U.S. Department
of Transportation
Federal Aviation
Administration

InFO

Information for Operators

InFO 26003
DATE: 01/22/26

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info/all_infos

Subject: Spatial Disorientation (SD) Training for Pilots.

Purpose: This InFO serves to recommend SD training for Title 14 of the Code of Federal Regulations (14 CFR) parts 91, 91 subpart K (91K), and 135 operations.

Background: In Safety Recommendation A-21-006, the National Transportation Safety Board (NTSB) identified SD[1] as a safety issue connected to a high-profile fatal helicopter accident and directed the Federal Aviation Administration (FAA) to convene a panel to evaluate SD simulation technologies to determine which applications are most effective for training pilots to recognize and mitigate SD. Based on NTSB accident investigation data, pilot SD continues to be a contributing factor in accidents. SD occurs when a pilot's perception of direction of flight is not consistent with reality, often due to the lack of visual references or conflicting signals from the body's sensory systems. The Spatial Disorientation Training Workgroup (SDT WG) submitted recommendations for consideration by the Air Carrier Training Aviation Rulemaking Committee (ACT ARC) Steering Committee on January 25-26, 2023[2]. The ACT ARC Steering Committee adopted the recommendations and submitted them to the FAA on May 10, 2023. To reduce the possibility of SD accidents in the future, the FAA recommends that operators and training providers incorporate SD theoretical and practical training into their operations.

Discussion: Given that approximately 80 percent of all aviation accidents involve human factors[3], the FAA recommends a greater focus on SD training beyond the scope of current guidelines. SD training should emphasize avoidance of conditions where SD can occur, as well as recognition of onset and recovery from SD events. SD training should include the types of training, training methods, and special emphasis areas described below:

[1] See NTSB Safety Recommendation A-21-006 (February 25, 2021). The accident occurred on January 26, 2020 and involved a Sikorsky S-76B helicopter, N72EX, operated by Island Express Helicopters, Inc. as a part 135 on-demand flight. The helicopter crashed into terrain in Calabasas, California.
[2] See ACT ARC 23-1, *Simulation Training Devices Suitable for Spatial Disorientation Training*, and ACT ARC 23-2, *Part 135 Helicopter Operations Spatial Disorientation Training*, (May 10, 2023).
[3] See Ch. 13, *Helicopter Flying Handbook* (FAA-H-8083-21B), Federal Aviation Administration (2019)

A. Types of Training.

a. Scenario-Based Training. This training should include unexpected scenarios that mimic real-life situations where disorientation may occur to cultivate practical flying skills in an operational environment.

b. Maneuver-Based Training. This training should focus on isolating single events or maneuvers in a controlled environment. By doing this, pilots can gain a deeper understanding of how these situations can lead to SD, and learn effective strategies to recognize, counteract, and recover from such disorientation.

B. Training Methods. Participating in a comprehensive training program, comprised of both theoretical training and practical training, that incorporates solid ground academics along with ground-based and in-flight training further adds to the effectiveness of SD training. Theoretical training consists of ground school, which trains in the physiological systems and structures involved and the mechanisms by which pilots experience SD. Theoretical training establishes the foundation from which situational awareness, insight, knowledge, and skills are developed, and therefore should be accomplished prior to practical training for the associated flight events. Practical training consists of exposure to stimuli likely to produce SD, either in an aircraft or suitable ground-based training device. Such exposure allows the pilot to correlate sensations and perceptions experienced during SD with the knowledge obtained from theoretical training.[4]

Training methods that could be incorporated into a comprehensive training program may include:

a. Ground School Training. Theoretical training helps the pilot understand the causes of disorientation, physiological and environmental factors, and the importance of trust in aircraft instruments over sensory inputs.

b. Simulator Training.

i. Full-Flight Simulators: These offer realistic flight deck environments and can simulate various SD scenarios, such as loss of visual references and unusual attitudes.

ii. Spatial Disorientation Trainers: These are specific devices designed to create illusions and teach pilots how to recognize and recover from SD.

c. In-Flight Training. Under controlled conditions, flight instructors can demonstrate how easily SD can occur and teach recovery techniques. In-flight training often includes flying with instruments only, while using view-limiting devices to block the outside view and reinforce reliance on aircraft instruments rather than sensory perception.

d. Refresher Training Course. All pilots should participate in regular ground and in-flight refresher training courses to reinforce an understanding of common SD causes and practice instrument scanning techniques, including cross-checking data from multiple sources (e.g., electronic flight

[4] See ACT ARC 23-2, (May 10, 2023).

bag, Air Traffic Control (ATC) resources, etc.). Refresher training should also review SD recognition and recovery techniques.

C. Special Emphasis Areas.

a. Common Locations. Pilots should be trained in awareness of common locations for SD, including but not limited to, mountainous areas, low altitudes, coastal regions, uncongested areas, and locations with a lack of weather advisory. Operators and pilots should remain vigilant when conducting operations in these types of locations, which could lead to SD.

b. Common Environmental Conditions. Pilots should be trained in awareness of common environmental conditions for SD, including but not limited to heavy precipitation, areas of rapid weather changes, night operations, areas of common fog development, pollution-induced low visibility zones, and near volcanic eruptions. Operators and pilots should stay vigilant regarding these environmental conditions that could result in SD.

c. Immediate Recognition and Acceptance. Awareness and vigilance during flight help pilots learn to quickly identify symptoms of SD. Once recognized, pilots can accept that they are experiencing SD and immediately rely on the aircraft instruments to correct any erroneous perceptions. Ignoring or fighting disorientation can lead to dangerous situations.

d. Recovery Strategies. By following the strategies below, pilots can better manage and recover from SD, enhancing safety and reducing the risk of accidents. It is important to remember that these are not all the strategies available. There may be additional strategies an operator may develop at their discretion.

i. Trust the Instruments. It is imperative pilots learn to rely on the flight instruments over the pilot's sensory perceptions when feeling disoriented. Flight instruments provide objective data about the aircraft's orientation and are crucial for safe flying.

ii. Fly Straight and Level. If a pilot becomes disoriented, the pilot should focus on flying straight and level using the aircraft's flight instruments until they can regain situational awareness.

iii. Cross-Check Instruments. It is imperative that pilots regularly cross-check multiple flight instruments to ensure they are giving consistent information. This can help confirm the aircraft's true orientation.

iv. Avoid Sudden Movements. Pilots should make smooth, gradual adjustments to the aircraft controls as well as head and body movements, to minimize the risk of further disorientation.

v. Regain Visual Reference. Pilots may elect to regain visual references by descending to a known safe lower altitude or by climbing to a higher altitude where they can see the ground or the horizon. Once in visual conditions, pilots should remain in visual meteorological conditions for the remainder of the flight.

vi. **Stay Calm and Focused.** Panic can worsen the disorientation. When experiencing SD, pilots should take a few deep breaths and focus on the training received, recovery procedures, and checklists available. In a two-pilot crew operation, the pilot experiencing SD should communicate what he or she is feeling to the other crewmember and should coordinate control of the aircraft as soon as practical.

vii. **Communicate with ATC.** If available, pilots should communicate their situation to ATC for further assistance and guidance.

e. **Appropriate Use of Autopilot Systems.** If available, pilots should engage the autopilot to maintain stability and control of the aircraft. This can give a pilot time to regain situational awareness and to recover from SD.

Resources: For further details, please consult the following publications for guidance on how an operator may enhance their training programs:

- **ACT ARC Recommendations:**
  - ACT ARC Recommendation 23-1;
  - ACT ARC Recommendation 23-2.

- **FAA Pilot Safety Brochure: Spatial Disorientation**

- **Handbooks (Dynamic Regulatory System (DRS)) (Website)**:
  - Airplane Flying Handbook (FAA-H-8083-3C);
  - Aviation Instructor's Handbook (FAA-H-8083-9B);
  - Aviation Weather Handbook (FAA-H-8083-28A);
  - Helicopter Flying Handbook (FAA-H-8083-21BB);
  - Instrument Flying Handbook (FAA-H-8083-15B);
  - Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25C);
  - Risk Management Handbook (FAA-H-8083-2A).

- **NTSB Safety Recommendation A-21-006**

Recommended Action: Part 135 Directors of Operations and Chief Pilots and 91/91K general aviation operators should develop pilot SD training modules including ground, simulator (if available), and flight training for integration into their training program(s). Part 135 operators should also develop and integrate the following topics into their general operations manuals: procedures for SD awareness, avoidance, recognition of onset, and recovery techniques.

Contact: Questions or comments regarding this InFO should be directed to the Air Transportation Division, AFS-200 at 9-AFS-200-Correspondence@FAA.gov.