

HISTORICAL FIRE: Chemical Fire in Apex, North Carolina

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This is a summary of Report 163 of the United States Fire Administration's "Investigation and Analysis of Major Fire Incidents" and Technical Report Series.

Apex is a town of approximately 30,000 residents in the central part of North Carolina, located in Wake County just south of Raleigh. The town operates three fire stations with a combination career and volunteer system of 27 full-time employees, 12 part-time employees and 15 volunteers. Minimum shift strength is eight, including a shift commander. The department staffs three engine companies, one tower ladder company and other support equipment. It provides fire suppression, rescue, first-responder emergency medical service, and operations-level hazardous materials response. The fire chief is also the town's emergency manager.

At 9:38 p.m. on Thursday, Oct. 5, 2006, the AFD was dispatched to a report of a chlorine odor near the intersection of Schiefflein Road and Investment Boulevard. AFD dispatched its standard response of two engines and a chief officer (shift commander). Because the regularly assigned shift commander was on leave, the chief of the department responded in his place.

The Environmental Quality Company (EQ) operated a business that handled commercial hazardous waste at 1005 Investment Road. The original tenant of the facility was EnviroChem, which began operations in 1988 in what was then the "new" industrial park. EnviroChem operated the facility until 2002, when EQ took over. The company's business involved collecting, processing and repackaging industrial waste for transport and proper disposal. EQ operates 12 other facilities in the United States and is based in Michigan. In 2005, the EQ plant in Romulus, Michigan, suffered an explosion and fire, and approximately 2,000 people had to be evacuated.

The Apex facility was a two-building complex with an office and warehouse storage area in one building and a seven-bay hazardous waste storage area in the other building. The footprint of the whole complex was approximately 175 feet by 100 feet. There were parking aprons on both the north and south sides of the buildings. A truck tanker loading and unloading area was located to the immediate east of the hazardous waste storage area and included eight storage tanks. The building was an unprotected steel structure and did not have a sprinkler system.

Upon arrival, four minutes later, at 9:42 p.m., Engine Company 3 reported a large vapor cloud and requested a second-alarm assignment. Crews then began an initial reconnaissance to determine the source of the cloud. The chief of the department arrived at 9:52 p.m., took command and established the initial Incident Command Post near the intersection of Schiefflein Road and Investment Boulevard. He began the process of evacuating the community, an effort which ultimately involved 17,000 people.



Fire conditions prevented the reconnaissance teams from locating the daily manifest inside the structure. Since it was not possible to ascertain what chemicals were burning and what the plume might contain, the Incident Commander decided not to fight the fire. Instead, companies constructed a berm or dike to contain the liquid runoff that was starting to present near the edge of the EQ property. Companies arriving on subsequent alarms assisted with the evacuations. The fire department contacted the EQ Company and requested that a representative come to the scene. The EQ plant manager arrived on scene and reported that the fire involved pesticides, oxidizers, contaminated metals, flammable and combustible materials, lead, and sulfur. EQ also reported that they had requested a private firm specializing in chemical fires to respond. That response, however, did not arrive for 12 hours, because the firm was located in Arkansas.

By about 9 a.m. on Friday, Oct. 6, 2006, the fires had died down enough to permit the Apex and the contract firefighters from EQ to begin offensive operations. By 5 p.m. Apex Fire Command was terminated, and the site was turned over to the EQ contract firefighters. The last of the fires was extinguished by 1 a.m. on Saturday, Oct. 7.

The key element contributing to the success of operations was that Apex had a very well-defined plan that was practiced routinely. They made a commitment to train to the plan, and when they had an incident, they used the plan as a foundation for the response. Apex was prepared to evacuate the town in large part because police, fire, EMS, public works and elected officials all participate in federally required biannual exercises for the Shearon Harris Nuclear Power Plant, located 10 miles from the town. Communities within 50 miles of a commercial nuclear reactor are required to plan for evacuation, emergency public information, sheltering and other protective actions. Instructions on what to do in case of an emergency are routinely sent to the public via mailings with water and tax bills.

The fire department also did something the study team found unique. The fire chief requires the shift commander to prepare and complete an I-204 form from NIMS at the beginning of every shift. This form is an assignment listing and is a fundamental part of a written Incident Action Plan. Large incidents such as major chemical fires require written IAPs. By requiring the shift commander to have an I-204 completed in advance, the formal written IAP process had already been set in motion at the time of the fire.

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Reference: Sensing, Daryl and Simpson, Patrick. (2008). Chemical Fire in Apex, North Carolina. In Department of Homeland Security, U.S. Fire Administration, Technical Report Series (USFA-TR-163/April 2008). Maryland: National Fire Academy.



Initial Explosion and Plume Cloud



Secondary Explosion during Fire Operations



Aftermath of the Fire



Chemical Containers