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LEAK DETECTION AND ELIMINATION PROGRAM

ABERDEEN CHEMICAL PLANT

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4

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TABLE OF CONTENTS

- A. GENERAL
- B. VINYL CHLORIDE CONTINUOUS MONITORING SYSTEM
- C. HNU PORTABLE HYDROCARBON DETECTORS
 - 1. INTRODUCTION
 - 2. OPERATION
 - 3. DETECTION PRINCIPLE AND THEORY
- D. TLV PORTABLE HYDROCARBON DETECTORS
 - 1. INTRODUCTION AND DETECTION PRINCIPLE
 - 2. OPERATION
- E. CONTINUOUS MONITORING SYSTEM - CALIBRATION AND MAINTENANCE PROCEDURES
 - 1. CALIBRATION
 - 2. MAINTENANCE
- F. HNU PORTABLE HYDROCARBON DETECTOR - CALIBRATION AND MAINTENANCE PROCEURES
 - 1. HNU CALIBRATION
 - 2. HNU MAINTENANCE
- G. TLV PORTABLE HYDROCARBON DETECTOR - CALIBRATION AND MAINTENANCE PROCEDURES
 - 1. TLV CALIBRATION
 - 2. TLV MAINTENANCE
- H. ROUTINE LEAK PATROL - DATA RECORDING AND HANDLING
- I. LOCATION OF CONTINUOUS MONITORING POINTS
- J. ACTION PLAN FOR LEAK ELIMINATION
- K. DEFINITION OF THE FIXED POINT MONITORING SYSTEM ACTION LEVEL AND A LEAK

LEAK DETECTION AND ELIMINATION PROGRAM

ABERDEEN CHEMICAL PLANT

LIST OF TABLES

TABLE 1	ANALYZER SECTION, OPERATING CONTROLS AND INDICATORS
TABLE 2	MONITOR MODULE, OPERATING CONTROLS AND INDICATORS
TABLE 3	SEQUENCER MODULE, OPERATING CONTROLS AND INDICATORS
TABLE 4	AMPLIFIER MODULE, OPERATING CONTROLS AND INDICATORS
TABLE 5	COMPONENT MODULE, OPERATING CONTROLS AND INDICATORS
TABLE 6	VALVE MODULE, OPERATING CONTROLS AND INDICATORS
TABLE 7	DUAL PREAMP MODULE, OPERATING CONTROLS AND INDICATORS
TABLE 8	SPECIFICATIONS FOR MODEL PI - 101 PHOTOIONIZATION ANALYZER
TABLE 9	BRIEF DESCRIPTION OF INSTRUMENT CONTROLS AND FUNCTIONS
TABLE 10	VERIFICATION OF ELECTRONIC ZERO FOR PHOTOIONIZATION ANALYZER
TABLE 11	RELATIVE PHOTOIONIZATION SENSITIVITIES FOR VARIOUS GASES
TABLE 12	SOME DERIVATIVES OF OLEFINS
TABLE 13	RELATIVE SENSIVITIES FOR VARIOUS GASES
TABLE 14	SPECTRUM ANALYSIS TROUBLESHOOTING CHART
TABLE 15	OVEN HEATING SYSTEM TROUBLESHOOTING CHART
TABLE 16	TLV TROUBLESHOOTING PROCEDURES
TABLE 17	LOCATION OF CONTINUOUS MONITORING POINTS
TABLE 18	ACTION LEVELS FOR LEAK DETECTION REPORTING AND ELIMINATION PROGRAM

LEAK DETECTION AND ELIMINATION PROGRAMABERDEEN CHEMICAL PLANTLIST OF FIGURES

FIGURE 1	CONTROL PANEL FUNCTIONS OF PHOTOIONIZATION ANALYZER
FIGURE 2	TIME RESPONSE FOR THE PHOTOIONIZATION ANALYZER
FIGURE 3	TYPICAL CALIBRATION CURVE FOR PHOTOIONIZATION ANALYZER
FIGURE 4	BLOCK DIAGRAM OF PHOTOIONIZATION ANALYZER
FIGURE 5	ELECTRICAL BLOCK DIAGRAM OF PHOTOIONIZATION ANALYZER
FIGURE 6	CALIBRATION PROCEDURE FOR PHOTOIONIZATION ANALYZER
FIGURE 7	COMPONENT PARTS OF PROBE
FIGURE 8	COMPONENT PARTS OF LAMP HOUSING
FIGURE 9	COMPONENT PARTS OF READOUT UNIT
FIGURE 10	POWER SUPPLY PC BOARD
FIGURE 11	TLV CIRCUITRY ADJUSTMENT POTENTIOMETER LOCATIONS
FIGURE 12	LOCATION AND ADJUSTING R-13
FIGURE 13	TLV SNIFFER CHASSIS SUBASSEMBLY

LEAK DETECTION AND ELIMINATION PROGRAM

ABERDEEN CHEMICAL PLANT

A. GENERAL

The emission standard for vinyl chloride requires the plant to have a formal leak detection program.

The Federal Register describes specific criteria which must be met within the program. This document describes the leak detection program. Each of the specific requirements will be met. Namely, this program describes:

The continuous VCM detection system which is used by the plant.

The portable hydrocarbon detectors which are used by the plant.

The calibration and maintenance procedures for the above equipment.

The Routine Leak Patrols and procedure when a leak is found by the portable hydrocarbon detector.

The location of the continuous monitoring points which are used for leak detection.

The criteria which will be used to identify the presence of an action level and a leak.

The action plan which will be used to eliminate a leak after it has been detected.

LEAK DETECTION AND ELIMINATION PROGRAMABERDEEN CHEMICAL PLANTB. VINYL CHLORIDE CONTINUOUS MONITORING SYSTEMIntroduction

The concentration of vinyl chloride in the atmosphere is continuously monitored by four flame ionization chromatographs, each of which is operated continuously. Each chromatograph is a Honeywell Model 1000 Process Gas Chromatograph manufactured by:

Honeywell Systems, Inc.
6625 McGrew Street
Houston, Texas

Each chromatograph sequentially measures, on a continuous basis, the vinyl chloride content in air samples taken from ten different locations. A total of forty (40) locations are monitored throughout the plant continuously and the concentrations at each point are recorded.

DescriptionAnalytical Technique

The Flame Ionization Detector used in the Honeywell 1000 Process Gas Chromatographs has a lower detection limit of 0.1 part per million.

The special-purpose elements of the FID chromatograph are a flame cell, an FID Electrometer Assembly, a Temperature Control/Inverter Assembly, and a plug-in FID Amplifier Module which mounts in the Control Section.

The flame cell consists of an ignitor wire, a hydrogen-fed burner, and an electron collector. Within the cell, hydrogen combustion occurs in an electrical field created by the voltage from the ionization inverter. Because of the carbon-free property of hydrogen, ionization occurs only when a carbon-bearing sample is injected into the flame. Ionization causes current to flow from the collector in direct proportion to the amount of the hydrocarbon elements present in the sample. The output current from the flame cell is routed through the Electrometer (Preamp) in the Analyzer, and is applied to the input of the FID Amplifier in the Control Section. The gain is made available for external recording.

The FID Electrometer Assembly is physically divided into two major subassemblies: the Power Supply-Electrometer P.C. Card Assembly, and the Electrometer P.C. Card Assembly. The electrometer power supply accepts + 20 volt inputs from the Control Section power supply, and produces regulated plus and minus 15 volt outputs for operation of the electrometer circuits and the inverter located on the Temperature Control/Inverter P.C. Card Assembly. The inverter output is a -100 volt ionization potential which is applied to the base (burner) of the flame cell.