

# CALLBACK



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## “Did you know?” – ATC and Emergencies

“We declared an emergency with ATC.” Thousands of incident reports in the ASRS Database Online (DBOL) contain this, or similar, phrasing. Many of these reports also describe two standard questions that ATC asked pilots following an emergency declaration:

- “What is your fuel remaining?”
- “How many souls are on board?”

Why does ATC request this information? For one ASRS reporter, these questions created confusion and distraction during a smoke-in-the-cockpit emergency.

■ *While repositioning aircraft...and descending from 17,000 feet MSL in IMC and moderate rime icing conditions, with all anti-icing equipment selected on, I experienced smoke in the cockpit while passing through approximately 10,000 feet. When I changed frequencies to Approach, as requested by Center, but before checking in, I first smelled and then observed smoke coming from behind the instrument panel directly in front of me. I believe that I was cleared to descend to 9,000 feet...but in all the ensuing confusion, trying to communicate my emergency to ATC, responding to their requests, hand fly the aircraft, while trying to determine and isolate the source of the problem, I may have descended through the altitude that I was previously cleared to....*

*At around 7,800 feet, I managed to stop the smoke by turning off the environmental control switch and the windshield heat. After collecting my wits, I queried ATC and asked them what altitude they wanted me at. They responded by authorizing me to descend to 4,000 feet. They did not indicate that I had busted my altitude or violated my clearance in any way, but I believe in all the confusion I may have...I continued to my destination and landed without further incident, somewhat shaken but nevertheless relieved to be safely on the ground....*

*Thinking back, I seriously doubt that being asked for ‘number of souls on board and fuel remaining’ did anything to help me deal with the emergency, but rather only served to distract me from the task at hand and increased my concern about my predicament...It certainly had no bearing on my situation and did nothing to help me resolve the problem. At best, it only served to contribute to the confusion and provided an unnecessary distraction....*

ATC requests fuel/passenger information primarily so that it can be forwarded to Crash Fire Rescue (CFR) personnel at the airport where an emergency landing might take place. CFR is very anxious to have this information, as it allows them to act on an informed basis regarding:

- How many people are to be accounted for
- How much (or little) fuel will potentially be spilled, or burning

CFR also has detailed information on equipment types and passenger loads that can predict where passengers will be

exiting an aircraft. This allows them to concentrate their fire suppression efforts where they will do the most good.

So if you are involved in an emergency, remember that ATC is asking these questions for a good reason—to be able to provide optimal Crash Fire Rescue assistance following an emergency landing.

## Why ATC Declares an Emergency

For another ASRS reporter, erratic oil pressure readings led to an ATC declaration of an emergency.

■ *I told Center that I wanted to divert to ZZZ because of erratic oil pressure readings. I explained that I was pretty sure it was the gauge and wanted to land just to be sure and that all else was fine. They cleared me to ZZZ and put me over to ZZZ Approach. ZZZ Approach asked me, how many souls on board? And, how much fuel? I replied ‘2 on board and a couple hours of fuel and that I did not declare an emergency and was fine.’...They vectored me in for straight-in final and cleared me to land on Runway YY. They had a fire truck waiting for me. This, in my opinion, was overkill and a waste. Maybe they didn’t believe that I was fine...Now the FAA has contacted me asking about the incident...I was straight [forward] with the situation and what did I get?—Fire trucks and a call from the FAA....*

Air traffic controllers operate under the instructions provided in Order 7110.65S (Air Traffic Control Manual). Section 10-1-1-d of this manual states, “...When you believe an emergency exists or is imminent, select and pursue a course of action which appears to be most appropriate under the circumstances and which most nearly conforms to the instructions in this manual.”

Controllers are further instructed to “provide maximum assistance” to aircraft in distress, and to enlist emergency services and facilities “when the pilot requests or when you deem necessary.”

Controllers, in other words, must rely on their best judgement of when to declare an emergency for a pilot. Situations that merit an ATC emergency declaration include, but are not limited to, the following [Section 10-2-5 of the Air Traffic Control Manual]:

- Officials responsible for the operation of the aircraft [dispatchers, for example] inform ATC of an emergency
- There is an unexpected loss of radar contact and radio communications with any IFR or VFR aircraft.
- Reports indicate an aircraft has made a forced landing, is about to do so, or its operating efficiency is so impaired that a forced landing will be necessary.
- Reports indicate the crew has abandoned the aircraft or is about to do so.
- An emergency radar beacon response is received.

To return to our report example, erratic oil pressure readings may be symptomatic of a situation that could lead to a forced landing, whether or not the pilot thinks that is likely. ATC’s declaration of an emergency was understandable in this situation.

### ASRS Alerts Issued in March 2008

Subject of Alert	No. of Alerts
Aircraft or aircraft equipment	21
Airport facility or procedure	13
ATC procedure or equipment	8
Company policy	1
<b>Total</b>	<b>43</b>

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### March 2008 Report Intake

Air Carrier/Air Taxi Pilots	2931
General Aviation Pilots	853
Controllers	145
Cabin/Mechanics/Military/Other	303
<b>TOTAL</b>	<b>4232</b>



# Hypoxia and Carbon Monoxide Effects on Pilot Performance



Chapter 8 of the Aeronautical Information Manual, “Medical Facts for Pilots,” contains a wealth of information on conditions that can adversely affect pilot performance and fitness for flight. Among these are two conditions that are amply illustrated by ASRS incident reports—hypoxia and carbon monoxide (CO) poisoning. This month we look more closely at these conditions through the eyes of ASRS reporters who have “been there.”

## Hypoxia

Hypoxia is a state of oxygen deficiency sufficient to impair functioning of the brain and other organs. Hypoxia from exposure to altitude is due to the reduced barometric pressure encountered at altitude. For optimum protection against hypoxia, Part 91 pilots are encouraged to use supplemental oxygen above 10,000 feet during the day, and above 5,000 feet at night (to prevent deterioration of night vision). Part 121 pilots must comply with more stringent regulations.

This BE35 pilot received a “real education” about hypoxia after flying for hours at 12,500 feet MSL

■ *In retrospect, it is clear to me that I encountered an advanced case of hypoxia in my VFR descent. I had been cruising for about 4 hours with flight following at 12,500 feet, and the flight at that altitude had been progressing uneventfully. When I announced to Center that I would commence a VFR descent, I was handed off to another sector. This is when things went awry. I think I may have heard wrong or selected a wrong frequency, but my attempts at contact went nowhere, and somehow I was unable to return to my previous controller. This seems incredible for a pilot with my level of experience, but, while flying the airplane was no problem, handling even the most simple mental tasks became almost impossible. As a result, I entered Class B airspace without a clearance. I...am in excellent health, have never smoked, and do not drink alcohol. But I realize now that...prolonged flight, even at the legal altitude of 12,500 feet, can have a very detrimental effect on one's mental capacity...I received a real education, and one of the first things I will invest in will be portable oxygen equipment.*

FAR 91.211 requires the use of supplemental oxygen at cabin pressure altitudes above 12,500 feet MSL up to and including 14,000 feet MSL for flight durations of more than 30 minutes.

## Carbon Monoxide (CO) Poisoning

Carbon monoxide is a colorless, odorless, and tasteless gas contained in exhaust fumes. Most heaters in light aircraft work by air flowing over the exhaust manifold. Exhaust gases can escape through manifold cracks and seals, and enter the cockpit. A pilot who experiences symptoms of headache,

drowsiness, or dizziness while using the heater should suspect carbon monoxide poisoning and immediately turn off the heater and open air vents.

Heads-up action by a flight instructor prevented a carbon monoxide poisoning incident from becoming worse.

■ *While working in the practice area with my student, I noticed my vision of the glass cockpit getting slightly fuzzy. After this started, I also noticed I was getting a slight headache. I blamed this on the fact that I had been wearing my contacts all day and they've been known to do this. But I also started to watch myself for any further symptoms of hypoxia/carbon monoxide. While doing landings, my student complained of feeling dizziness, slightly sick, and a headache, and asked me if I could turn the heat down to see if cold air could make him feel better. I immediately realized that we were both experiencing symptoms of carbon monoxide poisoning. I immediately turned off the heater and opened all the fresh air vents in the aircraft to full. We departed [practice area] and returned to [airport] as fast as possible and at low altitude to combat any further symptoms...Both of us felt better once the fresh air started flowing. I was glad that I had recognized the symptoms early enough that neither of us had severe symptoms....*

Air carrier flight crews can also be exposed to exhaust fumes—and carbon monoxide poisoning—as this Captain's report describes.

■ *During cruise flight, I, the Captain, began to experience the necessity to cough a lot. I questioned the First Officer as to how he was feeling. I expressed that I had a headache and was [nauseous]. The First Officer expressed the same feelings. I told him to use the oxygen mask and that I would do the same until we figured out why we were feeling this way. There was an odor in the cockpit that could be compared to the exhaust of an automobile. We did not advise ATC due to the uncertainty of what was going on. We were quite confused. I had suggested that we shut off the LP bleed air from the right engine since that was where the majority of the air supply to the cockpit was coming from. I did this knowing that the aircraft would remain pressurized with the left engine LP bleed. About 10 minutes after shutting off the right engine LP bleed we noticed the exhaust smell dissipate. The rest of the flight was uneventful....*

*Maintenance...went to a local hardware store to buy a CO detector. After placing the CO detector in the cockpit and running the engine, the purchased CO detector experienced a CO alarm reflecting the presence of CO in the cockpit... I can only deduce that the First Officer and myself experienced CO poisoning during cruise flight.*

The reporter later learned that the right engine of this aircraft was replaced because the precise source of the carbon monoxide could not be determined.