OAS-35A
(4/18)

Interagency Aviation Lessons Learned

Subject: Human Factors – Expectation Bias in Aviation Operations

Area of Focus: Flight Safety

Distribution: All Aviation Operations

Discussion: During a recent aviation mishap investigation, it was discovered that a critical item (tail rotor block) was not removed during the preflight inspection. This flight control limitation ultimately resulted in an in-flight aircraft emergency that required a run-on landing. There are many factors that may result in an item being missed on a preflight checklist. Two of the most common factors are distractions and complacency. In this situation, the pilot was interrupted on two separate occasions during their preflight inspection. Additionally, there are over 180 identified cognitive biases that can affect decision-making. A cognitive bias is a mental shortcut (also known as a heuristic) that our brains use to process information efficiently and make quick decisions.

One specific cognitive bias that can contribute to unintentional deviations from operational procedures such as missed items on a checklist is **Expectation Bias**. Expectation bias is the tendency to perceive or interpret information in a way that aligns with our expectations, rather than what is actually occurring. In aviation, this can lead to critical safety risks. Expectation Bias can affect pilots, aircrew, dispatchers, and maintenance personnel where they misinterpret information to align with preconceived expectations therefore missing deviations from the norm.

"For example, a pilot contacts the tower and indicates they're ready for an intersection take-off. The controller clears the pilot for runway 10, however the pilot departs from runway 28 because that is what the pilot was expecting and where they have typically departed from in the past.

Other things play into the expectation such as routine or familiarity. We humans tend to be creatures of habit. If a person is used to doing things a certain way (such as taking off from runway 28) and doesn't expect the runway change due to winds, that person might simply proceed as though nothing has changed. This might even be despite acknowledging the actual assigned runway from ATC."[1]

[1] Woods, S. *Just a Bit Biased*, FAA.gov, www.faa.gov/sites/faa.gov/files/2024-12/just_a_bit_biased_FAA.pdf. Accessed Aug. 2025.

Mitigation Strategies:

1. Practice Active Confirmation – Don't assume; verify. Use verbal confirmations and cross-check data before action. *Example:* Confirming coordinates and frequencies with ground and dispatch on every flight.
2. Emphasize Crew Resource Management (CRM) – Encourage challenge-response communication. All crew should feel empowered to question assumptions. Maintain focus on a task and do not allow yourself to be distracted (e.g., do not allow someone to interrupt your preflight inspection).
3. Use "Pause and Check" Technique – Before high-workload phases, take a brief pause to review current conditions, especially if they conflict with previous expectations.
4. Repetition Awareness – Repetitive missions can increase the risk of expectation bias. Familiarity can lead to complacency, so approach all phases of flight as if it's the first of the season. During preflight, treat each inspection and briefing as new, focusing on details that might be missed. If disrupted at any phase—preflight, taxi, takeoff, cruise, or landing—back up and re-verify steps to ensure nothing is skipped. Inject variety into briefings by highlighting changes in weather, crew locations, hazards, or mission details.
5. Encourage After Action Review and Debriefing – Debriefing operations can highlight near-misses caused by assumption-based errors and foster a culture of learning.

Expectation bias is subtle, but it can steer crews in the wrong direction. The best countermeasure is a culture of deliberate verification and open communication. Stay alert, check assumptions, and speak up when something doesn't look or feel right.

/s/ Keith C. Raley
Keith C. Raley
Chief, Aviation Safety, Training, Program Evaluation, and Quality Management
DOI, Office of Aviation Services

/s/ Lori Clark
Lori Clark
Branch Chief - Aviation Safety Management Systems
USDA, Forest Service