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MIAMI VALLEY DISASTER SERVICES AUTHORITY
AFTER ACTION REPORT
ON
THE MIAMISBURG TRAIN DERAILMENT

Prepared By:

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MIAMISBURG AFTER ACTION REPORT

Situation:

On Tuesday, July 8, 1986 at 4:29 PM a 44 car freight train heading to Cincinnati derailed in the City of Miamisburg. A tanker containing 12,000 gallons of white phosphorus ruptured and began burning intensely. Within minutes, adjacent cars containing animal fat, new vehicles, and newsprint also were ignited. A tank car containing sulfur was also located nearby; the sulfur, it was conjectured, was not involved in the conflagration. The flames from these burning cars were shooting above tree top level and emitting a smoke plume 1,500 feet into the air which was traveling in a northeast direction.

Mission:

Since the City of Miamisburg is a member of the Miami Valley Disaster Services Authority (MVDSA), the Director of that agency, Mr. Edwin R. Kovar was summoned by City Officials to report to the Incident Command Post. As outlined in MVDSA's Emergency Operations Plan (EOP), the mission of this organization is to coordinate planning and preparation for nuclear attack and natural or technological disasters.

Execution:

Upon arrival to the scene of the tank car spill, Mr. Kovar reported to the makeshift Command Post located on the west side of the Sycamore street bridge. For the next forty five minutes or so, Mr. Kovar was asked to serve as a fact gatherer until the Miamisburg Fire Chief arrived and could formally establish command. This interlude was extremely useful, particularly in a hazardous material spill incident, because it enabled those present to assess the possible dangers associated with the burning cars and the impact areas. It was during this time that the train's manifest was procured and the train's crew was interviewed.

Establishing Responsibility:

Upon arrival to the scene, Fire Chief, Bob Menker established a formal Command Post at the same location and made fire sector command assignments. The authority of local government to marshal this disaster was challenged later that evening by officials from the CSX Railroad; it was their intention to begin removing and extinguishing the burning tank car. After some discussion, the railroad official was ushered from the Command Post under threat of arrest. Local authority was not challenged again for another day.

Assignment of Emergency Functions:

One of the first tasks performed by MVDSA after formal command was established was to report to the Mayor of Miamisburg (Mr. Mears) and request that he convene a meeting of the City Council and formally declare a state of emergency. Once declared, he was informed, the Governor's Office should be contacted.

In accordance with both the MVDSA E.O.P. and the Miamisburg Plan, both the City Manager, Mr. Kissinger and Chief Menker completed the assignment of functional commands. As the fire and law departments had mutual aid agreements with the following cities Brookville, Butler Township, Centerville, Clay Township, Clayton, Dayton, Engelwood, Farmersville, German Township, Germantown, Harrison Township, Huber Heights, Jackson Township, Jefferson Township, Kettering, Madison Township, Mad River Township, Miami Township, Montgomery County, Moraine, New Lebanon, Oakwood, Perry Township, Phillipsburg, Randolph Township, Riverside, Trotwood, Union, Vandalia, Verona, Washington Township, and West Carrollton, units of the mutual aid departments reported to the scene to fill the manpower assignments made by the fire and law commands.

Actions Taken by Respective Responders:

MVDSA - By the evening of the first day of the spill incident, the following tasks were performed by the Director and staff of MVDSA.

1. Reported to incident - two staff members
2. Contacted State DSA and informed them of situation
3. Informed Mayor of procedures for declaration
4. Helped gather information on scene
5. Staffed Command Post
6. Obtained ham radio operators
7. Activated plan Bulldozer
8. Assisted in evacuation
9. Contacted Red Cross
10. Handled media interviews
11. Staffed DSA office with volunteer and staff person - handled phone calls and maintained log and contact with EOC
12. EBS activation
13. EOP review
14. Outdoor warning
15. Contacted Health Department
16. Met with Governor - worked on hot-line setup
17. Met with State DSA reps. for briefing

Fire Department

1. Established Scene Command
2. Call for mutual aid
3. Coordinated staging
4. Coordinated equipment usage
5. Fought fire
6. Ordered evacuation
7. Sounded outdoor warning
8. Set up communications for fire ground activities and City Hall
9. Established contact with Public Utilities and Department of Transportation personnel

Law Command (included all city officials)

1. Conducted primary evacuation
2. Traffic control
3. Established law enforcement communications
4. Outdoor warning through PA systems

Railroad Officials and EPA

1. Began sampling water
2. Built makeshift damn across to Bear Creek to prevent Miami River contamination

Hazardous Materials Response Team

1. Studied train's manifest
2. Called CHEMTEC
3. Kept Mayor and Command Post apprised of findings
4. Suggested that water be used to suppress fire
5. Aided in fire suppression

City Administration

1. Evacuation
2. Public information - including phone bank rumor control
3. Water and sewage activities
4. Communications and general decision making
5. Assumed legal authority and responsibility, such as record keeping

Wednesday, July 9, 1986

The fire was under "control" on the morning of July 9. For the most part, all the cars had been extinguished save for the newsprint car and the phosphorus car. City Officials continued their plea for people not to return to their homes. Even though the fire was suppressed and the plume was minuscule compared to the previous day, city officials and others at the Command Post considered the situation far from being abated.

Most of July 9th was spent gathering data from allsorts of sources; it was learned that the tank car containing phosphorus was built in 1966 before stricter standards were enforced. It was during this lull in the action that Mr. Kovar suggested that an Emergency Operation Center be established. The gathering at City Hall had informally been considered as an EOC, but it was limited in terms of its scope. The staffing of this informal EOC was parochial in nature and Mr. Kovar was concerned that there needed to be a place where all responders local, state and federal could meet and assist in the decision making.

Before this decision could be made however, there was a report from the Command Post that an explosion had occurred in the phosphorus car and that fire and the smoke plume were as bad as the previous day. The phosphorus car had shifted because of the badly erroded track near the trestle gave way after being deluged with fire hoses for over 24 hours. City officials issued an evacuation order for the entire city and neighboring jurisdictions. It was at this moment that the second EBS message to evacuate was issued by the Director of MVDSA.

Police departments from 53 police jurisdictions along with other political departments began a massive evacuation of the City and surrounding areas. Some 30,000-40,000 individuals evacuated the area and either reported to family and friends or to public shelters. Two large and several small shelters were opened at this time near the southern edge of Dayton.

It was decided that the tank car would be allowed to burn under controlled conditions; hoses were set on tripods and turned on the burning car. Under these conditions, many of the responders were pulled off duty assignments and given several hours sleep.

Thursday, July 10, 1986

Weather trackers from Clermont County DSA, Monsanto Research and EPA reported Thursday morning that winds had shifted during the night away from the populated eastern areas towards the north. Plume dispersion in this direction was much better due to plume height and mixing effects. Because of this mixing and controlled burning, City Officials did not evacuate areas to the north but rather established zones of safety. The Caution Zone included the southern third of the city furthest from the fire. Citizens were allowed full access but were advised to stay tuned for changes in the situation. The Irritant Zone included closer areas to the south and east. Citizens were advised to stay clear of these areas. Lastly, the Restricted Zone encompassed the northwest areas of the city. Road blocks were set up on all roads leading to this area; citizens attempting to enter this area were turned back.

Late in the morning of July 10, officials from the Communicable Disease Center, the Federal Environmental Protection Agency, the Federal Railroad Administration and the National Transportation Safety Board arrived at the Command Post to assist the local effort. It was at this juncture that local control of the scene was challenged for the second time. This time the U.S. EPA protested the handling of the proposed plan to increase the burn rate. The dispute was settled and control remained at the local level.

Late in the afternoon, the tank car was vented and excess air pumped in to accelerate the burn. Everyone at the scene was confident that all the phosphorus would be consumed by the following morning.

The night of July 10 was complicated by the passage of severe winds and rain which forced the relocation of the Command Post as the plume shifted in that direction. In addition, an earthquake shook the area early in the morning.

Friday, July 11, 1986

Much to the surprise of all responders, the tank car was burning with no sign of let up on the morning of July 11.

Even though an EOC was established on the preceding day, it was not functioning consistently because of meetings being held to maintain local control of the scene. However on Friday, the EOC was finally functional as it should have been.

At 3:30 PM the EBS network was again used by Mr. Kovar to clarify and update the previous evacuation order and to explain the concept of the three zones.

Later in the evening at the EOC, City Officials announced the chosen plan to end the crisis. The plan involved moving the car some 35 feet to a level position to level the remaining phosphorus which would expose more of the product to oxygen and further accelerate the burning. If however the car came apart in the process, it would be pushed into a pit and buried with wet sand. The car was leveled without incident and the burn was increased.

Again on the night of July 11, storms helped and hindered the workers. It helped shield workers from the intense heat of the burning car but it hindered workers at the Command Post when gusts of winds blew it over and again forced a temporary evacuation of the Command Post.

Saturday, July 12, 1986.

On the morning of July 12, there was a sense of calm at the Command Post; the tank car was burning but without the intensity of the preceding days.

Upon inspection of the tank car, workers found 4 inches of phosphorus "mud" cracking and bubbling in the bottom of the car. It was decided that a blanket of water would be poured over the mud to extinguish the remaining fire.

After the fire went out, the car was pulled ahead 60 feet to a bed of sand and opened whereupon the remaining product was offloaded into drums for disposal.

Since the incident, the car was unloaded, the track was repaired. The cleanup efforts however will continue throughout the month of October; phosphorus from the ruptured car saturated the soil near the trestle.

CRITIQUE:

Prepared by Miami Valley Disaster Services Authority

Exercise Date - 7/8/86 - 7/12/86

Number of Participants - 2,300

Population of DSA Area 801,000

EMA Funded

Level of Exercise - Multi-Jurisdictional

Activation - EOC activated

Type of Exercise - Actual occurrence

Purpose of Exercise - Unplanned, but exercised all aspects of response

Agencies Represented - Duties (governmental entities):

Elected officials of Miamisburg, Dayton, West Carrollton, Moraine, Washington Township, and Centerville participated in the declaration of emergency, public relations, media contact, financial record keeping, maintaining city functions, providing manpower, providing food, providing road workers, barricades, and equipment.

Comment:

The major criticism of the handling of the incident by elected officials is that they did not request a declaration of an emergency from the Governor's office in a timely or an appropriate manner.

Police - Duties Listed Earlier

Comment:

The only criticism made regarding police activities centered around problems associated with the mutual aid response. There was such a large turnout of other police departments that some of the other departments were not briefed adequately on clearance procedures which resulted in difficulty gaining access to the scene by essential personnel.

Sheriff - Montgomery County Only

Comment:

They had excellent communication capability but were underutilized

State Patrol - Ohio

Comment:

Use of State Patrol helicopter was a valuable asset in keeping the skies clear of unwanted plane traffic. Helicopter also useful in plume observation.

Fire Departments (see previous list for participants):

Comment:

Mutual aid response created problems in fire staging area; too many vehicles in too small of space. Many fire vehicles became mired in the flood plane. Some felt that they were not adequately briefed about the possible hazards associated with the chemicals involved.

EMS - Same Mutual Aid as Fire (see previous listing)

Comment:

EMS personnel on scene were used to give assistance to fire fighters, etc. for fatigue, injuries and burns.

Offsite EMS personnel were involved in answering medical questions at

the EOC hotlines. EMS units were also extensively used in making removals from adjacent communities to area hospitals.

The only criticism from EMS units was that it was difficult keeping up with emergency room status at various hospitals because of walk-in patients.

National Guard - The local unit of the National Guard was requested to stand-by when the Governor made the offer.

Environmental Protection Agency - The Southwest District EPA, Region V personnel and members of the Federal Emergency Response unit were all at the Scene.

Comment:

Local EPA felt that there was need for better communication for their personnel with EOC and Command Post.

They also needed better and faster turn around on weather data so that more accurate plume dispersion could be calculated.

Had concern at times that certain areas were not evacuated.

Federal EPA - their major criticism centered on tactics of moving and ventilating tank car may unnecessarily endanger lives of workers and community.

Criticism of EPA at federal level was primarily that they did not work closely enough with local officials in the beginning and were more concerned with establishing their authority.

Public Works - There was a limited mutual aid useage of public works people from other cities on a loan basis.

Comment:

See elected officials

Public Health - State Health, Communicable Disease Center and Local Health District personnel were primarily concerned with evacuation procedures and follow-up health problems gleaned from a survey recently completed for the City of Miamisburg.

Comment:

Communicable Disease Center felt that the establishment of hazard zone was done without sufficient input from their organization.

Health Organization felt that the Communicable Disease Center was not active early enough to become involved in decision making process.

Red Cross - The Dayton Chapter and members from Preble County were active in feeding, clothing, and transporting individuals to shelter areas.

Comment:

Red Cross Officials felt that too many shelters were being opened without first contacting their organization. This created a logistics problem for them in terms of staffing and obtaining clearance from police officials.

Red Cross also felt left out of the decision making process in the EOC.

Communication Groups:

Communication groups involved during the incident included the Dayton Amateur Radio Association, Cellular One Corporation, the FM Association, Monsanto Ham Operators, Warren County Ham Operators, and Clermont County DSA.

These organizations did an excellent job of filling communication gaps created in the communication network as well as being assigned to any official that was without communication capability.

Comment:

There was one criticism regarding information picked up by news media when ham operators were talking among themselves. This incident caused a temporary dissemination of a false rumor.

Utilities:

The Dayton Power and Light Company was involved in running temporary service whenever it was needed but some locations could have been more efficiently operated if someone would have taken the time to request temporary service (example, at the Command Post).

Emergency Management Organizations:

The Ohio DSA, MVDSA, Clermont County DSA, Darke County DSA and Warren County DSA were all at the scene operating in different capacities.

Comment:

MVDSA and the Ohio DSA were criticised for not establishing a Command Post earlier. MVDSA asked that this be done Tuesday morning but City Officials did not think it was necessary at that moment. EPA made a comment that they were unable to obtain a communication and weather monitoring equipment from the State Disaster Services.

Transportation Resources:

Transportation was used in a variety of ways but was most useful in the evacuation to shelter areas. Organizations involved in transport included the Red Cross, Regional Transit Authority.

Comment:

There was no criticism of the transportation resources.

News Media:

Coverage of the incident was so extensive that a complete listing of all stations was impossible to obtain but included all TV stations in Dayton, Cleveland, Cincinnati, Columbus. Radio stations nationwide including National Public Radio and newspaper people from nearly everywhere.

Comment:

Media personnel were not centrally located. As a result they were interviewing anyone that would talk to them. This resulted in conflicting accounts of what was happening.

Media helicopters flying over the scene created a phenomenon called "helio thump" which interfered with radio communications.

Other Organizations Present:

The following is a list of organizations that were present but not evaluated: Department of Natural Resources - Fish & Game, Public Utilities Commission, Department of Transportation, Hulcher Emergency Service, O.H. Materials, DOT's Federal Railroad Administration, National Transportation Safety Board.

Functions Evaluated:

Warning and notification went exceptionally well except that when the outdoor warning system was activated, other rogue frequencies created by the dense traffic in the area shut the sirens down. The sirens were totally ineffective in this situation.

Notification using local dispatch and the EBS network functioned without flaw.

Some responders could not contact their individual dispatches and were therefore unable to receive assignments through their own disaster coordinators; they received assignments once they arrived upon the scene by local personnel.

Communication on the state radio between MVDSA was not used extensively but it was, it worked well.

Shelter Evaluation:

The main criticism of the use of shelters in this incident centers around a lack of coordination between municipal officials and the Red Cross; shelters were being opened without first making provision for food, clothing and cots with the Red Cross. As a result, the Red Cross had difficulty staffing these shelters. If fewer, larger shelters had been utilized, this problem could have been alleviated.

Another criticism of some shelters was that they were not adequately cooled for use as a mass shelter; the weather was unusually warm and it took a good while to cool the arena that was used in one evacuation. As a result, evacuees had to be moved to another shelter.

Lastly, some individuals complained that on occasion, some shelters were located in the plume. This criticism was valid on a few occasions but it's appropriate to remember that the entire community was engulfed by the plume on several occasions.

Evacuation Evaluation:

As mentioned earlier, this evacuation was the largest associated with any train derailment in the United States. In all, there were two major evacuations and several minor ones. The two largest were of the Cities of Miamisburg, West Carrollton and parts of Moraine. The smaller ones involved townships and the City of Germantown.

The success of the evacuation effort can be attributable to several factors. The most important aid to evacuation was the visible plume. It was estimated that 50% of all evacuated did so based on the reports and the visual effects of the plume.

Another important factor was an early commitment and massive use of manpower to effect a door-to-door evacuation by the City of Miamisburg.

As important as any other reason for an effective evacuation was the use of TV and radio during the entire incident. Much of the early footage of the derailment was seen live on TV. Both TV and radio were also very effective in broadcasting information via the EBS alerting network.

Fire and law enforcement activities were adequately addressed in a previous section of this report.

Health and Medical Evaluation:

This incident did not make extensive use of EMS units as personal injuries were minor in nature and most of these injured sought treatment themselves.

As mentioned earlier, the only problems pertaining to medical operations involved a lack of good information from hospitals to the incident regarding their capacities and their staffing of the emergency rooms on their own.

When several hospitals activated their internal disaster plans, it was reported that some difficulty was experienced in trying to contact their off-duty medical staff due to overloading of telephone lines.

Emergency Public Information Evaluation:

Early in the incident, there was some problem with inconsistency of information released from the scene of the incident. This was partly attributed to the media wandering around uncontrolled and partly due to a lack of a Public Information Officer being appointed early.

As soon as a Public Information Officer was named and a media area was established, emergency public information flow was excellent.

Several distant communities were somewhat bothered by the fact that MVDSA and other local government did not call them with advisories to their communities need for evacuation.

Resource Management:

For the most part, resources existed in abundance. The problems in resource management involved specialty items such as phosphorus drums, weather monitoring equipment and extra radios. Eventually all of these needs were met.

Emergency Operations Center/Direction and Control:

As discussed earlier, by not establishing an EOC early on, many other organizations felt as though they were excluded from much of the decision making. Perhaps one of the reasons that an EOC was not established is the question of local authority being challenged. Miamisburg must have felt that in order to maintain control, they must, at least for a while, keep a tight grip on all decisions and actions taken in the early hours of the spill.

Lessons Learned:

1. Obtain better understanding of how the multitude of local state and federal agencies are supposed to interact in their respective roles in dealing with such a disaster. To this day, many of the roles and responsibilities are not clearly understood.
2. Establish an Emergency Operations Center as early as possible. This may in fact help and not hinder establishment of local control.
3. Not enough precaution was exercised throughout the incident; at first, responders had inadequate knowledge of toxicity and later, media personnel were not kept far enough away.
4. Better site to off-site communications
5. A need for better organization with Red Cross
6. It is extremely important to understand how to keep control and responsibility for scene control. If once relinquished by such acts as accepting promise of funding or a simple request for assistance, all local accountability can be lost.