

Fire Investigation Summary

Düsseldorf

**Airport Terminal Fire
Düsseldorf, Germany
April 11, 1996**



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**National Fire
Protection Association**

On Thursday, April 11, 1996, a fire in an occupied passenger terminal at the airport in Düsseldorf, Germany, killed 17 people and injured 62. The fire began at approximately 3:31 p.m., about the time someone reported seeing sparks falling from the ceiling in the vicinity of a flower shop at the east end of the arrivals hall on the first floor. When two fire fighters from the Airport Fire Brigade responded curb side to the terminal at 3:33 p.m., they detected an odor inside the building and asked that an electrician respond, as problems with the motors on the automatic doors in the area had been reported in the past. At 3:38 p.m., however, smoke was seen coming from the vents in the flower shop, and the ceiling began to glow and drop burning embers. All airport apparatus and personnel were requested and were on the scene by 3:40 p.m.

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At 3:58 p.m., a very rapid fire buildup occurred throughout a large area of the first level of the terminal, and the Düsseldorf Fire Brigade was called. Two engines, a ladder, a water tanker, and a command officer responded to the scene at 4:07 p.m. By that time, heavy smoke and fire was showing from the doors on the first level, and the officer requested the equivalent of a second alarm. At 4:15 p.m., 44 minutes after the initial alarm, he requested that all city units respond immediately to help in the operation. By the time the fire was extinguished, 701 personnel from 12 different rescue services or municipalities had responded to the incident on 215 pieces of apparatus.

The fire was finally declared under control at 7:20 p.m., 3 hours and 49 minutes after the first report of sparks was called in.

According to the Düsseldorf Fire Brigade, seven of the victims died in two elevators, five in one and two in another. It was determined that some of the people were on the roof of the parking garage watching planes take off and land when they saw smoke coming from the terminal and decided to leave using the elevators. Unfortunately, the elevators opened into the fire area on the first level. Eight more victims died in a VIP lounge on the third level, which was a mezzanine overlooking the second, or departure, level of the building. Another victim died in a lavatory, although his exact location is not known. The location of the last victim, who died several weeks after the fire, is also unknown at this time.

German authorities determined that the fire began when a welder working on expansion plates in a roadway above the lower level of the terminal building ignited the polystyrene insulation used in the void above the ceiling on the first level. The smoke and flames spread throughout the first level, then extended to the second level through unprotected open stairwells and escalator openings. The fire did significant damage in the vicinity of the stairwells, and heavy smoke damage throughout approximately two-thirds of the second and third levels. Smoke also spread to the fourth level through unprotected escalator openings.

The area where the fire occurred was not equipped with any automatic sprinkler systems. Dry standpipes were located in the stairwells on the curb side of the terminal building, but they were not connect-

ed to a municipal water supply and had to be charged by fire apparatus. The building was also equipped with an alarm system that used voice annunciation in German, French, and English. Manual pull stations and smoke detectors were located throughout the building, but there was no smoke detection in the void, since it reportedly was not used as a return air plenum.

The airport was completely shut down for 3 1/2 days following the fire. Limited operations were restored the Monday after the blaze, and the airport was back to 90 percent operations as of July 1, 1996. Tents and hangars were used as temporary terminals.

Several factors were determined to have contributed significantly to the loss of life and property damage:

- Failure of workmen to take adequate precautions during welding operations
- The presence of combustibile insulation in the ceiling void above the lower level of the terminal
- A lack of automatic suppression systems in the void and in the occupied area of the terminal
- Unprotected vertical openings that allowed the fire and smoke to spread to the upper levels
- The transmission of erroneous information over the voice annunciation system during the first 10 minutes of alarm activation.



- The ability to shut down the public address system in the lounges. (This system was also used to transmit the emergency voice announcements.)
- Inadequate means of egress capabilities from the VIP lounge on the mezzanine level
- Two occupied elevators that opened directly into the fire area

Other significant factors that arose during the fireground operations include the following:

- Lack of adequate communications capabilities between the command staff and the fire fighting units
- Insufficient radio frequencies available for fire ground operations
- Lack of awareness of the building layout
- No fire fighter accountability system
- Insufficient command staff to manage the incident

NFPA's Fire Analysis and Research Division has not been able to find any incident in its records of an airport structural fire involving this many fatalities anywhere in the world. As of the date of this report, this is the worst loss of life in a structural fire in an airport terminal facility.

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The National Fire Protection Association's Fire Investigations Department documents some of the most significant fires and incidents throughout the world. The objective of these investigations, and the subsequent reports that are prepared, is to determine what lessons can be learned from these incidents. This information is then made available to the fire safety community to be used in developing future codes and standards and to modify fire ground operations.

NFPA Fire Investigations Department

One Batterymarch Park

Quincy, MA 02269 USA

(617) 984-7467 (tel)

(617) 984-7056 (fax)

investigations@nfpa.org

www.nfpa.org



NFPA® National Fire Protection Association

Fire Investigations Department
One Batterymarch Park
P.O. Box 9101
Quincy, Massachusetts, USA 02269-9101