



Interoffice Communication

To "OSHA - Engineering and Work Control Plan" File
From J. P. Warner
Date October, 1977
Subject UPDATE OF ENGINEERING AND WORK PRACTICE CONTROLS PLAN

Attached is an update of this Plant's engineering and work practice controls plan for complying with the OSHA VCM Exposure Standard. This update is in the form of a Status Report keyed to the exposure sources listed in the April, 1975, plan (copy attached).

All work practice controls have been implemented and significant progress has been made on most of the engineering controls. Currently, however, we are having to rely on breathing air to limit the VCM exposure from some exposure sources.

J. P. Warner

J. P. WARNER
Process Engineer
CONOCO Chemicals
Oklahoma City Chemical Plant

APPROVED:

Ralph T. Ferrell

RALPH T. FERRELL
Plant Manager
CONOCO Chemicals
Oklahoma City Chemical Plant

JPW-spt
Attachment
CC: (RTF-File), AWS, DEM, RAF, JAW, JWW

CCR 000010508

STATUS REPORT - OCTOBER, 1977
UPDATE OF ENGINEERING AND WORK CONTROLS PLAN
FOR COMPLIANCE WITH OSHA VCM EXPOSURE STANDARD
CONOCO CHEMICALS
OKLAHOMA CITY CHEMICAL PLANT

EXPOSURE SOURCE

1. Residual monomer in slurry and resin.
2. Obtaining and handling samples.
3. VCM railcar unloading.

STATUS

1. All batches are routinely being steam stripped. The stripping operation has reduced VCM residual in the slurry to such a low level that it was possible to deregulate the dryer building. In addition, the Plant is air purging the slurry blend tanks to further reduce the VCM in the dryer feed.
2.
 - a. After evaluation of current sampling programs, our existing lab hood space was found to be adequate.
 - b. Work practice controls have essentially eliminated worker exposure from this source. Several preliminary designs for a closed reactor sampling system have been tested. Design work for a permanent system has been started.
 - c. The advent of steam stripping of all reactor batches and air purging of the slurry blend tanks has eliminated dryer line sampling exposure problems.
3. Work practice controls have essentially eliminated employee exposure to VCM from this source. A design to significantly reduce VCM releases when unloading railcars has been completed and is being tested at one unloading site.

CCR 000010509

EXPOSURE SOURCE

4. Chem wash screener.
5. Reactor rinse after dump.
6. M-500 dryer exhaust.
7. *All rotary seals, flexible hoses, pipe unions, and flanges, valve stems and swivel joints which are in low or high concentration VCM service.

STATUS

4. Steam stripping has significantly reduced exposure resulting from this source. Different steam stripping operating conditions are being investigated to determine their effect on residual VCM in the slurry and reactor vapor space. Information learned from these tests will be adopted into the Plant operating procedures.

A Plant test run on a new reactor cleaning system was completed in June, 1977. This system was no more effective than the existing cleaning system.
5. The initial rinse is now going to the sewer. This is done to minimize VCM at the slurry dump screener since the dump screener has a higher potential for VCM exposure.
6. Steam stripping has lowered the total VCM to the dryers by such a great amount that revisions to the exhaust stacks are not necessary.
7. Problems with fixed point monitor system located in the reactor area of the Plant has been greatly reduced due to a maintenance/training program set up with the manufacturer. The second fixed point monitor freed from the dryer building is in the process of being relocated to the reactor area. Both systems are being tied into a computer monitor which will allow continuous monitoring of the regulated areas. These changes will increase our capabilities to locate VCM leaks.

*The frequency of the extensive leak check has been reduced.
This is due to finding few and small leaks during previous checks.

EXPOSURE SOURCE

8. Opening and working on equipment or piping which may contain VCM in low or high concentrations.

STATUS

8. Specified work practices are being followed. Electropolished internals, continuous flushes of the reactor chem wash spray nozzles, and new spray nozzles have greatly reduced the need to open and clean the reactors. A system to reduce plugging in recovery systems by the injection of hydroquinone has been installed.

CCR 000010511

ENGINEERING AND WORK PRACTICE CONTROLS PLAN
FOR COMPLIANCE WITH OSHA VCM EXPOSURE STANDARD
CONOCO CHEMICALS
OKLAHOMA CITY CHEMICAL PLANT
April, 1975

EXPOSURE SOURCE

Residual monomer in
slurry and resin.

WORK PRACTICE CONTROLS

ENGINEERING CONTROLS

1. Design and install equipment required for steam stripping the slurry. Essentially all processing equipment downstream of the polymerization reactors is designed for atmospheric pressure and therefore open to the atmosphere. Processing slurry or resin in this equipment causes the emission of unreacted VCM which can lead to exposures above 1ppm. Plant tests have shown that steam stripping before dumping to the blend tanks substantially reduces the concentration of VCM in the slurry. Thus, the amount of VCM available for emission from the open processing equipment will be greatly reduced by steam stripping and exposure problems will be minimized. In particular, exposures at the dump screener, chemical wash screener, blend tanks, centrifuges, dryers, resin screeners and resin loading areas will be decreased and residual VCM in resin product leaving the plant will be decreased.

CCR 000010512

EXPOSURE SOURCEWORK PRACTICE CONTROLSENGINEERING CONTROLS

2. Obtaining and handling samples.

2. Wear personnel protection equipment which meets OSHA standards when sampling reactors, slurry, wet cake, or resin.

2. a) Install a new laboratory hood to provide more work and storage space for slurry and reactor samples.

b) Prepare an engineering design for a closed reactor sampling system. Samples obtained during the early part of reaction contain high concentrations of VCM. By enclosing the reactor sampling system, exposure in the reactor area will be decreased because VCM will not be emitted from the sample in the working area.

c) Prepare an engineering design for an improved resin sampling system at the M-500 dryer.

VCM rail car unloading

3. Wear personnel protection equipment which meets OSHA standards while at the unloading rack during car hook-up and disconnect.

3. Prepare an engineering design to install glasses in unloading lines and rearrange valving at the unloading racks. Installation of sight glasses will eliminate venting to the atmosphere when determining liquid to vapor transition at the end of unloading. Rearrangement of valving will minimize the volume vented during disconnect.

CCR 000010513

EXPOSURE SOURCE

WORK PRACTICE CONTROLS

ENGINEERING CONTROLS

4. Chemical wash screener.

4. Design and install an enclosure and vent system for the chemical wash screener similar to the system on the dump screener.

5. Reactor rinse after dump.

5. Transfer the effluent from the initial water rinse after reactor dump to the dump system and eliminate transfer to the sewer.

6. M-500 dryer exhaust.

6. Prepare an engineering design to elevate the stack for the M-500 dryer exhaust. Currently, M-500 exhausts at the loading rack level which leads to exposure problems under certain wind conditions. Stack elevation will eliminate this problem.

7. All rotary seals, flexible hoses, pipe unions and flanges, valve stems and swivel joints which are in low or high concentration VCM service.

7. At least once per month, measure VCM concentrations at all hoses, flanges, unions, seals, valve stems and swivel joints in low or high concentration VCM service. Repair or replace leakers on-the-spot, where necessary. List other leakers for repair or replacement on the maintenance schedule. The fixed point monitor will detect the occurrence of relatively large leaks which will be attended immediately.

CCR 000010514

EXPOSURE SOURCE

Opening and working on equipment or piping which may contain VCM in low or high concentrations.

WORK PRACTICE CONTROLS

8. a) Before opening, remove VCM from equipment or piping to the lowest practical level by flushing, purging and/or evacuation, where possible.
- b) Wear personnel protection equipment which meets OSHA standards when opening equipment or piping which may contain VCM.
- c) Before commencing repair work, measure the VCM concentration in or near opened equipment or piping to determine what protective equipment is required and if further VCM removal should be attempted.

ENGINEERING CONTROLS

8. Install electropolished internals in all reactors. Plant experience has shown that the frequency of reactor entries for cleaning is decreased when electropolished internals are used. This is due to a decrease in polymer build-up on electropolished internals as compared to the build-up on other internals. The plant has five sets of internals. Two sets are electropolished and installed. One set is at the shop for electropolishing. The other two sets will be electropolished when they can be switched out.