

CALLBACK

From NASA's Aviation Safety Reporting System



Number 320

August 2006

Interrupted Checklists



Checklists are an orderly and sequential collection of "best practices" for configuring an aircraft for safe flight. Checklists must often be accomplished amid a host of competing cockpit priorities—obtaining clearance, responding to calls from ATC, consulting charts, taxiing for takeoff, and communicating with the cabin crew, to name just a few. Routine cockpit duties can interfere with reading of the checklist and lead to "checklist disruptious"—failure to complete the checklist and configure the aircraft properly for flight.

The consequences of disrupted or interrupted checklists are varied and potentially serious, as illustrated by this month's selection of ASRS reports on the subject.

Checklist Interrupted—No Flaps Takeoff

This B737-800 flight crew was interrupted twice while running pre-departure checklists, and a cockpit warning device that could have alerted them to the aircraft's unsafe configuration, failed to function.

... We performed the After Start checklist and the First Officer called for taxi. As we started the taxi, I called for the Taxi checklist, but immediately became confused about the route and queried the First Officer to help me clear up the discrepancy. We discussed the route and continued the taxi... We were cleared for takeoff [on] Runway 01, but the Flight Attendant call chime wasn't working. I had called for the Before Takeoff checklist, but this was interrupted by the communications glitch. After affirming the Flight Attendants [were] ready, we verbally confirmed the Before Takeoff checklist complete. On takeoff, rotation and liftoff were sluggish. At 100-150 feet as I continued to rotate, we got the stick shaker. The First Officer noticed the no-flap condition and placed the flaps to 5 degrees. The rest of the flight was uneventful. We wrote up the takeoff warning horn but found the circuit breaker popped at the gate.

The cause of this potentially dangerous situation was a breakdown in checklist discipline attributable to cockpit distraction. The Taxi checklist was interrupted by my taxi route confusion. The Before Takeoff checklist was interrupted by a Flight Attendant communication problem. And for some reason, the takeoff warning horn circuit breaker popped, removing the last check on this sort of thing... From now on, if I am interrupted while performing a checklist, I intend to do the whole thing over again.

Another procedure used by many pilots is to stop (hold) the checklist at the item where an interruption takes place; when the checklist resumes, repeat the last completed item and continue with the rest of the checklist.

Checklist Interrupted—Low Pressurization

A Citation flight crew learned that skipping the Preliminary Checklist can lead to a deflating flight experience.

While climbing through FL220, I observed an amber caution annunciator system message about cabin altitude. I donned my mask and stopped climb. The Captain informed ATC that we had a pressurization problem and needed to level off. Seconds later, while the Captain was performing the Abnormal checklist, we got a red caution annunciator system message. The Captain donned his mask and informed ATC that we were descending while I flew the aircraft. We were cleared to 11,000 feet. Upon further completion of the checklist we discovered that the bleed selects were both off. Selecting the proper position on the bleeds solved the problem.

Interruptions to the preflight routine contributed to non-accomplishment of the Preliminary Checklist. I skipped ahead to the next checklist in order to start the APU, and forgot to return to the Preliminary Checklist. The most effective method of preventing a recurrence is to not attempt to do procedures out of sequence on the checklist.

Checklist Interrupted—Runway Excursion

A Challenger flight crew found that holding instructions interfered with completion of the In Range Checklist.

Approaching the VOR, we were slowing for the approach to ZZZ. I had started the 'In Range' Checklist, completing most of the items on the list, when we received holding instructions only 1-2 miles from the holding fix. By the time I responded to ATC, we were nearly on top of the fix. I interrupted the checklist to prepare for the hold. After entry... we received a vector to intercept the localizer for the ILS approach to ZZZ. The approach was completed normally to touchdown. When we landed on the wet Runway 26 at ZZZ, we attempted to deploy the thrust reversers, which did not deploy. When I checked the switches, the 'unsafe to arm' lights were on. It took a few seconds to stow the levers and arm the reversers, but it was too late. With the very wet runway and downhill landing, we were unable to stop before the end of the runway. We exited the end of the runway at a relatively low speed hitting a runway end light... Arriving at the ramp, we inspected the aircraft to find a slightly damaged right gear door...

Upon reflection... it seems evident to me that I never completed the interrupted 'In Range' Checklist, thereby not arming the thrust reverse system prior to landing.

ASRS Alerts Issued in June 2006

Subject of Alert	No. of Alerts
Aircraft or aircraft equipment	8
Airport facility or procedure	2
Company policy	1
Company policy	1
Total	12

A Monthly Safety Bulletin from

The Office of the NASA
Aviation Safety Reporting
System,
P.O. Box 189,
Moffett Field, CA
94035-0189

<http://asrs.arc.nasa.gov/>

June 2006 Report Intake

Air Carrier/Air Taxi Pilots	2223
General Aviation Pilots	766
Controllers	83
Cabin/Mechanics/Military/Other	137
TOTAL	3209

Our “Interrupted Checklists” feature continues with three General Aviation reports. In the following incidents, pilots might have avoided mishaps when interrupted by (1) resuming the checklist from the “Hold” point, or (2) starting checklists over again.

Checklist Interrupted— Damaged Rotor Hubs

A Training Captain describes how a helicopter “fam ride” went awry after a preflight inspection was interrupted:

■ ...While on a training flight, the right side transmission cover for a Eurocopter AS355-FL Twin Star departed the aircraft while inflight in the traffic pattern...The flight was a familiarization flight with a prospective new hire. During the preflight inspection, I (Training Captain) was called away from the aircraft to assist our mechanics with the lifting and turning of a transmission from another helicopter. I then returned and moved another ship out of the way so that the training aircraft could be towed out of the hangar to the flight line. The aircraft was started and [a variety of] maneuvers were performed...After entering a left downwind to Runway 27...I felt something hit the aircraft, which caused a momentary shuddering. I took control of the aircraft and notified ops that I believed I had suffered a bird strike...

Inspection revealed that the right side transmission cover had departed the aircraft...I can only guess that I undid the latches and was called away and then failed to close them, or that I did not close them properly. I can only offer as a cause, the fact that I allowed myself to be taken away from a preflight and after having done so, not go back and start the preflight all over again...

The First Officer’s report added: *During the postflight inspection, it was discovered that damage to the 3 main rotor hubs was sustained.*

Checklist Interrupted—Fuel Starvation

A Cessna 310 pilot with one eye on an approaching weather system tried to repeat the Pre-Descent Checklist several times—but was interrupted by multiple distractions.

■ ...It was a busy time, as I was assigned a STAR that I had to study...and was having trouble picking up the weather. I tried to run my Pre-Descent Checklist 3-4 times, but was interrupted by traffic on the TCAS, or controller descent instructions. As I was being vectored onto the final approach course, I hit a wall of heavy rain and began to lose the right engine at that time. I assumed it was the rain that was killing the engine (wrong!) and began trying to diagnose the problem and control the airplane at the same time. At this time I reported the problem to the controller. The rain and wind were fairly strong...and kept me from running the Emergency checklist. About this time the second engine failed as well and I began a steep descent about 7-9 miles from the airport, as I established best glide. I told the controller that I had now lost both engines, and he told me that I would not make [airport] at the current

rate of descent. For whatever reason (luck, training, or abject fear), I suddenly remembered that I had been on the auxiliary fuel tanks and switched to the mains (which each had 40 gallons in them). Both engines came to life just as [airport] came into sight...

I will never again be running on auxiliary fuel when I begin my descent. I will find a way to get through the Pre-Descent Checklist no matter what happens...I am a fanatic about checklists and yet, on one of those rare occasions when I let my checklist scan fall through the cracks, it almost cost me...

Checklist Interrupted—Gear-Up Landing

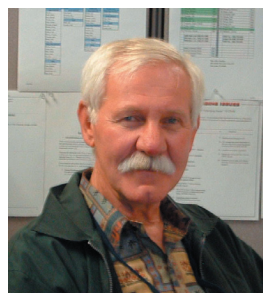
CALLBACK #292 (January 2004) noted, “Two factors, distraction and preoccupation, are common to most of the gear up incidents reported to ASRS.” Both factors were present in this gear-up incident reported by a Lake Buccaneer pilot.

■ I was on base leg to final when the second aircraft called on the radio announcing their position on a practice VOR approach. The approach was to Runway 23 and the runway in use was Runway 05. I called the aircraft to verify that they had me in sight on final. After the short exchange on the radio, they continued to fly the missed approach and I continued the short final approach to a gear-up landing. Contributing factors: The radio conversation and looking for the traffic approaching the opposite end of the runway, interrupted my approach check sequence...I should have extended my approach pattern or made a go-around until conflict with traffic was resolved. This would have given me more time to review my checklist.

Editor’s Note: Callback has previously summarized important research on checklist human factors and typography by Dr. Asaf Degani of the NASA Ames Research Center. These studies are available on Dr. Degani’s HomePage at <http://ti.arc.nasa.gov/people/asaf/index.php>, under the link for Procedure Development and Design.

Meet the Staff

Fred “Fast Freddy” Lohden



Fred Lohden is a triple-threat aviator—a former Navy pilot, a retired UAL Captain, and a charter pilot for a Northern California company. Fred joined the ASRS staff in 2003 as an Aviation Safety Analyst, and has applied his diverse flying background to analysis of air carrier, corporate, and General Aviation reports.

Fred spent 21 years as a Naval Aviator, serving in Vietnam and retiring as a Commander. He was a Captain with United Airlines for 20 years, and flew the B737, B757, B767, B747-400, and A320 aircraft before retiring in 2002.

In addition to his report analysis work at ASRS, Fred is an active charter pilot, a job that keeps his flying skills honed. He also enjoys sailing, woodworking, and model trains.