

BY BARRY SCHIFF

## Thinking matters

When the emergency checklists won't cut it

**TRANS WORLD AIRLINES** Flight 235 departed routinely and at night from Los Angeles to Honolulu on May 28, 1989. Heading toward Dinty, the first fix on Oceanic Track Delta, the Lockheed L-1011 climbed to its assigned altitude of 33,000 feet. This was 2,000 feet below the flight-planned altitude of 35,000 feet, an altitude already occupied by Qantas Airways. This lower flight level would increase fuel consumption somewhat, but with 98,000 pounds of fuel in the tanks, this was not of concern.

Fuel remaining at Dinty was 1,000 pounds low. No problem. At the next fix, Dopps, fuel remaining was 2,000 pounds low. Still not a problem.

Two and a half hours after takeoff, the Lockheed TriStar was near the equi-time point, a calculated fix along the route from which it would take as much time to proceed to Honolulu as it would to return to Los Angeles (based on winds aloft). It was here that the crew noticed that fuel remaining was 5,000 pounds low. This seemed to be an excessive deficit, so a detailed check of fuel consumption was performed. Although the fuel-flow gauges indicated that total fuel consumption was a normal 15,000 pounds per hour, the tanks were now emptying at the rate of 23,000 pph—8,000 pph too much. If the engines were not burning the excess fuel, where was it going?

One of the pilots turned on the wing lights and went into the cabin to visually inspect the wings and wing-mounted engines. Horrified, he saw fuel vapor streaming over the wing near the left engine. After he reported what he had discovered, the flight engineer announced that at this rate of fuel loss, the aircraft would have dry tanks 300 miles short of Honolulu. Hilo, on the Big Island, was closer, but there wasn't enough fuel remaining to get there, either. Nevertheless, the crew declared an emergency, turned a tad left, and headed for Hilo.

The crew decided that it might be possible to stem the leak by shutting down the left engine. This would also reduce the possibility of fire. It was determined after shutdown that this barely slowed the leak. Fuel continued streaming over the wing.

The captain then suggested operating (crossfeeding) the two remaining engines from the leaking left tank. In this manner, some of the fuel that would otherwise flow overboard would be consumed by the right and center engines. Not as much would be wasted.

Further calculations indicated that this might make available just enough fuel to hobble to Hilo (alongside the Coast Guard and Air Force escorts). Prayers were answered as the aircraft touched down with the fuel gauges indicating empty and the fuel-warning lights illuminated. There was insufficient fuel aboard to have made a close-in go-around.

This modern-day version of *The High and the Mighty* received little media attention. It went largely unnoticed because no one had been injured and no metal had been bent. Had the crew not begun an abnormal fuel-crossfeed procedure as soon as it had, or if the flight had taken a few minutes longer, Flight 235 would have made worldwide headlines.

This incident proves that flying can be a thinking game that requires more than what is learned in training. Procedures and emergency checklists are developed only for anticipated problems. Sometimes, though, stuff happens for which there are no checklists, and pilots must adapt quickly—often by thinking outside the box. Can the procedure used by the crew of TWA 235 be used to extend range in a lightplane with a leaking fuel tank? You bet it can.


One way to help prepare for an unusual emergency is for pilots to know their aircraft systems—and to know them well.

Another example of an unanticipated emergency is what happened to United Airlines Flight 232 less than two months after the TWA incident. The McDonnell Douglas DC-10 lost all three hydraulic systems, as well as the use of all flight controls, the result of the catastrophic failure of the center engine. Captain Al Haynes and his crew had to quickly develop procedures using only engine thrust to pitch and roll their crippled craft to a runway at Sioux City, Iowa (SUX). That most of those aboard survived was miraculous, a testament to extraordinary airmanship.

The saga of TWA Flight 235 proved to me that fate really is the hunter. I flew that same airplane along the same route only two days earlier. That fuel leak could have developed on my flight. I have always been haunted by wondering if my crew and I would have handled the problem as successfully. I would like to think that we would have, but I obviously will never know.

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