

The tests were video taped with one camera positioned at 12:00 in front of the nose of the aircraft oriented towards the tail so an exterior view of the smoke exiting from any of the fuselage openings could be observed. The other video camera was set up in the doorway to the flight deck looking down the aircraft aisle to the rear galley. This view recorded the movement of smoke as it exited the aircraft. The rear exit to the stairway was closed. The first PPV test was performed opening only the rear side doors (R2 and L2) to obtain a benchmark of time and PPV performance.



All newer commercial passenger aircraft manufactured by Boeing (with the exception of the B717) and Airbus only have side fuselage doors and over wing hatches. These manufacturers are no longer producing aircraft with stairs at the rear of the aircraft.

Two smoke generators were used inside the cabin - one in the front section of the aircraft cabin and one in the rear cabin area. Capt. Allomong wore a Self-Contained Breathing Apparatus (SCBA) to avoid smoke inhalation while the cabin filled with smoke and opened the rear doors (L2 and R2) once the tests began. He radioed when smoke completely obscured visibility from the rear of the cabin to the flight deck. John Thompson and Luis Cadena of Tempest Technologies also entered the cabin and opened the over wing hatches upon ASO Pierce's signal. The elapsed time for the first test was one minute twenty-six seconds (1:26) to ventilate the entire aircraft using the standard 24" blower. When the second test was conducted with the 27" extended shroud blower, the time was one minute twenty-two seconds (1:22). Some smoke was pushed through the rear stair opening of the aircraft through the stairway door. The rear door to the cabin was closed as much as possible only to allow enough space for an extension cord connected to the smoke generator. Once the benchmark was established, additional tests were conducted alternating the blowers while opening two over wing hatches and four doors on the fuselage. The 24" model with the standard shroud took one minute fifteen seconds (1:15) and the 27" extended shroud took one minute twelve seconds (1:12) for smoke removal.

Tests were also conducted by opening a combination of two over wing hatches and four fuselage doors that allowed the prevailing wind to ventilate the aircraft. After more than three minutes and forty seconds (3:40), it was observed that using only prevailing wind had little effect on interior ventilation with the existing 10 knot cross wind conditions. A blower was then used to clear the aircraft for more tests.

#### **TESTING FOR A SIMULATED EMERGENCY SLIDE EXTENSION**

The final test was conducted to determine what effect positioning the stair truck further away from the aircraft would have while using the 27" extended shroud blower. Thompson hypothesized that more entrainment of air and faster ventilation could be obtained with the fan backed further away from the door. ASO Pierce and Capt. Allomong explained that in actual aircraft firefighting applications, the inflatable escape slide must



**CABIN FILLED WITH ARTIFICIAL SMOKE**