

# What's That Smell?



By Lt. Gabriel Tonozzi

Imagine finishing a two-hour workout, then setting fire to your pair of dirty wool socks. The putrid, light smoke almost would be transparent as the moisture starts to evaporate, then the cloth starts to burn, and the smoke becomes more pronounced. I would not recommend burning your new Zeilinger's for effect, but this is the only way to describe the peculiar smell TACAMO, VQ-3, crew 9 experienced on departure from Travis AFB.

After a normal three-hour preflight, and having checked all our emergency equipment, we were ready to take off. After an uneventful start and taxi, the engines roared to life as the engineer set takeoff thrust. All systems appeared to be normal as we sped through decision speed. A few seconds later, we rotated into the clear, northern California sky and began a climb to our initial altitude of 6,000 feet.

Passing through 5,000 feet, the aforementioned smell became apparent throughout the jet. I asked the rest of the crew if they could smell anything, and moments later crew members from the back of the aircraft piped up on the interphone that they smelled the fumes. We leveled at 6,000 feet, activated the fire bill, and notified departure control we were planning for an emergency return to Travis.

Everyone donned their oxygen masks and carried out their fire-bill duties, while air-traffic control provided vectors to enter downwind for runway 21R. To compound our problem, the pilot and copilot's oxygen-mask microphones were not working properly because of a faulty switch discovered on postflight. We could hear departure control, but we couldn't respond; the controller reported hearing interference only when we transmitted.

Within two minutes, the flight engineer reported the air-cycle machine, compressor temperature abnormally was high, and he was unable to take over manual control. The bypass valve was stuck in the full-cool position, and the valve could not be opened, which

made it impossible to control the temperature in the air-conditioning system.

The quick-thinking flight engineer shut off the bleed-air supply from all four engines, eliminating the air-conditioning air source and eliminating the source of the fumes. With the smoke and fumes under control, the crew removed their oxygen masks and restored two-way communications with departure control.

As the smell started to dissipate, we began to weigh our options. As we climbed, the flight engineer concluded the air-cycle machine would cool, and we probably would develop icing in the water-separator. Conversely, as we turned on the bleed air for pressurization and cabin-temperature control, we would encounter overheating of the air-cycle machine.

Using crew-resource management (CRM), we decided the emergency return no longer was necessary. However, continuing the eight-hour mission was not an option. We could fly below 10,000 feet for four hours to reach landing weight, or dump the fuel, land, and fix our stuck bypass valve to resume our line of alert. Considering the priority of our mission, we elected the second option and told air-traffic control we needed to adjust aircraft gross weight. ATC gave us holding instructions, a climb to 10,000 feet, and clearance to commence fuel-dumping operations.

The fuel dump and subsequent landing occurred without incident, and, once on deck, our suspicions about the stuck bypass valve were confirmed. A greater mechanical malfunction, aircraft depressurization, or possible fire had been averted because of solid CRM and technical knowledge of the environmental system. The crew was well-prepared for activation of the fire bill because multiple drills had been run during previous flights. Experience from crew-coordination drills, simulator events and training flights proved invaluable while handling the situation. 

Lt. Tonozzi flies with VQ-3.