

west faces. Most of these were seen near the end of the period, perhaps indicating that conditions on the upper floors had begun to rapidly deteriorate.

10:18 a.m. to Collapse of WTC 1 at 10:28:22 a.m.

By shortly after 10:18 a.m., the fire spreading toward the west on the north side of the 92nd floor was approaching the edge of the face. Despite the presence of flames over a significant length of the floor, the fire appeared to be burning with a low intensity at separated locations, with essentially no smoke coming from nearby open windows. An event took place within the tower at 10:18:48 a.m. that generated a pressure pulse with sufficient magnitude to force a large amount of smoke from the open windows on the 92nd floor, along with smaller amounts from open windows on other floors on the north face and on the other faces of the tower. While it seemed likely that the pressure pulse was generated by some sort of collapse within the tower, e.g., a portion of the core settling or a partial floor collapse, it has not been possible to determine the nature of the event or even its general location based on the visual record. Shortly after the pressure pulse, an intense fire appeared at the western edge of the 95th floor. Over the next several minutes, the fire on west side of the 92nd floor grew dramatically, with heavy internal flames visible over most of the western half of the floor. Fires present elsewhere on the north face were dying down during this period. When the tower began to collapse, it acted as a piston, forcing air downward onto other floors and out through openings. As a result, large volumes of fire and smoke were pushed from windows on the 92nd floor at several locations across the face, confirming the presence of an extensive area of fire. Flames were also pushed from windows in the northwest-corner room on the 95th floor, indicating that a significant fire was still present nearby. Flames were not expelled from elsewhere on the north face, providing additional evidence that intense fires observed earlier at other locations on the face had either died down or gone out.

Views of the east face during the final ten minutes were limited and partially obscured. A small fire was clearly burning near the center of the 101st floor. Several long-distance videos show that around 10:21:15 a.m. there was an intense burst of flame from the 98th floor at a location roughly half way between the center of the east face and the south end. This new region of intense fire rapidly expanded in both directions to cover about one-fourth of the width of the face. The new area of fire on the south side of the 98th floor remained the dominant feature on the east face until the collapse. Roughly 3 s prior to collapse initiation, this line of fire brightened noticeably. During the collapse, bright flames were expelled from the southern side of the 98th floor, confirming the presence of an intense fire in the area. Expelled fire was not visible coming from the other fire floors on the face, suggesting that the fires present elsewhere were much smaller than that on the south side of the 98th floor.

Views of the south face of WTC 1 were also limited for this time period, but several photographs taken from a helicopter flying relatively close to the tower provide a good indication of conditions on this face roughly half way through the period. Figure 2–3 shows a cropped view of one of these photographs shot from the southwest at 10:22:59 a.m. Fires are visible on the east side of the face on the 92nd through 98th floors. A long-distance video showed that the particularly intense fire on the 98th floor moved into the area around 10:19 a.m. Close inspection of the photograph reveals that many of the columns on the south face in the vicinity of 95th floor to the 98th floors were bowed inward at this time. Somewhat smaller flames are visible on the west side of the face on the 92nd, 96th, 98th, 99th, and 100th floors. Around 10:25 a.m. heavy smoke and fire appeared from windows in a room located on the southwest corner of the 94th floor. Long-distance videos show that during the period leading up to the tower