

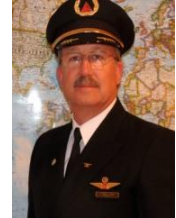


# Flight Standards Update

## Checklist Discipline

March 7, 2017

Previous Flight Standards Updates and Hangar Talk articles are available via the "Line Lessons/Safety" link on the Flight Ops DeltaNet site. Hangar Talk and the Flight Standards Updates are also available on your tablet.



### Introduction

"We did the checklist; I don't know how we missed it..."

### Background

Most of us know exactly where we were and what we were doing when the 9/11 terrorist attacks occurred. For us old-timers, we can also remember the pain, sorrow and grief we felt when we heard about the following two events.

- 1989: Delta Air Lines Flight 1141, a B-727, crashed shortly after takeoff from Dallas-Fort Worth Airport following a no-flap/no-slat takeoff
- 1988: Northwest Airlines Flight 255, (shortly after the Republic merger) a MD-80, crashed shortly after takeoff from Detroit Airport following a no-flap/no-slat takeoff

A third event occurred in 1990, when USAir Flight 5050, a B-737, ran off the runway at LaGuardia Airport and dropped into adjacent waters, following an attempted takeoff with an improperly set rudder trim.

Lack of **checklist discipline** contributed to all three accidents. Checklists are an essential component of aviation safety and standardization. Checklists coordinate tasks, enhance safety and promote CRM/TEM. Used properly, a checklist can trap crew errors and lapses of memory.

### Examples of Checklist Errors

While these accidents may seem like "ancient history" to some, current ASAP reports and FOQA data indicate a negative trend with checklist discipline and compliance. Some of the events below (listed by phase of flight) have occurred multiple times:

- Departure from a runway intersection when the WDR required full-length, resulting in a reduced margin of safety
- Departure with the engine driven hydraulic pumps selected off resulting in what the crew believed was a major hydraulic failure causing an unnecessary airborne return. (The aircraft had just come from the hangar)
- Departure with the pitot-heat off resulting in unreliable airspeed indications and a significant low speed event resulting in an altitude loss of 1,900 feet
- Departure without an aircraft logbook
- Several attempted takeoffs with only one-engine running



- Attempted takeoff with full rudder trim resulting in an RTO
- Takeoff with full aileron trim set resulting in a significant wing-low event immediately after lift-off
- Takeoff with the stab trim set out of the takeoff range. The crew reset the trim during the takeoff roll.
- Takeoffs with the wrong flap setting resulting in a reduced margin of safety. Crews did not realize their error until after takeoff
- Takeoffs with the fuel pumps improperly set. One event resulted in the flight landing with less than 200 pounds of useable fuel in each main tank.
- Takeoffs with the fuel cross-feed valve open
- Approaches on short final (below 300' HAT) without landing flaps set
- An approach on short final (below 300' HAT) with the landing gear retracted
- Engines left running after the completion of the shutdown checklist

**What do all these events have in common? The crews thought they had correctly completed the checklist—but they had not. They missed an opportunity to trap an error.**

### **Types of Checklists**

- “Do-list” checklists
- “Challenge-response” checklists

### **Do-List Checklists**

To avoid extensive memorization and reduce errors, our non-normal QRH checklists incorporate the “call-do-respond” philosophy. The checklist leads and directs the configuration of the aircraft during a non-normal event.

Recently, a crew completed the hydraulic system pressure checklist for a hydraulic reservoir (“RSVR”) light, resulting in the complete shutdown of two functioning hydraulic systems and an unnecessary divert. Many years ago, during initial climb from LAX—without referencing the QRH EEC fault procedure—a 767ER Captain inadvertently shutdown both engines thinking he was deselecting the EECs. A quick thinking First Officer immediately reselected the fuel switches “ON” and prevented a ditching.

When we slowly and deliberately read the QRH checklist title, understand the alert message and condition statement, we select the correct QRH procedure and successfully complete it. When we rush into the corrective action or attempt to complete non-memory steps by memory, the error rate significantly increases. Before delving into a non-normal checklist, first take the time to assess the situation. As a wise Captain once said, during an emergency remember to “Slow down and wind the clock.”

### **Challenge-Response Checklists: A Verification Double-Check**

Our normal checklists are “challenge and response.” These checklists might be more accurately termed, “challenge, **verify** and respond.” They provide an essential double-check of the procedural items accomplished by memory.

We are excellent at challenge and response: however due to familiarity, distractions, rushing, and complacency, verification is the concern. Reading and responding is straightforward; as the bullet list above indicates, verification requires checklist discipline. Have you ever witnessed a pilot responding to a checklist while looking at their tablet or a pilot rushing through the checklist responses believing that speed equates to proficiency? Checklist discipline is a dual responsibility. Responding without looking or continuing to read the checklist when a fellow pilot is responding without looking are examples of casual compliance. Do not accept casual compliance.

Note: While some may say that checklist responses, such as “SET” or “CHECKED” are part of the problem, the majority of recent errors all involve checklists requiring specific “fill in the blank” responses. For example, the wrong flap setting for takeoff or landing, an improperly set stab trim, wrong runway position for takeoff and an engine left running at the gate. Continuous improvement is one of Delta’s hallmarks. Checklist construction is an on-going discussion topic.

### **Checklist Discipline: Tools to Trap Errors**

So what can we do to improve verification?

- Set the tone during your initial brief: “it’s not your leg, it’s not my leg, it’s our leg”
  - Invite your crew to speak up, especially when they feel rushed or have a concern

- If they express a concern, listen to them
- When responding to a checklist look before responding. **A quick glance is not a check.**
  - Verification requires discipline. We are all susceptible to “looking without seeing,” in which we see what we expect to see, rather than what is actually there
  - Avoid expectation bias by pointing at or touching a gauge, switch or panel. This will force you to look.
  - Pointing or touching also makes a checklist more reliable by drawing both pilots’ attention to the items being verified and slowing the pace of checklist execution.
  - Verify the anticipated action, before taking your hand away from a switch, valve, etc.
- When you observe a pilot responding without looking
  - Immediately stop reading the checklist
- If you are interrupted or become distracted
  - Start the checklist from the beginning
- Manage the workload
  - Be deliberate. When possible, do not call for or initiate a checklist during heavy workload or when completing other tasks
- Adhere to Delta policy, turn off your cell phones before the beginning of the Preflight Checklist to the completion of the Shutdown or Secure Checklist
  - They are a distraction.
  - You don’t text and drive, don’t text and fly (fly includes preflight, ground and post-flight operations)
- Complete checklists early
  - To help ensure a stabilized approach, when conditions warrant:
    - Descending through 2000’ AFE begin final configuration
    - Complete the Landing Checklist by 1000’ AFE

### **Conclusion**

We, the pilots, are the ultimate guardians of a safe flight. To ensure that Delta is the safest, most reliable and leading airline brand, we must continually strive to improve. We have the authority, responsibility and skills to make a difference. To be a better pilot tomorrow, you must change something today.

Thank you for the job you do day in and day out.

Fly safely,



Ed Sternstein  
Managing Director – Fleet Operations