INDOOR AIR QUALITY IN COMMERCİAL AIRCRAFTS

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ABSTRACT

Modern aircrafts are equipped with Environmental Control Systems (ECS) to provide safe, healthy and comfortable flight for both passengers and crew. In this system, outside air is taken from power system of aircraft and mixed with the filtered indoor air and introduced to the cabin. ECS's has been designed to reduce the air pollutants that can possibly come into the cabin and to control the temperature, pressure, humidity and ventilation of the cabin air

Today's commercial aircrafts are exposed to different atmospheres, having different temperature, pressure and humidity changes. Aircraft cabins have indoor characteristics similar to those of houses and office buildings. But still these cabins differ from other buildings in some aspects, such as available space per person, pressurizing requirements and being inactive within the cabin. Passengers are exposed to atmospheric factors such as, low-humidity, reduced air pressure, various air pollutants (ozone, carbon monoxide and other organic chemicals and biological structures).

Cleanness of the air in a space defines the indoor air quality of that space. Clean air is the air that does not contain pollutants higher than a level defined by standards and not causing disturbances in the peoples consuming this air. In this study, current ECS's have been briefly studied and the risks have been emphasized regarding air pollutants, health and comfort within the context of indoor air quality. In addition, various recent studies have also been touched in the text.

In the context of this study, the questioning forms have been prepared for the passengers and the crew in various airways in Turkey. Literature survey and questioning process is the first stage of this study. The second step will cover the various measurements that will be done on the airlines working in Turkey, regarding to the indoor air quality. During the second stage of the study, indoor air temperature, humidity, vibration, noise, the level of bacterial growth that can cause the transmission of infectious diseases, will be measured using sensors placed in various areas of the cabin.

However, since the information about the complaints have not been collected in a center, it is very difficult to establish a link between the factors affecting indoor air quality and the potential risks from them.

The studies that will be held in this area will no doubt be helpful in establishing a desirable indoor air quality in aircrafts and these efforts will lead to the preparation of IAQ standards for aircrafts. Furthermore, particularly for long distance flights, an indoor air quality meeting the high comfort needs and having no health and safety risks will be achieved.

Up to now, after many aircraft travels substantial amount of complaints have been received from the passengers and the crew, related with the flight, cabin environment (pressure and humidity), airborne particulates and contaminants (cleaning agents, hydraulic fluids, ozone) and physiological effects (fatigue, noise, sitting in close, and jet lag)

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