

In the impact region was further damage that would cost the lives of all the 1,355 people from the 92<sup>nd</sup> floor to the 110<sup>th</sup> floor. The crash and flying debris had collapsed the walls of all three stairwells and interrupted all elevator service to the upper 60 floors. All opportunity for escape had been eliminated.

## **2.4 THE JET FUEL**

To the wings of the 767-200ER, the perimeter columns acted like knife blades, slashing the aluminum fuel tanks and atomizing much of the 10,000 gal of jet fuel liquid into a spray of fuel droplets. Atomized jet fuel is highly flammable (similar to kerosene), so both the hot debris and the numerous pieces of electrical and electronic gear in the offices were more than sufficient as ignition sources. A surge of combusting fuel rapidly filled the floors, mixing with dust from the pulverized walls and floor slabs. The pressure created by the heated gases forced the ignited mist out the entrance gash and blown-out windows on the east and south sides of the tower. The resulting fireballs could be seen for miles, precipitating many 9-1-1 calls.

Less than 15 percent of the jet fuel burned in the spray cloud inside the building. A roughly comparable amount was consumed in the fireballs outside the building. Thus, well over half of the jet fuel remained in the building, unburned in the initial fires. Some splashed onto the office furnishings and combustibles from the aircraft that lodged on the impacted floors, there to ignite (immediately or later) the fires that would continue to burn for the remaining life of the building. Some of the burning fuel shot up and down the elevator shafts, blowing out doors and walls on other floors all the way down to the basement. Flash fires in the lobby blew out many of the plate glass windows. Fortunately, there were not enough combustibles near the elevators for major fires to start on the lower floors.

## **2.5 8:47 A.M. TO 9:02 A.M. EDT**

The burning of the jet fuel cloud had consumed much of the oxygen within the 94<sup>th</sup> and 96<sup>th</sup> floors, although photographs showing survivors indicated there were some zones with breathable air. The oxygen-starved fires died down, but didn't quite go out. Within the first 2 min after the impact, fires could be seen in the north side windows on the 93<sup>rd</sup> through 97<sup>th</sup> floors, the 96<sup>th</sup> floor of the south face, and the 94<sup>th</sup> floor of the east face. As fresh air entered the perforated facades, there began the steady burning of the office furnishings and the 13 tons of combustibles from the aircraft that would eventually overwhelm the already damaged building. By 9:00 a.m., these fires had grown and spread to the extent shown in Figure 2-5. In addition to burning around the aircraft entrance hole, there was intense burning on the north, east, and west faces of the 97<sup>th</sup> floor. Large fires burned on the south side of the 96<sup>th</sup> floor and the east side of the 94<sup>th</sup> floor. At 8:52 a.m., a stream of smoke emerged from the south side of the 104<sup>th</sup> floor, although there was no evidence of a significant fire there yet.

There was no way to fight the fires. The piping providing the water supply to the automatic sprinklers had been broken, and water was flowing down the stairwells. Even had this not happened, the system was designed to supply water to about 8 sprinkler heads at one time, enough to control the flames from as much as 1,500 ft<sup>2</sup> of burning material. The water supply was likely sufficient to control fires up to triple that size. The fires, however, had already grown far larger than that.