Task II.B: Runway Incursion Avoidance

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Lesson Overview

References

- AC 91-73B

- PHAK 14-30

- PHAK (Chapter 8, Appendix I)

- AOPA Airport Diagram Flashcards FAA-H-8083-3B, Airplane Flying Handbook (Chapter 2, Chapter 10)

- Slide Presentation

Objectives

    The student should develop knowledge of the elements related to proper incursion avoidance.

Key Elements

1. Read back all clearances

2. Head down activities only when stopped

3. Always have current Airport Diagram (AD)

Elements

1. Challenges Unique to Taxiing

2. Appropriate Cockpit Activities

3. Steering, Maneuvering, Maintaining Taxiway, Runway Position, and Situational Awareness

4. Hold Lines

5. Landing and Rollout

6. Airports with a Control Tower

7. Airports without a Control Tower

8. Exterior Lighting and Night Operations

Schedule

1. Discuss Objectives

2. Review material

3. Development

4. Conclusion

Equipment

1. White board and markers

2. References

3. iPad

IP's Actions

1. Discuss lesson objectives

2. Present Lecture

3. Ask and Answer Questions

4. Assign homework

SP's Actions

1. Participate in discussion

2. Take notes

3. Ask and respond to questions

Instructor Notes

Attention

Runway Incursion Video

Overview

Review Objectives and Elements/Key ideas

What

Runway incursion avoidance provides practical guidance with the goal of increasing safety and efficiency of aircraft movement on the airport surface while reducing the risk of runway incursions.

Why

> Runway incursions have sometimes led to serious accidents with significant loss of aircraft as well as life. Although they are not a new problem, with increasing air traffic, runway incursions have been on the rise.

Lesson Overview

With increasing air traffic runway incursions have been on the rise. One of the biggest safety concerns in aviation, these days, is the surface movement accident. Increasing expansion at many airports have resulted in more complex runway and taxiway layouts. It is easy to get lost, or confused, taxiing in these complex environments.

Certain activities must be carefully managed during ground operations. The pilot's workload should be at a minimum during taxiing, and maximum attention paid to the environment in which movement is occurring. This can be accomplished by use of SOPs which direct attention only to essential activities while taxiing, and the completion of pre-taxi checklists before ground movement. All heads down activity should be performed while the aircraft is stopped.

Challenges unique to taxiing

During taxi a **sterile cockpit** should be implemented to minimize distractions. This means no cell phones, no conversations, or anything else unnecessary to the safe taxi operation. Prior to taxi route planning from the current location to the designated runway should be done, and a current copy of the airport diagram should be at hand. Additionally, some large airports have pre-designated taxi routes and the pilot should familiarize themselves with these routes if they are in use. Always write down ATC taxi instructions to avoid confusion, and prior to taxiing review the route given and insure that the intentions are clear.

When taxiing near other aircraft extreme care is required. Pilots should use a "continuous loop" process to monitor all aircraft extremities and insure they are clear of any obstacles. Also be vigilant when crossing other taxiways, or entering identified "hot spots" on the airport surface. Listen to clearances given other aircraft to identify conflicts, and be particularly cautious if another aircraft on the frequency has a similar call sign.

Taxi Summary

- Surface movement accidents—one of the biggest safety concerns in aviation.
- Increased traffic/expansion at airports can create complex runway and taxiway layouts—makes surface operation more difficult, creates a more hazardous potential for incursions.

Appropriate cockpit activities

Minimize pilot's workload during taxi operations.

- SOPs direct attention to essential tasks while taxiing.
- Complete pre-taxi checklists and data entry prior to taxiing.
- Only do heads down activities when the aircraft is stopped.

Sterile cockpit

From taxi through climb: keep focus on taxiing and ATC. Don't use cell phones or have conversations with others—avoid anything unnecessary to the duties of flight.

Planning, review, and briefing

Route planning: have a current copy of the airport diagram, review pre-designated taxi routes for familiarity at large airports. Review expected/possible routes based on runway in use and usable taxiways if no pre-designated taxi routes.

Review: Write down ATC taxi instructions to prevent mistakes and ensure you are following the given instructions, not the expected/planned instructions. Ask ATC for help if confused, or ask for progressive taxi.

Briefing: Review and brief hot spots, and stay alert in those areas, as they are the most common accident areas. Brief the route.

Taxiing Near Other Aircraft

"Continuous loop" process to monitor and update progress/location. Know your present location and mentally calculate the next location on the route that will require increased attention (e.g. crossing traffic, hot spot, etc.)

Understand clearances issued to pilots, other aircraft, vehicles. Be especially vigilant with aircraft with similar call signs—avoid inadvertently executing clearance for another aircraft.

Steering and maneuvering

Use rudder to maintain centerline—keep centerline aligned between your legs.

Maintaining position

Always have current airport diagram on hand—monitor location and route.

If uncertain of location, stop and ask for help. Don't stop on a runway. Low visibility conditions—use everything available (airport diagram, heading indicator, airport signs, markings and lighting). Brief requirements and special considerations before taxi, and be alert if ATC states to hold short of the ILS critical area line.

Hold Lines

- Indicate where aircraft should stop when approaching a runway.
- Unauthorized crossing may result in an incursion with landing/departing traffic (higher speed = more hazardous incursion).
- Approaching hold lines from solid side—do not cross without clearance.
- Approaching hold lines from dashed side—cross and stop once fully past solid lines.

Landing/Rollout

When landing on runway that crosses/approaches another runway`"

- Brief the situation.
- Understand where you will stop, what taxiways are appropriate, any hotspots.
- Taxi slow, don't exit at high speeds.

If stopped between parallel runways, only cross after clearance. Don't cross the solid side of hold short lines without clearance.

After landing, ensure that the entire aircraft (including tail section) has crossed over the hold short line—entire aircraft is clear of the runway safety area. If unable because of adjacent parallel runway's hold short line, stop and advise ATC.

After landing, nonessential communications/pilot actions should not be initiated until clear of the runway.

Airports with control towers

Use standard ATC phraseology at all times to facilitate clear and concise communication. State who you are, where you are, and what you want, when making initial contact with any controller. Focus on ATC clearance—don't perform any nonessential tasks while communicating with ATC. Read back all clearances.

Airports without a control tower

Planning: be familiar with local traffic pattern direction and pattern altitude. During calm wind conditions, flight ops may occur at more than one runway. Aircraft may be using an IAP to runways other than the VFR ops runway. Be alert, communicate intentions on CTAF, listen for other aircraft ops.

Maintain situational awareness—be aware of the route, know where you are at all times.

Not all aircraft are radio-equipped—before entering/crossing a runway, listen on CTAF for inbound traffic, scan the full length of the runway, including the final approach/departure paths of runways that you will enter/cross.

Monitor/communicate on CTAF from engine start, taxi, and until 10 miles from airport.

Exterior Lighting and Night Ops

Exterior lights—used to make aircraft more conspicuous on airport surface.

- Engines running—turn on rotating beacon any time an engine is running.
- Taxiing—prior to commencing taxi, turn on navigation, position, anti-collision lights. Turn on taxi light when moving/intending to move on ground, turn it off when stopped or yielding or as

a consideration to others. Don't use strobe lights if they will adversely affect the vision of others.

- Crossing a runway—use all exterior lights.
- Entering departure runway for takeoff or LUAW—turn on all lights except landing lights.
- Takeoff—turn landing lights on when receiving takeoff clearance, or when commencing takeoff roll at an airport without an operating control tower.

At night, and when cleared to LUAW, line up slightly off the centerline to enable a landing aircraft to differentiate you from the runway lights.

Be cautious at night—reduced visibility makes taxiing more difficult. Ensure you remain on assigned taxi route (easier to get confused/miss a turn). Taxi slower, give yourself time to stop if something suddenly appears in range of sight (animal, debris, etc.), look closely for taxiway markings (especially hold short lines). Use taxiway edge lights/signs to maintain position.

Conclusion

One of the biggest safety concerns in aviation is the surface movement accident. By focusing resources to attack this problem head-on, the FAA hopes to reduce and eventually eliminate surface movement accidents.

ACS Requirements

To determine that the applicant exhibits instructional knowledge of the elements of runway incursion avoidance by describing:

1. Distinct challenges and requirements during taxi operations not found in other phases of flight operations.

2. Procedures for appropriate cockpit activities during taxiing including taxi route planning, briefing the location of hot spots, (can be found in AFD) communicating and coordinating with ATC.

3. Procedures for steering, maneuvering, maintaining taxiway, runway position, and situational awareness.

4. The relevance/importance of hold lines.

5. Procedures for ensuring the pilot maintains strict focus on the movement of the aircraft and ATC communications, including the elimination of all distractive activities (i.e. cell phone, texting, conversations with passengers) during aircraft taxi, takeoff and climb out to cruise altitude.

6. Procedures for holding the pilot's workload to a minimum during taxi operations.

7. Taxi operation planning procedures, such as recording taxi instructions, reading back taxi clearances, and reviewing taxi routes on the airport diagram.

8. Procedures for ensuring that clearance or instructions that are actually received are adhered to rather than the ones expected to be received.

9. Procedures for maintaining/enhancing situational awareness when conducting taxi operations in relation to other aircraft operations in the vicinity as well as to other vehicles moving on the airport.

10. Procedures for briefing if a landing rollout to a taxiway exit will place the pilot in close proximity to another runway which can result in a runway incursion.

11. Appropriate after landing/taxi procedures in the event the aircraft is on a taxiway that is between parallel runways.

12. Specific procedures for operations at an airport with an operating air traffic control tower, with emphasis on ATC communications and runway entry/crossing authorizations.

13. ATC communications and pilot actions before takeoff, before landing, and after landing at towered and non-towered airports.

14. Procedures unique to night operations.

15. Operations at non-towered airports.

16. Use of aircraft exterior lighting.

17. Low visibility operations.

Memory Items