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SOME OBSERVATIONS ON FIRE DEPARTMENTS' RESPONSE  
TO THE MASSIVE FIRE IN CHELSEA, MASSACHUSETTS

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### Objective

At 3:56 p.m. on Sunday, October 14, 1973, a fire in an abandoned warehouse was sighted which would eventually destroy 18 city blocks and damage 12 others in Chelsea, Massachusetts, a city of around 32,000 people and an industrial satellite of Boston. At its height, this conflagration was thought to be a "fire storm" with the smoke of the blaze visible from as far as 50 miles away. Because of the large area affected, and the number of fire departments involved in controlling this conflagration, the Disaster Research Center took this opportunity to study the organized response to a relatively rare phenomena in present day American cities, a massive fire situation. A two-person research team was sent to Chelsea, Massachusetts, staying two days, October 16 and 17. Their focus was primarily on the mobilization and coordination of the various fire departments involved, as well as some of the supporting organizations' activities. The following general questions were asked to obtain the information:

- (1) Who took charge of the fire departments' response to the fire?
- (2) What organizations (fire departments, police departments, National Guard, etc.) were involved in the emergency period?
- (3) How were the various emergency organizations mobilized? And how were they then coordinated?
- (4) What were the problems confronted in this massive fire situation?
- (5) What role did the local civil defense organization play in the coordination of activities?

### Field Work

The field team contacted major emergency organizations including:

- State civil defense
- Regional civil defense
- City fire department
- City police department
- American Red Cross
- City mayor's office
- Area television stations

In the cases of the fire and police departments, and the mayor's office, intensive interviews were conducted with key officials. The data obtained from other organizations, e.g., all civil defense offices, Red Cross, and television stations, was not so extensive since these organizations were not involved in the fire-fighting response. Cooperation from the city and local officials was very good, though most were still quite busy with problems related to the disaster.

### Chronology and General Observations

The observations of the field team, which are based on overall and general impressions are centered, first of all, on the fire departments involved and their response, and secondly, on the supporting organizations' responses, such as those by the police, National Guard, etc.

The fire was spotted at 3:56 p.m. Sunday, October 14, 1973 by an off-duty, out-of-town policeman. At this time the fire alarm headquarters (hereafter referred to as Central Headquarters), which is across the street from the city hall, struck the first alarm which alerted all Chelsea fire stations. Within 11 minutes the second, third and fourth alarms were sounded, which by pre-arrangement summoned eleven additional fire engine trucks and two additional ladder trucks from nearby communities including Boston. This additional equipment and manpower automatically comes to the assistance of Chelsea under a mutual-aid agreement which provides for mutual assistance under specified alarm arrangements. For example, when the third alarm was struck regarding the fire area, this alarm automatically communicated to Everett, Boston, Revere, and Waltham fire departments that each should send one engine fire truck to the fire area. In addition, other specified communities or sub-fire stations within the communities previously mentioned sent engines to those fire stations which were sending engines to the Chelsea fire. This provides a fire-fighting cover for those station areas which sent engines to Chelsea. The fourth alarm operates in like fashion.

After the fourth alarm was sounded, the Chelsea fire chief asked for 20 additional engines from the communities within his fire district. Massachusetts is split into 14 fire districts. Chelsea and the 30 surrounding communities are in District 13. Again, a mutual-aid plan links the fire departments within this district. However, the plans after a fourth alarm are less specific, more informal. Indeed, the entire mutual-aid plan is informal in the sense that it is not legally incumbent upon community fire departments to lend assistance. However, since there are obvious mutual benefits to be derived from such cooperation, the informality and unofficial nature of much of the planning presents no handicap to the plan's liability.

Within each of the 14 fire districts, intra-fire department communication exists. In the district in which Chelsea is located, Newton is the command communications point. It was to Newton Control that the Chelsea fire chief directed his call for 20 additional pieces of equipment. Moments after this, the chief again called Newton Control and informed the 30 surrounding community fire departments that a "conflagration" was at hand and that all available pieces of equipment (which are to respond to such a call) should come to Central Headquarters rather than go directly to the fire area as would be the normal procedure. In addition, the chief called outside of his district to the fire district headquarters immediately to his north and again broadcast for assistance. This communication was not routed through Newton Control since none of the 14 districts have intercommunications, but it was done by the Chief through telephonic communication. Eventually, between 85 and 100 communities provided fire fighting assistance. In all, a total of about 2,000 firemen and pieces of equipment were mobilized in the direct and indirect fire fighting effort.

After these additional pieces of equipment arrived at Central Headquarters, they were dispatched to specific positions in the fire area. In general, this outside equipment was set up as a last line of defense toward which the Chelsea fire fighters retreated. This stratagem worked and allowed the Chelsea fire fighters to gradually pull back to this last line where the fire could then be contained.

At the scene, the fire deputies were positioned in various spots around the inflamed area, and each coordinated the efforts in that immediate area. The overall coordination was the responsibility of the Chelsea fire chief. He utilized the radio communications available whenever possible; however, not all fire fighters were reachable through radio communications due to the high level of noise and activity, so runners, often using the traditional fire fighting hand signals, were used.

Because a major bridge leading into the city was closed for repairs on its upper deck, the emergency vehicles coming from the south had a traffic-free route into the city via the lower deck which was opened at the request of the Chelsea fire chief. This was a very significant "break" for it allowed the equipment quick access to the fire area.

The problem in the first instance was not one of extinguishing the fire but of containing it. The area which was to be almost completely leveled ( and that had been scheduled for urban renewal) was a deteriorating industrial section where most of the industries were small businesses which reclaimed scrap metal, rags, tires, etc. The buildings were generally wooden, three-story tenements which, with the judicious use of metal facades, had been transformed into small business establishments. (Of historical interest is the fact that this very same neighborhood was razed by a fire back in 1908.)

The movement of the fire over the area was aided by northwesterly winds as high as 50 m.p.h. blowing off Boston Harbor. Embers were carried for blocks by the wind and the narrowness of many of the streets allowed the fire to cross them by heat radiation. After a short time, this "fire storm" was creating its own winds. By 8:00 p.m., 20 percent of the city had been consumed.

The fire fighters at the scene were not only confronted with the high winds pushing the flames forward and requiring them to continually pull back, in the process of which much equipment was lost, including the first Chelsea pumper vehicle on the scene, but they were also confronted by problems with many of the hydrants. In January of 1973 the fire chief had warned the city that 93 hydrants were ineffective in fighting fires because of low water pressure or no pressure at all. To compensate for this problem the Chelsea firemen had been trained to use a relay system in which several hoses are connected to reach the fire area from an operational hydrant, or to use supplementary water supplies. In addition to this, some of the hydrants had spigots which were too small (two inches) for the present-day hoses (four inches). The intense heat from the "fire storm" caused fire hoses to burst occasionally, which increased the difficulties with water pressure.

The blaze was not brought under control for approximately seven hours after it began. Railroad tracks along the western edge of the affected area were a major help in containing this conflagration, for they served as a barrier. Following the lengthy emergency period, double shifts of firemen continued working in the area until Wednesday both days (8:00 a.m.- 6:00 p.m.) and nights (6:00 p.m. - 8:00 a.m.). Normally, following a major fire only one shift would be continuous until all danger was over. Not only were the out-of-town fire departments used at the scene, but they covered the Chelsea city fire stations.

Before going on to discuss the role of the supporting organizations, it should be mentioned that sight-seeing traffic congestion was a major problem which affected the later mobility of the fire equipment. It was this problem which received the major part of the supporting organizations' attention.

When the first alarm sounded, the Chelsea police department was aware that there was a fire because they can monitor the fire band communications. Patrol cars immediately went to the scene and began evacuating the area residents by announcing the threat over a loud speaker in Spanish and English. About 250-270 families were evacuated, of whom about 100 eventually lost their homes. The other major task of the police department was to begin directing traffic around the fire as sight-seers began to gather. One hour after the fire began, the police were told by the mayor to block off every major road leading into Chelsea. The State Police were the major support in this effort. Police from many surrounding communities, including 500 off-duty Boston police, came within a short time period to assist the Chelsea police. Approximately 1,000 State Police and local community police were used in traffic control. There were also four units (500 people) of National Guard at the Chelsea armory that afternoon which were also asked to help with traffic control and patrolling the area. These functions were primarily coordinated by the Chelsea police headquarters. While the State Police were sealing off the city from sight-seers, the National Guard was helping to seal off the stricken area, and began patrols to watch for looters, although looting was never an actual problem.

Apparently the local civil defense office was not involved in the coordination of the response to this fire. At least it was not salient in the thinking of the major emergency organizations. However, a representative of the state civil defense office arrived at the Chelsea City Hall even before that office was notified of the disaster, and began supplying needed equipment, such as pumps.

### Conclusions

It should be apparent from our descriptive chronology that the various fire departments' responses were quite successful in terms of mobilization and coordination. Perhaps the single most important factor which contributed to this successful conclusion was the pre-planning implicit in the mutual-aid agreements. These agreements have led to a history of cooperation in terms of specific action under specified conditions. (Some of these mutual-aid agreements are more than 100 years old.) Although these agreements included no specific procedures after a fourth alarm was sounded, the plans did provide for a logical extension of the areas from which assistance would be requested. Also, several informal rules

operated to facilitate coordination. For example, the chief in whose area a fire occurs is always in command of all fire vehicles sent into that area. The specification of a specific central assembly area for the incoming fire vehicles (though a change from initial operating procedure where trucks go directly to the area) contributed to effective coordination. Again this tactic was within the organizational memory since it also had been used in the recent past by other fire departments within the fire district.

In addition to the above, several fortuitous circumstances existed which contributed to the successful response. The nature of the fire itself was such that it allowed for a reduction of administrative choice. That is, though large, it was really only one fire. Being concentrated rather than diffuse, the response could more easily be coordinated since one area rather than many areas were in question. Also while fire equipment eventually came from many localities, the fire itself was solely within one legal jurisdiction reducing certain kinds of coordination problems. In addition, the fire occurred on a Sunday, hence little, if any, business traffic existed to block fire vehicles, though this was a mixed blessing since many people-at home on a Sunday afternoon-flocked to the fire site creating traffic difficulties. However, a 4:00 rush-hour traffic jam certainly would have proved formidable to incoming emergency vehicles. Finally, since the fire area was sparsely populated, being primarily an industrial zone, relatively few people needed to be warned or evacuated. Thus, the effort could concentrate on containing and extinguishing the fire rather than on the removal of threatened victims.

Finally, in turning to the relationship between the fire departments and the supporting organizations, one notes a good deal of cooperation but little official coordination. Since they are all emergency organizations by nature, the need for official coordination is minimized. The natural division of labor between the police department and the fire department also contributed to the complementary relationship of their respective activities in this emergency situation. While generally the chief of police was the overall coordinator for patrol and traffic responsibilities in the area of his jurisdiction, his authority was occasionally superseded by the mayor, who is a former police officer. This, however, did not appear to create any major problems.

All in all, the response to the massive fire was relatively well coordinated and there were no unusual or major problems. However, despite this, it took seven hours to bring the conflagration under control and almost three days to extinguish the blaze totally. This observation might raise some questions about some of the plans advanced for coping with fires in far more extreme situations, such as in the aftermath of a nuclear attack situation.