

NIOSH STUDY (CABIN AIR QUALITY)

Question #36: Please summarize the major findings and recommendations from the FAA/NIOSH study on cabin air quality.

Answer:

FAA/NIOSH Study:

The Federal Aviation Administration (FAA)/ National Institute of Occupational Safety and Health (NIOSH) Study ended the fourth year of a five-year program in 1999. The study was authorized to design and conduct studies of the chemical, physical, and microbiological aspects of the aircraft cabin environment. Female reproductive health studies, cabin environmental health studies, and ventilation/respiratory symptomology studies are in progress. These studies include the characterization of cosmic radiation onboard commercial aircraft, and exposure data for the study of reproductive health of female flight attendants. Also included was the characterization of biological contaminants that have been documented to cause a variety of adverse health effects.

On board air samples have been collected and are being analyzed from cabin environmental quality exposure assessment studies that were conducted by NIOSH. These samples were collected on the same flights when measurements were made for the cosmic radiation exposure assessment. The highest levels of carbon dioxide, carbon monoxide, oxides of nitrogen, and particulates usually are measured during the initial ground operations and during takeoff. The carbon dioxide levels also are slightly elevated during the beverage service, and then rise again during descent, landing and taxi to the terminal. Ozone levels are measurable during ground operations, due to air pollution at airports, but tend to be elevated at higher cruise altitudes and more northern latitudes. The measurement of 0.2 parts of ozone per million parts of air may have been higher than the Federal Air Regulation (FAR); however, NIOSH has cautioned against making preliminary conclusions before they have been able to thoroughly analyze the data.

Computational Fluid Dynamics (CFD) studies are in progress to model airflow and biological contaminant migration throughout the typical aircraft cabin. In addition, a system to measure and track particles emitted by humans during coughing, sneezing, and talking has been designed and constructed. An adapted tracer gas study will measure the age of air in aircraft cabins in the upcoming year. Questionnaire studies involving reproductive history and ovulatory function in female flight attendants are well underway.

Although scientific presentations have been made at meetings of the American Society for Testing Materials (ASTM), the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), the Aerospace Medical Association (AsMA), and university research symposia, NIOSH has not formally published their results or made conclusions and recommendations based on the existing study progress.