

**OAKLAND-BERKELEY HILLS**

**TUNNEL FIRE**

**CALIFORNIA FIRE INSTRUCTORS WORKSHOP**

**OCTOBER 20, 1991**

## The Oakland-Berkeley Hills Fire

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Oakland Fire Department

Sunday, October 20 will be remembered as the date of one of this nation's most costly fires; the worst fire involving loss of life and property since the Great San Francisco Earthquake and Fire of 1906.

The magnitude and scope of what is simply referred to as the "Tunnel Fire" is far beyond the experience of any living American firefighter. Only those who fought the Chicago Fire last century and those who battled the Great Fire in San Francisco would be able to identify with this conflagration and firestorm.

A fire storm is defined as a fire which creates its own weather, this was certainly the case in Oakland, the fire itself contributed to its own spread by supplying wind to an already very windy day. A conflagration has been described as a fire which exceeds the boundaries of the city block of origin. The Tunnel Fire did much more than this by burning beyond neighborhood after neighborhood. Both fire storm and conflagration are accurate terms when applied to the Tunnel Fire, neither, however, come close to adequately describing what actually happened.

The origin of the fire was on a steep hillside in what some have called a box canyon above state Highway 24 near the entrance to the Caldecott Tunnel. This is a wooded area with heavy underbrush, narrow streets and steep terrain, populated with many expensive homes. The unusual weather conditions are described in FEMA's Hazard Mitigation Report as follows: "...and unusual east wind, at speeds in excess of 65 miles per hour, that race down from the crest of the Oakland-Berkeley Hills. Coupled with record high temperatures well into the nineties, the hot dry winds gusted and swirled through five years of drought-dry brush and groves of freeze damaged Monterey Pines and Eucalyptus trees. All the conditions for a major disaster were present that morning of October 20th, 1991."

More than 25 firefighters were on the scene overhauling hotspots from a fire the previous day. It is important to note that Saturday's fire had been well overhauled, hose lines were left in place surrounding the burn area, the fire area was checked by Oakland fire companies during the night, and fire crews had been on the scene hours before ignition on Sunday.

These are prudent and accepted firefighting methods.

Eyewitness accounts testify that a sole ember blew into a tree just outside the burn area, and the tree exploded into flame, and the resulting fire was quickly out of control raging around and over firefighters who were indeed fighting for their lives. Rescue and evacuation efforts were made as firefighters were forced to fall back to defensible space.

A request for additional fire units and air drops were immediately called for. Soon, streets were clogged with residents trying to get out, sightseers and emergency personnel trying to get in.

The fire quickly established four fronts, west downhill toward state Highway 24 and the Rockridge district, north toward the Claremont Hotel, south toward Broadway Terrace, and east toward Contra Costa County.

The Oakland Fire Department is divided into three battalions commanded by an assistant chief and two battalion chiefs.

Assistant Chief Donald Matthews was the Incident Commander, Battalion Chief James Riley was assigned as Division "A" Commander, and Battalion Chief Ronald Compos responded to Oakland Fire Dispatch Center to coordinate logistic, recall, and dispatch functions. Later, Assistant Chief John K. Baker responded from home and was assigned the role as Incident Commander when Assistant Chief Matthews opted to be Operations Chief. At approximately 1145am Fire Chief P. Lamont Ewell arrived on the scene at the command post and officially assumed command.

The Oakland Fire Department uses the Incident Command System (ICS) to manage all emergency incidents, as was the case with the Tunnel Fire.

The system consists of an incident commander who directly supervises four functional groups: operations, planning, logistics and finance.

The operation and planning functions were conducted at the scene from the department's mobile command post, while logistics and finance functions were conducted from the dispatch center.

This was the basic structure of initial management of the Tunnel Fire. This structure remained intact until late into the evening when the California Department of Forestry provided an overhead management team to assist with the enormous task of managing such a large fire.

At this point a joint command was established that consisted of Oakland, Berkeley, Piedmont and the Department of Forestry.

Oakland Firefighters were assisting with evacuation efforts as they were forced to retreat from the advancing inferno. Division "A" Chief James Riley and Oakland Police Officer John Grubensky were killed while trying to help citizens escape the fire. Both Chief Riley and Officer Grubensky were found with the remains of those people they were trying to help. It is important to note that these courageous men were very aware of their tenuous position and had ample opportunity to save themselves, but refused to leave before the evacuation of residents was complete.

The rapid spread of the fire in four different directions presented both line firefighters and chief officers with numerous and severe problems.

#### EVACUATION

Even though evacuation of residents is a responsibility assigned to the Oakland Police Department, fire units were heavily involved with this effort while trying to stop the advancing flames. It has been estimated that more than 5,000 people were evacuated from the burn area, some through very narrow streets in blinding smoke, and blowing debris.

#### WIND

The wind played a most crucial part in the scenario which manifested itself once the fire was established. The wind blew into the Oakland hills from the east, over and down ridge tops forcing flames to swirl in many different directions causing the fire to burn down hill as quick, and in some cases quicker, than up hill. This prevented firefighters on the scene from falling back to defensible space because there was no place to hide, fire crews were trapped and forced to protect themselves under an umbrella of water as the flames roared over and around them. One veteran firefighter observed the fire progress one hundred yards in fifteen seconds. This Santa-Ana type wind pushed the fire along wide fronts, bypassed firefighters who were making a stand and then left them in isolated pockets of unburned areas.

The wind whipped the fire into the Hiller Highlands development and consumed all combustibles (homes, vegetation, and vehicles) in sixteen minutes. The wind caused the fire to pre-heat everything in its path, and caused structures and contents to explode almost instantly.

Pilots flying California Department of Forestry helicopters complained that their bucket drops were not effective because the water vaporized as the strong winds dispersed it over the very hot fire.

#### COMMUNICATIONS

The Oakland Fire Department uses two operational radio frequencies to communicate between the dispatch center and the thirty fire companies in the city. Communication with other jurisdictions is usually accomplished on the state wide mutual aid frequency which is referred to as the "White Fire." channel.

The effectiveness of these frequencies was soon reduced because of the overwhelming load placed upon them by fire units requesting assistance, commanders trying to place resources, and the dispatch center's attempts to send fire companies into the burn area. These problems were compounded, by additional fire units from surrounding cities which began to arrive to assist with the fire. The steep hilly terrain in the Oakland hills also interfered with radio signals, in some cases creating "dead spots" which drastically reduced radio effectiveness.

The Oakland Fire Department is currently converting to an 800 megahertz radio system which will provide a virtually unlimited number of radio frequencies. It is expected that this will mitigate much of the overload of tactical channels that was experienced during the initial stages of the fire.

In addition, proposals have been made to fire departments surrounding the City of Oakland which will permit those jurisdictions to participate in the 800 megahertz radio system.

#### MUTUAL AID

Requests for mutual aid in the form of air support and fire suppression units were made during the initial stages of the fire, and additional requests were made throughout the day.

Mutual aid requests are processed through the State Office of Emergency Services. Requests were channeled through Alameda County OES which is divided into north and south zones, and then from the county level to the state.

By late afternoon, 370 fire engines from far away as the Oregon-California state line in the north, to Bakersfield in south and Nevada to the east were in or on their way to Oakland.

Aircraft- in the form of helicopters and large air tankers from hundreds of miles away made hundreds of water drop on the fire.

This was the largest mutual aid effort ever undertaken in the State of California.

Planning sessions with jurisdictions which border Oakland have been taking place to discuss methods of enhancing the mutual aid system.

#### WATER SUPPLY

Fire units lost water at the height of the fire, forcing them to retreat because the supply tanks and reservoirs which provide water to the hill area were emptied. Loss of water occurred primarily for five reasons, they are:

Extraordinary fire suppression efforts used a tremendous amount of water. (Estimated 20 million gallons)

Residents wetting roofs and vegetation, many leaving sprinklers running after evacuating.

As homes were consumed by the fire the water service supplying those homes began to flow freely. Hiller Highlands alone accounted for over four hundred water services.

Water supplying the tanks and reservoirs is pumped from lower parts of Oakland to the higher elevations. The electrically powered supply pumps could not replenish depleted tanks once the fire destroyed power lines to the pumps.

Some areas, such as the Rockridge district (which was developed in the 1920's) is supplied by four inch mains which are considered to be insufficient by today's standards, they could not supply enough water to fight a fire of this magnitude.

Many mutual aid fire engine companies could not hook up to Oakland fire hydrants because they use two-and-one-half inch hose couplings and Oakland fire engines use three inch couplings.

Many steps are currently being taken to augment the water supply system. Some of those steps are:

Acquire an above-ground portable water delivery system.

Investigate the feasibility of standardizing hydrant connections.

Install cisterns and pumping stations at strategic locations.

#### VEGETATION MANAGEMENT

The Oakland Fire Department is in the process of intensifying the existing vegetation management program by increasing the public education component of the Hill Area Hazard Abatement Program.

#### CODES AND ORDINANCES

The Fire Department is actively seeking changes in the Oakland Municipal Building Code which will accomplish the following:

Require Class "A" (non-wood) roofing in the Hazard Zone

Require one-hour exterior construction in the Hazard Zone

Require residential sprinklers in the Hazard Zone

#### AFTERMATH

The Tunnel Fire will eventually become the most studied fire in American history. The fire was viewed on prime time television around the world, it has been documented by professional and laymen alike. The question of origin of the fire has been and continues to be the focus of investigation.

Ultimate responsibility for finding the cause of the fire lays with the Fire Investigation Unit of the Oakland Fire Department Fire Prevention Bureau. Inspectors from the Fire Investigation Unit have worked with the Governor's Task Force which is represented by the California State Fire Marshals Office and the Alameda County Fire Investigation Team. The Alameda County Fire Investigation Team is composed of representatives from the District Attorney's Office, the Bureau of Alcohol, Tobacco, and Fire Arms, along with investigators from the surrounding fire districts.

Fifteen-hundred man-hours were spent in the first week following the fire, most of that time conducting interviews with survivors and performing overhaul operations by sifting through debris searching for evidence.

The origin of the Tunnel Fire is located next to 7151 Buckingham Road. The cause of the fire, however is still under investigation.

**FIRE STATISTICS**

Deaths	25
Injuries	150
Single Family Dwellings Destroyed	2,843
Single Family Dwellings Damaged	193
Apartment Units Destroyed	433
Total Living Units Damaged or Destroyed	3,469
Total Acreage Burned by the Fire	1,520
Fire Perimeter	5.25 miles
Fire Loss Dollars	\$1,537,000,000