International Association of Fire Fighters®

Mini-Drill #001

Response to a Hazardous Materials Incident
Vapor Cloud Present

Developed by

Hazardous Materials / Weapons of Mass Destruction
Training Department

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Training Materials

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IAFF MINI-DRILLS

FACILITATOR INSTRUCTIONS

PURPOSE

The purpose of the IAFF Mini-Drill is to provide emergency responders with an opportunity to utilize their local jurisdiction's standard operating procedure / guideline (SOP / SOG) documents to address the issues present during an incident involving hazardous materials.

Each drill consists of:

- Facilitator Guide
- Photograph(s) or diagram(s) from an actual incident
- Incident information for each stage of the response process[1]
- Resource documents (e.g., Material Safety Data Sheet (MSDS) for the materials involved in a product release)

The length of each drill will vary by the incident and student involvement, and is intended to last between 1½ to 2 hours.

PROCEDURE

The Facilitator should:

1. Read through the Facilitator Guide prior to delivery with the students, note the points where the incident photograph, incident information and resource documents should be used. These areas are indicated by boxes and bold type.

2. Be familiar with local jurisdictional SOPs / SOGs that address the type of incident and adapt them to the situation presented.

3. Have a working knowledge of the definitions presented in the chemical and physical properties of hazardous materials.

4. Guide the discussion and make sure that it stays focused on the issues presented in the drill.

1 The systematic response process Analyze, Plan, Implement and Evaluate (APIE) correlates with the competencies outlined in NFPA® 472, Standard for Competence of Responders to Hazardous Materials / Weapons of Mass Destruction Incidents, 2008 Edition.

FACILITATOR GUIDE

TOPIC: Response to a Hazardous Material Incident

TIME REQUIRED: 1½ to 2 Hours

MATERIALS:

- Local jurisdiction Standard Operating Procedures/Guidelines
- Chalk or white board or large paper pad
- Chalk/markers
- Photograph of incident
- Resource document—MSDS for Anhydrous Ammonia
- Incident information—Analyze, Plan, Implement and Evaluate

MOTIVATION: During an emergency, the decisions and actions of the initial responders are critical to the successful outcome of an incident. This includes the rapid assessment of the situation, identification of the materials involved and establishing an Incident Action Plan (IAP). Personnel must be familiar with their jurisdiction's SOPs / SOGs and implement them effectively based upon the situation present.

OBJECTIVE: Given a photograph of an emergency incident, a resource document and incident information, the student will identify the appropriate actions to identify the hazardous material involved, perform a hazard and risk analysis and identify the incident priorities. The student should follow local jurisdictional SOPs / SOGs to establish an incident management system, based upon the National Incident Management System (NIMS) principles.

ENABLING OBJECTIVES:

1. Identify locations where hazardous materials may be present and how the locations relate to the type and quantity of materials present.

   - Residential
   - Commercial fixed sites
   - Transportation routes
   - Non-structural/outside locations

2. Use the MSDS to identify the following chemical and physical properties and how they relate to the release of a hazardous material.

   - Physical state
   - Vapor pressure
   - Boiling point
   - Vapor density
   - Specific gravity
   - Solubility
   - Flammability
     - Flash point
     - Ignition temperature
     - Flammable range
   - Toxicity
     - Routes of entry

3. Identify clues for recognizing hazardous materials.

   - Dispatch information
   - Occupancy and location
   - Container shape and size
   - Placards, labels and markings
   - Shipping papers and facility documents

4. Identify considerations when developing an Incident Action Plan (IAP) for an emergency response.

   - Incident priorities
   - Personal Protective Equipment (PPE)
   - Resources available
     - Personnel
     - Equipment
     - References
   - Incident Command System
     - Single command
     - Unified command
   - Accidental versus intentional

5. Identify benchmarks when evaluating effectiveness of emergency response actions.

   - Incident priorities
     - Successful completion
     - Deficiencies
   - Scene security
   - Termination activities

OVERVIEW:

- Hazardous materials locations
- Chemical and physical properties of hazardous materials
- Recognition of hazardous materials
- Incident Action Plan (IAP)
- Evaluation of emergency response actions

Introduction

Discuss the following with students.

Emergency responders must be able to quickly respond to emergency incidents, rapidly assess the conditions present and determine the incident priorities. When hazardous materials are involved, they must be able to perform a hazard and risk analysis and determine the appropriate strategy and tactics to produce a more favorable outcome.

Using the APIE process[1] will help responders during the decision-making process:

1. Analyze the problem.
2. Plan the response.
3. Implement the plan.
4. Evaluate the progress.

1 The APIE process is a simple response tool which provides a set of actions to implement for all emergency response situations—Analyze the Problem, Plan the Response, Implement the Plan and Evaluate the Progress. APIE is broad enough to be used for all types of response situations including fire, medical and HazMat / WMD incidents. The process is based on the tasks / competencies outlined in NFPA® 472, Standard for Competence of Responders to Hazardous Materials / Weapons of Mass Destruction Incidents, 2008 Edition.

Notes for Facilitator

Provide students with the photograph of the incident (Handout 1).

Review the information on the handout entitled *Analyze the Problem* (*Handout 2*) with students.

Discuss the considerations for analyzing the problem—the type of facility, chemical and physical properties (using the MSDS) and their effect on the incident.

Analyze the Problem

- Start with knowledge of area, pre-plans and previous experience
- Identify locations with hazardous materials
  - Residential
    - Normally do not have a large quantity
    - Small amounts of many substances
    - Materials involved in a fire produce hazardous gases
  - Commercial fixed sites
    - Manufacturing
    - Nature of site—chemical, industrial
    - Large quantity, small variety
  - Laboratory/research
    - Small quantities, large variety
    - Synergistic effect—what happens when mixed with other materials
    - Stability of materials, e.g., picric acid with presence of crystallization

- Transportation routes
  - Highway—location, quantity
  - Rail—location, quantity
  - Air—location, quantity
- Other non-structural/outside locations
  - Pipeline—location, quantity and type of material
  - Landfills

- Chemical and physical properties (use MSDS provided for discussion)
  - Physical state—solid, liquid or gas
  - Vapor pressure
  - Boiling point
  - Vapor density
  - Specific gravity
  - Solubility
  - Flammability
    - Flash point
    - Ignition temperature
    - Flammable range
  - Toxicity
    - Routes of entry
      - Inhale
      - Absorb
      - Ingest
      - Inject
    - Acute versus chronic effects

Notes for Facilitator

Review the information on the handout entitled *Plan the Response (Handout 3)*.

Give students the MSDS for chemical involved (Handout 4).

Discuss the considerations for planning the response.

Plan the Response

- Consider the following:
  - Dispatch information
    - Name of product, if known
    - Injuries, victims entrapped
    - Location
    - Actions being taken at scene
  - Occupancy and location
    - Type of facility and chemicals involved
    - Pre-plans available
  - Container shape and size
    - Transportation
    - Storage
  - Placards, labels and markings
    - DOT placards and labels
    - NFPA 704 Marking System
    - Military Marking System
  - Shipping papers and facility documents
    - Shipping papers
    - MSDS

Note for Facilitator

Review the information on the handout entitled *Implement the Plan (Handout 5).*

Discuss the actions for implementing the plan.

Implement the Plan

- Establish Incident Command System (ICS)
  - Scene control—establish zones
  - Incident Commander (IC) and command post identified
  - Single command versus unified command
  - Accidental release versus intentional release
- Develop an Incident Action Plan (IAP)
  - Identify incident priorities
    - Life safety
    - Incident stabilization
    - Property conservation
  - Resources and personnel available
    - References
    - Training of personnel
    - PPE requirements
    - Resources available
    - Decontamination requirements

Note for Facilitator

Review the information on the handout entitled *Evaluate Progress (Handout 6).*

Discuss the considerations for evaluating the progress.

Review the key points below.

Evaluate Progress

- Evaluate the status of the Incident Action Plan
  - Identify benchmarks to assist in identifying progress
  - Incident priorities
    - Life safety—rescue, treatment and transport of patients
    - Incident stabilization—scene stabilizing versus incident escalating
    - Property conservation—includes the environment
  - Identify any deficiencies in the IAP and determine cause(s)
    - Termination activities
    - Debriefing
    - Post-incident analysis
    - Critique

Review

- Hazardous materials locations
- Chemical and physical properties of hazardous materials
- Recognition of hazardous materials
- Development of an Incident Action Plan
- Evaluation of emergency response actions

Mini-Drill #001

Response to a Hazardous Materials Incident
Vapor Cloud Present
Handout #1

OBJECTIVE:

Given a photograph of an emergency incident, a resource document and incident information, identify the appropriate actions to identify the hazardous material involved, perform a hazard and risk analysis and identify the incident priorities. Follow local jurisdictional standard operating procedure / guideline (SOP / SOG) documents to establish an incident management system, based upon the National Incident Management System (NIMS) principles.

Handout #2

ANALYZE THE PROBLEM

On April 9, 2001, shortly before 4:00 a.m., fire fighters in Lincoln County, Missouri responded to a chemical leak from a tank at a large agricultural service company. Upon arrival, responders encountered a vapor cloud that was hanging over a three-acre wide area, caused by product that was flowing from an open valve. The cloud was temporarily held in place by a flood levy surrounding the plant. First responding units requested additional information from dispatch before determining their staging areas.

Handout #3

PLAN THE RESPONSE

The vapor cloud drifted more than 400 yards and eventually surrounded the first responding units. Five fire fighters were transported to a local hospital for treatment. Officials believed the major release of anhydrous ammonia, which is used in farming operations, was caused by someone trying to tap the chemical's tank for methamphetamine production. Responders retreated upwind approximately a quarter of a mile away from the cloud. Additional mutual aid responders from nearby St. Charles and Warren counties were mobilized to the scene.

Handout #4: Material Safety Data Sheet (MSDS)

LAROCHE INDUSTRIES INC. -- ANHYDROUS AMMONIA -- 0000-

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MSDS Safety Information
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MSDS Date: 02/01/1994
MSDS Num: CKVZT
Tech Review: 11/15/2000
Product ID: ANHYDROUS AMMONIA
Responsible Party
Cage: TO945
Name: LAROCHE INDUSTRIES INC.
Address: 1100 JOHNSON FERRY ROAD N.E.
City: ATLANTA GA 30342 US
Info Phone Number: 404-851-0300/404-491-7987
Emergency Phone Number: (800) 424-9300
Resp. Party Other MSDS No.: 5B81-83
Preparer's Name: R. C. CANNON
Chemtrec IND/Phone: (800)424-9300

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Contractor Summary
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Cage: TO945
Name: LAROCHE INDUSTRIES INC.
Address: 1100 JOHNSON FERRY ROAD N.E.
City: ATLANTA GA 30342 US
Phone: 404-851-0300/404-491-7987

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Ingredients
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Cas: 7664-41-7
RTECS #: BO0875000
Name: AMMONIA (NH3); % WT: C-GRADE = 99.5, P-GRADE = 99.995.
OSHA PEL: 35 MG/M3;50 PPM
ACGIH TLV: 17 MG/M3;25 PPM
ACGIH STEL: 24 MG/M3;35 PPM
EPA Rpt Qty: 100 LBS
DOT Rpt Qty: 100 LBS

Ozone Depleting Chemical: N

Cas: 7732-18-5
RTECS #: ZC0110000
Name: WATER (H2O); % WT: C-GRADE = 0.4, P-GRADE = 33 PPM.
OSHA PEL: NONE ESTABLISHED
ACGIH TLV: NONE ESTABLISHED
ACGIH STEL: NONE ESTABLISHED
Ozone Depleting Chemical: N

Name: OIL; % WT: C-GRADE = 0.1, P-GRADE = 2 PPM.
OSHA PEL: 5MG/M3
ACGIH TLV: 5MG/M3

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Health Hazards Data
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Route Of Entry Inds - Inhalation: YES
Skin: YES
Ingestion: NO
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO

Effects of Exposure:
IDLH LEVEL=500 PPM. AMMONIA IS A STRONG ALKALI AND READILY DAMAGES ALL BODY TISSUES. AMMONIA IS NOT A CUMULATIVE METABOLIC POISON, NOR IS IT A LISTED CARCINOGEN BY IARC, NTP OR OSHA. INHALATION:

DEPENDING ON EXPOSURE CONCENTRATION AND DURATION, EFFECTS CAN VARY FROM NONE OR ONLY MILD IRRITATION TO OBSTRUCTION OF BREATHING FROM LARYNGEAL & BRONCHIAL SPASM TO EDEMA AND SEVERE DAMAGE TO MUCUS MEMBRANES OF THE RESPIRATORY TRACT WITH POSSIBLE FATAL RESULTS. LATENT EDEMA AND RESIDUAL REDUCTION IN PULMONARY FUNCTION MAY OCCUR. SKIN CONTACT: PROLONGED CONTACT WITH HIGH CONCENTRATIONS CAN CAUSE PAINFUL (SIGNS AND SYMPTOMS OF OVEREXPOSURE).

Signs And Symptoms of Overexposure:
HEALTH HAZARDS - ACUTE/CHRONIC TISSUE DAMAGE, FROSTBITE AND SERIOUS CHEMICAL BURNS.

EYE CONTACT: EXPOSURE TO LIQUID OR HIGH CONCENTRATIONS OF VAPOR CAN CAUSE PAINFUL, INSTANT AND POSSIBLY IRREVERSIBLE DAMAGE TO TISSUES SUCH AS CONJUNCTIVA, CORNEA AND LENS. GLAUCOMA AND OPACITIES MAY OCCUR.

INGESTION: TISSUE DAMAGE, CHEMICAL BURNS, NAUSEA AND VOMITING CAN OCCUR. AMMONIA IS A GAS UNDER NORM AL ATMOSPHERIC CONDITIONS AND INGESTION IS UNLIKELY.
First Aid:

EYE CONTACT: FLUSH WITH LARGE AMOUNT OF WATER FOR AT LEAST 15 MINUTES THEN IMMEDIATELY SEEK MEDICAL AID.

INHALATION: REMOVE FROM EXPOSURE. IF BREATHING HAS STOPPED OR IS DIFFICULT, ADMINISTER ARTIFICIAL RESPIRATION OR OXYGEN AS NEEDED. SEEK IMMEDIATE MEDICAL AID. SKIN

CONTACT: IMMEDIATELY FLUSH WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CLOTHING. CLOTHING FROZEN TO SKIN SHOULD BE THAWED WITH WATER BEFORE REMOVAL. SEEK IMMEDIATE MEDICAL AID.

INGESTION: DO NOT INDUCE VOMITING. HAVE THE VICTIM DRINK LARGE QUANTITIES OF WATER IF CONSCIOUS. IMMEDIATELY SEEK MEDICAL AID. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

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Handling and Disposal
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Spill Release Procedures:
STOP LEAK IF FEASIBLE. AVOID BREATHING AMMONIA.
EVACUATE PERSONNEL NOT EQUIPPED WITH PROTECTIVE CLOTHING AND EQUIPMENT.
USE COPIOUS AMOUNTS OF WATER SPRAY OR FOG TO ABSORB AMMONIA VAPOR. DO NOT PUT WATER ON LIQUID AMMONIA. CONTAIN RUN-OFF TO PREVENT AMMONIA FROM ENTERING A STREAM, LAKE, SEWER OR DITCH. RELEASE OF 100 LBS. OR MORE OF AMMONIA WITHIN 24 HOURS MUST BE (SEE ECOLOGICAL INFORMATION)

Waste Disposal Methods: DISPOSE IAW ALL FEDERAL, STATE AND LOCAL REGULATIONS (FPN). RECOVER AMMONIA IF FEASIBLE. OTHERWISE, LET AMMONIA EVAPORATE IF APPROPRIATE. ONLY PERSONNEL EXPERIENCED IN AMMONIA SPILLS SHOULD ADD WATER TO LIQUID AMMONIA. DISPOSE OF DILUTED AMMONIA AS A FERTILIZER OR IN AN INDUSTRIAL PROCESS. EPA WASTE ID NO: NOT APPLICABLE.

Handling And Storage Precautions: REFER TO ANSI K81.1 STANDARD FOR STORAGE AND HANDLING INFORMATION. PROTECT CONTAINERS FROM PHYSICAL DAMAGE AND TEMPERATURES EXCEEDING 120F. USE ONLY APPROVED STORAGE SYSTEMS. ZINC, COPPER, SILVER, CADMIUM AND THEIR ALLOYS MUST NOT BE USED IN AMMONIA SYSTEMS SINCE THEY CAN BE RAPIDLY CORRODED BY IT.

Other Precautions: AVOID HYDROSTATIC PRESSURE, WHICH CAN CAUSE EQUIPMENT RUPTURE, BY ADHERING TO PROPER FILLING PROCEDURES AND THE USE OF HYDROSTATIC PRESSURE RELIEF VALVES WHERE APPROPRIATE. CONTACT LENSES MUST NOT BE WORN WHEN WORKING WITH AMMONIA.

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Fire and Explosion Hazard Information
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Lower Limits: 16% (IN AIR)
Upper Limits: 25% (IN AIR)
Extinguishing Media: WITH A SOURCE OF IGNITION, AMMONIA WILL BURN IN THE RANGE OF 16-25% IN AIR, USE WATER FOG OR SPRAY TO EXTINGUISH FLAMES.

Fire Fighting Procedures: USE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE EQUIPMENT (FP N). STOP FLOW OF GAS; MOVE CONTAINERS FROM FIRE ZONE IF POSSIBLE. STAY CLEAR OF TANK HEADS. USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS & PROTECT PERSONNEL. USE WATER SPRAY TO CONTROL VAPORS. (UNUSUAL FIRE & EXPLOSION HAZARD)

Unusual Fire/Explosion Hazard: PERSONNEL MUST BE EQUIPPED WITH APPROPRIATE PROTECTIVE CLOTHING AND RESPIRATORY EQUIPMENT. DO NOT PUT WATER ON LIQUID AMMONIA.

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Control Measures
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Respiratory Protection: RESPIRATORY PROTECTION APPROVED BY NIOSH FOR AMMONIA MUST BE USED WHEN EXPOSURE LIMITS ARE EXCEEDED. WHETHER A CHEMICAL CARTRIDGE RESPIRATOR OR A SELF-CONTAINED BREATHING APPARATUS IS SUFFICIENT FOR EFFECTIVE RESPIRATORY PROTECTION DEPENDS ON THE TYPE AND MAGNITUDE OF EXPOSURE.

Ventilation: LOCAL POSITIVE PRESSURE &/OR EXHAUST VENTILATION SHOULD BE USED TO REDUCE VAPOR CONCENTRATIONS IN CONFINED SPACES. AMMONIA VAPOR, BEING LIGHTER (SUPPLEMENTAL).

Protective Gloves: IMPERVIOUS GLOVES (FP N). RUBBER GLOVES (MFR).

Eye Protection: ANSI APPROVED CHEMICAL SPLASH GOGGLES, APPROVED FOR USE , (SEE WORK HYGIENE).

Other Protective Equipment: ANSI APPROVED EMERGENCY EYEWASH STATIONS AND DELUGE SHOWERS MUST BE AVAILABLE IN THE WORK AREA. POST A LIST OF EMERGENCY RESPONSE CONTACTS AND TELEPHONE NUMBERS. RUBBER OR OTHER

TYPES OF (SUPP DATA)

Work Hygienic Practices: EYE PROTECTION (CONT): WITH AMMONIA MUST BE WORN TO PREVENT EYE CONTACT WITH LIQUID OR VAPOR. A FACE SHIELD SHOULD BE USED FOR INCREASED PROTECTION FROM CONTACT WITH LIQUID.

Supplemental Safety and Health: VENTILATION (CONT): THAN AIR, CAN BE EXPECTED TO DISSIPATE TO THE UPPER ATMOSPHERE. AMMONIA CONCENTRATIONS MAY ALSO BE REDUCED BY THE USE OF AN APPROPRIATE ABSORBENT OR REACTANT MATERIAL. OTHER PROTECT EQUIPMENT (CONT): APPROVED PROTECTIVE CLOTHING SHOULD BE USED TO PREVENT SKIN CONTACT.

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Physical/Chemical Properties
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Boiling Point: =-33.2C, -28.1F
Melt/Freeze Pt: =-77.7C, -107.9F
Vapor Pres: (MM HG.)4802.9(94PSI)@60F
Vapor Density: 0.60 @32F
Spec Gravity: (H2O=1) 0.62 @ 60F
PH: OTHER INFO
Solubility in Water: 33% (WT) @68F
Appearance and Odor: COLORLESS GAS OR LIQUID WITH EXTREMELY PUNGENT ODOR.
Percent Volatiles by Volume: 100

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Reactivity Data
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Stability Indicator: YES ABILITY CONDITIONS TO AVOID).
Stability Condition To Avoid: HEATING ABOVE AMBIENT TEMPS CAUSES VAPOR PRESSURE OF AMMONIA TO INCREASE RAPIDLY. MATERIALS TO AVOID (CONT): TO FORM EXPLOSIVE FULMINATE-LIKE COMPOUNDS HAVE BEEN REPORTED.
Materials To Avoid: AMMONIA CAN REACT VIOLENTLY W/STRONG ACIDS. UNDER CERTAIN CONDITIONS, AMMONIA REACTS W/ BROMINE, CHLORINE, FLUORINE OR IODINE TO FORM COMPOUNDS WHICH EXPLODE SPONTANEOUSLY. REACTIONS OF AMMONIA W/GOLD, SILVER OR MERCURY
Hazardous Decomposition Products: HYDROGEN ON HEATING TO OVER 850F. THE DECOMPOSITION TEMPERATURE MAY BE LOWERED TO 575 F BY CONTACT WITH CERTAIN METALS SUCH AS NICKEL.
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: NOT APPLICABLE.

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Toxicological Information
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Toxicological Information: AMMONIA: FORMULA NH3, % WT. C-GRADE: 99.5, P-GRADE: 99.995. WATER: FORMULA H2O, %WT. C-GRADE: 0.4, P-GRADE: 33 PPM. OIL: %WT. C-GRADE: 0.1 P-GRADE: 2 PPM. INHALATION HAZARD.

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Ecological Information
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Ecological: SPILL/RELEASE (CONT): REPORTED TO THE NATIONAL RESPONSE CENTER AT 800-424-8802, AS WELL AS APPROPRIATE LOCAL AND STATE AGENCIES. IMMEDIATE (WITHIN MINUTES) REPORTING IS REQUIRED.

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MSDS Transport Information
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Transport Information: SHIPPING NAME: AMMONIA, ANHYDROUS, LIQUEFIED, 2.2, UN 1005, RQ, INHALATION HAZARD.

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Regulatory Information
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Sara Title III Information: NOTE: ANHYDROUS AMMONIA IS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA (1986, SECTION 313 OF TITLE III) AND 40 CFR PART 372.

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Other Information
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Other Information: NFPA: HEALTH - 3 (HIGH), FIRE - 1 (SLIGHT), REACTIVITY - 0 (LEAST). COMMON NAME: AMMONIA. MSDS CODE NO: 5B81-83. ORIGINAL ISSUE DATE: 8/85. REVISED: 2/94. PHYSICAL/CHEMICAL INFORMATION (CON'T): PH: APPROX. 11.6 FOR 1 N SOLUTION IN WATER.

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HAZCOM Label
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Product ID: ANHYDROUS AMMONIA
Cage: TO945
Company Name: LAROCHE INDUSTRIES INC.
Street: 1100 JOHNSON FERRY ROAD N.E.
City: ATLANTA GA
Zipcode: 30342 US
Health Emergency Phone: (800) 424-9300

Date Of Label Review: 11/15/2000
Chronic Hazard IND: N
Eye Protection IND: YES
Skin Protection IND: YES
Signal Word: DANGER
Respiratory Protection IND: YES
Health Hazard: Severe
Contact Hazard: Severe
Fire Hazard: Slight
Reactivity Hazard: None
Hazard And Precautions: IDLH LEVEL=500 PPM. AMMONIA IS A STRONG ALKALI & READILY DAMAGES ALL BODY TISSUES. INHAL: EFFECTS CAN VARY FROM MILD IRRIT TO OBSTRUCTION OF BREATHING FROM LARYNGEAL/BRONCHIAL SPASM TO EDEMA & SEVE RE DAMAGE TO MUCUS MEMBRANES W/POSSIBLE FATAL RESULTS. LATENT EDEMA & RESIDUAL REDUCTION IN PULMONARY FUNCTION MAY OCCUR. SKIN: PROLONGED CONTACT W/HIGH CONCENTRATIONS CAN CAUSE TISSUE DMG, FROSTBITE & SERIOUS CHEMICAL BURNS. EYE: EXPOS TO HIGH CONC OF VAP CAN CAUSE PAINFUL, INSTANT, & POSSIBLY IRREVERSIBLE DMG TO TISSUES, CONJUNCTIVA, CORNEA & LENS. GLAUCOMA & OPACITIES MAY OCCUR. INGEST: TISSUE D AMAGE, CHEMICAL BURNS, NAUSEA & VOMIT CAN OCCUR.

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Handout #5

IMPLEMENT THE PLAN

HazMat response teams were able to determine that the leak was coming from an 18,000 gallon horizontal storage tank of anhydrous ammonia. Fire fighters were able to get upwind from the cloud and move in from the north side, closing the main valve to the tank. Officials found that someone had sliced through a high-pressure hose to the tank, hack-sawed through the locks on the valves and then beat the caps off the valves in order to offload the product for an illegal methamphetamine laboratory. The tank was about 67% full prior to the leak, and dropped to about 60% before the leak could be controlled at the main valve. Investigators later determined that about 200 gallons of anhydrous ammonia had been released.

Handout #6

EVALUATE THE PROGRESS

The initial evacuation effort involved removing residents within a one-mile radius, including a section of Interstate Highway 70. About 250 people were evacuated from about 100 homes and another 5,000 were asked to stay indoors. Fire fighters in full protective gear also drove through the town to make sure that no one remained outdoors during the event. The local police were watching area hospitals for anyone with possible effects from the exposure such as chemically induced pneumonia, scarring of lung tissue or tissue burns. Of the approximately 700 methamphetamine labs discovered in Missouri last year, about one in ten was discovered through fire department responses to fires and HazMat spills.