

University of Delaware
Disaster Research Center

RESEARCH NOTE
#2

SOME ORGANIZATIONAL AND COMMUNITY ACTIVITIES
AFTER AN EXPLOSION AT THE THOMPSON CHEMICAL
COMPANY, ATTLEBORO, MASSACHUSETTS

Daniel Yutzy

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Much of the material in this preliminary report has been derived using funds from the Office of Civil Defense, Office of the Secretary of the Army, under Contract No. OCD-PS-64-46, Subtask 2651A. The report has not, however, yet been reviewed formally by the Department of Defense nor issued officially by OCD to the general public.

THE DISASTER RESEARCH CENTER
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Research Note #2

Some Organizational and Community Activities after
an Explosion at the Thompson Chemical Company,
Attleboro, Massachusetts

By
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Department of Sociology
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Introduction

On Sunday evening, January 12, 1964, a major explosion ripped through the Thompson Chemical Plant at Attleboro, Massachusetts. Monday afternoon, the Disaster Research Center decided that the disaster should be used primarily as a field training exercise for a two-man team. However, in addition to the experience aspects, it was felt that perhaps some valuable observations could be made in relation to two possibly unique aspects of this disaster.

1. Early news reports indicated that Rhode Island Police and other emergency units had assisted during the emergency. What, if any, were the jurisdictional problems involved in crossing State and municipal boundaries? Under what authority were out-of-state units after they arrived at the scene?
2. A severe snowstorm with near zero temperatures had inundated the New England area on Monday, January 13. What, if any, were the problems caused by this additional environmental stress? Were rescue and fire fighting operations hampered?

By late Monday afternoon when the DRC team was ready to leave Columbus, the inclement weather had grounded nearly all northeast bound flights. However, after a brief delay they were able to fly to Boston via Washington, D. C. The field team arrived at Attleboro on Wednesday morning.

The DRC team spent two days in the Attleboro area interviewing responsible officials in the various organizations which became involved

during the emergency. One or more officials in the following organizations were interviewed:

Attleboro Fire Department
Attleboro Police Department
Attleboro Health Department
Attleboro Civil Defense
Attleboro Red Cross Chapter
Sturdy Memorial Hospital in Attleboro
Red Cross Chapter in Providence, Rhode Island
State Fire Marshal's Office in Boston, Mass.

The field team experienced very little difficulty obtaining interviews. Officials in all organizations contacted were quite willing to take time to discuss the activities of their organizations. The only exceptions to this were officials of the Thompson Chemical Company where the blast occurred. It would appear that they were sensitive to the possible legal liability incurred by deaths and injuries and also by extensive damage to residences close to the plant. In addition they expected investigations by the State Fire Marshal and insurance companies. Plant officials indicated that an interview "might" be granted after a week or more had elapsed (and when they were less busy). We were unable to secure an interview with them.

We will present first a brief resume of the events related to the explosion. Secondly, we will discuss several aspects of this disaster, including organizational relationships which became operative, and note their importance for organizational emergency planning.

It should be noted that this report, based upon information gathered during a field training mission, represents a limited compilation of selected data. The report is not a case study of this disaster, nor does it represent an attempt to set forth all aspects of the organizational responses in this emergency.

The Setting

Attleboro, Massachusetts is a municipality of over 27, 000 population. Located in the eastern section of the State it is bordered on the north by North Attleboro and Mansfield, on the east by Norton, on the south by Rehobeth and Seekonk and on the southwest and west by the State of Rhode Island. It is 32 miles from Boston, 12 miles from Providence, Rhode Island, and 197 miles from New York City. This small city was established in 1894 and incorporated as a city in 1914. Today it is definitely an industrial center. A 1961 report indicated that there were 679 firms within the city limits. At that time, eighty-four percent of the labor force was employed in manufacturing. Median income per family was \$6, 171 in 1960.

The Attleboro Police Department has 40 regular policemen available when the entire force is mobilized. There are in addition about 100 Civil Defense auxiliary police which may be called upon to assist in fairly large-scale operations.

The Fire Department has 85 regular-duty firemen. There is one Civil Defense auxiliary fire squad of about 10 men also available.

During the night of the disaster all regular and auxiliary fire and policemen were on duty.

For the past ten years Attleboro has been part of an eight community mutual aid network. By agreement, when a three-five alarm is sounded in any one of the eight communities, the rest are all notified. Men and apparatus converge upon the stricken community. Upon arrival at the fire headquarters, they are allocated to the various necessary positions at the

discretion of the local fire chief. Thus in a mutual aid emergency, while a local pumper and its crew are at the fire, a pumper and crew from a neighboring town "covers" their normal area of responsibility. Five of the eight communities in the Attleboro mutual aid net are linked via radio, the other three must be alerted by telephone.

The Thompson Chemical Plant has been in operation at the Attleboro site for about 7 years. During this time nearby residents lodged many complaints against the plant. Safety disks would rupture with a loud noise; there were odors and dust problems. Since the plant processed highly volatile chemicals while producing plastics the company was required to take rather extensive safety precautions. From its inception, plant officials frequently assured townspeople that the plant was safe, that no major explosions would occur and that, in any event, nearby residents were in no immediate danger. A continuing and close relationship developed between the Attleboro Fire Department and the Thompson Company. Firemen made practice runs to the plant with apparatus and assisted in the instruction of the plant fire brigade. An automatic fire alarm box was installed in the plant to provide fast alerting when needed. To handle potential emergencies, the company installed a water sprinkler system and established a fire brigade among employees.

In spite of these efforts, residents of the Hebronville area around the plant apparently still felt uneasy. They were aware of the fact that there had been a number of minor explosions. The latest of these had occurred on Friday the 10th of January at 2:29 a. m. awakening many Attleboro and

Seekonk residents. The two blasts, 14 seconds apart, had inflicted only minor damage to the plant.

The Explosion: Community and Organizational Response

On Sunday, January 12, 1964 at 6:51 p. m. a major explosion followed by a raging fire shattered sections of the Thompson Chemical Plant in Attleboro, Massachusetts.¹ Of the six main buildings at the plant, only three remained relatively intact after the fire was put out. Thus about half the plant was completely destroyed.

Six employees were killed instantly; the seventh died several days later. All deaths were due to extensive burns. Some of the casualties were so badly burned that identification was nearly impossible. Approximately 40 others were injured either by the explosion or while fighting the ensuing fire.

The blast also did extensive damage to the surrounding residential area. Windows were blown out, doors and door frames ripped from the walls, and houses moved on their foundations. The Fineberg School, about 1/4 mile from the plant, had every window in the side facing the blast blown out. Glass was imbedded in the walls opposite the windows. Various reports indicated that the explosion was heard as much as forty miles away.

The response of crisis organizations in the community was immediate. The initial explosion triggered a fire alarm in the Attleboro fire headquarters. Within the first minute, an off-duty fireman in the vicinity of the plant

1

A preliminary investigation by the State Fire Marshal's Office produced no conclusive evidence concerning the cause of the explosion. However, it was established that a safety disk had ruptured allowing highly volatile vinyl chloride gas to escape.

turned in another alarm. The deputy fire chief on duty immediately dispatched men and apparatus from the Hebronville sub-station and from headquarters. Since it was the Thompson Plant alarm, he expected a potentially large-scale problem. At this point he had no idea what set off the alarm.

The Hebronville engine company arrived first and immediately radioed the deputy chief, who was enroute, that "it was really going". The deputy chief could see a black cloud mushrooming upward at a distance of three miles as he received this message. Without further delay, he called headquarters and ordered the desk man to put out a general assembly call for the entire department, to send all apparatus to the Thompson Plant, and to start calling mutual aid.

The Attleboro Police Department has a fire alarm tap in their headquarters building. Whenever the alarm sounds they dispatch a cruiser to the scene. Thus the police cruiser arrived at the plant shortly after the first firemen. Apprised of the situation by police radio, by the fire alarm and by telephone, the police dispatcher now issued a call for all off-duty policemen. He also called the local radio station and asked them to broadcast appeals for all off-duty fire and police personnel to report for duty immediately. All of this was done before 7:00 p. m. The police chief went directly to the plant area. When he arrived he assigned three sergeants to direct all police activities around the disaster area.

The impact of the explosion plus almost immediate radio and TV coverage brought allegedly "thousands" of spectators to the scene. Only the first few emergency fire and police crews were able to proceed to the plant

without hindrance. Those who arrived a few minutes later were delayed by hundreds of cars and pedestrians converging on the impact area.

The police blocked off all streets leading into the impact area and routed the very heavy traffic completely around it. Emergency crews, police, city officials, newsmen, etc., were allowed to go into the area but plant officials had difficulty gaining entry. However, in spite of police efforts at securing the area, many motorists abandoned their cars and, joined by local residents, moved across the fields and residential areas to the plant grounds.

Meanwhile, the two dispatchers at police headquarters were "swamped" with incoming calls requesting information, offering assistance, etc. Police from Massachusetts State Highway Patrol offered assistance; also Rhode Island State Troopers, Providence and Pawtucket police.

During the first hour or so, further explosions seemed imminent as spreading fires swept through a large warehouse and approached the V2 unit-- a replica of the V1 unit in which the initial blast occurred. Meanwhile, dense clouds of black, toxic smoke hampered the efforts of firemen. Gas masks became a necessity. Most of the smoke did not rise directly into the atmosphere but remained next to the ground. A slight breeze caused the heavy cloud to drift southwestward toward the Seekonk area threatening nearby residents. Shortly after 8:00 p. m., an official member of the Attleboro Health Department, riding with a patrolman outside the impact area, suggested that the residents be evacuated from the immediate vicinity of the Thompson Plant. Using the public address system on the cruiser,

the patrolman began urging the people to evacuate. Other police joined the work, driving slowly up and down the streets warning residents of the danger. Shortly after 9 p. m., about 30 minutes to an hour after police began the evacuation, the fire chief also issued an evacuation order. By this time, most of the people, an estimated 100 families, had moved out.

Meanwhile the Red Cross had mobilized in Attleboro, Providence and Seekonk. The Seekonk unit is a branch of the Providence Chapter. The director in Providence activated his chapter at about 7:20 p. m., as soon as the TV announcer identified the site of the explosion. When the Seekonk chairman reported that the plant was close to the Seekonk line and that the heavy black pall of smoke was drifting toward their jurisdictional area, the Providence director ordered him to open and staff an evacuation shelter. However, as a result of continuous information provided by mobile radio and TV units, nearby residents deluged the Attleboro Red Cross Center with numerous offers to house evacuees. Eventually all evacuees found lodging with relatives, friends or other townspeople. Thus the Seekonk shelter remained unused except for one family which spent the first night there. By about 1:00 a. m. the fire was "contained" and the evacuation order rescinded. Nevertheless, very few evacuees returned that night. At the request of the Attleboro Police Chief, Red Cross kept its shelter in Seekonk open until 4:00 p. m. the next day.

The Attleboro Civil Defense was quite active during the entire disaster. By prior arrangement the police dispatcher called the local director as soon as the "3-5" alarm was sent out. He immediately alerted his sector director and the CD auxiliary fire and police squads in Attleboro. The

CD voluntary auxiliary units assisted regular fire and police personnel during most of the night.

During the crisis hours requests for men and equipment were forwarded to sources of supply via three major channels: through the mutual aid network out of fire and police headquarters, through radio and TV media and through the local CD headquarters.

The Attleboro CD office became a communications center for procuring supplies and equipment. Requests from firemen at the scene were relayed to the CD office via direct line telephone from fire headquarters. These requests were then forwarded to appropriate sources. Thus, the Attleboro CD, with the assistance of the area CD sector director who was on telephone standby, was responsible for the prompt arrival of foam trucks, gas masks and a number of emergency crews and apparatus. When the local director felt he had sufficient supplies organized he went to fire headquarters to coordinate incoming men and materials. As supply vehicles and emergency units called by CD arrived he arranged for police escort to the impact area.

Several days later, after the emergency was clearly past, residents of the Attleboro-Seekonk area adjacent to the plant banded together to prevent the Thompson Chemical Plant from resuming operations. Naming themselves the Community Citizens Organization, they hired attorneys to take whatever legal measures seemed necessary. Four days after the blast Thompson Company officials announced they would not resume processing of polyvinyl chloride resin at the Attleboro plant. On the following Tuesday, January 21, the company made a legal agreement with the Community Citizens Organization

not to reactivate the two polyvinyl chloride resin sections at Attleboro.

Some Organizational Problems and Implications

1. Coordination and Control

a. Where responsible organizational officials are not specifically "instructed" or prepared by prior planning to stay out of the actual disaster area and set up a control center, they will move in with their organizational personnel and become directly involved in rescue operations. This is dysfunctional to the extent that their skills and authority would be more effectively utilized at a control center.

For example, in the Attleboro emergency the fire chief went right to the Thompson Plant and engaged in direct rescue and fire fighting activities with his men. He remained at the plant throughout the night until it was clear the fire had been "contained". He thus restricted his activity to the immediate impact area. This potentially jeopardized his organization's effectiveness in two ways:² (1) He was exposed to great danger. Had another explosion occurred it could have wiped out the most capable and experienced men in the fire department. This would have greatly accentuated the emergency and at the same time, drastically reduced the organization's capability. (2) While involved with the fire before him the chief could not very well maintain over-all control of emergency operations. By law he was to assume

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What is said here is not intended as a criticism of this fine and dedicated public servant. (In fact he demonstrated unusual personal courage.) Rather, these statements are intended as illustrations of weaknesses in organizational role structure which could be corrected.

complete authority and direct the entire operation. The chief's direct involvement with the fire restricted the scope of his authority and created a partial authority vacuum at the top.

b. Where there is no plan for an over-all interorganizational control center (to be staffed by responsible officials who have authority to allocate men and equipment as well as issue evacuation orders and request aid), organizational units tend to work independently at the task which "seems most urgent", for some time.

In Attleboro, during the post impact period firemen worked inside the plant area, policemen in the adjacent residential area and along major streets and highways. The Providence, Rhode Island, Red Cross Chapter set up a shelter in Seekonk while the Attleboro Red Cross compiled a list of persons willing to provide shelter in their homes. Local CD officials procured men and supplies.

Fortunately, the activities of the various organizational units meshed fairly well. Only a few instances of overlapping effort or conflict occurred. But no one knew what all the other organizations were doing or not doing. Even in a small-scale disaster a relatively independent organizational attack could be dysfunctional: i. e., a focus upon the most dramatic and apparent needs may overlook other pressing but less apparent problems.

c. In a disaster setting where there is no central control area, authority lines become blurred. In some cases action is taken in the absence of proper authority.

d. Members of crisis organizations as police and firemen, given a

disaster in which they feel impelled to act and the absence of clear authority for such action, may in some cases, act upon the suggestion or command of someone who has no authority.

These two statements may be illustrated by an event which occurred during the height of the crisis at Attleboro. Both the possibility of another explosion and the heavy pall of smoke threatened the safety of nearby residents and indicated that an evacuation was in order. But the fire chief, who clearly had authority to issue evacuation orders was busy inside the plant area. And neither the police chief nor the mayor, who were outside the plant, called for an evacuation. Thus when the local health agent, who was with one of the patrolmen in the threatened area, suggested that the nearby residents should be evacuated for their own safety the police began evacuating the people. The health agent had no authority to issue evacuation orders. In fact, he only suggested it. But the patrolman with him immediately acted upon his suggestion. It was over an hour later when the proper authority issued an order to evacuate.

e. Disaster studies indicate necessity, in large-scale disasters, of establishing a control center to coordinate communications, men, supplies and equipment. It would appear that a control center is also needed in a small-scale disaster with a concentrated impact area. In the Attleboro situation the emergency operations were relatively constricted spatially--about two to three miles in diameter including the areas involved in the evacuation and where there were traffic problems. There was no overall official control center in the impact area or elsewhere at any time during

the post impact period. A control center at the impact area with telephone and radio communications would have facilitated the emergency effort, viz.:

-The Fire Chief, Police Chief, Thompson Plant officials, and Attleboro city officials could have met there to coordinate all rescue and relief activities.

-Over response could have been determined much sooner.

-Proper lines of authority could have been maintained.

-Allocation of men, equipment and supplies could have been made more effective.

2. Communications

Rapid and accurate communication is a vital part of all post disaster operations. Planning for disaster contingencies tends to emphasize emergency communication links between the most obvious manifest crisis organizations but to overlook other less obvious interorganizational linkages.

In most disasters telephone switchboards of manifest crisis organizations are jammed with incoming calls for some time. Planning usually includes mobile radio communications units at headquarters and at the impact area. There are usually radio links between fire and police headquarters. In some areas Red Cross and CD offices also have emergency radio communications linkages with fire and police units. However, beyond this, there seems to be little preparation for the eventuality that normal communication channels will become clogged and therefore nearly useless in the immediate post impact period. Responsible officials at the Sturdy Hospital in Attleboro were unable to discover the nature and extent of emergency medical services

required. Repeated efforts by the administrator to reach either police or fire headquarters by telephone met with complete failure. Finally, by questioning a plant employee, it was discovered that there were relatively few casualties requiring medical care. This enabled the hospital to adjust its preparation to a more realistic level.

It actually took firemen only minutes after their arrival at the scene to discover that there were only a few casualties. However, during the communications tie up, the Sturdy Hospital staff put into effect "level three" of their disaster plan. This involved calling in all duty personnel. Doctors, nurses and supplies were prepared for a large number of casualties. Later, at about 7:45 p. m., one of the patients who was brought in from the explosion area reported that no more than 15-20 persons were working at the plant at the time of the explosion. At this point the hospital administrator asked radio announcers to suspend all calls for additional hospital personnel. In spite of this doctors, nurses and paramedical persons kept calling or coming to the hospital most of the night to volunteer their services. Thus the hospital was "over staffed" during the night,

A direct communications link with fire and police headquarters could have prevented the initial "over preparation" and reduced the night-long influx of hospital personnel.

3. Alerting and Mobilization

In all sudden disasters there is a time lag between impact and the alerting and mobilization of rescue. The length of this time lag depends in part upon how quickly information about the disaster spreads. The immediate post impact period is characterized by a partial information vacuum. Such

information as is available is incomplete and often inaccurate. Organizations alerted during the immediate post impact period must mobilize without sufficient information concerning the type and amount of assistance needed. This situation tends to produce an over response by organizational emergency units.³

In the Attleboro situation officials in responsible organizational positions activated emergency units very rapidly and prepared for an emergency of much greater magnitude than in reality existed. Over response was widespread so that the perimeter of the impact area was flooded with fire, police rescue squad and other emergency units.

Hospitals from many surrounding communities--as far away as Boston, Massachusetts and Central Falls, Rhode Island--called to offer supplies and skilled technical assistance. For example, the Notre Dame Hospital at Central Falls sent a technician with a supply of fresh blood. The Quonset Naval Station at Quonset, Rhode Island, sent a medical team which set up an emergency treatment station at Hebronville.

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This statement may appear inconsistent with a tentative generalization advanced in DRC Research Note #1, "Organizational Response to an Explosion at Medina AEC Base, San Antonio, Texas, November 13, 1963," by J. Eugene Haas, pp. 4-5. But further examination reveals at least one key difference. In the Attleboro setting trained organizational personnel were mobilized. In San Antonio full mobilization would have involved the entire community with potential repercussions in the event of a "false alarm" and possible personal injuries. This was a contingency which city officials were not ready to face without sufficient information indicating that clear and present danger existed. In fact, as Haas points out, the San Antonio CD did activate some of its standard emergency procedures but stopped short of issuing public warnings or evacuation orders.

The Providence, Rhode Island, Red Cross Chapter mobilized its disaster team and set up an evacuation shelter in Seekonk. This was done in the absence of any specific information as to the extent of the disaster. At the time the director gave his order they only knew that (a) there had been an explosion, and (b) it was at the Thompson Chemical Plant in Attleboro.

It may be argued that full mobilization is the most practical initial response to a disaster situation of unknown severity and extent. Being prepared for the worst possibility would ensure adequate preparation for lesser contingencies. Granting this, the tremendous convergence of extra and unneeded emergency units and supplies can become a major traffic problem blocking incoming men and supplies which are badly needed and hampering removal of the injured. Initially the over response may be functional but it quickly becomes dysfunctional by accentuating the clogging of approach and exit routes. There is need for quick and accurate assessment of the nature, scope and severity of a disaster and for rapid, accurate dissemination of information to pertinent sources.

4. Public vs. Organizational Perception of Tasks

In an emergency setting organizational units may engage in activity which is not directly task oriented but which is oriented toward maintaining a favorable image for the public. For example, in the Attleboro setting, a severe snowstorm hampered fire fighting the day following the explosion. With heavy snow and driving winds it became increasingly difficult for firemen to work effectively. The fire had been "contained" or controlled for some hours but it was still sending up dense clouds of smoke. The main

problem remaining was the warehouse containing miles of vinyl plastic hose, bags, and powder. When the exterior side walls collapsed the asbestos roof with its heavy steel girders and supports fell down upon the burning material. During Monday afternoon and night and through Tuesday morning, firemen continued to pour water on the collapsed structure. They knew that the extinguishing effect was practically nil since the asbestos roof remained intact and shed the water. Bad weather conditions prevented firemen from doing the thing which to them seemed most effective, i. e., chopping holes in the roof to "flood out" one area after another. But according to their own statements they continued spraying water on the warehouse for almost 24 hours because of "the public". The alternative would have been to stand by until the storm abated. However, as long as a heavy column of smoke rose from the warehouse firemen felt impelled to be doing something which gave the appearance of fulfilling their traditional functions.

5. Jurisdictional Problems

One of the interesting aspects of this disaster was the multi-community and two state response. As mentioned above (p.1) Rhode Island State Police and other emergency units assisted during the emergency. In fact, emergency units of all kinds crossed state and municipal boundaries at will during the post impact period.

In Massachusetts there has been a long-standing tradition of intercommunity cooperation and assistance among police and fire departments. The Attleboro mutual aid network represents a more systematized approach to intercommunity assistance. Such arrangements exist all over the state. In

the past police and fire departments in Rhode Island municipalities close to the state line have also crossed the state line frequently to assist Massachusetts communities. When ever an emergency exists it is understood that the local officials will have complete authority over all incoming units.

This procedure was followed in Attleboro. Thus, there were no jurisdictional problems of any consequence because of prior experiences and understandings regarding such matters.

6. The Weather as an Additional Environmental Stress

The blizzard which hit the New England area on Monday, the day following the explosion, did not seriously affect rescue and fire fighting activities.

The crisis was past before the storm arrived. Mop up fire extinguishing was delayed for about 24 hours by the weather, and near zero temperatures quickly froze fire fighting equipment (hoses, nozzles and pumps) when it was not being used. But these were only incidental difficulties--the main problem had been resolved. In this sense, this disaster did not provide an opportunity to observe what such additional environmental stress might do to organizational plans and functioning in emergencies.