

A Clean Sweep

Bacteria, rodents and insects are on the no-fly list.

BOOKS

Does Your Aircraft Have a Drinking Problem?

Guide to Hygiene and Sanitation in Aviation: Module 1, Water; Module 2, Cleaning and Disinfection of Facilities

World Health Organization (WHO) Press. Third edition. 2009, released April 2010. 60 pp. Figures, tables, references, annexes.

This supersedes the previous edition of the *Guide*, published in 1977. Although it says that basic principles of hygiene have not changed since then, the aviation world has, with new health threats as a consequence.

Besides the growth in air traffic, “the current trend in international civil aviation is toward aircraft of larger passenger-carrying capacity and greater range,” the *Guide* says. “The introduction of air services into areas with inadequate public health infrastructure, such as food handling and storage, water supply, and waste disposal, creates a challenge for aircraft operators. To protect public health, the application of high standards of hygiene should form an integral part of airport and aircraft operations.”

Occasional reports of incidents involving food-borne illness associated with international travel are reminders of the importance of ensuring the quality of food and drinking water aboard aircraft, the *Guide* says. The boldest headlines, however, have been generated by the potential for the transmission through commercial aircraft flights of communicable diseases such as severe acute respiratory syndrome (SARS) and extremely drug-resistant strains of tuberculosis. They have created a renewed interest in an aircraft environment conducive to health, the *Guide* says.

This edition of the booklet addresses “water, food, waste disposal, cleaning and disinfection of facilities, [disease] vector control and

cargo safety, with the ultimate goal of assisting all types of airport and aircraft operators and all other responsible bodies in achieving high standards of hygiene and sanitation, to protect travelers and crews engaged in air transport.”

Although public health specialists have the responsibility to see that, for example, the source of water coming into the airport and aircraft is disease-free, they cannot monitor the entire supply chain. Airport and operator management personnel, as well as cabin crewmembers, need to keep an eye out for possible contamination.

Besides the original source, the aircraft drinking water supply chain has three additional stages:

The airport water system. This includes the local area distribution system. Some airports have their own water treatment facilities;

The transfer point. This, the *Guide* says, “is typically a temporary interconnection between the hard-plumbed distribution system of the airport (e.g., at a hydrant) and the aircraft water system, by means of potable [drinkable] water vehicles and carts, refillable containers or hoses. This water transfer process provides multiple opportunities for the introduction of contaminants into the drinking water”; and,

The aircraft water system. This includes “the water service panel, the filler neck of the aircraft finished water storage tank and all finished water storage tanks, including refillable containers/urns, piping, treatment equipment and plumbing fixtures within the aircraft.” Next stop, the aircraft’s galley and lavatory outlets serving passengers and crewmembers.

The *Guide* says that random testing of water on aircraft by Health Canada, the U.K. Association of Port Health Authorities and the U.S.



Environmental Protection Agency has raised aircraft water health concerns. The Canadian and U.S. studies revealed the presence of total coliforms on 15 percent and *E. coli* bacteria on as many as 4 percent of aircraft.

“Most total coliforms are not pathogens per se, but a positive test is an indicator of inadequate sanitation practices; *E. coli* are indicative of recent fecal contamination, and some *E. coli* are human pathogens,” the *Guide* says.

In response, the *Guide* offers detailed health guidelines for water management, with a list of indicators to gauge whether each is being followed. The guidelines include plans for each component of the water supply chain; meeting WHO *Guidelines for Drinking-Water Quality* or national standards; monitoring water quality; ensuring an appropriate response when a risk is detected; making potable water available in sufficient quantity, pressure and temperature throughout the supply chain; and independent surveillance of water quality by a qualified authority.

The other module includes equipment cleaning, primarily “the removal of dirt or particles,” and disinfection, or “measures taken to control, deactivate or kill infectious agents, such as viruses and bacteria.”

The *Guide* says, “Commercial air transport is potentially an efficient means for spreading communicable disease widely by surface contact and proximity to infected persons.”

Disease vectors are not limited to coughing and sneezing passengers. Every so often the news media report, in a humorous tone, about a “SWAT team” searching an entire airliner after a rat is spotted. The risk is real, however. Rodents and insects are efficient carriers of infection. Flies should not fly — on airliners.

After outlining the routes of infection transmission that can occur aboard aircraft, the *Guide* again provides guidelines along with indicators of their observance. These include keeping an airport in a sanitary condition at all times; designing and building airports in a way that facilitates proper cleaning and infection; having post-event disinfection procedures to prevent contamination from spreading; keeping

aircraft in a sanitary condition at all times; designing and building aircraft to facilitate proper cleaning and disinfection; and having onboard procedures to prevent the spread of disease and contain infection at the source.

Standard disinfection procedures are described.

— Rick Darby

Toe-to-Toe in the Sky

How Boeing Defied the Airbus Challenge: An Insider’s Account

Pandey, Mohan R. CreateSpace, On-Demand Publishing, 2010. 242 pp. References, index.

To take the most obvious issue first, Pandey, a longtime Boeing employee, says that his book “in no way represents Boeing’s position; it is only my personal perspective. I hope I have represented all sides — Boeing, Airbus and various industry positions — fairly and accurately.” Using the pronoun “we,” meaning Boeing — as in “at the end we outmaneuvered Airbus” — does not inspire confidence in the book’s objectivity. Readers will make their own judgments about fairness.

Nevertheless, pilots, aviation industry managers and flight enthusiasts will find much of interest in Pandey’s description of the technical, economic and political issues involved in producing new airliner types. Primarily, this is an account of the development of the Boeing 777, part of its manufacturer’s response to competition from Airbus, and particularly the A340 four-engine, long-range passenger jet and its twin-engine stablemate, the A330.

Pandey describes the Airbus A320 family as having frayed nerves at Boeing, taking a big bite out of the market for the Boeing 737 series. The A330/340 model threatened to challenge the long-range dominance of Boeing’s “jumbo” jet, the 747, and its 767. “After looking at various options, including a three-engine 7J7, by the late 1980s, Boeing concluded that to attack both the A330 and the A340, its new airplane had to be a fuel-efficient big twin,” Pandey says. That was the genesis of the 777.

One of the many hurdles, other than technological and production, that Boeing had to deal



with for its 777 to pay off was extended operations (ETOPS) regulations. “Boeing had to secure ETOPS approval for these big twins,” Pandey says. “But there was a wrinkle. The FAA [U.S. Federal Aviation Administration] requirements stressed the importance of in-service experience.”

The FAA and other regulatory agencies internationally — which would have a say in the long-haul routes the 777 was designed for — required that a new type-and-engine combination be operated for a year to qualify for 120-minute authority; that is, to be permitted to operate routes up to two hours flight time from the nearest airport that could be used for an emergency landing necessitated by an engine failure. An additional year of in-service experience was required for 180-minute authority.

But the 777 was designed for the international, overwater market. Boeing could not afford for its 777s to be confined to medium-range, overland flights for a year or two, even assuming any buyers would want it for such service. “Boeing had to find a way to allow the new twins to operate on ETOPS sectors from the first day of revenue operations at the airline,” Pandey says.

Boeing worked with its own engineers, as well as its engine suppliers, to make the 777 “service-ready” for ETOPS, as well as non-ETOPS, flight. It created “design, build and support” teams, whose members worked together with the aim of making engineering compatible with manufacturing and design. And there was another new development.

“For the first time, Boeing was designing the airplane digitally,” Pandey says. “There would be no paper drawing — it was a ‘paperless’ airplane. The famous saying in the manufacture of an airplane used to be [that] when the weight of the paper drawing exceeded the airplane’s actual maximum takeoff weight, it was time to stop designing and start building the airplane. This time, the designers would not be able to use this dictum.”

The book describes the elaborate negotiations to obtain ETOPS certification “out of the box” for the 777 and the fierce competition, both technological and political, between Boeing and Airbus. The playing field is different now,

with Bombardier and Embraer moving into the medium-capacity, medium-range market and going toe-to-toe with Boeing and Airbus. The team names will change, but the game will be the same.

— Rick Darby

WEB SITES

News From EASA

EASA General Publications, <www.easa.europa.eu/ws_prod/g/g_comms_general_publications.php>

The European Aviation Safety Agency (EASA) develops common safety and environmental rules for the European Union. Working with its member states, the agency’s operational tasks include rulemaking, certification, research, and data collection and analysis. Some of the former responsibilities of the European Joint Aviation Authorities have shifted to EASA.



To stay abreast of EASA activities, visit the “general publications” section of its Web site. Copies of EASA’s annual reports and annual safety reviews are available. *EASA News* and annual reports are in English. Annual safety reviews are available in multiple languages.

Current and past issues of *EASA News* expand on regulations, standards, programs under way, anticipated events and more. The February issue reports, “Preliminary safety data for 2009 show that it was the year with the lowest number of fatal accidents on record for the 31 member states of the European Aviation Safety Agency.” Issues may be read online or printed at no cost. ➤

— Patricia Setze