

OYSTER CREEK DIVISION
UNIT I VCM/EDC

INDUSTRIAL HYGIENE PROTOCOL 1983
COMPREHENSIVE

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OYSTER CREEK DIVISION, DOW CHEMICAL U.S.A.

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AUTHOR: Michael D. Reid

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DISTRIBUTION:

C. BIRD

D. GREEN

K. HUFF

S. GOODE

B. HOLDEN

K. WEST

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PURPOSE

In 1969 the vinyl chloride/ethylene dichloride (VCM-EDC) plant came on line in the Oyster Creek Division at Freeport, Texas. Since the initial start-up many operating conditions and plant facilities have been altered to optimize production. Many additions have been made such as vent collection systems and thermal waste disposal units which reduce or eliminate environmental emissions and subsequent employee exposure.

Since the recognition of vinyl chloride as a cancer suspect agent in 1974 and more specifically since the current OSHA VCM standard became effective in 1976, a great deal of attention has focused on evaluation employee exposures to VCM. Over 1000 eight hour TWA tests have been conducted in order to define employee exposures and evaluate control measures as they were implemented. Exposures to EDC and various chlorinated hydrocarbon by-products were also determined when sampling for VCM at this location. The effectiveness of the control measures mentioned is demonstrated by the fact that none of the in-plant job classifications experienced any overexposures to VCM during routine sampling performed in 1982.

Because the exposure guidelines for VCM and other indigenous compounds are very low, a comprehensive industrial hygiene survey is necessary in 1983 to insure continued minimal exposures. Evaluations for noise and chlorine exposure will be included with the chlorinated hydrocarbon determinations.

AIR SAMPLING PROCEDURE AND ANALYSIS

The determination of employee TWA exposure to chlorinated hydrocarbons will be achieved through the use of activated charcoal adsorption mediums and subsequent desorption in CS₂ and analysis by gas chromatography. The two specific methods used are the 3M #3500 Organic Vapor Monitor and commercial or hand loaded charcoal tubes with Sipin SP-1 personal monitoring pumps. Detailed procedures for each are included in the protocol supplement.

Portable hydrocarbon detectors will be used to determine instantaneous airborne concentrations of VCM and other hydrocarbons. The two types of instruments used are the HNU PI-101 photoionization detector and the Century OVA 108. The HNU uses a 10.2 eV ionization tube and is selective to VCM over most other compounds in the plant. The OVA has a flame ionization detector and measures total hydrocarbons. High readings from the OVA are identified by supplemental syringe grab samples analyzed via gas chromatography. Both the HNU and the OVA are calibrated with a certified NBS traceable 5 ppm VCM in air mixture purchase from Matheson. Calibration mixture quality assurance is performed upon delivery by G.C. cross analysis.

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