BEFORE THE SUBCOMMITTEE ON AVIATION
HOUSE PUBLIC WORKS AND TRANSPORTATION COMMITTEE

AIRLINE CABIN AIR QUALITY

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TESTIMONY OF

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Mr. Chairman and Members of the Subcommittee:

Thank you for this opportunity to address the Subcommittee about the important issue of aircraft cabin air quality. My name is Dee Maki and I am the National President of the Association of Flight Attendants, AFL-CIO, which represents 33,000 flight attendants at 21 U.S. carriers. Accompanying me today is Chris Witkowski, AFA's Air Safety and Health Director. As you can imagine, since the aircraft is the working environment for flight attendants, cabin air quality is a matter of vital interest to the Association of Flight Attendants.

I am here today to discuss the quality of cabin air, its health impact on flight attendants and the failure of the federal government and carriers to address this situation. Currently, flight attendants and passengers on many flights are not provided adequate amounts of fresh air and, thus, may be exposed to unacceptable amounts of bacteria, viruses and other potential health risks -- without the protection of adequate federal regulations.

This occurs because less fresh air is being circulated in the cabins of newer airplanes which mix recirculated air with fresh air drawn from outside the aircraft. Most planes built prior to the early 1980s were designed to provide 100 percent fresh air that was replaced every three minutes. Today, newer airplanes offer an even mix of fresh air and recirculated air that is

exchanged much less frequently -- up to seven or more minutes. Cabin air exchange rates on a Boeing 747-300 with option low flow, for example, are as low as once every nine minutes during descent.

The National Academy of Sciences, in its 1986 report, The Airliner Cabin Environment, stated that about 30 percent of the hours flown by U.S. airlines in 1985 were on aircraft with recirculation systems. By 1990, the comparable figure had increased to 40 percent.

Additionally, because of variations in seating density, air circulation rates can vary widely within the cabin. Air flow may be two or three times greater in the first-class and business sections than in the economy section.

Another cause of ventilation reduction is the fact that flight crews on most aircraft can regulate the Environmental Control Units (ECU), or airpacks, that deliver fresh air. This "flow control" capacity is installed to allow crews to adjust airflow when the aircraft is carrying less than a full load of passengers. However, in this day of fuel conservation, airline carriers may encourage their flight crews to operate an ECU at a lower level than is appropriate. This "low flow" or "pack off" saves fuel and money. I have attached three documents from two carriers and one union that give examples of carriers urging

flight crews to decrease air flow to save fuel and money.

Unfortunately, reducing fresh air circulation can increase the amount of airborne toxins, viruses and bacteria in the cabin. If not properly ventilated, a tightly sealed airliner is the ideal environment for the spread of bacteria, viruses and fungi. As a result, flight attendants and passengers are exposed to one another's respiratory ailments as well as high levels of carbon dioxide and other gases including vapors and fumes from materials and chemicals inside the aircraft.

In addition to the problems caused by reducing the ECU, other problems can be attributed to the high efficiency particulate air filters, or HEPA filters, used on aircraft. While the airlines stress that HEPA filters remove airborne particles before air is recirculated in the aircraft cabin, the filters can become blocked. These filters can remove a high percentage of airborne particles, including bacteria and viruses that collect in clumps. But they are ineffective against single viruses. These viruses pass through the HEPA filter and then circulate throughout the cabin. Eventually, the filters do get clogged by airborne particles and become ineffective if not changed often enough.

I would like to take a moment to comment on the Air Transport Association's recent study regarding air quality on aircraft. AFA has many questions concerning how this study was conducted in

terms of the methodology of collection and the frequency of collection of samples, especially bacterial samples. The scientific methodology greatly impacts the amount of microbial aerosols captured. In its report, ATA stated that the two "fresh air" airplanes showed significantly lower average levels of contaminants than the aircraft with recirculated air. This indicates to us that the HEPA filters used on new aircraft were not as effective in removing bacteria as expected.

Another concern we have with the ATA study is their data on respirable particulates. Their data indicates that the average amount of respirable particulates was 170.1 micrograms per meter cubed. Only nonsmoking flights were tested. In the 1989 DOT sponsored GEOMET study, a comparable amount of respirable particulates were found on smoking flights only, but a much lower amount was found on nonsmoking flights. This raises questions about the measurements of this level of particulates in the ATA study. Furthermore, we are baffled by the discrepancy within the study which on one hand lists "staphylococcus aureus," a potential pathogen, as one of the bacterial organisms isolated from samples but also states that "no bacterial or fungal respiratory pathogens were isolated during this study."

Research has found that flight attendants and airline passengers as a population may be particularly susceptible to infection. In a paper presented at the 1991 Paris Air Show, Dr. Helen Ashworth,

technical manager at Pall Biomedical, a leading filter manufacturer, reported that viruses survive well in the low humidity conditions common aboard aircraft. She believes that passengers may be more susceptible to infection because they are "stressed, tired and their respiratory system is compromised due to low humidity," all factors shared by flight attendants.

For a variety of reasons, it is difficult to determine how current airline practices contribute to the spread of infectious diseases. For one thing, the government does not monitor or track the frequency or seriousness of crew and passenger complaints regarding cabin air quality. For another, few complaints are recorded since flight attendants and passengers may never realize that they are contracting or spreading an infection when they fly.

In addition, while most people normally would not fly when seriously ill, they may well fly during the incubation period before symptoms of an illness become evident. And this period of latency happens to be the period when infections are most likely to be transmitted.

Because flight attendants and airline passengers generally scatter upon reaching their destination, it is difficult to spot any trend of post-flight illness that may develop. Infectious diseases may have an incubation period of several days, so flight

attendants and passengers may not connect an after-the-trip illness to recent airline travel.

There are at least two examples of illnesses linked to poor cabin air quality on record. In 1979, nearly three-fourths of the 54 people aboard a flight bound for Kodiak, Alaska, became ill after the plane was delayed on the ground for three hours while the ventilation system was not functioning. The problem was discovered only because many of the passengers visited the same doctor when they reached this remote destination. It may well be that many comparable situations have gone undetected when flight attendants and passengers dispersed upon arrival in more populated areas.

In a second case in 1986, dozens of people on a flight from Chicago to Hawaii complained of headaches and nausea. The National Transportation Safety Board reported that the flight crew's second officer experienced similar symptoms after he visited the cabin, and he "said that once he personally experienced the headache, he rejected the notion that the flight attendants were just complaining..." Investigators later determined that one of the aircraft's recirculating fans had been inoperative and that filters on the other two were clogged.

Recently, the Centers for Disease Control and Prevention (CDC) investigated transmission of tuberculosis (TB) in the case of two

flight attendants who were diagnosed as having tuberculosis after flying with another crew member with active TB. In October of last year, CDC concluded that TB "was transmitted from an infectious flight attendant to crew on the aircraft." Additionally, researchers tested a number of passengers who flew with the infected flight attendant during this time. The passengers who tested positive on tubercular skin tests all flew when the flight attendant was most infectious. The study concluded that passengers could have been infected with tuberculosis in flight.

It is unreasonable to expect that an airline, or its crew, will be able to know, on any given flight, whether or not there are passengers in the cabin with infectious TB, influenza, chicken pox, colds, etc. In addition, it is difficult to know which passengers are too ill to fly and should be removed from the flight. Because of these unknowns on any given flight, it is imperative that all the airpacks be operating and the fresh air flow be set on maximal flow.

AFA has received many anecdotal complaints from its members about poor cabin air quality and related respiratory problems and other health difficulties. One AFA safety and health representative reported that some flight attendants have felt so sickened from cabin air that they could not work their next scheduled flights. AFA has reports of flight attendants who have suffered severe

headaches, disoriented feelings, dizziness, severe chest pains, stomach cramps and numbness of limbs to name a few symptoms. We have had flight attendants who have been too sick to carry out their safety responsibilities and have used oxygen onboard aircraft to relieve their symptoms. Most of these members have dealt with flight crew and managements who have been unconcerned, uncooperative and unhelpful in assisting them to determine the exact source of their symptoms.

The Association of Flight Attendants is concerned that despite years of talk about aircraft air quality, there has been little action. A 1981 article distributed by the Washington Post news service told readers that "Fresh air in airplane cabins has been a subject of perennial complaint." Here we are thirteen years later and it is still a subject of great debate and not much action as far as the government is concerned. The government has not actively sought to compile data on health problems associated with cabin air quality, let alone set adequate regulations.

Federal regulations state only that "each passenger and crew compartment must be ventilated" and that compartment air "must be free from harmful or hazardous concentrations of gases or vapors." [14 CFR 25.831(a)&(b)] But there are no explicit requirements for ventilation rates for passenger cabins. The regulations spell out specific limits only for concentrations of

carbon monoxide (50 ppm), carbon dioxide (30,000 ppm) and ozone. I would like to note that on May 2nd, the FAA released a Notice of Proposed Rulemaking (NPRM) which lowers the limit for carbon dioxide in aircraft. AFA is pleased that the FAA has finally acknowledged the current high levels of carbon dioxide in aircraft but continues to believe the lower limit recommended is not low enough.

Additionally, there are no FAA rules concerning maximal airflow. The National Academy of Sciences, in its 1986 report, found wide variations in aircraft ventilation rates, with some flight attendants and passengers receiving well below 10 cubic feet per minute per person of fresh air. The report recommended that "maximal airflow be used with full passenger complements to decrease the potential for microbial exposure and that recirculated air be filtered to reduce microbial aerosol concentrations."

In 1989, the FAA did issue a NPRM that would set limited air flow standards for aircraft yet to be certificated, but it falls far short of the standards needed to assure adequate fresh air for flight attendants and passengers. After five years, this limited proposed standard has yet to be acted on.

Before I conclude my remarks, I would like to make a few comments on the issue of pesticide spraying on international flights.

Pesticide spraying required by some governments is subjecting many AFA members to inhalation and skin absorption of pesticides on a regular basis. The label on one insecticide being used on aircraft, which contains d-phenothrin, warns that the product is hazardous to humans if swallowed, breathed or absorbed through the skin. However, while spraying this insecticide, flight attendants, as well as passengers who are onboard, inhale the dangerous vapors. In addition, since the spray drips down their arms during spraying, some pesticide is absorbed directly into flight attendants' skin. We are encouraged by Transportation Secretary Federico Pena's recent interest in this issue and are hopeful that the U.S. government will move forward to protect flight attendants from this dangerous pesticide spraying.

To conclude my remarks, let me say that AFA is very concerned about the serious health implications of poor cabin air quality facing flight attendants today. We strongly believe that we need solid air quality standards for the aircraft cabin. It is time we protect the health of flight attendants and passengers through Congressional action if the FAA continues to fail to regulate in this area. In addition, AFA believes there should be a national reporting system so crew members and passengers can report problems that may be associated with air travel and cabin air quality to determine if there are trends or clusters of illnesses occurring.

Enough is known to warrant the establishment of ventilation standards for the closed environment of the aircraft cabin, just as is the norm for public buildings and other facilities. Carriers should make it standard practice to run their air packs at full capacity even when carrying reduced loads, since reducing total flow usually results in poor circulation patterns in the cabin. Running the airpack to full capacity will help to increase the amount of fresh air per cubic foot for each cabin occupant. Certainly, flight attendants and passengers should be able to count on some minimum level of fresh air to counter the dangers of infection and illness when they fly.

Mr. Chairman, thank you for this opportunity to address this Subcommittee. I will be happy to answer any questions you may have.