



Maryland
**EMS
NEWS**

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Mention January 4, 1987 to Maryland rescue, EMS, hospital, or emergency support personnel and there is probably instant recognition — memories not of the National Football League playoff game or Sunday dinner but of one of the worst disasters they ever confronted. On January 4 at 1:30 pm, approximately 15 minutes after pulling out of Penn Station in Baltimore, the Amtrak "Colonial," a 12-car passenger train, crashed headlong into the rear of three connected Conrail freight locomotives.

Both trains were traveling north on parallel tracks; approximately one-half mile from the bridge over the Gunpowder River, the four railroad tracks merge into two. The Conrail train should have stopped and allowed the Amtrak train to pass; but for yet unknown reasons, the Conrail merged onto the same track into the path of the Amtrak "Colonial." The Amtrak train jumped sideways off the track and three of its cars toppled on to each other, with the bottom one "accordianized" to be almost unrecognizable. Wreckage was strewn over a half-mile.

Recalling what had happened, passengers described feeling the train lurch forward, being thrown from their seats and hurled within the car along with luggage and other objects; lights going out, and people screaming and pushing to get out; smoke and flames from spilled diesel fuel ignited by power lines.

The accident occurred in Chase, a small residential community in northeast Baltimore County. Within minutes after a Chase resident dialed 911, rescue workers were on the scene. How they and the thousands of hospital and emergency support personnel, as well as residents, responded to the tragedy is detailed in the following pages. We thank all who contributed to these articles.

Amtrak-Conrail Train Crash



Aerial view of Amtrak train wreck (photo by Maryland State Police).



Rescue personnel are confronted with fire when they arrive at the scene (photo by Craig Schleunes, Balto. Co. Fire Dept.).



Rescuers work to extricate trapped passengers for treatment (photo by Craig Schleunes, Balto. Co. Fire Dept.).

Arriving at Scene; Identifying 'Sectors'

The first fire and medical personnel to arrive at the scene of the crash were confronted with a fire fed by diesel fuel, hundreds of passengers who had walked into yards and wooded areas on both sides of the tracks, and the wreckage of the 12 cars of the Amtrak Colonial and 3 Conrail locomotives. The first medic units were surrounded and stripped of their supplies by passengers seeking medical treatment for themselves and others. Some of the medical personnel received bruises from anxious passengers pulling on them in their attempts to receive assistance.

Minutes after their arrival, fire suppression teams extinguished the fire involving the locomotives and some of the passenger train compartments. The emergency plan of the Baltimore County Fire Department had been implemented after officers received radio reports of the extent of the incident on their way to the scene. EMS and fire personnel moved quickly to organize the ambulatory passengers. Search and rescue teams prepared to enter the train cars, where they suspected victims were trapped.

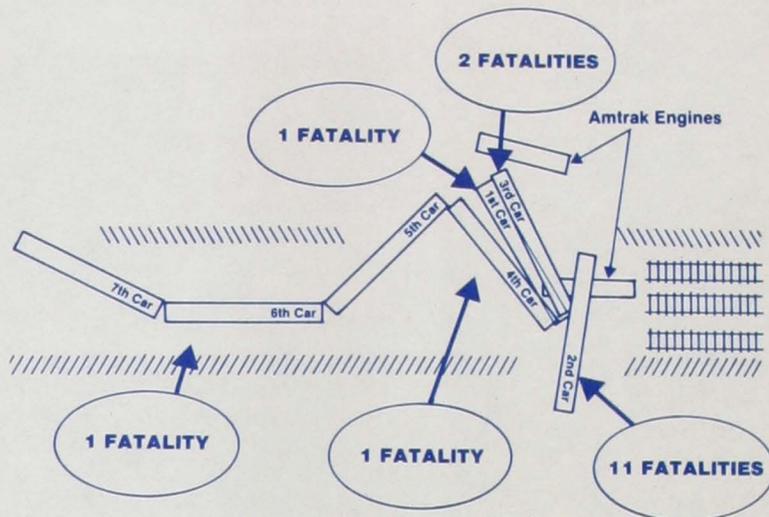
The wreck of the Colonial covered an enormous area. The normal length of the intact passenger train and two locomotives was slightly more than 1000 feet. On impact with the Conrail locomotives, it had folded accordion-like into about 750 feet of wreckage. Three of the first four cars had piled on top of one another, crushing the bottom one (a cafe car) into a 4-foot-high entanglement of metal. The

other 8 cars had derailed at various angles.

Hundreds of passengers were able to walk away from the crash site. They had exited from both sides of the train and gathered in wooded areas, crowded onto access roads, and began to disperse into the nearby homes.

Rescue personnel established medical and fire suppression sectors in parallel, in accordance with the Baltimore County Fire Department's standard operating procedures, to facilitate the triage, treatment, and transport of victims and handle the fire and extrication problems. Ultimately, seven medical sectors and four fire sectors were identified.

The first EMS supervisor on the scene established medical command in the area that would become the medical command post. A primary triage, treatment, and transportation area was established next to medical command and became Medical Sector 1 on the Eastern



Avenue side of the tracks. Approximately 100 passengers congregated initially in this sector.

Medical Sector 2 was on Eastern Avenue near Station 54, about 1.5 miles from the crash site, a staging area for emergency vehicles. All EMS apparatus responded to that site and awaited instructions from the transportation officer.

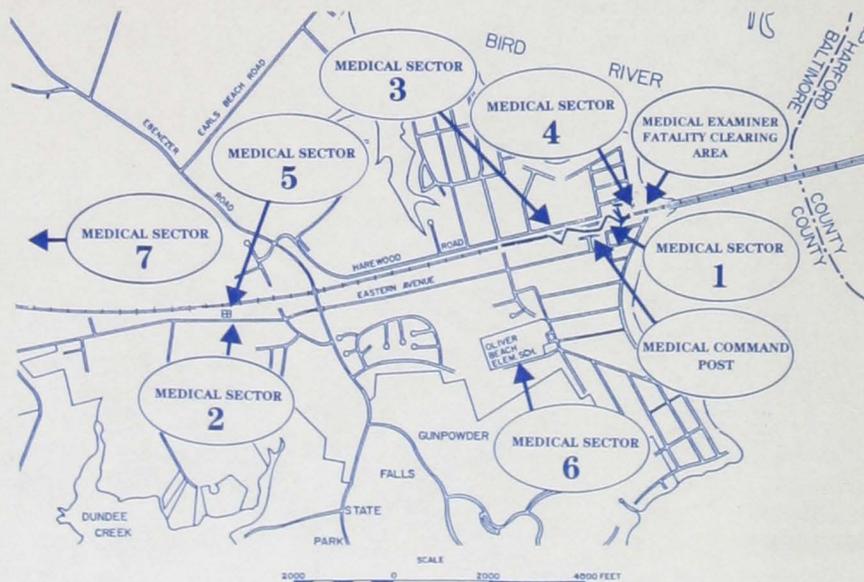
The Harewood Park side of the tracks became Medical Sector 3, another primary triage, treatment, and transportation area. About 70 patients had gathered initially in that area.

Medical Sector 4 was the extrication area on the tracks. This same area was identified as Fire Suppression Sector 4.

As the response intensified, the logistics were modified by the medical command officer to enhance the efficiency and safety of patient transport. To eliminate confusion resulting from radio communications regarding patient transport being transmitted on the one medical channel assigned to response teams in Medical Sectors 1 and 3, a secondary triage, treatment, and transportation area (Medical Sector 5) was designated at Station 54. Oliver Beach Elementary School was designated Medical Sector 6, the aeromedical staging area for Maryland State Police and Army National Guard helicopters.

Medical Sector 7 was at Bowley's Quarters Fire Station, which, in conjunction with Chase and Bowley's Elementary Schools being used by the Baltimore County Police Department, was a clearing area for train passengers who did not need hospital medical treatment.

Overall, more than 400 people were processed through the secondary triage area, over 175 were transported to hospitals, and 15 were dead at the scene (one woman later died at the MIEMSS Shock Trauma Center from her injuries).



BCFD Incident Command System

Among the factors contributing to the efficiency of the response to the Amtrak/Conrail crash was the incident command system used in the Baltimore County Fire Department (BCFD). Acting Capt. Gary Warren of the BCFD, who was the medical command officer during the response, explained that the system of establishing sectors and sector officers with defined task assignments has been in effect in the fire department since 1976. The incident command structure was enhanced in 1986. Rehearsals of the system have enabled EMS and fire personnel to become familiar with it.

At the local level, the command structure is utilized routinely. The BCFD has seven EMS supervisors who cover the county districts. A supervisor responds to all ALS runs. For example, if a report of a vehicular rescue is received, an ALS ambulance responds as well as an EMS supervisor in a nontransport EMS unit: upon arrival, the personnel utilize the command structure. Regionally, fire department personnel have participated in mock disasters to test the National Disaster Medical System (NDMS) and the Maryland Disaster plan — drills involving hundreds of patients and responders.

The on-scene incident commander during the response to the train crash was Deputy Chief Edward Bartenfelter. (Capt. Hausman was the initial incident commander. The responsibility was transferred to Battalion Chief Rice and then to Deputy Chief Bartenfelter as they ar-



The command post (photo by Craig Schleunes, Balto. Co. Fire Dept.).

ived.) Deputy Chief Bannister served as a "roving incident commander." He supplied information to Deputy Chief Bartenfelter in the command post and helped in the decision-making processes. The command post was in place about 40 minutes after the crash and was located at Sylvan and Red Bird avenues.

Medical command was established initially by Supervisor Beth Halley, the first EMS supervisor on the scene; command was passed to Acting Lt. David Murphy upon his arrival and then to Acting Capt. Warren, who retained that responsibility for the duration of the search and rescue. Joseph Sontag, battalion chief in charge of EMS in the BCFD, served as liaison in the command post between EMS operations and the incident commander.

The BCFD commanding officers in the seven medical sectors reported di-

rectly to the incident commander. The following people held those positions: Medical Sector 1, Acting Lt. Kenneth Kulisiewicz; Medical Sector 2, Supervisor Mark Norris; Medical Sector 3, Acting Lt. Harold Cohen; Medical Sector 4, Supervisor Russell Hicks and Supervisor Beth Halley; Medical Sector 5, Lt. Clifford Ritterpusch and Acting Lt. David Murphy; Medical Sector 6, Supervisor Joseph Brown; and Medical Sector 7, Battalion Chief Richard Yeagell.

Regarding the response to this disaster, Deputy Chief Bartenfelter said, "I am very proud to be associated with the Baltimore County Fire Department and with MIEMSS. Everyone from all of the responding agencies gave their total effort. We practice our procedures for years and, when a true emergency occurs, it is good to know that the system works."

MIEMSS Provides Support, Coordination

MIEMSS, the state EMS agency, provides support and coordination during an incident such as the Amtrak train wreck. On a daily basis MIEMSS provides system development and coordination, while the local jurisdictions provide direct primary prehospital emergency medical services. Since the train accident occurred in Baltimore County, the agency in charge of the train wreck scene was the Baltimore County Fire Department.

MIEMSS was directly involved during the rescue and EMS operations in the following ways:

- MIEMSS Shock Trauma Center Go Teams of surgeons and nurses, who are often called to the scene of a major accident, climbed into upended train cars and worked under adverse conditions with fire department personnel to

deliver the most advanced care possible.

- The MIEMSS communications system, including EMRC and SYSCOM, functions around the clock. Following their normal operating procedures, EMRC alerted hospitals, obtained bed counts, and coordinated ambulance EMS communications to hospitals; SYSCOM coordinated Maryland State Police Med-Evac helicopter flights, contacted MIEMSS personnel who were needed, and arranged for transportation for Shock Trauma Center Go Teams.

- Personnel from the MIEMSS crisis intervention preparedness teams and critical incident stress debriefing program counseled many victims, as well as rescue personnel, police officers, and Amtrak employees at the scene (see page 11 for more details).

- MIEMSS field operations person-

nel responded to the scene to assist the incident commander and helped with direct patient care, triage, communications, organization, and the management of transportation.

Hundreds of prehospital care providers from Baltimore County and nearby Maryland jurisdictions, who are certified by MIEMSS, provided on-scene medical treatment by following medical protocols that had been set by MIEMSS.

The functionally integrated components of the Maryland EMS system worked together to ensure swift, appropriate patient care, comfort for victims and their families, and counseling for rescue workers as needed. The Maryland EMS system, which networks the in-hospital and prehospital emergency medical care resources together, worked well as an efficient life-saving system.

Communications Essential to Rescue

Various communication systems were integral to the rescue effort. The benefits of foresight and rehearsal of disaster response plans were again demonstrated in the network that provides voice communications among emergency personnel in the state.

The responsibilities of the Emergency Medical Resources Center (EMRC) during the Amtrak/Colonial incident were an expansion of its daily duties — that is, to coordinate ambulance EMS communications to hospitals, particularly within MIEMSS Region III (in which the train wreck occurred). In addition to providing those avenues during the response, EMRC was responsible for determining the availability of beds in hospitals near the disaster. When EMRC heard radio reports of the disaster, an operator called Baltimore County Central Alarm to confirm the information. EMRC's hospital call-down sequence was initiated immediately. Andy Pilarski, chief of communications operations in MIEMSS, explained that the hospitals nearest the incident are contacted to notify them of the incident and to request information about the number of available beds in their facility. EMRC's goal is to obtain a 150 percent bed commitment based on the estimated number of patients. At 2:25 pm, an officer in the Baltimore County Fire Department command post called EMRC to confirm the disaster and give estimates of the number of victims. As a result of the hospital notification process, EMRC had valuable information about hospital bed status ready for the officer: six hospitals had responded by that time and 130 beds were available in the three closest medical facilities.

Throughout the response, EMRC maintained updates of hospital bed status to assist the personnel at the scene in their decisions about patient transport.

Systems Communications (SYSCOM), also located in Region III, has the daily responsibility of maintaining communication with Maryland State Police (MSP) helicopters during Med-Evac operations. SYSCOM's additional charges during the January 4th incident were to initiate the MIEMSS disaster call-down protocols and to provide voice contact between MIEMSS personnel in the Shock Trauma Center and personnel at the scene.

After the SYSCOM operators had confirmed the early reports of a train wreck in the Chase area, they began to call specified directors and other individ-

uals within MIEMSS to inform them of the situation. Those people then followed protocols to contact others on their staffs.

According to Mr. Pilarski, SYSCOM's work mostly involved MIEMSS' administrative needs: contacting and transporting personnel, providing communications links, coordinating the transportation of Go Teams to the site, and ensuring that necessary medical equipment and supplies were taken to the scene on helicopters returning there after delivering a patient to the Shock Trauma Center.

One of the 10 available channels in the EMS communications system was dedicated to EMS personnel at the disaster site. This channel was used to contact EMRC and SYSCOM to coordinate medical activities, including requests for Go Teams, special medical and surgical supplies, and updates of hospital bed status.

SYSCOM could communicate with MSP helicopters but not with Army National Guard helicopters, which use a different transmitting frequency. To facilitate the relay of information about helicopter transport of patients, a communications officer was sent to the scene to communicate directly with SYSCOM via cellular phone.

Portable cellular phones proved to be of great value in this emergency response. Because so many victims and responders were involved, conventional communication systems were at times overwhelmed and other mechanisms such as portable cellular phones were needed. The problems associated with these phones (for example, limited operating battery time; use of this system by media personnel, causing saturation of the cellular sites; and lack of cellular phone service in some areas) are recognized, and other provisions are being made to enhance the EMS system's pre-



One of several organizations offering support (photo by Craig Schleunes, Balto. Co. Fire Dept.).

paredness to respond to future incidents.

More than 100 amateur radio operators (hams) from nine Maryland counties, Delaware, Pennsylvania, Virginia, and the District of Columbia provided communications support during the response to the crash. Hams were located at the command post at the scene, the Baltimore County Emergency Operations Center (EOC), the Anne Arundel County EOC, the Howard County EOC, Station 54 in Chase, Red Cross headquarters in Baltimore, Baltimore City Civil Defense headquarters, and Baltimore County Civil Defense headquarters. Other locations of ham operators were the Chase Elementary School, Oliver Beach Elementary School, Bowley's Quarter Fire Station, and Harewood Community Center. When the shelter was opened at the Sheraton-Broadway for passengers requiring temporary accommodations,

(Continued on page 8)

'Go Teams' at Scene

Medical care rendered to a victim at the scene of an accident is frequently a significant factor in the patient's survival outcome. "Go" Teams from the MIEMSS Shock Trauma Center have responded to the scene of an accident if requested. During the course of the Amtrak train wreck rescue, the incident commander from the Baltimore County Fire Department requested four Go Teams.

Each team consists of a MIEMSS Shock Trauma surgeon or physician and a nurse from the admitting area. Teams carry their own supplies such as blood, blood products, and surgical and resuscitative equipment and are prepared to perform stabilizing and resuscitative measures even during the course of the extrication. Go Teams provide medical support as directed by the on-scene medical commander. The county medical commander at the Amtrak scene was Frank Barranco, MD, senior fire surgeon of the Baltimore County Fire Department. The state medical commander was Ameen I. Ramzy, MD, state medical director and state EMS director, who is also a volunteer fire surgeon in the Baltimore County Fire Department.

The Go Teams provided direct patient care to the trapped victims and also assisted at the secondary triage and treatment site. The Go Teams remained on the scene for approximately 30 hours, for as long as portions of the train were still being moved apart, in the event that any rescue workers would be injured.

Helicopter Transport: Coop. Effort

Aeromedical evacuation of 27 patients from the Amtrak train wreck site was a cooperative effort between the Baltimore County Fire Department, MIEMSS, the Maryland State Police (MSP), the Army National Guard, and the Air National Guard. Working together, they put 11 helicopters in the air, deployed them efficiently and safely, illuminated the improvised landing field, airlifted patients to hospitals, and quickly carried needed equipment and supplies from hospitals to the scene by flying over the congested traffic.

An Army National Guard helicopter from the 29th Air Traffic Control Group based in Glen Arm was returning from a training flight when the crew spotted a plume of smoke in the distance. They flew to the scene, saw the enormity of the accident, and immediately notified their headquarters and the Glenn L. Martin State Airport control tower. The helicopter then landed adjacent to the train tracks to assess the situation. One of the crew was also a member of the MSP Aviation Division, so he alerted the MSP helicopters, which were quickly on the scene.

Originally it was thought that helicopter operations could be set up at the Chase Fire Station, but there was not enough room to deploy all the aircraft. An MSP helicopter went aloft to survey the area and it was decided that the parking lot and field of the Oliver Beach Elementary School would be an appropriate landing field. A command post was set up under the direction of Maj. Warner Sumpter, commander of the MSP Aviation Division, who coordinated the action with Col. Rod Lindsay, commander of the Army National Guard unit. Seven MSP Med-Evac helicopters and four Army National Guard helicopters participated in the rescue action.

Cognizant that some other emergencies might occur around the state that might require MSP Med-Evac helicopters while the bulk of the force was busy with the Baltimore County emergency, the State Police kept helicopters at their home bases in Salisbury and Cumberland and relocated Centreville's helicopter to Martin Airport. Additional flight crews were called back to duty by the MSP to support the demand requirements. Twelve of the most seriously injured patients were taken to hospitals and to the Shock Trauma Center by MSP Med-Evac helicopters, and by re-

quest of the Baltimore County Police Department the MSP aircraft also took aerial photos of the scene. They remained at the scene until 12:30 that night.

Three Army National Guard UH1H helicopters were on the scene early in the incident; a fourth craft was sent in later. Army National Guard air traffic control equipment was emplaced and utilized. As an example of the cooperation between the units involved, Col. Lindsay explains, "The MSP helicopters handled the more seriously injured patients because their crews have more advanced medical training than ours and they have on-board medical life support equipment." Army National Guard helicopters transported 15 patients to St. Joseph's, Fallston, and South Baltimore General hospitals and Francis Scott Key Medical Center. Each of the helicopters carried medical attendants, including a nurse from Franklin Square Hospital, a captain in the Air National Guard, an EMT from the Baltimore County Fire Department, and a nurse from Martin Airport. Army National Guard helicopters worked until 7:30 pm; the crews were debriefed until 9 pm; and one aircraft was placed on 5-minute notice after that.

The military aircraft did not have direct radio links with the Systems Communications (SYSCOM) Center at the Shock Trauma Center. SYSCOM coordinates MSP Med-Evac transports, including setting up communication between prehospital care providers in the field and hospital-based physicians; alerts admitting area staff and keeps them informed of the patient's condition; and mobilizes various emergency personnel who meet the patient at the heliport. A MIEMSS field operations supervisor established a communications link between SYSCOM and the helicopter staging area through his cellular phone. For several hours he was assisted by a SYSCOM communications operator who had been sent to the scene. MSP helicopters (as well as emergency vehicles) brought additional medical equipment and supplies from hospitals as requested by on-scene personnel.

The community residents and the local Seven-Eleven store were very helpful to the personnel at the landing site, supplying them with food and hot and cold drinks. The State Police were so impressed with the neighborhood participation that they sent letters of thanks to local newspapers and to individuals whose

names they knew.

The improvised landing field was illuminated by Air National Guard light carts, 4-wheel drive vehicles fitted with gas-generated lights. Part of the 135th Tactical Airlift Group and the 175th Tactical Fighter Group stationed at Martin Airport, the units also brought fire-fighting foam that was used by the Baltimore County Fire Department to re-supply its trucks; lent their "Jaws of Life" to units working on the extrication; and set up tents for a temporary morgue and for places for workers to get in out of the cold. Some went into the train cars for search and rescue. Air National Guard facilities at Martin Airport were used for stress debriefing of the emergency workers (see article on page 11). Col. Robert D. Cardwell, Jr., base commander of the 135th Tactical Airlift Group, says that there were 69 members of the Air National Guard working at the scene.

Chaplains from both the Maryland State Police and the military entered the wrecked train cars to comfort the victims.

"I've never seen an action run more smoothly," Maj. Sumpter says. "We've always known that we might need to interact with other organizations as we do during NDMS drills, and it worked very well."



Removing an injured patient (photo by Craig Schleunes, Balto. Co. Fire Dept.).

Rescue Efforts Continue for 10 Hrs.

Amtrak officials estimated that 600 to 800 people had been on the train (the most recent number reported by Amtrak is more than 650). They could not provide an accurate count of passengers or their locations because the Colonial was an unreserved train. Therefore, rescue workers did not know how many victims were entrapped. Early estimates ranged from 10 to 100.

It was feared that victims were trapped at the bottom of the pile of wreckage in the cafe car, which could have been a gathering place for passengers before the crash. It was eventually determined that the cafe car had been closed at the time of the crash; searches of the wreckage confirmed that this car had carried no passengers or crew members.

Rescue workers had to climb onto the train cars and lower themselves into the passenger compartments. Ropes and ladders were used extensively in the search for and rescue of victims.

The front cars that had piled together needed to be shored up to prevent movement that would have further endangered victims trapped inside as well as the EMS workers. One of the cars did shift during the rescue, and a safety alarm was sounded to temporarily evacuate the rescuers from the train. Large air bags supplied by Sullivan's Towing Company and a front-lift loader were used to stabilize the car.

Immense strain was put on the Hurst tools used for extrication. They were in operation for more than 20 hours and were being applied to heavy metal of train car construction. In some areas, the tools had to be suspended on ropes (and operated by rescuers who were also suspended) to reach areas where victims were trapped. As breakdowns occurred, some parts could be exchanged among rescue companies at the scene. The Liberty Supply Company sent a representative from Pennsylvania to repair the tools on-site as needed.

Many entrapped victims needed immediate life-saving medical care in addition to rescue from their metal confines. In some places, space for only one rescuer was available near an injured passenger. Medical and extrication personnel had to enter the space alternately. Ameen Ramzy, MD, a volunteer fire surgeon in the Baltimore County Fire Department and the state medical director and state EMS director, explained that medi-



Initial triage and treatment (photo by Craig Schleunes, Balto. Co. Fire Dept.).

cal treatment would be administered to stabilize a patient as much as possible and then a member of an extrication team would enter the space. "From previous experience with auto accidents," said Dr. Ramzy, "a pattern has emerged for difficult extrications. Medical treatment and extrication efforts take place side by side, with frequent checks of the patient's status."

At one point, 12 rescue teams were working simultaneously on top of and inside the cars. The last viable patient was removed from the wreckage about 12 a.m. on Monday (approximately 10.5 hours after the crash).

Before moving the train cars that were crushed, the commanding officers wanted to ensure that no additional victims were trapped in the wreckage. They requested the assistance of the Maryland State Police K-9 Division and of Dogs East, an organization of search and rescue dogs and handlers. The dogs are trained to find human scent and to signal to their handler if a person, alive or dead, is in the area being searched. No additional entrapped victims were found by the dogs. That information helped to confirm the commanding officers' decision to proceed with the removal of the cars.

Chief Paul Reincke of the BCFD praised the state's EMS system and all who participate in it. "The response to the Amtrak/Conrail crash was a total system effort. Maryland's EMS system is so successful because of its components of planning, training, tiered response,

communications, transportation, and alerting of hospitals.

"Training is the basis of success. Disaster drills held by MIEMSS and the Baltimore County Fire Department have tested the capabilities of the system and made its participants better prepared to respond to an incident such as the train crash. What we learned in those drills paid off in the response to this incident.

"All of the personnel involved are to be commended. We proved that the system works."

'Mutual Aid' Response

Mutual aid agreements among jurisdictions within Maryland and with other states provide a mechanism for the sharing of resources during times of public need. In compliance with the terms of these agreements, fire and EMS units from Baltimore City, Harford County, and Anne Arundel County responded directly to the crash site in Baltimore County.

In times of disaster, community needs for EMS and fire service coverage do not cease. Companies from other jurisdictions helped to provide that coverage in areas that are usually served by the units and personnel who were needed at the Amtrak crash site. In addition to the jurisdictions listed above, units from Carroll and Howard counties in Maryland and from York County in Pennsylvania were sent to Baltimore County stations to ensure that emergency assistance was available to county residents.

Law Enforcement Role at Disasters

"We have to rewrite the book after each incident," says Maj. Robert Oatman, chief of detectives in the criminal investigation division of the Baltimore County Police Department, describing police participation at the Amtrak train wreck site. "Emergency planning can be used only as a reference; the use of manpower and equipment must be improvised to suit the circumstances. The 'experts' are the people who handled the last incident anywhere in the world. Each incident is studied to see what can be learned to constantly upgrade emergency services response."

The role of law enforcement at the scene of a disaster is to:

- Secure the perimeter of the scene. This includes preventing unauthorized people from entering and preventing looting. Police remain on the scene after the fire departments and rescue services leave.

- Provide traffic direction. At the

Auxiliary Support Groups

Three volunteer auxiliary support services were on the train wreck site dispensing food to rescue workers: the Central Alarmers and the Box 234 Association, which serve the Baltimore County Fire Department in the eastern and western halves of Baltimore County, respectively; and the Box 414 Association, which serves the Baltimore City Fire Department and was there on a mutual aid basis. The three organizations work together on major incidents and share resources if necessary.

Twenty members of the Central Alarmers worked a total of 400 hours serving 36 pounds of hot dogs, 12 pounds of coffee, 10 large cans of soup, 24 cases of soda, 24 loaves of bread, 60 dozen doughnuts, 15 boxes of hot chocolate, a case of cookies, and food that was donated from people in the area.

Ten members of the Box 234 Association worked a total of 250 hours and served 95 gallons of coffee, 150 cups of tea, 380 cups of hot chocolate, 720 sandwiches donated by the local VFW, 5 gallons of soup, 50 dozen doughnuts, 25 gallons of iced tea, and 45 gallons of soda and punch.

Ten members of the Box 414 Association worked a total of 150 hours and served 30 gallons of coffee, 100 cups of tea, 375 cups of hot chocolate, 100 sandwiches from the Red Cross, 20 cups of soup, and 25 cups of soda.

train wreck site there were only two rural roads bisected by the train wreck for incoming and outgoing traffic. They became congested with emergency vehicles.

- Work with the National Transportation Safety Board (NTSB). The NTSB investigates to determine the probable cause of the accident and makes safety recommendations to avoid future accidents. Both the Baltimore County Police and the Maryland State Police work closely with them, especially in cases involving fatalities.

- Investigate deaths, work closely with the medical examiner to identify bodies, and keep records. Police documentation is often used in insurance cases.

Finding a wallet on or next to a body is inconclusive identification. Other information is used, including fingerprints, dental records, bone structure, blood type, race, height, weight, and sex to determine identification. Some bodies can be identified quickly; others require lengthy investigation.

Supporting the 509 Baltimore County Police on the scene were law enforcement officers from other agencies and jurisdictions. These included 60 Amtrak police; 30 officers from the Harford County Sheriff's Office; 9 Maryland Port Authority police, whose command post was used for the incident; and 185 Maryland State Police.

In addition to traditional police duties, the Baltimore County Police Department brought in its unique community relations unit called Citizen-Oriented Police Enforcement (COPE). Originally conceived by County Police Chief Cornelius Behan as a tool to reduce fear in neighborhoods that have experienced crime, COPE has evolved into a unit that uses communication skills to meet community needs of all kinds (for example, arranging for better lighting or to fix potholes or replacing property damaged in the course of an incident). COPE consists of three units of 15 people each, divided into eastern, central, and western sections.

Within six hours of the train crash Chief Behan met with Baltimore County Executive Dennis Rasmussen, Maj. Oatman, and COPE Coordinator Maj. Lawrence Schissler to activate services to the community around the disaster area. Although ordinarily this would have been the job of the eastern unit, for such a large incident all units were activated.

It was COPE's responsibility to assess the needs of the community such as:

- Physical loss or damage to property, such as damages to lawns from the tire tracks of emergency vehicles; blankets, ladders, and lawn chairs borrowed; and the use of phones in private homes to call victims' families out-of-state. Members of the police recruit class were brought in for trash pick-up detail.

- Identification of heroes, such as those who were involved in the rescue effort and whose homes were open to rescuers, victims, and the media to use the bathrooms, have a cup of coffee, or just rest in a warm environment.

- Answering questions about possible damage to water wells, the effect of the diesel fuel that was spilled around the area, and whether there were toxic materials aboard the train.

- The emotional effect on the residents who, as impromptu rescuers, helped bloody, crying, screaming, and dying victims. Quickly printed flyers were sent out by COPE inviting members of the community to attend meetings (see article on psychological services on page 11). More than 200 residents of the Harewood Park/West Twin Rivers/Oliver Beach communities attended the meetings. According to Lt. Fred Kessler, director of the eastern COPE unit, "There were more positive than negative comments. And we found out that what the people don't tell us can be as important as what they do tell us."

In two weeks following the disaster, COPE identified the homes that were involved in the cleanup action and interviewed 1300 people who were residents or business people of the area. "The business people were also very responsive to the crisis," says Maj. Schissler. "They emptied their shelves for the rescue."

President Reagan's staff identified the names of members of the community who were called "real heroes" by newspaper articles, and called for verification of the names from the COPE master list. Members of the community and the police and fire departments were invited to a recognition ceremony at the White House. COPE arranged to transport 66 people to the White House.

Fifteen days after the incident, COPE issued a 900-page report including who did what, what property was missing or damaged, the response of Amtrak, the status of the water supply, and the strength of the trestles.

Over 175 Treated at Area Hospitals

When the Amtrak train wreck was first reported it was impossible to predict how many injuries and fatalities there would be. According to Amtrak's most recent tally, the train carried more than 650 people; the cars were broken, crushed, upended, and some were on fire. In response to the initial incident description and reports of mass casualties and trapped victims, MIEMSS activated an areawide 20-hospital alert.

Passenger injuries were bad, but the numbers could have been much worse. There were 15 fatalities at the scene and another person died later at the Shock Trauma Center; more than 175 persons required hospital treatment; and more than 400 persons were evaluated and processed through the secondary triage and treatment center at the Chase fire station.

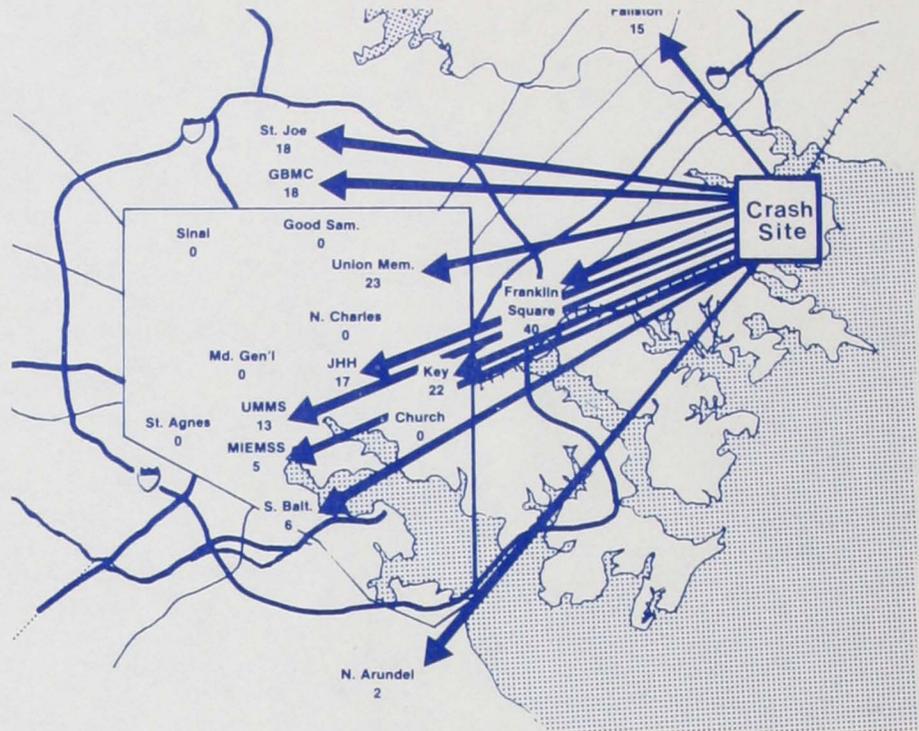
Not every hospital that was alerted received patients, but they all stood ready to help if needed. Some hospitals activated their full disaster plans, some alerted extra staff, and some considered their staff on hand to be sufficient. Many staff called in to ask whether they were needed, or came in just in case they were needed. Extra staff who reported included doctors, nurses, operating room teams, chief executive officers, administrators, laboratory technicians, central supply personnel, radio operators, switchboard operators, security guards, public affairs officers, photographers, chiefs of services, department chairmen, registrars, clerks, nutrition personnel, and volunteers of every description — even staff members who could act as interpreters if needed.

Communications Integral

(Continued from page 4)

hams provided communications from that site to Amtrak and Red Cross personnel. The amateur radio system was also used at the Holiday Inn in Moravia, the bereavement center opened for families of the dead and gravely injured victims.

Packet radio, which was demonstrated in the 1986 NDMS exercise in Prince Georges County, was used by hams stationed at Fallston General Hospital, Franklin Square Hospital, and the University of Maryland Medical System. This technology pairs a computer and a radio and is used to transmit lists of patient information.



Geographical distribution of patients treated at hospitals.

Medical Examiner's Office

"Dead men tell no tales," is an old saying that has been proven untrue by modern forensic medicine. On the contrary, data learned from fatalities in the Amtrak train wreck might help to save lives in the future.

By learning such details as exactly where the victims were at the time of the accident and whether there was alcohol or carbon monoxide present in the body, the medical examiner's office can determine the circumstances that led to death. Questions that they seek to answer with this information include whether the outcome would have differed if the train cars or train seats were constructed differently; whether seat belts or some other method of passenger restraint might have prevented some injuries; and if the cold weather had a bearing on the fatalities.

Data are being analyzed to evaluate why the victims died and to determine what actions might be taken in the future to avoid as many similar deaths as possible. These are the long-term goals of the medical examiner's office. However, the short-term goals at the scene were different.

At the scene of the accident, the mission of the medical examiner's office is to participate in the disaster command

team to supervise the recovery of fatalities; to determine where they were at the time of the accident; to safeguard the valuables on the bodies; to see that they are properly identified and tagged; and to transfer the bodies to the State Medical Examiner's Office for examination. Chief Medical Examiner John E. Smialek, MD, and his staff worked in a temporary morgue set up in a tent beside the train tracks. The Baltimore County Police Department helped gather information to identify the dead. The families of the train's passengers were under severe stress. They needed information about their relatives, and needed to have the bodies released as soon as possible. By working together around the clock, the medical examiner's staff was able to release all of the bodies within 28 hours, a commendable feat.

Dr. Smialek says, "It is important for the medical examiner's office to work cooperatively with the other agencies involved. For example, bodies being brought in with no indication as to where they were found would hamper our investigation. By working together other agencies understand our needs and responsibilities and know how to gather the information that is needed."

Red Cross: Blood, Disaster Services

"People came out in the middle of the night to donate blood," says Jeffrey M. Varnes, executive director of the Central Maryland chapter of the American Red Cross, which provided both blood services and emergency services during the recent Amtrak train crash.

According to Mr. Varnes, there was an outpouring of concern shown by the citizens of this area for the victims of the train crash. "The blood donor center more than doubled its usual amount of donations during the week." The accident happened on Sunday, a day the blood donor center is ordinarily closed. But spontaneously, Red Cross workers gravitated to the center and donors lined up outside, although there would be no announcement or appeal for blood until later. Red Cross workers, including 40 nurses, 15-20 laboratory technicians, and volunteers, began arriving at 2:30 pm. A TV announcement was made stating that the center would be open at 6 pm. But by 4 pm there were donors at the door, and the action started.

Many people waited for three or four hours to donate blood. On Sunday there were 709 donors; on Monday, 1300 donors, the largest number in a single day in the history of the blood donor center; and on Tuesday, 900 donors. Each donor gives one unit of blood; one badly injured trauma victim may require 100 units. "The donations did not stop until 3 o'clock in the morning," says Deborah K. Douglas, MD, deputy executive director of the Chesapeake Regional Red Cross Blood Services. "And some donors stayed on and worked as volunteers."

It takes approximately 12 hours to process a unit of blood; therefore, these fresh units were not available for use until the next day. The blood donor center was already short of inventory and had, in fact, been appealing for donations all week. The units that were rushed to hospitals all over the Baltimore area were helicoptered in from Philadelphia, from the Pennsylvania/New Jersey blood donor center; brought by the Maryland State Police from the Washington, DC, blood donor center; and found their way here by various other means from blood donor centers as far away as Norfolk, Virginia, and Alabama. This blood was later reciprocated from some of the blood supply brought in during the week.

Paul Ness, MD, executive director of the Chesapeake Regional Red Cross Blood Services, says, "The disaster pro-

duced an overwhelming response from the community in donating blood for the injured victims. The Red Cross and the hospitals are grateful to all who helped replenish blood supplies so that medical personnel had the resources to deal with the tragic emergency."

At the scene of the accident, emergency services were provided by 150 Red Cross volunteers from Central Maryland, Washington, DC, and the surrounding counties who sheltered and fed victims and workers; administered a bereavement center to notify the next-of-kin of the victims; and worked on disaster action teams escorting passengers from the

scene and assisting medical personnel.

The mobile canteen fed the workers at the fire hall and the elementary school 900 meals and snacks, including hot dogs, cold cuts, sandwiches, and hot and cold drinks.

The bereavement center set up at the Holiday Inn at Moravia Road had a room with coffee and snacks where families could wait to be notified about the conditions of their loved ones. Some families arrived in the middle of the night and did not receive any notification until late the next afternoon. Red Cross nurses and social workers were there to counsel and console the families.



American Red Cross, Central Maryland Chapter Exec Jeff Varnes (second from left) confers with disaster team volunteers (photo by Judith Varnes, Red Cross).

Salvation Army Quickly Mobilizes 15 Officers, 75 Volunteer Workers

Within 15 minutes of the Amtrak train wreck, the Salvation Army was notified of the disaster by a "Salvationist" who is a member of an amateur radio club. They immediately mobilized 15 officers and 75 volunteers from the Baltimore metropolitan area, Havre de Grace, Hagerstown, Frederick, and Annapolis. There was no access to the scene by private vehicles, so workers had to come by police or fire department vehicles. They began working at approximately 4:30 pm on Sunday, and didn't leave until after suppertime on Thursday. Some worked for 30 to 40 hours at a stretch.

Maj. Stanley Jaynes, divisional secretary for the Salvation Army in Maryland and West Virginia and the divisional disaster services coordinator, went to the "BASICS and more" grocery store at Eastpoint on Sunday and four or five

more times to get the necessary food, running up several hundred dollars worth of bills each time. The Salvation Army's two mobile feeding units served approximately 40 gallons of soup, 2,000 sandwiches, more than 5,000 cups of coffee, and 100 dozen doughnuts to workers and victims. After the emergency was over, the manager of "BASICS and more" called Maj. Jaynes to tell him that the food would not have to be paid for; it was a donation.

Donations of 250 hamburgers and 250 cheeseburgers were received from McDonald's; 100 loaves of bread were sent by the H & S Bakery; and doughnuts and other food were received from other restaurants in the area.

In addition to serving food, several Salvationists gave spiritual comfort to patients at Station 54.



Field Notes

By William E. Clark,
Director, Field Operations

Every day we are called upon to help individuals needing emergency assistance. But we never know what tomorrow or even the next minute might demand of us. And on January 4, 1987 it was just another typical Sunday until that fateful and terrifying instant when a high-speed passenger train rammed another train in Chase, MD.

We all know the resulting human suffering that occurred from this tragedy where 16 persons were killed and more than 175 injured. And many people could be labeled as heroes because of their personal actions in responding to the desperate need of the victims of the train crash for assistance.

It is during times like this that you can determine the fabric of the emergency system. When put to the ultimate test, and with the whole world watching, career and volunteer personnel showed their true professionalism in toiling side-by-side in and around the twisted wreckage, saving lives and recovering bodies. The Baltimore County Fire Department, under the direction of Chief Paul Reincke, demonstrated leadership and command at this disaster scene that was simply outstanding. They had a good plan and they stuck to it. They used good judgment in assembling the necessary response units through mutual aid plans, and they maintained good command and control of the scene. And they utilized the state EMS system to effectively handle the mass casualty situation. Both the prehospital and in-hospital responses were magnificent.

As we go forward in carrying out the work that we all have voluntarily chosen to do, let us remember that the public has both the expectation and dependency on us all to be able to respond in an effective and efficient manner in times of emergency.

I feel certain that through the recent catastrophe we all will renew our efforts and dedication to be better prepared to serve our communities. Because of your courage, hard work, self-sacrifice, and care for your fellow man, this proud tradition of emergency medical services continues to be a mighty legacy in this great state of ours.

Many Praise Rescue Efforts

Praise for the hundreds of people who responded to the Amtrak train crash came from many sources.

- President Reagan applauded the residents of Chase and rescue workers who aided the train crash victims. More than 60 of the residents, as well as rescue workers and politicians joined the President for a brief ceremony in the Old Executive Office Building, where he presented to the community a framed Private Sector Initiatives Commendation.

- MIEMSS Director R Adams Cowley, MD, commented that "our Maryland EMS system was put to its most demanding test since it was created. After seeing the wreckage, many people were amazed at the passenger survival rate. We were fortunate insofar as the accident would have been much worse if the collision had occurred slightly north, on the bridge carrying the railroad track over the Gunpowder River. In that event, it is likely that the entire passenger train would have plunged into the water and that relatively few of its passengers would have survived. We were also lucky that the accident occurred during the daytime and in an area close to homes and roads. Darkness and inaccessibility would have hampered rescue efforts. Certainly a major factor in the survival of the train passengers was the highly effective rescue operation under the command of the Baltimore County Fire Department and the cooperative efforts of units from neighboring jurisdictions. Everything worked like a well-rehearsed plan."

- In a letter to MIEMSS Director, R Adams Cowley, MD, U.S. Senator Barbara Mikulski wrote: "The triage system worked most effectively, and it was proven again that the services provided by the hospitals of Maryland are unsurpassed in the nation."

- Baltimore County Executive Dennis Rasmussen says he hopes he never sees a disaster of such magnitude again but he was gratified that Baltimore County has the manpower, capability, and leadership to respond to such an emergency.

He said, "I'm pleased with the coordination and professionalism of the fire and police departments. I observed firsthand the excellent work done by county workers whose swift, capable, and well-coordinated response expedited rescue and cleanup efforts."

He also expressed appreciation for the efforts of other Baltimore County departments such as public works, the board of education, health department, 911 emergency communications, and Civil Defense, all of whom contributed to the accident response.

- More than 50 organizations that participated in the emergency response to the Amtrak train crash were honored by the Maryland General Assembly. On January 20, each organization received a "Governor's Citation" in recognition of "outstanding response to the needs of the passengers and employees of the Amtrak train which derailed at Chase, Maryland; with particular acknowledgment of the comforting and, in many instances, life-saving assistance which was rendered with professionalism and compassion."

Book to Be Published

The Amtrak Wreck and Mass Casualty Incident: A Report on the Medical Response by the Maryland Emergency Medical Services System, will soon be published by the Charles McC. Mathias, Jr., National Study Center for Trauma and Emergency Medical Systems.



The Maryland General Assembly honors organizations that participated in the rescue efforts.

Mental Health Teams Respond

The physical devastation of disasters such as the January 4th Amtrak crash is accompanied inevitably by an emotional toll on victims and rescuers. The MIEMSS crisis intervention preparedness (CIP) team, a group of mental health professionals especially trained in disaster response, was called to action the afternoon of that incident to tend to the emotional needs of the hundreds of accident victims and EMS personnel who responded to the emergency.

Under the guidance of Marge Epperson-SeBour, director of MIEMSS' psychosocial services department and coordinator of the CIP team and the Maryland EMS critical incident stress debriefing (CISD) program, nine mental health professionals were involved in the response to the Amtrak derailment. Four CIP program participants were dispatched to the crash site at approximately 3:15 pm, about 1.5 hours after the incident. Others were called to Chase throughout the afternoon and evening, and into the following day, to relieve their colleagues and to continue the psychosocial support services at the scene.

Some participants in the recently organized Maryland CISD program were asked to assist the CIP team during the early response to the train wreck. In assisting the CIP team members, they offered immediate assistance to passengers and provided short educational sessions about typical reactions to trauma ("defusings") for EMS personnel, fire fighters, police officers, and Amtrak employees. For two weeks after the incident, CISD team members conducted formal psychological debriefings to help responders recover from stress reactions caused by the event.

Jeffrey Mitchell, PhD, who is an assistant professor in the emergency health services department at UMBC and one of the CIP team members at the scene of the train crash, relates that the mental health professionals involved in the disaster response had three roles: (1) to assist the victims of the crash, (2) to support EMS personnel at the scene, and (3) to advise the command staff of observations and recommendations related to the mental well-being of the rescue workers. These roles were divided among the team members.

The victims of the crash who were able to walk away from the train had many immediate needs: shelter from the

cold and wind, reassurance that help was available, telephones to call family members and friends, and assistance in finding alternate transportation. Some needed overnight lodging. Others needed task orientation from the team members to help them establish a productive plan and begin their way out of the daze that was a natural product of their experience.

Ms. Epperson-SeBour estimates that 150 victims were offered assistance by the CIP team. The team's work was complicated by the dispersion of the "walking wounded" throughout the adjacent neighborhood. Some had found shelter and help in private residences near the accident scene, and about 75 victims had gathered at the Harewood Community Center in Chase.

Jerry Huesman, a family counselor in MIEMSS' psychosocial services department and a member of the CIP team responding to the crash, described the kinds of assistance that were provided by the mental health workers in their interactions with the train passengers. They offered a supportive presence for the crash victims. The mental health personnel inquired if any of the passengers at the gathering places had friends or relatives who were trapped in the wreckage. They also forwarded lists of the passengers' names at the various locations to the command staff on site to assist them in accounting for all of the passengers.

EMS personnel on the scene were given assistance by the mental health personnel on an as-needed basis. The responders who were first on the scene were more likely to be overwhelmed by the magnitude of the wreckage and the number of tasks that needed attention. The EMS personnel who worked inside the train cars and interacted with trapped victims (who may or may not have been eventually rescued alive) were more likely to experience emotional reactions. Other typical reactions among the EMS providers included anger that the incident occurred and caused so much pain and devastation; excitement about saving lives and participating in a coordinated, productive rescue; confusion caused by the immensity of the event; disappointment over being required to stand idly by and not use their skills to the fullest extent because other rescue workers were occupying the limited space in the cars; and depression resulting from the

death of victims trapped in the wreckage.

When an EMS provider is treating a person with a medical emergency, he or she is involved in an intense cognitive process, the step-by-step process required to stabilize the patient. The rescuer occupied with the multitude of tasks to be done usually does not experience strong feelings immediately. But after the intensity of the incident is over, emotions surface as the rescuer mentally reviews the situation and his or her response to it.

The mental health personnel at the site tried to help the rescuers prepare for that reaction, and to minimize its effects, by conducting defusings. As EMS personnel were relieved at the scene, before being sent home, the command officer dispatched them to heated buses and later to Station 54 in Chase or to the Warfield Air National Guard facility, where members of the CIP team and psychologists from the Baltimore County Fire Department explained what reactions the EMS personnel should expect. They were told that frustration and anger are normal feelings during such an experience. The workers were advised to exercise and to monitor their diet and fluid intake to ensure that they were receiving proper nourishment. The counselors also explained that the rescuers might experience sleep disturbances, a sense of confusion, diffuse anxiety, extreme fatigue, and other such physical and cognitive signs of stress.

(Continued on page 12)



Rescuers work around the clock to free victims from the wreckage. Many defusings were conducted to help the rescuers cope with stress caused by the train crash (photo by Craig Schleunes, Balto. Co. Fire Dept.).

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Director: R Adams Cowley, MD
Editor: William E. Clark,
(301) 328-7800
Managing Editor: Beverly Sopp,
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Helping Victims, Rescuers Cope with Stress

(Continued from page 11)

During these short sessions, the mental health professionals also educated them about the typical emotional responses to emergencies, how to care for themselves, and how to monitor and manage their own stress symptoms in order to prevent strong stress reactions that are characteristic of the posttraumatic stress disorder (PTSD). The CIP team's information was shared with approximately 500 rescue workers.

The CIP team members worked closely with the command officers. If the mental health workers noticed acute signs of stress in a rescue worker, they would make that observation known to the command post so that appropriate action could be taken (for example, temporarily relieving the worker from the duties of patient extrication and treatment or calling the worker from the scene). The command officers attempted to rotate EMS personnel about every 45 minutes. If the workers were close to extrication of a trapped victim at the end of a work period, the commanders allowed the rescuers to remain involved until the victim was freed.

The CIP team members have commended the incident commanders for their concern for the EMS personnel. Christie Polen, the CIP team leader at the scene and a family counselor in MIEMSS' psychosocial services depart-

ment, noted how important it was for the workers to know that the command staff was as concerned about them as they were about the victims.

Train passengers were transported by Amtrak back to Penn Station in Baltimore to make alternate travel plans or to the Belvedere Hotel for lodging. Family services counselors were available at those sites to help victims and their families cope with the effects of the day's events.

Team members were also dispatched to the Holiday Inn in Moravia, the site of the bereavement center established by Amtrak with the assistance of the Red Cross, to work with families of the crash victims.

CIP team members remained at the accident scene until 5:30 on Monday morning, January 5th. Later that morning, several of them returned to the site to provide relief for the Baltimore County Fire Department psychologists and to continue the psychological defusings for the rescue units.

The need for mental health intervention for the residents of Chase became increasingly apparent. Many of the residents were directly involved in the rescue efforts and therefore experienced emotional and physical symptoms related to the stressful event. In a collaborative effort, Dr. Gene Ostrom of the Baltimore County Mental Health Department, John

Stein of the National Organization for Victim Assistance (NOVA), Dr. Paul Clavelle of the Baltimore County Fire Department, and Ms. Epperson-SeBour organized a series of community gatherings for the neighborhoods of Chase to help the residents deal with the emotional impact of the incident.

Seventeen formal debriefings have been conducted by the Maryland CISD team on request from volunteer fire/rescue units and other groups involved in the rescue, including Amtrak crews and members of the Red Cross teams. These took place at various locations throughout Baltimore City and Anne Arundel, Harford, and Baltimore counties. Requests for debriefings continue to come in to SYSCOM. Several debriefings for the fire force were conducted by the psychological service unit of the Baltimore County Fire Department.

Who looks out for the mental health needs of the mental health professionals? As participants in the emergency response to disasters, they too are subject to the spectrum of psychological reactions to the scenes of devastation and pain. The CIP team members who responded to the scene held their own debriefing about a week after the Amtrak crash to share their feelings about and their reactions to the event and to discuss their own experiences during that difficult time.