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Air Travel with Dummies

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How a team of engineers and mannequins is improving comfort and safety for passengers in airplanes

“This is it,” says Byron Jones, professor of mechanical engineering, as he flips several switches. The large, darkened air cabin springs to life with warm electronic hums and the sound of air circulating overhead. Stubby nozzles above passenger seats begin forcefully blowing air downward. Portable lighting rigs illuminate the cabin and its silent, lifeless passengers.

This is a scale-model Boeing 767 passenger cabin. Kansas State University researchers use it as a laboratory to conduct ground-based air cabin research for the Federal Aviation Administration and the commercial air transportation industry.

By Greg Tammen

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Engine safety

Mahan Nayernia Ami, instructor of civil engineering, works with a jet turbine engine, one of the smallest labs. He is looking at whether chemicals and toxic particles in the plane’s fuel and oil can contaminate the passenger cabin if one of the engines has a leak.

“There are several case studies in which passengers sued an airline because they reported smelling oil during the flight and then after the flight felt sick and had memory loss,” Nayernia Ami said. “These passengers reported that they could smell oil at all of the different concentrations through temperatures and pressure adjustments. Oil and fuel are then mixed into the engine, and Nayernia Ami looks at what happens during cooling.”

While he cannot speak to the medical effects, Nayernia Ami and colleagues have published multiple studies on their findings about various particles and chemicals that are released.

“If an engine is healthy, this kind of thing will not happen,” Nayernia Ami said. “But if there is something wrong with an engine, a small amount of oil may leak out. We look at how and how much.”

The FAA is working to develop sensor technology that can detect the source of a leak and automatically trigger an emergency off for the affected engine.