable cause without bias

Instruction Aids and Training Technologies

Reasons to Use Instructional Aids

When to Use Instructional Aids

- Planned, based on its ability to support a specific point in a lesson
    - Clearly establish the lesson objective
    - Gather data
    - Organize the material into an outline or a lesson plan
    - Select the ideas to be supported with instructional aids

Types of Instructional Aids

- Marker Board
- Supplemental Print Material
- Enhanced Training Materials
- Projected Material
- Video
- Interactive Systems
- Computer-Assisted Learning
- Models, Mock-ups, and Cut-Aways

Task D: Assessment and Critique

Reference: *FAA-H-8083-9A*

Objective

To introduce to the learner a basic understanding and types of assessment and critique

Elements

Schedule

1. Discussion of objectives, elements, and completion standards
2. Introduction
3. Lecture
4. Conclusion
5. Ask and answer questions

Equipment

- Powerpoint
- Markers
- References

IP's Actions

1. Discuss lesson objectives, elements, and completion standards
2. Present lecture
3. Answer questions

SP's Actions

1. Participate in lecture
2. Take notes
3. Ask questions

Completion Standards

The learner should be able to understand the types of critique and assessment and be able to explain them

Assessment

- Provides the instructor with immediate feedback on the quality of instruction

Purpose of Assessment

- Effective assessment provides critical information to both the instructor and the learner about how to learner is performing

What Makes Assessment Effective?

- Assessment needs to be both factual and align with the completion standards of the lesson

Objective

- The personal opinions, likes, dislikes, or biases of the instructor might affect an assessment
    - Instead, the assessment needs to be based on facts of the performers as they were, not as they could have been

Flexible

- The instructor should evaluate the entire performance of a learner in the context in which it is accomplished
    - Meticulously placing what say, what to stress, and what to minimize in the proper moment

Acceptable

- Assessments presented fairly, with authority, conviction, sincerity, and from a position of recognizable competence tend to work well
    - Building rapport with the learner before the assessment helps with this

Comprehensive

- A comprehensive assessment is not necessarily a long one, nor need it treat every aspect of the performance in detail

Constructive

- An assessment is pointless unless the learner benefits from it
    - When identifying a mistake or weakness, the instructor needs to give positive guidance for correction

Organized

- Almost any pattern is acceptable, as long as it is logical and makes sense to the learner

Thoughtful

- An effective assessment reflects the instructor's thoughtfulness toward the learner's need for self-esteem, recognition, and approval
    - While being straightforward and honest, the instructor should always respect the learner's personal feelings

Specific

- Comments and recommendations should be specific
    - Learners cannot act on recommendations unless they know specifically what the recommendations are

Types of Assessment

Traditional Assessment

- often involves the kind of written testing (e.g., multiple choice, matching) and grading
- Usually assesses the learner's progress at the rote and understanding levels of learning

Characteristics of a Good Written Test

- A test is a set of questions, problems, or exercises intended to determine whether the learner possesses a particular knowledge or skill
    - **Reliability:** Degree to which test results are consistent with repeated measurements
    - **Validity:** The extent to which a test measures what it is supposed to measure, and it is the most important consideration in test evaluation
    - **Usability:** The functionality of tests
    - **Objectability:** Describes singleness of scoring of a test
    - **Comprehensiveness:** The degree to which a test measures the overall objectives
    - **Discrimination:** The degree to which a test distinguishes the difference between learners and may be appropriate for assessment of academic achievement
        1. A wide range of scores
        2. All levels of difficulty
        3. Items that distinguish between learners with differing levels of achievement of the course objectives

Authentic Assessment

- asks the learner to perform real-world tasks and demonstrate a meaningful application of skills and competencies
    - Emphasizes the use of critical thinking skills rather than selecting from predetermined responses
- Learner-Centered Assessment: Asking open-ended questions to the learner
    - **Replay:** The instructor asks the learner to verbally replay the flight or procedure
        - Instructor looks for areas where the account does not seem accurate
    - **Reconstruct:** identifying the key things that the learner would have, could have, or should have done differently
    - **Reflect:** insights come from investing perceptions and experiences with meaning, requiring reflection on the events
    - **Redirect:** Relating the lessons learned to outside experiences and how they might help in the future

Oral Assessment

- The most common means of assessment is direct or indirect oral questioning of learners by the instruction
    - Fact Questions: Answers based on memory

    - High Order THinking Skills (HOTS) Questions: Require the learner to critically think

Characteristics of Effective Questions

- The instructor should devise and write pertinent questions in advance
    - Challenging
    - Concise, but clear
    - One idea
    - Adapted to learner ability
    - Applies to the subject

Questions to Avoid

- Puzzle
    - E.g. What is the first action you should take if a conventional gear airplane with a weak right brake is swerving left in a right crosswind during a full flap, power-on wheel landing?"
- Bewilderment
    - E.g. "In reading the altimeter—you know you set a sensitive altimeter for the nearest station pressure—if you take temperature into account, as when flying from a cold air mass through a warm front, what precaution should you take when in a mountainous area?"
- Toss-up
    - E.g "In an emergency, should you squawk 7700 or pick a landing spot?"
- Irrelevant: Questions unrelated to the test topics
    - E.g. Asking a question about tire inflation during a test on the timing of magnetos
- Trick: Cause the learners to develop the feeling that they are engaged in a battle of wits with the instructor, and the whole significance of the subject of the instruction involved is lost
    - E.g. response options are 1, 2, 3, and 4, but they are placed in the following form:
        A. 4
        B. 3
        C. 2
        D. 1
- Oversize: "What do you do before beginning an engine overhaul?"

Critique

- An effective critique considers good as well as bad performance, the individual parts, relationships of the individual parts, and the overall performance

What is Critique

- Used in conjunction with either traditional or authentic assessment, the critique is an instructor-to-learner assessment

Types of Critique

Written Critique

- Advantages

    - Instructor can devote more time to it
    - Learners can keep it
    - Learners have a permanent record of comments and feedback from other learners
- Disadvantages
    - Other members of the class do not benefit

Instructor/Learner Critique

- Instructor leads a group discussion in which the learners are invited to offer criticism
    - Should be carefully monitored and directed with a clear purpose

Individual Student Critique by Another Student

- Discussion of the performance and of the assessment can often allow the group to accept more ownership of the ideas expressed

Student Led Critique

- Learner leads the critique

Small Group Critique

- the class is divided into small groups, each assigned a specific area to analyze
- Each group presents its findings to the class

Self-Critique

- A learner critiques personal performance

Task E: Instructor Responsibilities and Professionalism

Reference: *FAA-H-8083-9A*

Objective

To introduce the learner to a basic understanding of the instructor responsibilities and the importance of maintaining professionalism

Elements

Schedule

1. Discussion of objectives, elements, and completion standards
2. Introduction
3. Lecture
4. Conclusion
5. Ask and answer questions

Equipment

- Powerpoint
- Markers
- References

IP's Actions

1. Discuss lesson objectives, elements, and completion standards
2. Present lecture
3. Answer questions

SP's Actions

1. Participate in lecture
2. Take notes
3. Ask questions

Completion Standards

The learner will be able to explain the importance of professionalism regarding the aviation instructor as well as understand the their responsibilities

The Aviation Instructor

What is an Aviation Instructor

- An aviation instructor is someone who transfers knowledge and helps learners meet and exceed established standards

Responsibilities of All Aviation Instructors

Providing adequate instruction

- No two learners are alike
    - The instructor must tailor his or her teaching technique to the learner by analyzing the learners personality, thinking, and ability

Emphasizing the positive

- Teaching in a way that gives the learner a positive outlook on aviation will contribute to the learners success

Ensuring Aviation Safety

- It is the instructor's responsibility for the safety of the both the learner and the aircraft
- It is also the instructors responsibility to mold the learner into be knowledgeable of aviation safety
    - A brand new student isn't going to know to keep his or her body away from a propeller

Helping Learners Learn

- Learning should be:
    1. Enjoyable
        - This helps the learner maintain a high level of motivation
        - Do not sacrifice standards of performance to make things easy
        - The learner experiences satisfaction by completing tasks or meeting standards of a challenge
    2. Interesting
        - Knowing the objective of each lesson gives interest and meaning to the learner

Demanding Appropriate Standards of Performance

- An aviation instructor is responsible for training an applicant to established standards of performance in both the Airman Certification (ACS)/Airman Practical Test Standards (PTS)
- The ACS/PTS is not a teaching document, but a testing document

Minimizing Student Frustrations

- Motivate Learners
    - When learners can see the benefits and purpose of a of the lesson their efforts, enjoyment, and motivation increase
- Keep learners Informed

    - Learners can feel insecure when they don't know what is expected of them
    - The aviation instructor can keep the learner informed in many various ways, including:
        - Providing an overview of the course or lesson
        - Keeping him/her updated on performance
        - Giving ample notice of exams or other requirements
- Approach Learners as Individuals
    - Each individual within the group has their own personality
    - When an aviation instruction doesn't take into account that each learner has a personality outside the classroom, their efforts are directed at an average personality that really fits no one
        - E.g. A classroom full of learners are all car mechanics, therefore a lesson on powerplants and system may come easier to them rather than an aerodynamics lesson
- Give Credit When Due
    - When learners do something well, they normally expect to be praised for their efforts and execution
    - Learners may become frustrated if there is no praise stimulus
    - Praise that is given too freely becomes valueless
- Criticize Constructively
    - Errors is training can not be corrected if they are not identified
    - The learner may become frustrated if they are putting in an earnest effort, failing, then receiving little to no feedback
- Be Consistent
    - Learners have a subconscious need to please their instructors
    - The learner will become confused if one thing is acceptable one day, and the next day it is not
- Admit Errors
    - Aviation instructors are people, it is possible to make mistakes. It is how to instructor handles these mistakes that determines learner outcome
    - The learner can sense if the instructor bluffs or tries to cover up a mistake, this will destroy the learners confidence
    - The instructor can win the respect of the learner by honestly acknowledging errors

The Flight Instructor

What is a Flight Instructor

- The flight instructors job is to "mold" learners into becoming safe, proficient, and professional pilots

Additional Responsibilities of Flight Instructors

- In addition to the aviation instructor responsibilities, the flight instructor takes on additional responsibilities including, but not limited to:
    - Evaluation of learner piloting ability
    - Pilot supervision
    - Practical test recommendations
    - Flight instructor endorsements

    - Additional training and endorsements
    - Pilot proficiency
    - See and avoid responsibility
    - Learner's pre-solo flight process
- Flight instructors should be current and proficient in the aircraft that they use

Professionalism

The aviation instructor is the central figure in aviation training and is responsible for all phases of required training. The aviation instructor should be a professional. This means striving to maintain the highest level of knowledge, training, currency, and proficiency in the field of aviation.

- **Sincerity:** The aviation instructor should be straightforward and honest at all times
- **Acceptance of the Learner:** The instructor should accept students as they are, including their faults and problems
    - The learner is a person who is there to learn and the instructor is a person who is available to help in the learning process
- **Demeanor:** The instructor should have a professional image which requires development of a calm, thoughtful, and disciplined manner
    - Avoid contradictory directions, reacting differently to similar or identical errors at different times, demanding unreasonable performance or progress, criticizing a learner unfairly, or presenting an overbearing manner
- **Personal Appearance and Habits:** Learners expect the aviation instructor to be neat, clean, and appropriately dressed
    - An instructor who is rude, thoughtless, and inattentive will not hold the respect of the lerner
- **Proper Language:** The instructor should speak normally, without inhibitions, and speaks positively and descriptively, without profanity
    - Use of profanity or other inappropriate language will lead to distrust or even complete loss of confidence in the instructor

Professional Development

- Aviation instructors need to continue to develop their knowledge and understanding in order to teach successfully
- Professional instructors do not become complacent or satisfied with their own qualifications and abilities and should continue to strive for new ways to improve themselves as a whole
- There are a variety of ways instructors can improve their qualifications

Ensuring Student Ability

- Flight Instructors need to ensure the learner pilot develops the required skills and knowledge listed in §61.87
- Consistent mastery without instructor intervention from preflight to shutdown is an indicator that a student is ready or nearing his/her first solo flight

Aviation Instructors and Exams

- Knowledge Tests
    - 14 CFR part 61, section 61.39(a)(1) requires that the applicant pass a knowledge test

    - AC 61-65 for endorsements
    - If the applicant fails a knowledge test, the applicant needs an endorsement from an authorized instructor who gave additional training in order to retake the test

- Practical Tests
    - The instructor should ensure the applicant is prepared for the test and has met all the regulatory requirements, including knowledge, proficiency, required endorsements, and experience requirements before the application process
    - Signing a recommendation imposes serious responsibility on the instructor

- Additional Training and Endorsements
    - AC 91-98 contains the information on currency requirements and guidance in regards to the flight review and instrument proficiency check (IPC)

Flight Review 14 CFR §61.56

- A pilot certificate does not expire, therefore, how do we know a pilot who hasn't flown in 10 years is still current and proficient to fly today?
- Required every (24) calendar months
    - Must have been completed in an aircraft for which the pilot is appropriately rated
    - An authorized instructor or other person approved by the administrator can give a flight review
    - Practical tests and the WINGs program may be in lieu of a flight review
- The purpose of a flight review is to provide for a regular evaluation of pilot skills and aeronautical knowledge in order to ensure the pilot can conduct safe flight
- Minimum of (1) hour of ground instruction and (1) hour of flight instruction, which must include a review of 14 CFR Part 91 operations
    - The person giving the flight review has discretion to determine which maneuvers and procedures the pilot may perform

Aircraft Checkouts/Transitions

- As an example, pilots certified in airplane single-engine land (ASEL) category can fly, assuming any additional endorsements are necessary, any single-engine land airplane
- Although both are ASEL, a Cessna 172 is much different than a Kodiak 100
    - The flight instructor should be current and proficient in the aircraft when conducting a checkout/transition
    - AC 90-109 provides further insight into this topic

Evaluation of Student Ability

- Evaluation refers to judging a learner's ability to perform a maneuver or procedure
- **Demonstrated ability:** Evaluation is based upon established standards of performance
    - The evaluation considers the learner's mastery of the elements involved in the maneuver or procedure, rather than merely the overall performance
    - E.g. A pre-solo learner would have different demonstrated performance than a learner working on solo xc operations
- **Keeping the learner informed:** Keep the learner informed of progress
    - Critiques should be in a written format to help aid the instructor in covering all areas noted

- **Correction of Errors:** When explaining errors in performance, instructors point out the elements in which the deficiencies are believed to have originated and, if possible, suggest appropriate corrective measures

Physiological Obstacles for Flight Students

- New learners may not be used to the environment of a light training aircraft
    - Negative sensations can be overcome by understanding the nature of their causes

Task F: Techniques of Flight Instruction

References: FAA-H-8083-9A

Objective

To introduce to the learner a basic understanding of the techniques of flight instruction

Elements

Schedule

1. Discussion of objectives, elements, and completion standards
2. Introduction
3. Lecture
4. Conclusion
5. Ask and answer questions

Equipment

- Powerpoint
- Markers
- References

IP's Actions

1. Discuss lesson objectives, elements, and completion standards
2. Present lecture
3. Answer questions

SP's Actions

1. Participate in lecture
2. Take notes
3. Ask questions

Completion Standards

The learner should be able to understand and explain techniques of flight instruction

The Practical Flight Instructor

Obstacles in Learning During Flight Instruction

Demonstration-Performance Training Delivery

- valuable in teaching procedures and maneuvers

Explanation

- Flight instructor needs to be well prepared and highly organized
- The explanation phase is accomplished prior to the flight lesson with a discussion of lesson objectives and completion standard

Demonstration

- Instructor demonstrates the skill and describes the actions simultaneously

Learner performance with Instructor Supervision

- Two steps that are performed concurrently
    - Learner performed the skill
    - Instructor supervises and coaches when necessary

Evaluation

- The instructor evaluates performance, records the learner performance, and verbally advises the learner on progress

Telling-Doing Technique

Instructor tells - Instructor does

- Explanation with a demonstration

Learner tells - Instructor Does

- Learner plays the role of the instructor
- Benefits:
    - Perceptions develop into insights
    - Learner is explaining the maneuver without the need to focus on performance

Learner tells - Learner Does

- If the learner has been adequately prepared and the procedure or maneuver fully explained and demonstrated, meaningful learning occurs

Integrated flight instruction

What is it?

- Flight instruction by both outside and inside visual references

Developing Habit Patterns

- Effective use of instruments also results in superior cross-country navigation, better coordination, and generally, a better overall pilot competency level
- General aviation accident reports provide ample support for the belief that reference to flight instruments is important to safety
    - Safety records of pilots with instrument rating are significantly lower than pilots without the rating

Procedures

- Each new flight maneuver is introduced with cross referencing outside and inside references
- The need to emphasize cross referencing is important throughout training

Ground Instruction

- Highly effective if it follows an overall plan designed to prepare the learner for flight

Use of Simulation Training Devices

-

Integrated Training Curricula

Logging Training Time and Experience

On-Aircraft Training

Assessment of piloting ability

Demonstrated Ability

- Based upon established standards of performance, suitably modified to apply to the learner's experience and stage of development as a pilot

Postflight Evaluation

- It is important for the flight instructor to keep the learner informed of progress
- Collaborative assessment includes learner self-assessment and a detailed assessment by the aviation instructor
    - E.g. "How do you think you did?"

Correction of Learner Errors

- Do not take controls from learners as soon as a mistake is made
- Safety permitting, let the learner progress partly into a mistake and find a way out

Pilot Supervision

- The learner must produce consistent mastery before the instructor endorses him/her for solo flight

Dealing with Normal Challenges

- Instructors should teach learners how to solve ordinary problems encountered during flight
    - Change of runway due to winds
    - Traffic pattern congestion
    - How to call for fuel

Practice Visualization

- Have students practice drawing a mental picture of the traffic pattern
- Aids in Scenario-Based Training

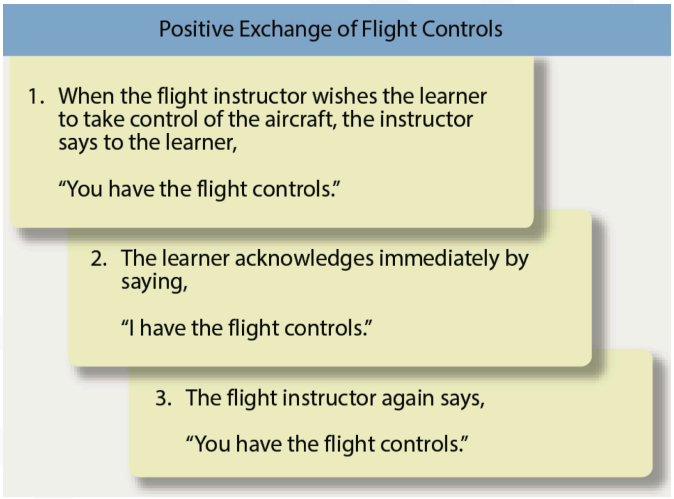
Positive Exchange of Flight Controls

Purpose

- Numerous accidents have occurred from lack of communication about who is flying the aircraft

Procedure

- especially critical during the demonstration-performance method of flight instruction
- Three step process between the learner and the instructor



Sterile Flight Deck Rule

- (14 CFR) part 121, section 121.542 requires airline flight crewmembers to refrain from nonessential activities during critical phases of flight
- Critical Phases of Flight
    - Ground operations involving taxi, takeoff, and landing
    - Operations below 10,000 feet MSL
    - Exception is cruise flight

Use of distractions

- National Transportation Safety Board (NTSB) statistics reveal that most stall/spin accidents occurred when the pilot's attention was diverted from the primary task of flying the aircraft
- Eastern Air Lines Flight 401

Aeronautical Decision Making

- provides a systematic approach to the mental processes used by pilots to consistently determine the best course of action in response to a given set of circumstances
    - What pilots intend to do based on the latest information they have

3-P Model

- Offers a simple, systematic approach to accomplishing each ADM task during all phases of flight
    - **Perceive:** Gather all relevant information
    - **Process:** Evaluate the information effects on safety and determine the best course of action
    - **Perform:** Act.

Task G: Risk Management

References: FAA-H-8083-9A, FAA-H-8083-2, ICAO

Objective

To introduce to the learner a basic understanding of risk and risk management

Elements

Schedule

1. Discussion of objectives, elements, and completion standards
2. Introduction
3. Lecture
4. Conclusion
5. Ask and answer questions

Equipment

- Powerpoint
- Markers
- References

IP's Actions

1. Discuss lesson objectives, elements, and completion standards
2. Present lecture
3. Answer questions

SP's Actions

1. Participate in lecture
2. Take notes
3. Ask questions

Completion Standards

The learner should be able to understand and explain what risk is and the risk management process

Risk

What is Risk

- The probability and possible severity of accident or loss from exposure to various hazards, including injury to people and loss of resources

Hazard

- It is a source of danger
    - E.g A nick in the propeller represents a hazard

Risk

- The future impact of a hazard that is not controlled or eliminated
    - measured by the number of people or resources affected (exposure); the extent of possible loss (severity); and likelihood of loss (probability)

Safety

- freedom from those conditions that can cause death, injury, occupational illness, or damage to or loss of equipment or property, or damage to the environment
    - safety is a relative term that implies a level of risk that is both perceived and accepted

Types of Risk

Identified Risk

- Risk which has been determined through various analysis techniques

Unidentified Risk

- Risk not yet identified

Total Risk

- The sum of identified and unidentified risks

Unacceptable Risk

- Subset of identified risk that must be eliminated

Acceptable Risk

- Part of identified risk that is allowed to persist without management action

Residual Risk

- Risk that is left over after system safety efforts have been fully employed
    - Sum of acceptable risk and unidentified risk

Identifying Risk

- You should methodically identify and classify risks to a proposed or ongoing flight by maintaining constant situational awareness
- We can identify risks through the use of the PAVE checklist

PAVE Checklist

- pilots have a simple way to remember each category to examine for risk prior to each flight
- Once a pilot identifies the risks of flight, he or she needs to be decide whether the risk or combination of risks can be managed safely and successfully

Pilot

- Am I ready for this trip?
    - Currency
    - Proficiency
    - Recency
    - IMSAFE Checklist
        - Illness: Do I have any symptoms?
        - Medication: Have I been taking anything?
        - Stress: Am I under physiological stress and am I prepared to handle even more stress during my flight?
        - Alcohol: Am I compliant with 14 CFR 91.17 and/or do I have a hangover?
        - Fatigue: Minimum crew rest requirements (Not required for part 91)
        - Emotion: How are my emotions?

Aircraft

- Fuel Requirements
- Is this the right aircraft for the mission?
- Inspections

En(V)ironement

- Weather
- Mountainous terrain
- IMC
- Icing conditions
- Airports
- Night flying
- Airspace
- Setting personal minimums

External Pressures

- Passengers
- Satisfying a personal goal
- Desire to demonstrate pilot qualifications
- Get-there-itis

5P Checklist

- The 5 Ps are based on the idea that the pilot has essentially five variables that impact his or her environment and that can cause the pilot to make a single critical decision, or several less critical decisions, that when added together can create a critical outcome

Plan

- The mission
- Basic elements of cross-country planning, weather, route, fuel, publications currency, etc
- Should be reviewed and updated multiple times

Plane

- Advanced avionics expanded the “plane” into checking the database, currency, and automation status

Pilot

- Taking physiological factors into account that could affect the pilot
- One they are determined, the pilot is in a better position to make alternate plans

Passengers

- The pilot should give him/herself an out and provide for alternate means of travel

Programming

- The electronic instrument displays, GPS, and autopilot reduce pilot workload and increase pilot situational awareness

IMSAFE Checklist

- One of the best ways that single pilots can identify risk associated with physical and mental readiness

Risk Management

Principles of Risk Management

- The goal of risk management is to identify safety-related hazards and mitigate the associated risks

Accept No Unnecessary Risk

- Flying is impossible without risk, but unnecessary risk comes without a corresponding return
    - E.g. If flying a new airplane for the first time, would you fly in low instrument meteorological conditions?

Make Risk Decisions at the Appropriate Level

- risk decisions should be made by the person who can develop and implement risk controls
    - E.g. Would you let Air Traffic Control make decisions for you during a flight?

Accept Risks When Benefits Outweigh the Costs

- All identified benefits should be compared against all identified costs
    - A day with good weather, for example, is a much better time to fly an unfamiliar airplane for the first time than a day with low instrument flight rules (IFR) condition

Integrate Risk Management into Planning at All Levels

- Risks are more easily assessed and managed in the early stages of planning a flight

Risk Management Process

- Identifies operational hazards and takes reasonable measures to reduce risk to personnel, equipment, and the mission
    1. Identify the Hazard
- Experience, common sense, and specific analytical tools help identify hazards
    2. Assess the Risk
- Each identified risk may be assessed in terms of probability and severity that could result from the hazard
    - Risk Assessment Matrix
    - Flight Risk Analysis Tool (FRAT)
- Using process defines the probability and severity of an accident
    3. Mitigate the Risk
- Investigate specific strategies and tools that reduce, mitigate, or eliminate the risk
- The analysis may consider the overall costs and benefits of remedial actions, providing alternative choices when possible

Safety Management Systems (SMS)

- Systematic approach to managing safety in aviation and other safety critical industries
- Airlines and other professional aviation organizations have implemented SMS

Safety Policy

- Defines the methods, processes, and organizational structure needed to meet safety goals

Safety Risk Management

- Determines the need for, and adequacy of, new or revised risk controls based on the assessment of acceptable risk

Safety Assurance

- Evaluates the continued effectiveness of implemented risk control strategies; supports the identification of new hazards

Safety Promotion

- Includes training, communication, and other actions to create a positive safety culture within all levels of the workforce

Bowtie model with examples