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Up in the Air: New Worries About 'Fume Events' on Planes

By SARAH NASSAUER

Any frequent flier knows that air on a plane can get pretty foul. But can it be toxic?

Flight crews and travelers are increasingly concerned with that question, amid growing attention to a particular aspect of the air pumped into planes. Air travelers breathe a combination of recycled cabin air and outside fresh air that has been compressed by the aircraft's engines—known as “bleed air.” But when the system malfunctions, chemical contaminants can occasionally end up circulating through the airplane, creating a so-called fume event.

Airline companies and jet manufacturers say that fume events are rare, and that when they do occur, air quality still exceeds safety standards. But unions representing pilots and flight attendants say the chemicals entering the aircraft cabin can endanger the health of flight crews and passengers.

Some unions have begun warning their members of potential respiratory and neurological dangers. At least two lawsuits have been filed in the U.S. by passengers and airline workers claiming contaminated cabin air made them sick. And investigations by the Federal Aviation Administration and other regulators around the world are seeking to determine what chemicals might be introduced, and what the health effects might be, when compressed engine air becomes contaminated with residues of engine oil, hydraulic fluid or other substances.

Some small studies already completed have generally been inconclusive, largely because of the difficulty of monitoring contamination events that occur so infrequently.

One such incident is suspected of having taken place on US Airways flight 1231 from Philadelphia to Tampa in March. When an unidentifiable smell floated through the cabin during the flight, one flight attendant thought it smelled like vomit, while the plane's first officer believed “it didn't smell toxic, just very unpleasant,” according to Judith Murawski, a health-hazards researcher at the Association of Flight Attendants who spoke to some of the crew after the incident.

By the time the Airbus 319 plane landed in Tampa around 9 p.m., some of the crew and passengers complained of feeling sick with headaches, itchy eyes, sore throats and nausea, Ms. Murawski said. Many of the crew spent the night at a local hospital having blood drawn and getting chest X-rays, she said.

According to US Airways maintenance records, which were reviewed by The Wall Street Journal, the airline's maintenance crew determined that the strange smell occurred because of an oil leak in the plane's auxiliary power unit, a small engine that powers an airplane's ventilation and other systems while the craft is still on the ground.

Oil leaks in the auxiliary power unit have “been known to cause an unpleasant smell in the aircraft,” said Morgan Durrant, a US Airways Group Inc. spokesman. But the airline doesn't believe it's a hazard to anyone's health, he says. Still, after some crew of the Tampa-bound flight sought medical attention, the airline investigated the cause in line with company policy. “In this case, we changed the auxiliary power unit the next day,” he said. He said the airline had no record that passengers sought medical assistance after the flight.

A spokeswoman for Airbus, a unit of European Aeronautic Defence & Space Co., said: “Airbus aircraft are designed to avoid air contamination in normal operating conditions.”

Aircraft rely on engine bleed air to pressurize cabins, provide ventilation and other uses. Once compressed, the air is cooled and sent into the cabin and cockpit. About 50% of the air in a plane's cabin is bleed air, and the rest is filtered recirculated air. Cockpits sometimes use 100% bleed air.

Leaking Engine Seals

Bleed air can get contaminated from engine oils and fluids when seals leak or when maintenance crews overfill fluid reservoirs. One contaminant that has raised concerns among airline unions and some scientists is tricresyl phosphate, an antiwear additive found in the engine oil of commercial jet liners that has been linked to neurological damage when ingested.

Terry Williams, a 40-year-old flight attendant with American Airlines, recently sued Boeing Co. and its McDonnell Douglas subsidiary after she started to feel sick during an April 2007 flight. After the plane touched down in Dallas, she observed “a smoky mist spewing from the ventilation system,” according to the complaint. Since then, Ms. Williams said, she has experienced tremors, vision problems and headaches. “It's been a complete life change. I'm a mother of a 3-

and a 5-year-old,” said Ms. Williams, who is currently on disability leave.

AMR Corp.’s American Airlines, which wasn’t named in the lawsuit, declined to comment on the incident.

Boeing also faces a lawsuit filed by a group of 20 passengers who flew on a charter flight from London to Orlando, Fla., in February 2007. The group says bleed air contaminated by an oil leak made them sick on a Boeing 767, according to the complaint. Since then, passengers say they have had respiratory problems, severe headaches, vomiting, bowel problems and extreme fatigue, the complaint says.

“The events alleged in these two lawsuits occurred more than two years ago,” said Dick Schleh, a Boeing spokesman. “We don’t yet know anything about the facts and circumstances surrounding the flights at issue in these lawsuits because the operators of the subject aircraft never reported anything unusual to Boeing.”

The suit involving the charter flight also names as defendants aerospace concerns Hamilton Sundstrand Corp. and its parent, United Technologies Corp., and AAR Parts Trading Inc., a subsidiary of AAR Corp.

“As a matter of policy, we do not comment on pending litigation,” said Matthew Perra, a United Technologies spokesman. A spokesman for AAR Corp. said the company doesn’t comment on pending litigation. The charter flight was operated by XL Airways, a unit of XL Leisure Group PLC, which ceased operating last year. A representative for the company, which wasn’t named in the suit, couldn’t be reached for comment.

Mr. Schleh, the Boeing spokesman, said that, in general, when bleed-air contamination occurs, “levels of these compounds of contaminants are low.”

He added that air on planes is healthy, safe and exceeds air-quality standards. Still, Mr. Schleh said, “Boeing is supportive of additional research” into bleed-air contamination.

How often bleed-air contamination occurs is unclear. A British government committee studying the matter estimated that fume events happen on 1% of flights, based on pilot reports. But it found a much lower rate of incidence—0.05% of flights—from studying airline maintenance reports. Those data suggest that between 14 and 279 flights that take off in the U.S. each day might experience a fume event.

Between 1999 and 2008, the FAA recorded over 900 fume events. But some airline-worker unions believe that contamination events are underreported by airlines and pilots. The event on the US Airways flight in March, for example, wasn’t reported to the FAA.

Mr. Durrant, the US Airways spokesman, said the airline believes “an unpleasant smell in the aircraft does not warrant reporting to the FAA. If it was smoke, we would.”

There is no reporting system in place to track people with symptoms they suspect stem from contaminated airplane air.

In 2003, Congress asked the FAA to fund research on bleed-air contamination. The research team, made up of academic scientists and union officials, collected air samples from 63 flights and collected health questionnaires from about 4,000 flight attendants.

The group recently turned its findings over to the FAA for review before they are released publicly. Researchers found low levels of tricresyl phosphates in some of the air samples taken, but generally the results were inconclusive, largely because of the small number of samples gathered, says Steve Hecker, a director in the department of environmental and occupational health sciences at the University of Washington and principal investigator for the study.

The FAA says other research it is conducting includes analyzing contaminants in aircraft filters and developing sensor technology that could be used to monitor onboard air.

Inconclusive Evidence

British regulators studied cabin air quality following complaints from a pilots union. In a 2007 report, the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment said that “it was not possible on the basis of the available evidence ... to conclude that there is a causal association between cabin air exposures and ill health in commercial aircraft crews.”

But the report said “that an association was plausible” based on the timing of contamination exposures and reports of acute health symptoms. Another study in Britain and one in Australia are under way, with results due out next year.

While scientific data don’t conclude that bleed-air contamination has negative health effects, flight crew representatives say evidence is sufficiently compelling to warrant companies taking action. It is “more probable than not that inhaling engine fumes is making people sick,” says Tristan Loraine, a former British Airways captain who co-chairs a London-based committee that represents airline workers on cabin air-quality issues.

Mike Holland, an American Airlines pilot and deputy chairman for radiation and environmental issues at the Allied Pilots Association, says the union recently began alerting members to the possible dangers of contaminated bleed air. He makes a point, for instance, of contacting American Airlines crew that he thinks might have been exposed to contamination based on pilot’s logs and maintenance records. He advises them of what symptoms to look for, including dizziness or difficulty breathing, and hands out a guide aimed at familiarizing medical providers with bleed-air contamination.

There isn’t much passengers can do if they are concerned about bleed-air contamination. The drop-down oxygen masks on a plane provide, in part, recirculated cabin air, although pilots and flight attendants have access to pure oxygen.

Airline-worker unions have suggested putting carbon or other filters into bleed-air systems to trap contaminants before they enter the cabin. But technical experts say that adding filters would require major engine adjustments to keep the correct amount of air flowing into the cabin and maintain fuel efficiency.

There are “many, many things you would have to think about before doing something like that,” says Andreas Halske, an engine expert and propulsion system engineer at Lufthansa Technik AG.

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