

108th and 109th floors. There were no visible indications that fires capable of breaking out window glass had reached the west face of WTC 2 prior to the collapse.

Many of the fires present during earlier periods were either no longer visible or were dying down during the final interval prior to the tower collapse. Some fire spread to the west has taken place on several floors on the north face. Areas with substantial fires include those on the north sides of the east face on the 79th and 80th floors (recall that the observed fires are combinations of sustained fires and short-lived flame releases) and the intense fire that grew on the west side of the south face at the 80th floor.

Summary and Additional Discussion of Observations for WTC 2 Fires

Compared to WTC 1, there was less observed fire spread in WTC 2, even when the differences in available time (102 min for WTC 1 and 56 min for WTC 2) are taken into account. Figure 2–12 compares WTC 2 integrated façade maps of fire observations for the entire 56 min period with initial fire distributions present shortly after the aircraft impact. Primary areas of fire growth and spread include the east side of the 83rd floor and locations to the west of the cold spot on several additional floors of the north face, much of the 81st floor and extensive areas toward the centers of the 79th and 80th floors on the east face, and areas on either side of the aircraft impact cavity on the south face, particularly to the west side of the 80th floor and to the east on the 81st and 82nd floors. The absence of visible fire suggests that substantial fires did not reach the west face of the tower during the available time.

Similar differences between WTC 1 and WTC 2 become apparent when changes in window condition (discussed in detail in NIST NCSTAR 1-6A) are considered. Recall that for WTC 1 the number of open windows following the aircraft impact (roughly 236) increased by more than a factor of five as a result of fire spread. For WTC 2 the number of open windows (estimated as 433) immediately following the aircraft impact was considerably larger, mostly due the fact that the aircraft struck toward the east side of the south face and caused extensive façade damage and window breakage along the east face and east side of the north face. When WTC 2 collapsed the estimated number of open windows was 620, having increased by less than 50 percent, reflecting the limited fire spread that had taken place.

A curious aspect of the fire behavior in WTC 2 was the presence of the cold spot on the north face, which covered three floors over a length equal to one-sixth of the face width. The existence of the cold spot implies that little fuel was available in the immediate vicinity to support burning. A number of possible explanations were considered for the absence of fuel. One is that the area was vacant and that there was limited fuel present prior to the aircraft impact. NIST is unaware of any information that supports such a conclusion. A second possibility is that the fireballs that exited through the area were so intense that they pushed most available fuel in the area to the sides or out through the opened windows. A third possibility is that the floor slabs, particularly on the 81st and 82nd floors, in the immediate area collapsed during the aircraft impact and fireballs, in effect, creating a cavity behind the cold spot. The available visual evidence both supports and argues against all three possibilities. NIST has concluded that insufficient information is available to allow a likely formation mechanism for the cold spot to be postulated.