

burning rate. The breaking of about 20 windows on the west side of the north face in the last 10 min indicated that there were interior fires or an overall build-up in the temperature of the gases. The observed window breakage along the south face in the last 10 min indicated the presence of a fire, but unlike the simulation, the fires had to have been away from the perimeter since they were not observed through the windows.

6.3.3 Floor 94

Floor 94 was directly impacted by the left wing of the aircraft, and a substantial amount of jet fuel was spread throughout the east side of the floor. Initially, severe fires were observed on the east face, and then steadily spread around the floor, with the heaviest activity in the end being in the southwest quadrant.

The simulation captured the movement of the fires reasonably well. The simulated fires burned vigorously in the northeast quadrant for the first 30 min. Then for the next hour, the fires moved at roughly the same rate as the real fires clockwise toward the southeast and counterclockwise toward the southeast. In some areas, the simulation shows the burning to be too close to the windows. The late fire on the south face was not seen in the photographs and videos.

6.3.4 Floor 95

The simulated fires started around the center of the north face where the fuselage of the aircraft hit. The fires then followed the pattern of window breakage. There was substantial fire activity predicted in the building core due to the extensive wall damage (NIST NCSTAR 1-2). The simulations suggested that air rising through the core mixed with the oxygen-starved fuel gases that were accumulating on this floor because of the relatively light exterior damage away from the impact zone. However, there was no evidence to confirm or deny the existence of vigorous fire activity within the core.

Taking into account the tendency to simulate burning too close to the windows, the overall pattern of the fires is reasonably consistent with the observations. The fire on the north side of the building was growing just before additional windows break there. The same is true for the fire on the middle of the east side. The early fire simulated on the south side is consistent, but burns too long or too close to the broken windows.

6.3.5 Floor 96

Floor 96 was directly impacted by the aircraft fuselage and inner wings. There was extensive damage to the core and internal walls. One simulated fire started to the east of the impact hole, spread southward along the east side of the building, and turned the corner to the south face. This behavior mimics closely the behavior of the actual fire. By contrast, the simulation overestimated the extent of the fire on the west face. The visual observations suggested that this fire originated in the south, not the impact area. The simulation is a fair rendition of the observations on the south side of the tower beginning about 15 min to 30 min after the aircraft impact. The model captured the delayed movement of the fires along the south face due to the presence of office walls.