Hazardous materials incidents and emergency medical response in Clark County

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Hazardous Materials Incidents and Emergency Medical Response
In
Clark County

Martha Dicey
ENV 499B
Final Draft Thesis
Advisors: Paul Richitt
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11/29/00
Abstract

Today's society was built on technological advancements and which also brought about the creation of hazardous materials. Hazardous materials are termed basically as a solid, liquid, or gas substance that, when released from a container, is capable of harming the environment, people or property. Hazardous materials can be found everywhere including industrial locations, backyard swimming pools, hospitals, and private homes. Transportation corridors such as railroads, boats, and trucks and in limited quantities by air are major areas where hazardous materials can be present. Incidents involving hazardous materials may occur during transportation or at any location where hazardous materials can be stored or used. Incidents may result in one victim or multiple victims and the preparedness of the community to handle such situations dictates the outcome. First responders are the first trained personnel to arrive on scene of a hazardous materials incident: firefighters, police and local emergency service. The preparedness of the first responder personnel in a hazardous materials incident is crucial to providing a positive outcome for all victims involved. The issues in question are the overall preparedness and OSHA compliance of local first responder personnel. These issues with regard to local fire departments and American Medical Response are posed throughout this paper.
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# TABLE OF CONTENTS

Abstract i

Acknowledgements ii

Table of Contents iii

Table of Illustrations v

Introduction 1

Hazardous Materials all around us 1

Government involvement with hazardous materials 4

Emergency Planning and the Law 5

First Response 7

Materials and Methods 10

Local Emergency Planning Committee Plan 10

National Fire Protection Association 11

American Medical Response 11

Clark County Health District Review 12

Interviews and Station Tour 12

Results and Discussion 13

Local Emergency Planning Committee 13

American Medical Response 16

National Fire Protection Association 20

Clark County Health District Review 22

Interviews and Station 24 Tour 22

Recommendations 25
References

Appendix A- Hazardous Materials All Around Us

Appendix B- Hazardous Materials Review- American Medical Response

Appendix C- Interview with Captain Osborn- Questions and Answers
TABLE OF ILLUSTRATIONS

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1: United Nations Hazard Classification System</td>
<td>3</td>
</tr>
<tr>
<td>Table 2: Federal Regulatory Structure</td>
<td>6</td>
</tr>
</tbody>
</table>
**Introduction**

*Hazardous materials all around us*

Hazardous materials are nothing new. Throughout history, technological advancements have not only created the modern society we enjoy, but have also brought about the creation and use of hazardous materials. A hazardous material is a toxicant or chemical which is potentially harmful to human health if handled improperly. The general public encounters hazardous materials on a daily basis. They are necessary to provide for our endless wants and needs for modern products and energy sources. Tanker trucks full of gasoline, a propane tank, or simply a disinfecting or cleaning agent, are all examples of hazardous materials. The use, manufacturing, storage, and transportation of hazardous materials certainly increase the risk of harmful exposure to humans. No country, state, city, or village is immune to the risks involved with hazardous materials because these materials can be found everywhere (Borak 1991).

The federal government and technical experts have taken the lead in defining a hazardous material. The following definitions given by the United States Department of Transportation (USDOT) and technical experts clearly define the meaning of hazardous materials.

"Any substance or material in a quantity or form that poses an unreasonable risk to health, safety, and property when transported in commerce (USDOT 1989)."

Technical experts legally define a hazardous material as:

1. A material and its mixtures or solutions that is identified by the letter "E" in the first column of the Hazardous Materials Table, 49 CFR 172.101, when
The terms hazardous material, hazardous substance, hazardous chemical, and hazardous waste are often used interchangeably or exclusively depending on the need. For the purposes of this paper, hazardous material will be used interchangeably for the terms previously stated.

Hazardous materials may be elements or compounds and can be found as gases, liquids, solids, or any combination thereof. Hazardous materials use has been placed into four classifications: transportation, storage, production and use. The classifications were created by the United Nations and the US Department of Transportation for use in placarding and labeling chemical containers so as to convey information about the chemicals contained within (see Table 1). An understanding of these classifications and the types of hazards that they represent allows responders to anticipate the potential harm if the hazardous materials are released from their containers. Generally, terms provided by the US Government and the technical experts in the field have provided a general understanding of the risk involved and the need for adequate response. Hazardous materials incidents are described as, "The release, or potential release of a hazardous material from its container (Borak 1991)".
<table>
<thead>
<tr>
<th>CLASS #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EXPLOSIVES AND BLASTING AGENTS</td>
</tr>
<tr>
<td>2</td>
<td>GASES</td>
</tr>
<tr>
<td>3</td>
<td>FLAMMABLE LIQUIDS/COMBUSTIBLE LIQUIDS</td>
</tr>
<tr>
<td>4</td>
<td>FLAMMABLE SOLIDS/REACTIVE SOLIDS AND LIQUIDS</td>
</tr>
<tr>
<td>5</td>
<td>OXIDIZERS AND ORGANIC PEROXIDES</td>
</tr>
<tr>
<td>6</td>
<td>POISONOUS LIQUIDS/SOLIDS AND INFECTIOUS SUBSTANCES</td>
</tr>
<tr>
<td>7</td>
<td>RADIOACTIVE MATERIALS</td>
</tr>
<tr>
<td>8</td>
<td>CORROSIVES</td>
</tr>
<tr>
<td>9</td>
<td>MISCELLANEOUS HAZARDOUS MATERIALS-ORM-D(OTHER REGULATED MATERIALS)</td>
</tr>
</tbody>
</table>
It is not only important to understand what a hazardous material is, but also \textit{where} they are. Large chemical production plants and transport vehicles are among the obvious places to find hazardous materials. The general public may not be aware of discrete or less obvious locations or methods of transport. Hazardous materials may be found anywhere in industrial locations, swimming pools, hospitals and homes. Large quantities of hazardous materials can be transported by either rail or ship. Aircraft are also used in the transportation of hazardous materials either in passenger or freight. Pipelines routinely carry flammable liquids or gasses all across the country. Storage of hazardous materials can be found at the site of production or in warehouses of the facility in which they are used (Griffin 1988) Appendix A-Hazardous Materials All Around Us.

\textit{Government involvement with hazardous materials}

The federal government's approach to regulation of hazardous materials in the United States originally focused on how the materials were used. Hazardous materials entering the environment were regulated according to whether they were being emitted into the air or into water, or if they were used in food and agriculture. This method of regulation had been used for decades but with the
advent of environmental awareness in the 1960's and 1970's, it became apparent that centrally focused regulations were not accomplishing the goal of protecting public health, safety, and the environment (Griffin 1998).

As environmental awareness grew, federal regulations developed. The responsibility for regulating and enforcing hazardous materials laws became split among three federal regulatory agencies. The Federal government has included various agencies' responsibilities for regulation and enforcement into what is known as the Code of Federal Regulations (CFR), which specifically detail the requirements under the various laws and illustrate where they can be found (see Table 2). Each agency has its own specific title under the CFR. The United States Environmental Protection Agency (USEPA) has the 40 CFR series, and the US Department of Transportation (USDOT) has the 49 CFR series. The 29 CFR series is the responsibility of the Occupational Health and Safety Administration (OSHA). All three of these agencies are responsible for regulation and enforcement of proper hazardous materials practice (Sullivan 1995).

**Emergency Planning and the Law**

In 1980, the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) was passed to protect public health as related to hazardous materials. As more information became available regarding health, safety, and risk with respect to hazardous materials, CERCLA was amended to include The Emergency Planning and the Community Right-to-Know Act of 1986; otherwise known as SARA Title III or EPCRA. SARA also led to an enactment, which required OSHA to develop standards for health and safety for
Table 2
Federal Regulatory Structure

Federal Regulatory Structure

Occupational Safety and Health Administration

Environmental Protection Agency

Department of Transportation

Occupational Safety and Health Act

Clean Water Act

Clean Air Act

CERCLA SARA

Safe Drinking Water Act

Toxic Substances Control Act

RCRA

HSWA

Safe Drinking Water Act

Toxic Substances Control Act

RCRA

HSWA

29 CFR 1900-1910

40 CFR 100-149

40 CFR 400-469

40 CFR 141-143

29 CFR 40 CFR

40 CFR 141-143

40 CFR 141-143

40 CFR 702-799

40 CFR 240-260

40 CFR 171-175

40 CFR 171-175

40 CFR 171-175

40 CFR 171-175

40 CFR 171-175

40 CFR 171-175
workers involved with hazardous materials, as well as standards for the emergency personnel responding to a hazardous materials incident. This in turn, led to hazardous waste operations and emergency response, 29 CFR 190.120 of 1989 also termed "HAZWOPER."

The Emergency Planning and Community Right-to-Know Act of 1986 requires states to establish a process for developing local hazardous material emergency preparedness programs and requires states to receive and evaluate information on hazardous materials at local facilities. The Act has four major sections: (1) Emergency planning (2) Emergency release notification (3) Community right-to-know reporting and (4) Toxic chemical release inventory reporting. The Act also requires each state to designate a State Emergency Response Commission (SERC). SERC appoints a group of Local Emergency Planning Committees (LEPC), which is responsible for coordinating and planning an emergency response to hazardous materials incidents in local communities. The state and local committees are instrumental in forming an effective response plan for hazardous materials incidents in communities of all sizes (Sullivan 1995).

First Response

There is always risk involved when dealing with hazardous materials. They can create an assortment of problems to humans and to the environment when the integrity of the material is breached. At any point in the life of the hazardous material it can become a threat to the environment. At the point when a hazardous material becomes a threat, or potential threat, the public and the emergency medical personnel responding are most vulnerable to exposure. That
is why the Clark County, Nevada LEPC for hazardous materials incidents is crucial to first responders to such incidents, for example emergency medical technicians (EMT). Jonathan Borak M.D describes a first responder to be, "The first trained personnel to arrive on scene of a hazardous material incident-usually officials from local emergency service, firefighters and police (Borak 1991)."

OSHA 29 CFR 1910.120 describes minimum levels of emergency responder skills, knowledge, and functional levels of first responder personnel to hazardous materials incidents. There are many levels of first responder training as dictated by OSHA regulations such as First Responder Awareness level, First Responder Operations level, and First Responder Technician level. Each of these three levels is defined by the amount of hours trained. The National Fire Protection Association (NFPA) has worked in conjunction with governmental agencies to provide expanded training requirements for first responders. A document known as NFPA 472, describes the requirements in detail. The basic principle in the OSHA, DOT and the NFPA 472 is that effective response is based on the competency of the responder, not just the number of training hours experienced.

First responders are the true backbone of all emergency responses in Clark County. Without the dedication put forth by all first responders, Clark County could very well be in a state of chaos. Without these guidelines, first responders and the citizens of Clark County would not be prepared for such emergencies as hazardous materials incidents. The primary focus of my research is primarily the first responder in emergency medical services role major emphasis is given to paramedics, Emergency medical technician’s, and fire department personnel.
whom are very often the first on scene of a hazardous materials incident or the first to discover an incident. The question is: Are the procedures for first responder medical personnel currently being utilized by EMS first responders in accordance with the law? Are these guidelines adequately communicated to all participating agencies?

In response to these questions, I will review the Emergency Management Services policies and procedures for all first response medical personnel in Clark County with regard to hazard materials incidents. A hazardous materials incident being defined as accidents, releases, and exposures to the public and private areas in Clark County. An evaluation of the impact of these policies and procedures on the first responder medical personnel will be reviewed for adequacy. After review of the guidelines, I will provide an assessment and recommendations for first responder personnel in hazardous materials incidents in Clark County.
Materials and Methods

The primary focus of this thesis is to evaluate the effectiveness of the current procedures and guidelines in place for first responder medical personnel to hazardous materials incidents in Clark County, Nevada. The first responder medical personnel consists of Clark County Fire Department (CCFD), Las Vegas Fire Department (LVFD), North Las Vegas Fire Department (NLVFD), Henderson Fire Department (HFD), Boulder City Fire Department (BCFD) and American Medical Response (AMR). Clark County has two hazardous materials response units and one local private ambulance company. To evaluate the preparedness of the local first responder medical personnel I will emphasize a review of the local fire departments preparedness and that of the local private ambulance company.

Areas of Concentration

LEPC-Local Emergency Planning Committee-Hazardous Materials Response Plan

The Local Emergency Planning Committee (LEPC) for Clark County, Nevada's hazardous materials incidents and emergency response plan will be evaluated for all first responders in Clark County. The LEPC's plan details information about probability of a hazardous materials incident in Clark County including sensitive areas and population's requirements of the local fire departments and other related agencies are detailed in the response plan. The
A focused exam of the local private ambulance service guidelines on how to respond and deal with hazardous materials incidents. The local ambulance service is contracted by Clark County Commission to provide ambulance transportation and respond to all 911 calls, and are defined as first responders, according to OSHA. The major difference between AMR and local fire departments is that they are solely emergency medical personnel and handle over 90% of patient transports in Clark County. They respond together with fire personnel on all medical responses, including hazardous materials responses. American Medical Response is very often first on scene and deal with the initial assessment of the emergency 911 calls. Taking into account all the above, facts I will review AMR's Health and Safety manual and training procedures for employees and make recommendations.
Clark County Health Districts Review of Hospital Preparedness for Contaminated Patients

The Clark County Health District oversees all elements of emergency medical services in the Clark County area including hospitals. The CCHD prepared a report that evaluated the preparedness of local hospitals to receive patients that are or were contaminated by a hazardous material. The CCHD's review will provide an overview of the ability of the local emergency medical services in dealing with contaminated patients received from any of the above service agencies outlined in this report.

Interviews and Station Tour

To facilitate a comprehensive review of local first responder preparedness I have conducted interviews with the following:

Richard Brenner-Clark County Fire Department- Fire Protection Engineer
Edward Lane-Paramedic Operations Supervisor-AMR
Edward Wetzel-Human Resources Director-AMR
Jessy Rogers-Paramedic/Firefighter-HFD Station 93
James Carpenter-Paramedic/Firefighter-CCFD Station 24
Tour Clark County Fire Departments Station 24- main station for the Hazardous Materials Emergency Response Team.
Captain Osborn-Station 24 “B” Shift
Informal Interviews with American Medical Response Employees requesting to remain anonymous.
Results and Discussion

Local Emergency Planning Committee-Hazardous Materials Response Plan

(LEPC-HMRT)

The LEPC’s Hazardous Materials Response Plan is a comprehensive plan detailing the responsibilities of all agencies involved or potentially involved in a hazardous materials incident. The Clark County government describes the purpose of the Hazardous Materials Emergency Response Plan is to establish common guidelines for responding to hazardous materials incidents anywhere within Clark County. The plan details agency responsibilities and actions to be taken upon discovery and responding to a hazardous materials incident. The primary interest with Fire Department personnel and rescue personnel i.e. American Medical Response the LEPC plan states that every response is to be approached in accordance with department guidelines for hazardous materials incidents and upon arrival to an incident assume incident command or report to the lead agency incident command. Further examples of responsibilities are determination or verification of the type of material involved and the exact nature of the hazard, and to notify required support agencies to report to the incident according to the Incident Command System.

The Incident Command System is described as an organized system of roles, responsibilities, and standard operating procedures used to manage and direct emergency operations. The LEPC”s organizational response plan details the operational structure of an incident. The on scene command at a hazardous materials incident shall be the responsibility of the lead agency having
jurisdiction. The lead agency may establish a coordinated command with other agencies and departments, but will retain overall responsibility until the incident is brought to a conclusion. The lead agency shall manage and coordinate a hazardous materials incident under the incident command system and shall be responsible for the identification of the incident resources and needs. The local fire department is deemed lead agency by the LEPC and shall accept and provide the position of incident commander for all hazardous materials within its jurisdiction. Two local fire departments maintain specially trained Hazardous Materials Response Teams for the specific purpose of responding to chemical emergencies. The teams provide expertise and equipment especially developed to help control and abate a hazardous materials incident the two teams are located within the Clark County Fire Department and Las Vegas Fire Departments (Photo: CCFD HAZMAT Unit Station 24)

Key points on training, updating and testing the plan were especially noted for the purpose of this paper. The LEPC has prescribed procedures for testing and updating the plan to verify the preparedness of the local emergency responders in Clark County. The committee stipulates that there will be at least one quarterly
Hazardous Materials Simulation highlighting key points of the response plan.

The LEPC will conduct a yearly review of the plan, change and update the plan in accordance to federal law. Exercises to test this plan are to be conducted annually within Clark County jurisdictions in the form of sit down meetings to full scale exercises the exercises are to include all agencies involved. The key highlight of the plan is the statement of training of the first responder personnel. The plan clearly defines by SARA Title III that all emergency personnel that may have to respond to a hazardous materials incident be trained to the level that he/she will be expected to perform. They recognize the training programs listed by OSHA for minimum levels of training and recognize NFPA-National Fire Protection Association standards 471 and 472 as an acceptable training standard and will recognize any training program, which meets or exceeds those standards. NFPA 471 and 472 meet the minimum requirements set forth by OSHA.

The training assumptions is that it is assumed that all departments/agencies will train their personnel to the level mandated for their particular function and maintain documentation of those training programs taught and the names of all personnel who have successfully completed the programs, and to make those records available to the LEPC upon request. The plan further details that personnel shall receive training prior to being permitted to take part in an actual emergency response at an incident involving hazardous materials and recognizes five training and competency levels; First Responder Awareness, First Responder Operational, Hazardous Materials Technician, Hazardous Materials Specialist, On-Scene Incident Commander.
American Medical Response

American Medical Response (AMR), formerly known as Mercy Medical Services (MMS), has been an integral part of the Emergency Medical Services community in Clark County for over 40 years. For background purposes, Mercy Medical Services’ parent company, MEDTRANS, experienced a corporate merger in 1997 with Laidlaw, Inc., which owns the ambulance service American Medical Response. The name American Medical Response was assumed in 1997. The company has grown with the community and has changed names and ownership throughout its history, but they have always provided the same continuity of care. Clark County runs a dual response system; a dual response system provides the private ambulance service and the local fire service responding to 911 calls together. The private ambulance provides the patient treatment and transportation to the hospital as well as working together with the fire service to provide on scene patient treatment. The Incident Command System was put into place in Clark County in 1997 to provide a framework and to identify the duties of each agency involved in an emergency response as dictated by the LEPC Hazardous Materials Response Plan.

In researching documentation of policies and procedures for American Medical Response personnel for hazardous materials incidents, a look back to when AMR was formerly known as Mercy Medical Services (MMS) was required. The last dated documentation of a detailed hazardous materials response program for AMR/ MMS prior to January 2000 was April 1995 and June 1992. The material was found in vehicles currently not being used for responding
to 911 calls. The currently used vehicles contained no policies and procedures manuals for hazardous materials incidents. Training materials dated prior to 1995 outline a fairly detailed training program in recognizing and responding to a hazardous materials incident. The training materials have not been used in 5 years, or in any new hire orientations and now annual update material was on record in the training department.

Prior to 1995 Mercy had a comprehensive response plan that reflected the requirements mandated by OSHA. A now former employee of Mercy-Las Vegas Fire Department Firefighter Charles Hurley designed the program accordingly he is an OSHA certified hazardous materials instructor and named the program the Hazardous Materials Program. The program details the training criteria following OSHA 1910.120 and NFPA 472 training guidelines for the first responder awareness level. In the program itself there is no mention of the Incident command system, previously discussed in the LEPC guidelines, just an internal command system within Mercy Medical Services. Furthermore, there is no mention of the OSHA required material to have on an emergency response vehicle that assists the first responders in identifying and responding to a hazardous materials incident. Literature dated in June 1992 is similar to the literature in 1995 but describes a Hazardous Materials Response Team (HMRT) specifically for Mercy Medical Services. The HMRT was a group of employees whom volunteered to be trained further in hazardous materials incidents and to function with the fire department in a more active role.
Training for employees consisted of an 8-hour training course conducted on the last day of new hire orientation and was updated annually and taught by an OSHA certified hazardous materials instructor. The last documented 8-hour OSHA required training by a certified instructor was June 1996. The current method of instruction consists only of a hazardous materials incident videotape played during orientation, taught by an uncertified instructor. The time allotted for hazardous materials incident instruction in a new hire orientation currently is 1 hour per AMR training department. One review session was conducted in the summer of 1999 by the means of a handout given during a mandatory in-service training on other unrelated topics the handout was briefly discussed for 10 minutes. The review of the material was never adequately tested for competency for the personnel it was given to. Informal interviews conducted with employees of AMR revealed great concern on the lack of training and preparedness for a hazardous materials incident. Employees when questioned on basic knowledge required by a first responder to a hazardous materials incident were unable to answer correctly and were unable to name any management/training personnel at AMR with hazardous materials incident knowledge.

As of January 2000, AMR published their first health and safety manual for the employees of Las Vegas. The new manual goes into great detail about AMR’s role in a hazardous materials incident. AMR recognized the fact that, as an ambulance operation, it can be called upon or may discover a hazardous materials incident in the course of its normal duties. The program is based on the role as providers of emergency medical treatment and providers of emergency
transportation for patients and personnel that have been properly decontaminated. AMR eliminates their role in rescue, extrication, or decontamination of victims unless specifically authorized. Program objectives are outlined in order to protect the employees, to ensure optimal care to decontaminated patients, and to facilitate effective teamwork with the fire department personnel and receiving hospitals. In pre-planning, AMR indicates participation in the Incident Command System and state they will participate actively in the formulation of local procedures and guidelines.

The health and safety manual addresses the training that all employees will receive prior to performing their duties and states that retraining shall be performed annually thereafter. AMR employees, according to the new manual, will be trained to the First Responder Awareness Level for Emergency Medical Services. The Emergency Recognition and Prevention section of the manual provides a list of personal protective clothing to be provided, a list of OSHA required equipment and literature to be placed on the ambulances to aid in identifying and responding to a hazardous materials incident. The new employee health and safety manual is published but is currently unavailable to the employees of AMR Las Vegas according to Ed Wetzel Human Resources. Mr. Wetzel stated currently AMR is reviewing its role in hazardous materials incidents and is not implementing any new policies or procedures for its employees. Mr. Wetzel indicated that AMR is trying to steer away from any involvement in hazardous materials incidents and relying on the local fire departments. When asking Mr. Wetzel if AMR currently had a local
representative able to answer further questions in regards to AMR’s role in hazardous materials incidents he indicated that there were no personnel available at AMR Las Vegas. In consulting with the training and operations department Mr. Edward Lane-Operations Supervisor stated that there is no OSHA certified training instructors but all training is conducted by Paramedic personnel. Mr. Lane has been with AMR/MMS for over 15 years and stated that over the past five years he has seen no effort by AMR to improve or implement a new hazardous materials program for its employees and feels that AMR is taking a risky chance by ignoring OSHA. (AMR, 1992, 1995, 2000) Appendix B, Hazardous Materials Review 1999.

**National Fire Protection Association (NFPA)**

The NFPA currently is the approved authority for hazardous materials training for first responder personnel. The NFPA has been cited in the LEPC guidelines for Clark County and American Medical Response. The NFPA standards 472 and 473 are the approved training guidelines for emergency personnel in hazardous materials incidents mandated by OSHA 1910.120. The local fire departments currently train under the NFPA guidelines. In NFPA 472, I focused on: Competencies for the First Responder at the Awareness Level, Chapter 2 and in NFPA 473: Competencies for EMS/HM Level 1 Responders, Chapter 2. The first responders in Clark County primarily fall under these two categories. Chapter 2 of NFPA 472 provides a definition and goals for competencies as a First Responder at the Awareness Level as:
“2-1.2 Definition: First Responders at the awareness level are those persons who, in the course of their normal duties, could be the first on the scene of an emergency involving hazardous materials. First Responders at the awareness level are expected to recognize the presence of hazardous materials, protect themselves, call for trained personnel, and secure the area (NFPA 472 1997)”.

Chapter 2 of NFPA 473 provides also the definition and goals for competencies for EMS/HM Level 1 Responders as:

“2-1.2 Definition: EMS personnel at EMS/HM Level 1 are those persons who, in the course of their normal duties, might be called on to perform patient care in the cold zone at a hazardous materials incident. EMS/HM Level 1 responders shall provide care to those individuals who no longer pose a significant risk of secondary contamination (NFPA 473 1997)”.

The NFPA 473 definition is not exclusive, it is in addition to the definition and goals to NFPA 472, and so the EMS Level 1 Responder must also meet the requirements of NFPA 472. The local fire departments are trained to the operational level of first responders unless otherwise trained to be on the Hazardous Materials Response Team. American Medical Response, as indicated previously, has a new health and safety manual out indicating that all field employees will be trained to the EMS/HM Level 1 First Responder Level. As of the date of this paper, AMR has not implemented this program with current or new hire employees failing to comply with current OSHA regulations.
Clark County Health Districts Review of Hospital Preparedness for Contaminated Patients

The LEPC requested the local health district to prepare a review of hospital preparedness to accept contaminated patients to the emergency room. This review is dated in 1995 and no current data is available. Since this report, there have been two new hospitals introduced to the valley: Summerlin Hospital and Mountain View Hospital, so they are not included in this report. The Clark County Health District's Emergency Medical Services Office (CCHD-EMS) surveyed all the hospitals and found that the hospitals depend heavily on the Hazardous Materials Emergency Response Teams of the Clark County Fire Department and The Las Vegas Fire Department to determine and provide initial on scene treatment and decontamination of patients. The CCHD indicated when asked in an informal interview if there was a more current report available they stated that the 1995 report is the most recent and they currently have no plans for updating the review.

Interviews and CCFD Station 24 Tour

Working as an Emergency Medical Technician-Intermediate, I saw a need to further exam hazardous materials incidents in Clark County. I interviewed Richard Brenner of the Clark County Fire Department a fire protection engineer and according to my colleagues is a leading expert in hazardous materials in Clark County my interview with him was brief but informative. Mr. Brenner expressed the need for more interagency training and involvement in preparing for hazardous materials incidents in Clark County. He stated that the current biggest
hazardous material of concern in Clark County is chlorine, not radioactive material, as many might believe. Chlorine is used in many parts of the county, he said, and poses a higher risk of contamination to a large population if there was an incident. He expressed concern over the preparedness of the local hospitals to accept contaminated patients, to which he provided me with the CCHD’s review of the local hospitals preparedness. The primary solution he strongly expressed was more training and adequate follow-up on the training to ensure competency from all first responders involved in hazardous materials incidents in Clark County.

Station 24 of the Clark County Fire Department is the designated station for the Hazardous Materials Emergency Response Team for CCFD. I took a tour of this station and interviewed the on-duty captain on hazardous materials and CCFDs’ preparedness for an incident. The station is a regular fire station that houses the hazardous materials response unit and the firefighters trained for this unit. Captain Mike Osborn was the on-duty captain “B” shift whom I interviewed. Captain Osborn has more than 20 years with the Clark County Fire Department and has been involved with the hazardous materials unit for over 10 years. Captain Osborn’s answers to my questions were consistent with Mr. Brenner and the general opinion was the same that we need more interagency training and follow-up on the competency of the responders. Captain Osborn did note that it is a hard task to do because in order to be able to be effective, it takes manpower and money to be able to accomplish it all. The biggest problem with dealing with a hazardous materials incident, he expressed, was the various
agencies involved and the lack of communication and understanding. "Without accountability of training of each agency you never know how a situation might turn out," stated Captain Osborn. In touring the response unit, I found that it was fully prepared with the equipment required by law. The high tech features and abilities of the unit were impressive. Computer system databases provided information on chemicals, dispersion models for chemicals, and programs on how to facilitate the response. Satellite hook-ups to National Atmospheric and Oceanic Administration are also included as part of the unit as well as hook ups to chemical databases available on-line. I inquired why there were only two teams in Clark County, and I was told that the reason we have the unit is because federal grants provided them to Clark County and they do cost a lot of money. I focused on Clark County Fire Department because Las Vegas Fire Department has the same set up as CCFD and the LEPC recognizes both entities as having the same capabilities. (Photo: Hazardous Materials Response Unit 24-CCFD) Appendix C- Interview with Captain Osborn-Questions and Answers
Recommendations

The strongest finding in my review of the preparedness of Clark County’s emergency medical services to respond to a hazardous materials incident was American Medical Response lack of a standard operating procedure for its employees. The second strongest finding is that which is posed by the Clark County Fire Department personnel that I interviewed, that there is a lack of interagency communication and cooperation to assure an effective emergency response to a hazardous materials incident. As OSHA has indicated, AMR is designated as a first responder and is expected to be competent in understanding how to respond to a hazardous materials incident. AMR’s management appears blind to the fact that there own employees can and very often first on scene to a known or yet to be discovered hazardous materials incident. The current ambulances being utilized to respond to 911 calls do not contain any material that is required by OSHA to assist the medical personnel in identifying a hazardous materials incident. No standard operating procedures are readily available or have been provided to employees for 4 years-NONE! Inadequate training by uncertified instructors is currently being used for new hire orientations. Informal interviews with employees demonstrated a lack of knowledge and preparedness for a hazardous materials incident to which the training and operations departments had no response.

My recommendations are as follows: AMR needs to implement a comprehensive standard operating procedure for its employees in regards to responding to hazardous materials incidents. The program needs to abide by
current OSHA laws and reflect the knowledge that AMR is part of the emergency medical service community and needs to take the responsibility in protecting their employees and the community they serve. AMR needs to employ an OSHA certified OSHA instructor at the local level in order to provide competent training to the employees. The program needs to be reviewed and updated annually by all employees, they need to show competency in prior skills in the form of pre and post testing of employees as required by OSHA. Participation in the LEPC review of the Hazardous Materials Response Plan annually will generate adherence to the law. As an active partner in the emergency medical services community in implementing and advising on new policies and procedures and participation in drills will improve interagency communication. All the above recommendations are essential in protecting the health and safety of its employees and the community.

The recommendation for the LEPC is the need to update the response plan, which hasn’t been done since 1997. The LEPC needs to actively investigate all agencies for competency training in hazardous materials incidents and verify certification. The LEPC can appoint an advisory board to oversee the adherence to the law by all agencies involved and to ensure full cooperation and communication by the agencies. The LEPC needs to request another review of the local hospitals preparedness to accept patients involved in a hazardous materials incident. The current review does not include two hospitals built since the review. The local fire departments and the LEPC need to assist the CCHD
and the local hospitals in preparing for patients of a hazardous materials incident and to help local hospitals comply with OSHA regulations.

My strongest recommendation is that the state and local emergency medical service boards implement continuing education units in hazardous materials and emergency response. Continuing education units are required every two years by EMS personnel to maintain certification and the ability to work in their capacity. This would assure that every agency would be compliant with OSHA regulations and assure consistency in the material taught. The state and local authorities oversee all first responders and grant certification based on competency. Why not include continuing education units for hazardous materials? I believe this is the best solution to an already overlooked problem and it would prevent injury or death to the responders and the people they respond to. The community depends on the silent heroes of emergency medical services.
References


Steve McClintock-CCFD, personal interview, 10 Sep 1998.


Appendix A

Hazardous Materials All Around Us
Appendix B

Hazardous Materials Review
American Medical Response
1999
Hazardous materials (or toxicants) are materials that are capable of harming living organisms.

For a substance to be toxic, it must:

- Have physical and chemical properties capable of producing harm
- Be present in sufficient amounts to do harm
- Be present in sufficient amount of time
- Have a route of entry into the body
- Reach a susceptible body organ or tissue

If any of these criteria is not met, no toxic effect occurs.

In order to determine the likely effects of an exposure, you must know the substance’s potential toxic effects, the amount present, the route and conditions of exposure, and the characteristics of the exposed person. Two of the most important factors determining chemical toxic effects are:

- Concentration of the substance
- Duration of exposure

The dose of an agent is the amount that reaches the susceptible organ (also called the target organ). Since this is impossible to determine accurately, duration of exposure and concentration of the toxic substance are used to estimate the dose received by an organ. It is important to note the suspected dose when reporting information about the patient.

Toxic effects can be produced by acute or chronic exposure to substances. Acute exposure occurs when the exposure is short-term (over a few hours) and absorption occurs fairly rapidly. Chronic exposure occurs during long-term (over several days to weeks, or longer) or repeated periods of contact.

For many agents or chemicals, the toxic effects following a single exposure are quite different from those produced by repeated exposures. An acute exposure may have both immediate and delayed effects. Example: the immediate effects of carbon monoxide poisoning include symptoms such as headache, weakness, dizziness, and loss of consciousness. Days or weeks after “recovery,” there may be signs of brain impairment such as confusion, lack of coordination, and behavior changes.

Routes of Entry
Three major routes of entry allow toxins to enter the body. They are:
Common Marking Systems for Hazardous Materials

A. DOT System: The Department of Transportation regulates not only the packaging and vehicles used in transportation, but also the types of labels and placards that must be attached to both containers and vehicles. The presence of a placard indicates a dangerous substance is present: the information on the placard indicates the specific type of hazard.

1. Placards
   DOT placards are diamond-shaped (10 ¼" on each side) and generally must be affixed on each side and end of a vehicle carrying hazardous materials. All bulk carriers (those designed to carry over 110 gallons or 1,000 pounds or more) require placarding, regardless of the quantity being transported. Non-bulk containers may or may not require placarding, depending on the amount and type of material carried. Some classes of materials (Explosives, Dangerous When Wet, Poison Gas, Poison, Radioactive materials, require that a placard be displayed no matter what quantity is carrier. Placards provide recognition information in the colored background, the symbol on top, the UN class number at the bottom, and the hazard class or the identification number in the center.

2. Labels
   DOT labels are 4-inch diamonds (or smaller, for cylinders) affixed to non-bulk packages of hazardous materials. Unlike placarding, labeling is not limited to the material’s primary hazard. A package containing a material that meets the definitions of more than one hazard class must be labeled for each of those classes.

B. Hazard Class and Identification Numbers
   The UN (United Nations) hazard class number must appear in the bottom of the diamond on both placards and labels. All hazardous materials are assigned a 4-digit DOT identification number. This number can be used in conjunction with the DOT Emergency Response Guidebook to determine the name of the material as well as hazard and response information.

C. The NFPA 704 Marking System
   The National Fire Protection Association (NFPA) has developed a marking system for fixed sites to indicate the dangers associated with various hazardous material handled at a location. This marking system is not used in transportation and is not federally regulated or required. The NFPA marking system uses a diamond divided into color-coded quadrants. Each quadrant is a specific color and indicates a material’s health hazard, flammability, reactivity, or specific hazard. Health, flammability, and reactivity hazards are ranked from 0 to 4, with 0 indication no risk and 4 indicating the greatest risk.

D. Military Marking System
   The military has developed its own marking system which is sometimes used on military shipments and fixed site facilities. The system consists of four hazard classes and three special hazard symbols.

E. Other Placarding/Labeling Considerations
Appendix C

Interview with
Clark County Fire Department
Captain Osborn-Station24
Hazardous Materials Emergency Response Team

1. At what level of first responder training is the members of the HAZMAT team?
   Technician Level. All firefighters are trained to operational level.

2. How many people comprise the team on a normal duty day? All together?
   12 to a team and a minimum of 6 on duty

3. How many Hazmat calls do you average a year?
   Last recorded available was 93 in 1997. Just for CCFDs’ unit.

4. What is the most common type of Hazmat call?
   Drug Labs, Gasoline leaks and Carbon Monoxide

5. What do you think is the most overlooked hazardous material encountered for first responders?
   Potentially radiological, household chemicals and gasoline.

6. How much training does the Team receive versus non-team members?
   Annually?
   Greater than 300 hrs initial training. 40 hour refresher training.

7. What types of resource materials do the rescues have in the rig to help them identify a hazardous material?
   The primary being the North American or the DOT Emergency Response Guidebook, NFPA 704 placards are an example of some but the haz-mat unit has an extensive library and computer system with satellite hook ups that help facilitate a response.
8. EMS personnel must possess at the minimum a first responder awareness level training to be able to work in the cold zone of a response. Do you feel that this training is enforced throughout Clark County?

No. There is no accountability being enforced with training and refresher training. No local authority has taken on the role to supervise training and refresher training of personnel.

9. Why does Clark County only have two Hazmat Teams? Given the number of different fire departments-LVFD, NLVFD, HFD, CCFD, and BCFD?

The federal government provides funding for the HAZMAT Teams and it would not be economically feasible by government standards to have a team for every agency.