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TO: Bob Whitlow

FROM: T. G. Grumbles

DATE: September 13, 1990

Interoffice  
Communication

VISTA

SUBJ: BENZENE, TOLUENE AND XYLENE EXPOSURE CONTROL PROGRAMS

Vista has benzene present at the Lake Charles Chemical and Lake Charles LAB plant and the Baltimore plant. The Baltimore plant also has toluene and xylene present. Based on the presence of these chemicals, exposure control programs and procedures are in-place to control workplace exposures. Below is a summary of those programs. It should be noted that benzene use is strictly regulated by the Environmental Protection Agency and the Occupational Safety and Health Administration. This regulatory control is enforced at a State and Federal level.

#### Employee Training

Vista has developed a training program for Benzene that covers general safety and health information on benzene and plant or location specific safe handling and emergency procedures. Employees are trained on an annual basis. The basic script for this program is attached.

The hazards of toluene and xylene are covered in the plants general hazard communication program.

#### Exposure Monitoring

Employee exposures to benzene are routinely monitored by personal exposure measurements and fixed-point area continuous monitoring. The frequency of personal monitoring varies at each location but exceeds OSHA monitoring requirements. A summary of benzene exposures at the LCLAB and Baltimore plants is attached. Benzene is a by-product of the ethylene production process at the LCCP. Due to a major turnaround and construction project on this unit, it was not possible to obtain routing exposure summary information. However, the results from monitoring done during the initial stages of the turnaround are described in the attachment.

Toluene and xylene exposure data for Baltimore is also included in the attachment.

The fixed-point area monitoring systems are used to measure ambient concentrations of benzene throughout the plants. Monitoring results are displayed in the control room and audible alarms set at specific concentration levels to provide early leak detection and assure the appropriate level of personal protective equipment is worn when responding to leaks.

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### Exposure Controls

Exposure controls consist of a combination of engineering controls, personal protective equipment (respirator) use and administrative procedures.

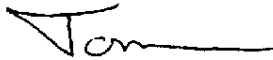
Exposure controls include equipment specifications to minimize fugitive emissions, closed process sewers, closed-loop sampling systems and localized exhaust ventilation where feasible.

All plants have specific, detailed respiratory protection programs specifying types of respirators to be used, conditions of use, training, and fit-testing. For the most part, Vista plants do not use air-purifying, negative pressure respirators for routine exposure controls. Air-supplied, positive pressure respirators, which provide a higher protection factor, are used in most routine jobs requiring respiratory protection.

Administrative procedures include work practices and policies dictating equipment preparation prior to opening, tank gauging, product loading and storage, and procedures to be used for other specific activities identified as having the potential for benzene exposure.

In addition to the above items all employees routinely exposed to benzene are provided the opportunity to take a multi-phasic physical exam designed to give early detection of benzene exposure effects. In the event of an emergency exposure, employees are required to participate in a urinalysis test that will help indicate if significant exposure has occurred.

In summary, Vista has formal programs in-place to control and monitor exposures to benzene, toluene and xylene in our manufacturing locations with the potential for exposures to these chemicals. Exposure monitoring results indicate current workplace exposure levels are well below applicable permissible exposure limits.

  
T. G. Grumbles

dlj

cc: R. D. Gamblin, J. A. DeBernardi

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BENZENE EXPOSURE DATA SUMMARIES  
PERSONAL, FULL-SHIFT MEASUREMENTS

|               | <u>BALTIMORE</u> | <u>LCLAB</u> | <u>LCLAB</u> |
|---------------|------------------|--------------|--------------|
| (ppm)         | 1990             | 1990         | 1989         |
| Concentration | No. of           | No. of       | No. of       |
|               | Measurements     | Measurements | Measurements |
| 0-0.59        | 83               | 82           | 117          |
| 0.6-0.99      | 4                | 0            | 0            |
| 1.0-5.0       | 3                | 0            | 1            |

LCCP benzene exposure measurements during recent ethylene unit turnaround: of 200 measurements made only one exceeded 1.0 ppm at 1.07 ppm.

All Baltimore toluene and xylene exposure measurements in 1989 and 1990 to date are less than 0.3 ppm.

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VIDEO

(Third Draft --- 7/17/88)

Super Name and Title

(Edit, add plant exteriors)

BENZENE:

WHAT IT IS

HOW IT AFFECTS YOU

WHERE IT IS FOUND

HOW TO PROTECT YOURSELF

OSHA REGULATIONS

General plant footage

AUDIO

Page 1

I. INTRODUCTION

(J.A. De Bernadi on Camera)

(Fade to Black)

(Music, not so loud)

Today we're going to discuss benzene.

We want you to know what it is...

How it can affect your health...

Where it is found in our plant...

How you can protect yourself...

And important information regarding the  
Occupational Safety and Health  
Administration, or OSHA, regulations for  
benzene.

If handled carelessly or unwisely,  
benzene can be very hazardous. We have  
developed engineering controls and safe  
work practices to reduce your exposure  
to benzene. As additional information  
becomes available, further efforts will

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*File - Projects  
Benzene Training  
film*

People working in plant

be made to develop controls and procedures to insure that your exposure to benzene is below the permissible exposure limits.

But achieving this requires your cooperation, and the purpose of this program is to give you information that will allow you to be a full partner in protecting your safety and health, and that of your fellow workers.

MSDS and other documents

Important written information on benzene, its hazards, regulations involving its use or manufacture, and safe practices for handling it, is available to you through your plant's existing hazard communication programs.

BENZENE:

UNDERSTANDING AND HANDLING  
ITS HAZARDS

What follows is an overview of the hazards posed by benzene, and the steps we will take together to handle them safely.

II. WHAT IS BENZENE?

Let's begin by explaining what benzene is, and how exposure to it can affect you.

List

Benzene is a clear, colorless liquid with a pleasant, sweet odor.

Person smells, notifies

If you believe you smell benzene you should notify your supervisor immediately, and take appropriate action to find the source.

List

Levels at which you can detect benzene's odor may be above those considered safe. This means it could harm you before you can smell it.

List

The chemical formula for benzene is  $C_6H_6$ . Some synonyms for benzene are Benzol, coal naptha, and phenyl hydride.

List

Benzene is flammable, and it's very volatile. It has a flash point of 12 degrees F.; an initial boiling point of 176 degrees F.; and a high evaporation rate. This means that significant vapor concentrations can build up even at a great distance from the point of release.

Benzene will float on water, having a specific gravity of 0.879, and a solubility in water of 0.06%, or only 600 parts per million.

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Benzene vapor is 2.7 times heavier than air, and will accumulate in low places such as sewers and trenches.

### III. HOW BENZENE CAN AFFECT YOUR HEALTH

(List)

Benzene can affect your health in a number of ways... if you inhale it, or if it comes in contact with your skin or eyes. Benzene is also harmful if you happen to swallow it.

#### Acute & Chronic Effects of Exposure

Benzene can have acute or chronic effects on your health.

#### Acute Effects (List)

Acute effects are those which occur rapidly: at the time of or soon after the exposure. Acute effects typically occur as a result of high exposures or exposure to the liquid.

#### Chronic Effects (List)

Chronic effects are those that occur over a long period of time, or after a long period of exposure to lower levels.

#### SHORT-TERM (ACUTE) OVEREXPOSURE:

Acute hazards of benzene include skin and eye irritation, and narcotic-like effects on the central nervous system.

(List)

If you are overexposed to high concentrations of benzene, well above the levels where its odor is first recognizable, you may feel breathless, irritable, euphoric, or giddy. You may experience irritation in eyes, nose and respiratory tract. You may develop a headache, feel dizzy, nauseated, or intoxicated. Severe exposures may lead to convulsions and loss of consciousness.

Exposures above 2,000 parts per million are considered to be immediately dangerous to life and health.

## LONG-TERM (CHRONIC) EXPOSURE:

Chronic hazards include disorders of the blood and blood-forming organs.

(List)

Repeated or prolonged exposure to benzene, even at relatively low concentrations may result in blood disorders, ranging from anemia to leukemia, an irreversible, often fatal blood cancer.

specify ?

Some blood disorders associated with benzene exposure may occur without symptoms.

(List)

Benzene can be absorbed through the skin, resulting in toxic effects.

(List)

Acute contact with the skin can produce redness or irritation. Prolonged contact with the skin can produce a dry, scaly type of dermatitis.

#### LIMITS FOR EXPOSURE

Because of the hazards of benzene, we have established specific limits for your permissible exposure.

(List)

In 1979, Conoco Chemicals established an internal exposure limit of 1 part per million on an 8-hour time weighted average basis, or TWA. Vista continued that internal exposure limitation.

In September 1987, OSHA revised their occupational exposure limit from 10 parts per million to 1 part per million for an 8-hour TWA, and 5 parts per million for a 15 minute TWA. This revision became effective in 1988.

Shot of the standard

Copies of the standard and the appendices are available to you upon request.

## AIRBORNE EXPOSURE

(List)

For airborne exposure, the maximum permissible exposure limit is 1 part of benzene vapor per million parts of air, as a time-weighted average, for an 8-hour workday. The maximum short-term exposure limit is 5 ppm, averaged over any 15 minute period.

## EYE/SKIN CONTACT

Eye and skin contact with benzene must be prevented.

IV. WHERE BENZENE IS FOUND  
IN THE PLANT

High exposures to benzene may be encountered in any area where benzene is processed or stored.

For example, high exposure can occur when you transfer benzene from one container to another. Such operations should be well ventilated and good work practices must be followed to avoid spills.

## Training session

You will be advised of all plant areas and operations where exposure to benzene could occur. If you ever have a question about a certain area, or suspect a leak or spill, see your supervisor at once.

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Regulated area in plant

Certain parts of the plant may be designated as Regulated Areas. These are areas where airborne concentrations of benzene exceed or may exceed the permissible exposure limits. These areas will be restricted to authorized persons, and respirators will be required.

The entrances to any regulated area will bear the following warning:

DANGER  
BENZENE  
CANCER HAZARD  
FLAMMABLE - NO SMOKING  
AUTHORIZED PERSONNEL ONLY  
RESPIRATOR REQUIRED

These regulated areas may be permanent, or they may be temporarily established during specified operations.

Show variety of containers

In addition to existing hazard communication signs, containers and process vessels with a 0.1% or greater content of benzene will bear this label:

DANGER  
CONTAINS BENZENE

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CANCER HAZARD

U. HOW YOU CAN PROTECT YOURSELF

Vista will be continuing various engineering controls and work practices to keep your exposure to benzene at or below the permissible exposure limits.

Workers in plant

In some situations, these steps alone are not enough, and we must use additional protective equipment.

RESPIRATORS

Respirators are required for those operations in which engineering or work practice controls are not feasible to reduce exposure to the permissible level, or where benzene is present in the workplace for less than 30 days per year.

(List)

Fit testing in progress

You will be supplied with appropriate respiratory protection equipment at no cost to you. Vista will perform tests to assure your respirator face piece fits properly, when you are first assigned to work in an area where benzene is made or used, and periodically thereafter.

Training in progress

Oista will provide you with thorough training in the use and limitations of the respiratory equipment you are required to use.

Worker using airline resp.

When you are required to use respiratory equipment, you must ensure the respirator is operating properly before beginning any work on equipment containing benzene, or entering any area known to be contaminated with benzene.

If you have any trouble with your respirator, leave the area and contact your supervisor for assistance immediately.

PROTECTIVE CLOTHING:

You must use protective clothing, such as boots, gloves, sleeves, aprons, and rain gear or slicker suits, over any parts of your body that could be exposed to liquid benzene.

EYE AND FACE PROTECTION:

If it is possible that benzene may get into your eyes, you must wear a face-shield, goggles, or both, depending on your particular situation. You must wear a face shield if your face could be splashed with liquid benzene.

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EMERGENCY AND FIRST AID PROCEDURES It is important that you know and follow specific emergency and first aid procedures, should any exposure to benzene liquid or vapors occur.

EYE AND FACE EXPOSURE:

Eye-wash scene

If benzene is splashed in your eyes, wash it out immediately with large amounts of water. If irritation persists or vision appears to be affected seek medical attention as soon as possible.

Notifying supervisor

If an injury occurs, follow established procedures for notifying your supervisor or the safety director regarding that injury.

SKIN EXPOSURE:

Washing arms

If benzene is spilled on your clothing or skin, remove the contaminated clothing and wash the exposed skin with large amounts of water and soap immediately. Wash contaminated clothing, including shoes and socks, before you wear them again.

AIRBORNE EXPOSURE:

If you or any other person breathes in large amounts of benzene, get the exposed person to fresh air at once.

(List)

Apply artificial respiration if breathing has stopped. Call for emergency medical assistance or a doctor immediately.

RESCUE PROCEDURE:

If it becomes necessary to enter a vessel or confined space for rescue purposes, follow the established rules and procedures for vessel entry.

SWALLOWING:

If benzene has been swallowed, do not induce vomiting. Call for emergency medical assistance immediately.

VI. MEDICAL SURVEILLANCE PROGRAM

(Dr. Drumwright On Camera)



Vista's medical surveillance program is designed to detect the early signs of toxic effects, particularly in abnormalities of red blood cells, white blood cells, and platelets.

(List)

All new employees will be given an initial exam and lab test with a complete blood count. For those employees who may be required to wear a respirator, pulmonary function tests will also be performed. Your medical history, specifically regarding bone

marrow problems and blood-related disorders, will become part of your records.

(List)

If you are exposed to benzene above permissible exposure limits, or if you have ever been exposed to 10 parts per million TWA or above, while employed by Vista, you will be provided with an annual medical examination and laboratory tests. These tests will be provided at no cost to you.

(List)

While these tests are not mandatory, you are encouraged to participate, as it is an integral part of our benzene safety and health program. If you decline, you will be asked to sign a waiver statement signifying that you were offered the opportunity and that you understand the risks of not participating.

(List)

If you are accidentally exposed to benzene, or may have been, Vista will make special laboratory tests available to you.

(List)

In the event of an emergency exposure, you will also be asked to provide a urine sample, on which a urinary phenol

test will be performed. This is a quick way to determine if your exposure to benzene may have been sufficient to cause adverse effects.

The purpose of this test is solely to detect possible health effects resulting from the exposure to benzene, and no other analysis will be performed.

Shots of records and notices

All medical records and exposure monitoring records are available to you by following currently established plant procedures. Notices are posted in the plants regarding procedures for obtaining these records.

(END OF DR. DRUMWRIGHT'S SECTION)

## VII. EXPOSURE MONITORING PROGRAM

(NARRATOR CONTINUES)

Vista makes periodic measurements to determine your exposure to benzene. We do this by taking breathing zone air samples from employees in areas where benzene may be present, and with continuous fixed-point monitoring.

Employee observing monitoring

You or your designated representative may observe the monitoring procedure.

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VIDEO

AUDIO

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Protective equipment in use

When monitoring takes place in an area where respirators or personal protective equipment must be worn, you or your representative will be provided with, and must use that equipment.

Notification posted

Within 15 working days of the receipt of the results of any monitoring performed, Vista will notify each employee of these results in writing, either individually or by posting the results in an appropriate and accessible location.

Close-up corrective action notice

Whenever permissible exposure levels are exceeded, the written notification will also contain the corrective action being taken to reduce your exposure, or will refer you to a document which states the corrective actions to be taken.

VIII. PRECAUTIONS FOR SAFE USE,  
HANDLING AND STORAGE

In addition to its health hazards, benzene also poses a severe danger of fire and explosion, if not properly handled and stored. We must all follow certain precautions for its safe use, handling and storage.

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Containers, close-up labels

Benzene liquid is highly flammable. Small containers containing benzene should be tightly closed, and stored in a cool, well ventilated area.

(List)

Benzene vapors may form explosive mixtures in air. The lower explosive limit is 1.3% or 13,000 parts per million.

(List)

Once again the flash point of benzene is 12 degrees F. In other words, at that temperature, benzene is releasing highly flammable vapors.

(List)

Exposure to heat or oxidizing materials increases benzenes instability.

Workers taking precautions

Whenever fire or explosion hazards are possible, all sources of ignition must be eliminated.

Use practices which will avoid sparking when opening or closing benzene containers, and be sure the containers are effectively grounded and bonded prior to opening or pouring.

No Smoking Sign

Smoking is prohibited in any area where benzene is used or stored.

Fire Extinguishers

Fire extinguishers are readily available. Know where they are located and how to operate them.

(List)

Appropriate first-aid extinguishers for benzene fires are carbon dioxide, dry chemical or halogen. Do not use a solid stream of water for fire fighting, since this will scatter and spread the fire. A fine water spray can be used to keep fire-exposed containers cool.

Existing graphic from old show?

Benzene vapors are heavier than air, and they can travel great distances along the ground and be ignited by open flames or sparks at some remote location.

Worker reports odor of benzene

That's one reason it's important to report any suspected leak or spill at once, and to be on guard if a spill occurs in another part of the plant.

Supervisor takes measurements  
(Show variety of devices used)

When in doubt, assume the hazard is real until measurements prove otherwise.

IX. STEPS IN CASE OF  
RELEASE OR SPILL

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Plant procedures have been established in the event a spill or release of benzene occurs.

Please refer to them for  
details etc. —

VIDEO

AUDIO

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continued safety of your fellow workers  
and yourself.

Vista Logo, Copyright

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If possible, small spills should be flushed to the plant sewer, to allow for treatment in the plant.

Benzene is a regulated hazardous waste for disposal purposes.

## XI. SUMMARY AND CONCLUSION

In this program, we have discussed what benzene is, where it is found in your plant, the hazards that it poses, and how we can handle them safely.

OSHA has now put into effect benzene exposure rules, establishing a limit of 1 part per million for an 8-hour time-weighted average, and 5 parts per million averaged over any 15 minute period.

The 1 part per million exposure limit has been in effect in our plants since 1979.

Copies of the benzene standard are available to you. Just ask your supervisor or plant safety director for details.

By understanding and following these procedures, you will help insure the