Cytec Industries Inc.

Fortier Manufacturing Complex

Waggaman, Louisiana
Jefferson Parish

EPA I.D. No. LAD 008175390

Hazardous Waste
Permit Application

Volume III

June, 1998

Summary of Contents

Volume I
Summary of Contents
Table of Contents
Transmittal Letter
Computer Diskettes
IT Response
Certification
Form HW-1
Part I//Part A
Chapter Responses

Volume II
Appendices A through M

Volume III
Appendices N through Q

Volume IV
Appendices R through BB

Volume V
Appendices CC through JJ

Volume VI
Appendices KK through LL

Volume VII
Appendices MM through PP

TABLE OF CONTENTS

Appendix N	LAC 33:V.517.E LAC 33:V.1519.B
Appendix O	LAC 33:V.517.F LAC 33:V.1507
Appendix P	LAC 33:V.517.G LAC 33:V.1509.G
Appendix Q	LAC 33:V.517.I LAC 33:V.1513

Appendix N

LAC 33:V.517.E
LAC 33:V.1519.B

Waste Analysis Plan

WASTE ANALYSIS PLAN CERTIFICATION

I have performed an assessment of the attached Waste Analysis Plan for Cytec Industries Inc. - Fortier Manufacturing Complex, EPA I.D. No. LAD 008175390, located in Waggaman, Louisiana. The Waste Analysis Plan is certified in accordance with Louisiana Administration Code (LAC) 33:V.1519.D.

With regard to the above duty, I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Orey Tanner

Registered Professional Engineer

Louisiana No. 13618

Signed: Orey Tanner Jr.

Date: 6/1/98

Cytec Industries Fortier Plant	Dept: Environmental	Number: ES-02
	Date: 05/28/98	Issue No. 1
	Title: Waste Analysis Plan	Supersedes: New Page 1 of 16

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Update Responsibility : Process Owner - Hazardous Waste
Implementation Responsibility: Responsible Care Coordinator

Distribution List

Copy No.	Location
1	SET Department
Copies can be access through the Cytec Fortier Plant Intranet	

Reference Documents: **LAC 33:V.1519**

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TABLE OF CONTENTS

		PAGE
1	INTRODUCTION	3
	1.1 PURPOSE	3
	1.2 SCOPE	3
	1.3 DEFINITIONS	6
2	PROCEDURE	6
	2.1 FACILITY DESCRIPTION	6
	2.2 WASTE ANALYSIS PARAMETERS	6
	2.3 SAMPLING PROCEDURES	9
	2.4 LABORATORY ANALYTICAL PROCEDURES	13
	2.5 WASTE RE-EVALUATION FREQUENCY	15
	2.6 SPECIAL PROCEDURAL REQUIREMENTS	15
3	CERTIFICATION	16
4	RECORDKEEPING	16

ATTACHMENT 1 - Waste Stream Descriptions

ATTACHMENT 2 - Cytec-Fortier Hazardous Waste Facility List

ATTACHMENT 3 - Example Waste Removal Form

ATTACHMENT 4 - Typical Sampling Equipment and Sampling Techniques

ATTACHMENT 5 - Example Request for Analysis and Chain of Custody Forms

1 INTRODUCTION

1.1 PURPOSE

The purpose of this standard is to establish a written Waste Analysis Plan which outlines the procedures to obtain a detailed chemical and physical analysis of a representative sample of the waste in order to treat, store, or dispose of the waste in accordance with applicable regulatory requirements.

The purpose of a written Waste Analysis Plan is to enable facility personnel to properly identify and classify all wastes that are generated, treated, stored and disposed of to ensure proper management in accordance with applicable regulatory requirements.

1.2 SCOPE

A waste analysis plan is required for all Treatment, Storage and Disposal Facilities (TSDF's), as well as generators treating hazardous waste in tanks or containers to meet Land Disposal Restriction (LDR) standards.

Therefore, the scope of this standard applies to hazardous wastes generated on-site, managed in permitted hazardous waste units on-site and disposed of on-site.

State and federal regulations require that hazardous waste facilities develop and follow a written Waste Analysis Plan, which describes procedures for analyzing waste. Fortier has developed this plan, based on procedures, which have been followed in the past, to characterize wastes and to provide information to aid in their treatment, storage and disposal. This plan must be maintained on-site and used by the environmental personnel, in cooperation with the operating departments, whenever a new or unknown waste must be characterized and/or analyzed, or when existing wastes must be re-analyzed or re-characterized.

Existing waste streams have been studied and analyzed based on the generic plan outlined below. The results of this study have been summarized and are included in Attachment 1 as a specific waste analysis plan for waste streams treated, stored or disposed of on-site at Fortier.

1.3 DEFINITIONS

Analysis –The analysis may include data developed under LAC 33:V.Chapter 49 and existing published or documented data on the hazardous waste or on hazardous waste generated from similar processes, in addition to or in lieu of analytical data.

Authoritative Sampling – Technique where sample locations are selected based on detailed knowledge of the waste stream without regard to randomization. Applicable to waste streams where sufficient historical, site and process information is available to accurately assess the chemical and physical properties of waste. The validity of the sampling is dependent upon the accuracy of the information used and the rationale for the selection of sampling locations is critical and should be well documented.

Composite Sample – A number of individually collected samples that are combined into a single sample for subsequent analysis.

Equipment Blank – Equipment blanks are prepared prior to sampling by running pure deionized water over sampling equipment and collecting the water into a clean sample container. If the equipment blank is found to be contaminated, the source of the contamination could be assumed to be from the equipment used during the sample operations.

Field Blank – A field blank is prepared in the field by filling a clean container with pure deionized water and appropriate preservative, if any, for the specific sampling activity being undertaken. If contaminants are found to be present in the field blank, it might be assumed that environmental factors (such as airborne contamination), sampling procedures (causing cross-contamination), or equipment (that is contaminated) were contributing to the levels of hazardous waste constituents found in the waste.

Field Duplicates – Field duplicates are independent samples that are taken from the same location at the same time and are used to measure the effectiveness of obtaining representative samples. The precision (reproducibility of analytical data) resulting from field duplicates provides an accurate reflection of the variance inherent to the waste composition and the sampling technique.

Grab Sample – A sample taken from a particular location at a distinct point in time.

Process Knowledge – Process knowledge includes detailed information on the wastes obtained from existing published or documented waste analysis data that is current and accurate or studies conducted on hazardous wastes generated by similar processes. For example, waste described in the K, F, P or U lists have already been designated as hazardous by EPA. Therefore, with many listed wastes the application of process

knowledge is appropriate because the physical and chemical make up of the waste is generally well known and consistent from facility to facility.

Quality Assurance – Quality Assurance (QA) is the process for ensuring that all data and the decisions based on that data are technically sound, statistically valid, and properly documented.

Quality Control – Quality Control (QC) procedures are the tools employed to measure the degree to which these quality assurance objectives are fulfilled.

Random Sampling – Techniques where sample selection and location are determined through the application of statistical methods. Used to collect representative samples where data is insufficient to justify authoritative sampling.

> Simple Random – All locations/points in a waste or unit from which a sample can be attained are identified, and a suitable number of samples are randomly selected.
>
> Stratified Random – Areas of nonuniform properties or concentrations are identified and stratified (segregated). Subsequently, simple random samples are collected from each stratum of the waste or unit.
>
> Systematic Random – The first sampling point is randomly selected but all subsequent samples are collected at fixed space intervals (e.g., along a transect or time intervals).

Representative Sample – To be representative, a sample must be collected and handled by means that will preserve its original physical form and composition, as well as prevent contamination or changes in concentration of the parameters to be analyzed. For a sample to provide meaningful data, it is imperative that it reflect the average properties of the universe from which it was collected, that its physical and chemical integrity be maintained, and that it be analyzed within a dedicated quality assurance program. Samples containing organics must be collected in such a manner as to minimize the loss of organics, i.e. volatilization, to maintain sample integrity.

Split Samples – Split samples are collected by actually splitting a sample volume in half and dispensing it into two different containers. Typically, split samples are collected for enforcement purposes. The facility splits samples with the enforcement authority as a check on the facility's own analytical program and data recordkeeping.

Trip Blank – Trip blanks are sample containers that are prepared with an inert material (such as deionized water) that are carried into and out of the field but are not opened at

any time during the sampling event. If the trip blank is found to be contaminated, the source of the contamination would be assumed to be the container itself, the environment in which the trip blank was prepared, or some other source located outside the sample area.

Waste Analysis – Waste analysis involves identifying or verifying the chemical and physical analysis of a representative sample of the waste or, in certain cases, by applying acceptable knowledge of the waste.

2 PROCEDURE

2.1 FACILITY DESCRIPTION

2.1.1 Description of Facility Processes and Activities

Cytec Industries Inc. – Fortier Plant is a chemical manufacturing complex producing: acetonitrile, acrylamide, acrylonitrile, aminonitrile, ammonia, melamine, methanol, methyl methacrylate, and sulfuric acid. The raw materials used in the manufacturing process include, but not limited to natural gas (methane), caustic soda, various catalysts, acrylic acid, hydroquinone,: acetone, methyl isopropylketone, propylene, sulfur and toluene. Intermediates generated during the production process include, but not limited to : acetone cyanohydrin, hydrogen cyanide, urea, and carbon dioxide.

2.1.2 Identification / EPA Classification and Quantities of Hazardous Wastes Generated

The identification / EPA classification and quantities of hazardous waste routinely generated at the Fortier Plant are included in the Part A of the hazardous waste permit application. Brief summaries of routinely generated wastes are also included in Attachment 1. These summaries are intended as examples and are not intended to be all inclusive.

2.1.3 Description of Hazardous Waste Management Units

A description of the hazardous waste management units is included in the Part A of the hazardous waste permit application. A list of the hazardous waste management units is also included in Attachment 2.

2.2 WASTE ANALYSIS PARAMETERS

2.2.1. Criteria and Rationale for Parameter Selection

Before a waste is generated on-site (e.g. by a new process) or after a waste is accidentally generated (e.g., from a spill), the waste must be characterized for appropriate treatment, storage and disposal. Generally, all wastes can be

characterized without analyzing for specific parameters by studying the origin of the waste. Information regarding the waste may be obtained by reviewing the product Material Safety Data Sheet (MSDS) and/or other vendor data. In general, the characterization of a waste is documented on a form such as the FPF 240 Form and supplementary characterization form. Examples of these forms are included in Attachment 3. These forms are included solely as examples and are subject to change.

2.2.2 Process-Generated Waste Characterization
These wastes must first be characterized by developing mass balances for the generating process and by the use of published and documented information on identical or similar processes. By studying reaction products and originating streams, constituents of a waste are developed and categorized as hazardous or non hazardous.

2.2.3 Some of the wastes determined by studying their generating process include listed wastes (e.g., K011 – Bottoms stream from the wastewater stripper in the production of acrylonitrile), characteristic wastes (e.g., D002 – Corrosive waste acid), and waste containing listed compounds (e.g., U009 – Acrylonitrile commercial chemical product). By also studying published and documented data, wastes can be determined to be ignitable, incompatible or reactive and can be managed appropriately in segregated systems, if applicable.

2.2.4 Spill Generated Waste Characterization
These wastes are first characterized by determining the source of the spill. If the spill originates from a leaking process pipe, process vessel, storage tank or similar mechanism, the waste is known to consist of the material being transferred, generated or stored in the leaking equipment. If the spill is from a transporting vehicle or container (e.g., from a tank truck or drum), the waste will consist of the material contained in the source. Generally, spilled materials can be immediately identified as hazardous or non hazardous wastes because the source of the spill is immediately known. Again, since the waste is known, proper management can be determined and implemented to avoid commingling of ignitable, incompatible or reactive wastes.

2.2.5 Special Parameter Selection Requirements
Although all wastes will be generally known as to their makeup and classification based on the above procedures, it may become desirable to analyze the wastes for specific parameters to determine appropriate handling procedures. When this becomes necessary, the following parameters will be analyzed if the rationale for analysis meets the stated criteria:

2.2.5.1 Ignitability / Flash Point (EPA Waste Code D001)
A measure of flash point may be desired when a waste may be expected to come in contact with a heat or ignition source.

2.2.5.2 Corrosivity / pH (EPA Waste Code D002)
A measure of pH may be desired based on any of the following rationale:

1) The material is to be placed in a container or tank, which is not compatible with corrosive substances.
2) The material is to be placed in a cyanide or sulfide bearing waste stream. (Toxic cyanides and sulfides can be released on contact with low pH materials.)
3) The material is to be commingled with a corrosive waste. (Low and high pH materials can react with one another often generating excessive heat.)
4) The material is to be commingled with metal bearing materials. (Some metals will react violently with low or high pH material.)
5) The material may be mixed or washed with water or solvents. (These types of materials can react with low or high pH material.)

2.2.5.3 Reactivity / Cyanides (EPA Waste Code D003)
A measure of reactive cyanides or sulfides may be necessary to determine the compatibility of streams that may contain cyanides or sulfides.

2.2.5.4 Toxicity Characteristic Leachate Procedure (TCLP) (EPA Waste Codes D004-D043)
A determination of the mobility of organic and inorganic contaminants present in liquid, solid and multiphase wastes may be required to properly characterize the waste to determine treatment requirements and method of disposal.

2.2.5.5 Total Suspended Solids (TSS)
A measure or solids composition may be desired when the waste is to be sent through a system which will collect solids to determine the rate of solids accumulation and to determine whether a waste is a waste water or a non waste water as defined in the Land Disposal Restriction regulations. TSS measurements also may be desirable if there is a possibility that the system may be damaged by solids.

2.2.5.6 Paint Filter Liquids Test

A determination of the presence of free liquids in a waste may be required to determine storage and treatment requirements prior to transportation and method of end disposal.

2.2.5.7 Additional Parameters

A measure of any other parameters may be desired to more specifically characterize the waste as to actual composition. Such parameters in the past have included total metals, total volatile organics, organic vapor analysis, total organic carbon, and specific compounds, such as acrylonitrile, acrylamide, methyl methacrylate, etc...

2.3 SAMPLING PROCEDURES

2.3.1 Sampling Strategies and Equipment

Sampling methods outlined in EPA's "Test Methods for Evaluating Solid Waste", SW-846 and other EPA approved references, have been condensed and modified for use by Fortier personnel in sampling hazardous wastes whenever such sampling becomes necessary.

2.3.1.1 Strategy

The sampling strategy is intended to address the following factors:

- Objectives of collecting the samples;
- Types of samples needed (e.g., grab or composite);
- Selection of sampling locations (e.g. authoritative or random);
- Number of samples;
- Sampling frequency;
- Sampling collection and handling techniques to be used;
- Physical properties of the waste to be sampled;
- Chemical properties of the waste to be sampled; and
- Special circumstances or considerations (e.g., complex multi-phase waste streams, etc...).

Each sampling event will be evaluated and reviewed to ensure that the appropriate sampling strategy is employed.

2.3.1.1.1 Contained Systems

When hazardous wastes in contained systems (containers, tanks, etc...) must be sampled, a simple random, stratified random or systematic random approach should be developed to obtain a representative sample. The following is a suggested

strategy for sampling, but may be modified by the individual who is taking the sample. Visually survey the area and determine how many samples should be collected in order to obtain a representative sample over the entire unit or area. The grid system approach is most useful for obtaining samples from any specific layer and/or from all areas in a contained unit. Samples over a large area may be composited into one sample for analysis, but it is recommended not to composite more than 6 individual grab samples. Compositing of samples is not recommended when there is a possibility of masking localized high concentrations of contaminants.

2.3.1.1.2 Pipelines

When hazardous waste flowing through pipelines must be sampled, an authoritative sample consisting of either a grab or composite sample may be obtained from a valve during flow shutdown unless a sample can be bled off safely from the line during operation. If a contained system dedicated only to that pipeline (at the entrance or exit of the line) exists, samples may be obtained at this point instead. Any sampling method approved as a safe method can be used for sampling from pipelines.

2.3.1.1.3 Sampling of Limited Access Systems

Some contained systems may permit limited access to their contents, which restricts the locations from which samples can be taken. If sampling is restricted, the sampling strategy must be designed to take sufficient samples to address potential anomalies in the waste.

2.3.1.2 Equipment

The following criteria are considered when determining the most appropriate type of sampling equipment to use for a given sampling strategy:

2.3.1.2.1 Physical Parameters

Physical parameter factors to consider are free flowing or highly viscous liquids, crushed, powdered or whole solids, contained in soil or groundwater, homogeneous or heterogeneous, stratified, subject to separation with transport, or subject to other physical alterations due to environmental factors.

2.3.1.2.2 Chemical Parameters
The sampling equipment must be constructed of materials that are not only compatible with the wastes, but are not susceptible to reactions that might alter or bias the physical or chemical characteristic of the waste.

2.3.1.2.3 Waste-Specific or Site-Specific Factors
An example of a waste–specific factor is an oily waste that must be collected directly into the sample container to prevent the oil and grease from adhering to the sides of another container and rendering the sample unrepresentative of the waste stream. An example of a site-specific factor is accessibility.

2.3.1.2.4 Examples of the types of equipment typically used for sampling particular waste types are listed below:

Waste Phase	Equipment Used		
Liquids	Coliwasa	Weighted Bottle	Dipper
Solids	Trier	Thief	Auger
	Scoop		

Typical equipment descriptions and instructions for use are included in Attachment 4.

2.3.2 These sampling methods and equipment are examples. This list is not intended to be all inclusive. Sampling methods and equipment will be used that will ensure that representative samples are collected in a safe and environmentally friendly manner. Sampling equipment will be clean prior to use to prevent cross contamination of samples. Samples will be collected in order from least contaminated to most contaminated to further reduce the possibility of cross contamination. Sampling equipment may be disposable. If sampling equipment is reused, the sampling equipment will be thoroughly decontaminated prior to re-use to prevent cross contamination.

2.3.3 Samples may also be taken from tanks, containers and pipelines by used existing nozzles (i.e. sample ports or drain valves) on the respective equipment and collected directly into a sample container. Other types of equipment or variations on the sampling procedures may be used as required by the particular sampling circumstance in order to comply with SW-846, or other EPA approved methodology.

2.3.4 Sample Preservation and Storage

Samples will be collected in the proper size and type of sample containers for the specific analyses to be performed, as referenced in SW-846 or other EPA approved methodology. Likewise, the volume of the sample collected will be sufficient to perform the requested analyses, as referenced in SW-846 or other EPA approved methodology. Samples will be preserved in the recommended method for various constituents in accordance with SW-846 or other EPA approved methodology. Methods of preservation are relatively limited and are intended generally to 1) retard biological action; 2) retard hydrolysis of chemical compounds and complexes; 3) reduce volatility of constituents; and 4) reduce absorption effects. Preservation methods are generally limited to pH control, chemical addition and refrigeration. The samples will be analyzed within the maximum recommended hold time for samples properly preserved in accordance with SW-846 or other EPA approved methodology

2.3.5 Sampling QA/QC Procedures

Quality Assurance and Quality Control takes place initially by the items outlined previously. Personnel collecting the samples are trained and experienced to assure that the samples are taken with the same level of precision each time and following appropriate sampling strategies using the appropriate equipment. Laboratory procedures are performed in accordance with EPA approved methodology including the maintenance and calibration of equipment, analyses of field duplicates, split samples, spikes, field blanks, equipment blanks and trip blanks as applicable. The following procedures are utilized by Fortier Laboratory personnel to provide for a QA/QC system:

1) The use of EPA approved methods or equivalent.
2) Calibration of equipment prior to use and confirmation of calibration during analyses.
3) Routine maintenance of laboratory instrumentation.
4) Sample labeling and identification throughout the analytical procedure.
5) Ten percent of all tests run in duplicate and ten percent of all samples are spiked. Duplicate values and spike recoveries must be acceptable before data is approved and reported.
6) Periodic analyses are run on blind standards to test the accuracy of the technician and the precision of the instrument.
7) Reagents used are ACS grade reagents. All standard solutions are provided and verified by an independent laboratory or are produced internally. Internally generated standards are created using procedures documented in the Laboratory Quality Assurance Plan from reagent grade materials. Standard

creation and concentrations are included in the laboratory QA/QC documentation.

8) Regular participation in external laboratory evaluations to determine the accuracy and overall performance of the laboratory.
9) Participation in the EPA Round Robin program to verify laboratory accuracy.

2.3.6 Chain of Custody

Chain of custody procedures involve the documentation of sample possession from the time of collection to the time that the samples are shipped off-site for analyses or disposed. At a minimum, the following information will be recorded when samples of waste or treatment residuals are collected:

1) the type of waste collected, including a brief description;
2) names and signatures of samplers;
3) date and time of collection and designation as a grab or composite including what type of composite;
4) signatures of any persons involved in the transfer of samples;

Sample collection is documented on a Chain of Custody and a Request for Analysis form. Examples of these forms are included in Attachment 5. These forms are subject to revision, but the basic content of the forms will be in compliance with applicable regulations.

2.3.7 Health and Safety Protocols

Safety and health considerations are taken into consideration when conducting sampling at the Fortier Plant. Employees who perform sampling activities should be trained with respect to the hazards associated with the waste materials, as well as with any waste handling procedures that will assist in protecting the health and safety of the sampler. The employees are trained in the proper protective clothing and equipment that must be used when performing sampling activities.

2.4 Laboratory Analytical Procedures

2.4.1 Selecting a Laboratory

In general, the samples are almost always submitted to the Fortier Plant Main Laboratory for analyses. If the Main Laboratory is unable to perform the requested analyses within the specified time frame, then the samples may be sent to a contract, commercial laboratory for analyses. The contract, commercial laboratories used to perform the analyses will be requested to supply appropriate QA/QC data to support the analyses.

2.4.2 Selecting Testing and Analytical Methods

The test methods for analyzing for any specific parameters are specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as revised as incorporated by reference at LAC 33:V.110, or an equivalent method approved by the administrative authority. The following table provides examples of the appropriate method number and reference for specific parameters and is not intended to be all inclusive. In addition, Cytec will use the most current version of the appropriate method at the time of analysis.

Test	Method
Ignitability / Flash Point	1010 (1)
	1020A (1)
	1030 (1)
Corrosivity / pH	1110 (1)
	9040B (1)
	9045C (1)
Reactivity / Cyanides	9010B (1)
Site Specific Waste Components	8015B (1)
(Acrylonitrile, Acetone	8260B (1)
Acetontirile,, Acrolein,	8270C (1)
Methyl Methacrylate, etc.)	8315 (1)
Acrylamide	8310 or 8316 (1)(4)
Paint Filter Liquids Test	9095A (1)
Toxicity Characteristic Leachate Procedure	1311 (3)
Metals	7000 series (1)
Organics	8000 series (1)
TSS	160.3 (2)
TOC	9060 (1)
Organic Vapor Analysis	Method 21 (5)

(1)Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, U.S. EPA, November 1986 through current revision.

(2) Methods for Chemical Analysis of Water and Waste, EPA –600/4-79/020, U.S. EPA, March 1979 through current revision.

(3) 40 Code of Federal Regulations: Part 261, Appendix II – Method 1311, Toxicity Characteristic Leachate Procedure.

(4) Method 8310 and 8316, modified for mobile phase and detection wavelength.

(5) 40 Code of Federal Regulations, Part 60, Appendix A

2.5 Waste Re-evaluation Frequencies

2.5.1 The analysis of wastes generated at the Fortier Plant will be reviewed or repeated as necessary to ensure that it is accurate and up to date. At a minimum, the analysis will be reviewed or repeated when there has been a change in process conditions, mechanical modifications, rerouting or diversion of waste streams, or any other condition that could materially change the characteristics or identification of the waste.

2.5.2 Plant operations personnel should notify an environmental representative whenever any of the conditions in Section 5.1 have occurred, to allow the environmental representative the opportunity to evaluate the waste stream in cooperation with operations personnel either by analysis, mass balance or other means of acceptable knowledge.

2.6 Special Procedural Requirements

2.6.1 Procedures for Ignitable, Reactive, and Incompatible Wastes
The Fortier Plant operating procedures are designed to properly manage ignitable, reactive and incompatible wastes. In general, these types of wastes are separated and protected from sources of ignition or reaction including but not limited to: open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical and mechanical) spontaneous ignition from exothermic reactions and radiant heat. Cytec does not allow smoking anywhere within the operating area. Smoking on-site is restricted to designated smoking areas. Cytec requires that activities that have the potential to generate heat or sparks can only be performed after the issuance of a "Hot Work Permit', which is part of the "Safety Work Permit" procedure. Cytec has a decontamination procedure that prevents mixing of potentially incompatible wastes. These types of wastes will be managed appropriately to minimize and / or eliminate threats to human health or the environment.

2.6.2 Procedures for Determining Volatile Organic Content
The applicability of certain regulations depends on the concentration of volatile organics in the waste streams. The procedures outlined in this plan will be used to determine the volatile organic content as it applies to those regulations. Sampling procedures should minimize the loss of compounds due to volatilization, biodegradation, reaction or sorption during the sample collection, storage and preparation steps.

2.6.3 Procedures to Ensure Compliance with LDR Requirements

Fortier will either test the waste, test an extract of the waste using approved test methods (i.e. TCLP), or use process knowledge of the waste to determine if the waste is restricted from land disposal. Fortier will also determine the underlying hazardous constituents of ignitable, corrosive and organic toxicity characteristic wastes, as applicable. TSS and TOC may be analyzed to determine whether the waste meets the definition of wastewater or nonwastewater as it relates to the land disposal restrictions. Fortier will comply with applicable regulations by:

1) notifying in writing any subsequent facilities that will treat, store, or dispose of the waste of its Land Disposal Restriction (LDR) status;
2) determine if treatment residues meet the established treatment standards;
3) assure that the wastes or treatment residues are in compliance with applicable LDR treatment standards before land disposal, if applicable; and
4) maintain documentation that the wastes meet the LDR standards for the specified length of time.

3 Certification

The Waste Analysis Plan has been certified by a Louisiana licensed professional engineer (PE), in accordance with applicable regulations.

4 Recordkeeping Requirements

4.1 A copy of the Waste Analysis Plan must be kept at the Fortier Plant.

4.2 Waste analysis regarding hazardous waste containers and compatibility testing must be placed in the operating record of the Fortier Plant.

ATTACHMENT 1 – WASTE STREAM DESCRIPTIONS

Waste Stream	**MISCELLANEOUS EFFLUENT STREAM (MET)**
Generating Process:	Production Plant Runoff (Acrylonitrile Plant, Methyl Methacrylate Plant, Acrylamide Plant and Aminonitrile Plant); deepwell backwash fluid, RCB waste and filter backwash, tank farm washdowns, tank scrubber water, railcar washouts (deminimus losses), hazardous waste area washdowns/cleanouts, product and hazardous waste area spills, off spec products, acrylonitrile column flushes, acrylonitrile stripper overheads, Acrylonitrile and Methyl Methacrylate Plant seal/knockout pot discharges, MET scrubber water, off-specification laboratory samples. Non-hazardous emergency routing (Acrylonitrile Coag, Melamine effluent, Fortier intercept ditch).
Waste Characteristics:	Corrosive Ignitable Reactive (Cyanides) Wastewater Column Bottoms Recovery Column Bottoms Acetone Cyanohydrin Acetone Acetonitrile Acrylamide Acrylic Acid Acrylonitrile Methanol Methyl Methacrylate Toluene
Waste Codes:	K011 K013 D001 D002 D003 D008 F001 P030 P063 P069 U002 U007 U008 U009 D018 U154 U162 U220 U003 D007 D038 F002 F003 F004 F005 U092 D035 D043
Sampling Method:	If necessary, via contained system or pipeline strategy at MET tanks or in the piping system.
Analytical Parameters:	None.
Analytical Method::	Not Applicable.
Rationale:	Known to contain above-identified waste by virtue of the generator knowledge.
Frequency of Analysis:	Need for analysis will be reevaluated when process or operation changes so require.
Waste Management:	From generating process to the pretreatment system to deepwell disposal.

Waste Stream:	**WASTEWATER COLUMN BOTTOMS (WWCB)**
Generating Process:	Acrylonitrile Production
Waste Characteristics:	Listed waste of LAC 33:V.4901.C. (Bottom stream from the wastewater stripper in the production of acrylonitrile); Reactive (cyanides); Benzene [1]; Pyridine
Waste Codes:	K011, D003, D018[1], D038
Sampling Method:	If necessary, via pipeline strategy at the effluent from the treatment system.
Analytical Parameters:	None
Analytical Method:	Not applicable
Rationale:	Known to contain above identified wastes by virtue of generating process.
Frequency of Analysis:	Need for analysis will be reevaluated when process or operation changes so require
Waste Management:	To WWCB Pretreatment System for filtration then deepwell disposal

[1]Benzene has not been detected above the detection limit for several years. Therefore, D018 is not currently used to identify WWCB.

Waste Stream:	**RECOVERY COLUMN BOTTOMS (RCB)** **(Formerly Net Stripper Bottoms)**
Generating Process:	Acrylonitrile Production
Waste Characteristics:	Listed waste of LAC 33:V.4901.C. (Bottom stream from the acetonitrile column in the production of acrylonitrile).
Waste Codes:	K013
Sampling Method:	If necessary, via pipeline strategy at influent to or effluent from treatment system as appropriate due to system configuration.
Analytical Parameters:	None
Analytical Method:	Not applicable.
Rationale:	Known to contain above identified wastes by virtue of generating process.
Frequency of Analysis:	Need for analysis will be reevaluated when process or operation changes so require.
Waste Management:	From the generating process to the pretreatment system to deepwell disposal.

Waste Stream:	**MMA WASTE ACID**
Generating Process:	Methyl Methacrylate Production
Waste Characteristics:	Corrosive (pH <2)
Waste Codes:	D002
Sampling Method:	If necessary, via pipeline strategy.
Analytical Parameters:	pH
Rationale:	Measure of corrosivity
Analytical Method:	9040B (SW 846)
Frequency of Analysis:	Need for analysis will be reevaluated when process or operation changes so require.
Waste Management:	Waste acid is directly piped to the Acid Plant for recovery. A portion of the acid stream is diverted on an as needed basis to the deepwells for pH and injection fluid density control.

ATTACHMENT 2
HAZARDOUS WASTE FACILITY LIST

CYTEC FORTIER

HAZARDOUS WASTE FACILITIES INSPECTION LIST

ACYRLONITRILE INSPECTION AREA

1) **WWCB Injection Well Pretreatment System Consisting of:**
   a) Catalyst Settling Tank TA-403
   b) Primary Filter Feed Tank TA-404
   c) Secondary Filter Feed Tank MF-307
   d) WWCB Well Injection Tank TA-402
   e) WWCB Backwash Tank - North TA-501 A
   f) South WWCB Backwash Tank TA-501 B
   g) WW Primary Filters (2) F-401 A and B
   h) WW Secondary Filters (2) F-401 C and D
   i) WW Cartridge Filters (4) CF-401 A, B, C, and D

2) **RCB Injection Well Pretreatment System Consisting of:**
   a) RCB / MET Backwash Tank 100-6 *
   b) RCB Filters (3) 100-5 A, B, and C

3) **Miscellaneous Effluent (MET) Well Pretreatment System Consisting of:**
   a) MET Injection Tank T-500
   b) MET Filters (4) HRD-V50 A, B, C, and D

4) **Underground Injection Wells**
   a) Well No. 1
   b) Well No. 2
   c) Well No. 3
   d) Well No. 4
   e) Well No. 5

UTILITIES INSPECTION AREA

1) Impound No. 1 (Closed Unit)
2) Impound No. 3 (Closed Unit)
3) Miscellaneous Effluent Tank 1 MET-1
4) Miscellaneous Effluent Tank 2 MET-2
5) Container Storage Building

ACRYLAMIDE INSPECTION AREA

1) Ancillary piping associated with the Miscellaneous Effluent (MET) header

METHYL METHACRYLATE INSPECTION AREA

1) MMA Lab Collection Tank 101-52
2) Ancillary piping associated with the Miscellaneous Effluent (MET) header

* Tank is shared between the RCB and Miscellaneous Effluent Pretreatment systems.

Note: All units may also accumulate hazardous waste in containers subject to 90-day storage limitations under RCRA.

ATTACHMENT 3
EXAMPLE WASTE REMOVAL FORM

FPF-240
Rev. 4/88

WASTE REMOVAL FORM

Sequence No.: _____ Disposer Req. No.: _____

Department: _____ Transporter Req. No.: _____

Charge code: _____ Maintenance Ord. No.: _____

SECTION I — REMOVAL REQUEST (Completed by Generator)

Material description: _____

Waste contaminated with _____

Estimated quantity _____ pounds, tons gallons, yards

Properties (circle all applicable): odorous, reactive, corrosive, toxic, flash point: < 200°F, < 140°F; vapor pressure ≥ 74mmHg, liquid, solid, sludge, other _____

Metals (circle if traces present): Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Other _____

Special handling: _____

Suggested disposal method: _____

Date removal required: _____

Signature: _____ Date: _____

SECTION II — REMOVAL APPROVAL (Completed by Environmental)

Non-regulated ☐ Regulated Non-Hazardous ☐ Hazardous ☐

Final Deposition: On-Site ☐ Off-Site ☐

Location: _____

Method: _____

State/EPA Waste No.: _____ Disposer Waste No.: _____

DOT Description: _____

Comments: _____

Approval valid for: one time, one job, one year, expires _____

Environmental Signature: _____ Date: _____

SECTION III — REMOVAL INFORMATION (Completed by Generator)

If placed in EOP facilities, Utilities Supervisor signature: _____

Where was waste placed? _____

Quantity removed: _____ pounds

Generator signature: _____ Date: _____

DISTRIBUTION:

White: Environmental (Final) Yellow: Generator Pink: Environmental (First)

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1. Describe waste: _____

_____

Source of waste: _____.

2. Please circle every item listed below which could potentially exist in the waste because of either contamination or presence in the original composition.

Arsenic	Barium	Cadmium	Chromium
Lead	Mercury	Selenium	Silver
Acetone	Acetonitrile	Acrolein	Acrylamide
Acrylic acid	Acrylonitrile	Benzene	Chloroform
Cresol	Cyanide	Methanol	MMA
Pyridine	Sulfides	Toluene	Xylene

Carbon tetrachloride	Dichlorobenzene
Dichloroethane	Dichloroethylene
Dimethylamine	Dinitrotoluene
Methyl ethyl ketone	Nitrobenzene
Tricholorethane	Trichloroethylene
Vinyl chloride	

Oil or grease	Flammable	Reactive
Pesticides	high pH	
Herbicides	low pH	

3. List any other material which could contaminate the waste. Include any nonhazardous process chemicals and products.

_____ _____

_____ _____

4. Waste characterization status (circle one)

A. Waste does contain circled and/or listed components.

B. Waste could be contaminated and requires analysis for the circled and/or listed components.

C. I certify that the waste is not contaminated and does not contain any of the components listed above.

Signature _____ Date _____

ATTACHMENT 4
TYPICAL SAMPLING EQUIPMENT
AND
SAMPLING TECHNIQUES

TRIER

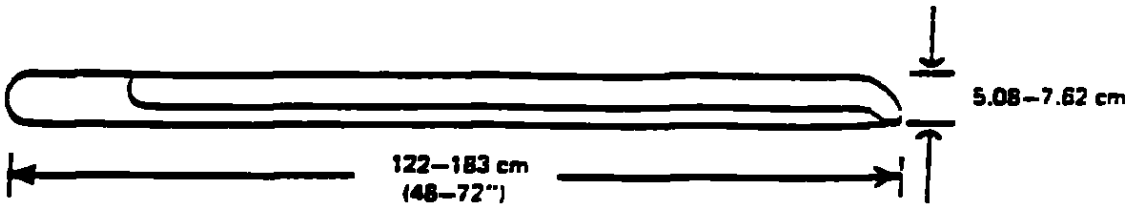
Scope and Application

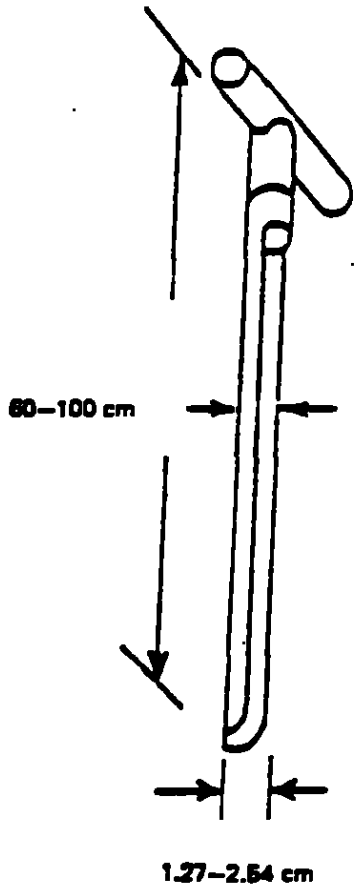
A trier consists of a tube cut in half lengthwise with a sharpened tip that allows the sampler to cut into sticky solids and loosen soil. A trier samples moist or sticky solids with a particle diameter less than one-half the diameter of the trier.

Procedure

1. Clean trier.
2. Insert trier into waste material 0 to 45° from horizontal. Rotate trier to cut a core of the waste. Remove trier with concave side up and transfer sample to container.

DIAGRAM OF TRIER





DIPPER

Scope and Application

The dipper consists of a glass or plastic beaker clamped to the end of a two or three-piece telescoping aluminum or fiberglass pole which serves as the handle. A dipper samples liquids and free-flowing slurries.

General Comments and Precautions

1. Do not use a nonfluorocarbon plastic beaker to sample wastes containing organic materials.

2. Do not use a glass beaker to sample wastes of high pH or wastes that contain hydrofluoric acid.

3. Paint aluminum pole and clamp with a two-part epoxy or other chemical-resistant paint when sampling either alkaline or acidic wastes.

Procedure

1. Clean beaker, clamp, and handle.

2. Assemble dipper by bolting adjustable clamp to the pole. Place beaker in clamp and fasten shut.

3. Turn dipper so the mouth of the beaker faces down and insert into waste material. Turn beaker right side up when dipper is at desired depth. Allow beaker to fill completely as shown by the cessation of air bubbles.

4. Raise dipper and transfer sample to container.

DIAGRAM OF DIPPER

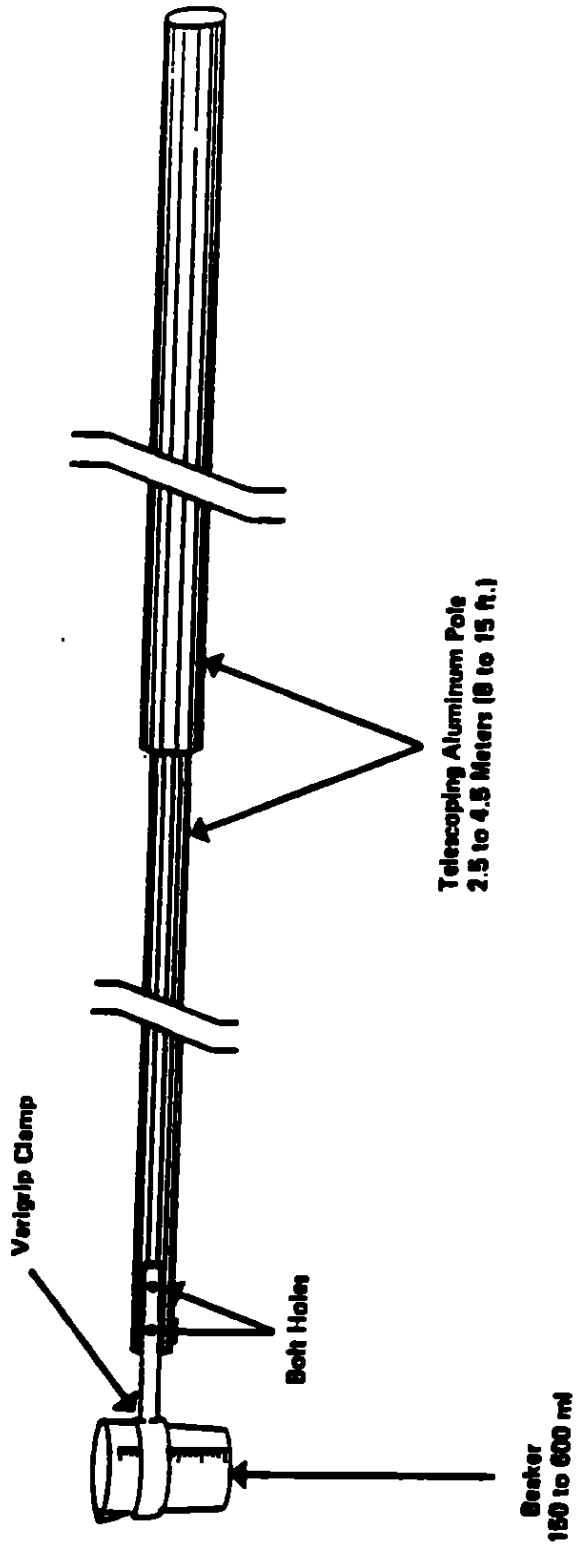


Figure 9-11. Dipper.

WEIGHTED BOTTLE

Scope and Application

This sampler consists of a glass or plastic bottle, sinker, stopper and a line which is used to lower, raise, and open the bottle. The weighted bottle samples liquids and free-flowing slurries.

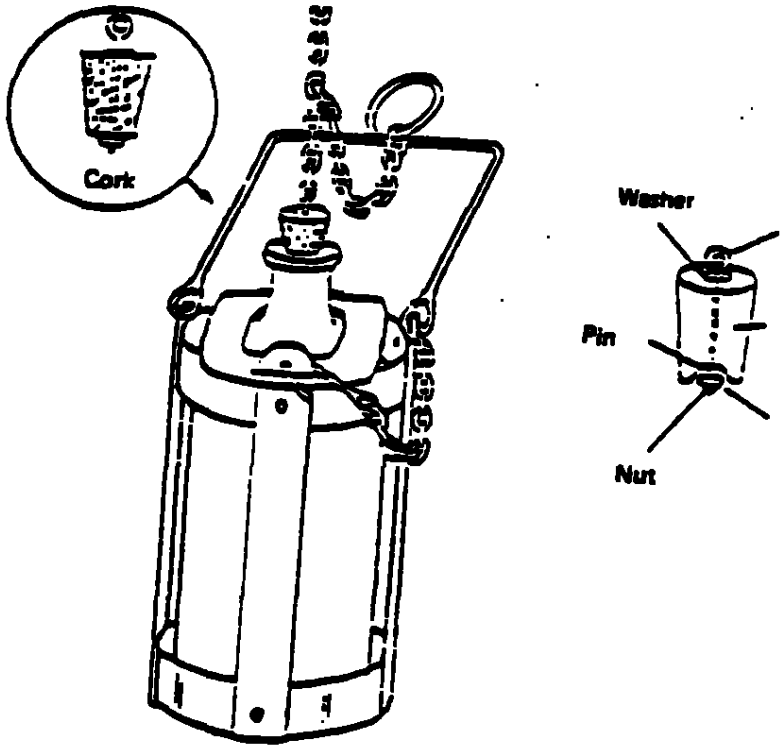
General Comments and Precautions

1. Do not use a nonfluorocarbon plastic bottle to sample wastes containing organic materials.
2. Do not use a glass bottle to sample wastes that contain hydrofluoric acid.
3. Before sampling, ensure that the waste will not corrode the sinker, bottle holder, or line.

Procedure

1. Clean bottle.
2. Assemble weighted bottle sampler.
3. Lower the sampler to directed depth and pull out the bottle stopper by jerking the liner.
4. Allow bottle to fill completely as evidenced by cessation of air bubbles.
5. Raise sampler, cap, and wipe off with a disposable cloth. The bottle can serve as a sample container.

DIAGRAM OF WEIGHTED BOTTLE



THIEF

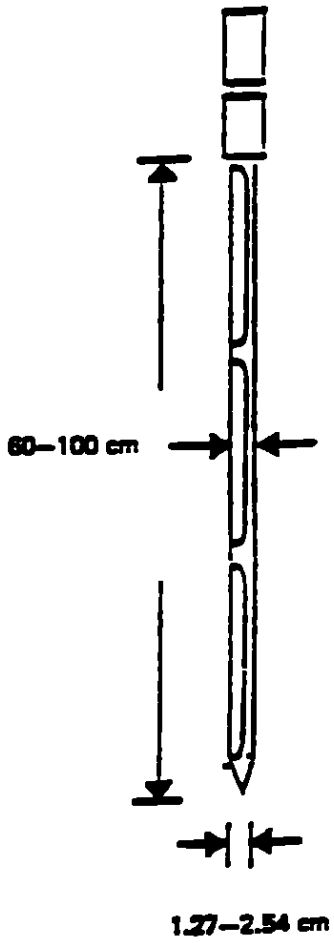
Scope and Application

A thief consists of two slotted concentric tubes, usually made up of stainless steel or brass. The outer tube has a conical pointed tip that permits the sampler to penetrate the material being sampled. The inner tube is rotated to open and close the sampler. A thief is used to sample dry granules or powdered wastes.

Procedure

1. Clean sampler.
2. Insert closed thief into waste material. Rotate inner tube to open thief. Wiggle the unit to encourage material to flow into thief. Close thief and withdraw. Place sampler thief in a horizontal position with the slots facing upward. Remove inner tube from thief and transfer sample to a container.

DIAGRAM OF THIEF



COMPOSITE LIQUID SAMPLER (COLIWASA)

Scope and Application

The Coliwasa is a device employed to sample free-flowing liquids and slurries contained in drums, shallow tanks, pits, and containers. It is especially useful for sampling wastes that consist of several immiscible liquid phases.

The Coliwasa consists of a glass, plastic or metal tube equipped with an end closure that can be opened and closed while the tube is submerged in the material to be sampled.

Procedure

1. Clean Coliwasa.

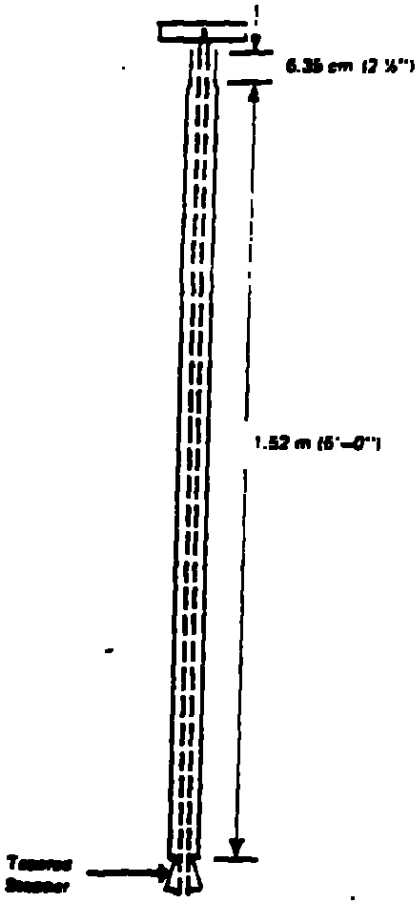
2. Adjust sampler's locking mechanism to ensure that the stopper provides a tight closure. Open sampler by placing stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.

3. Slowly lower the sampler into the waste at a rate that permits the level of liquid inside and outside the sampler to remain the same. If the level of waste in the sampler tube is lower inside than outside, the sampling rate is too fast and will produce a nonrepresentative sample.

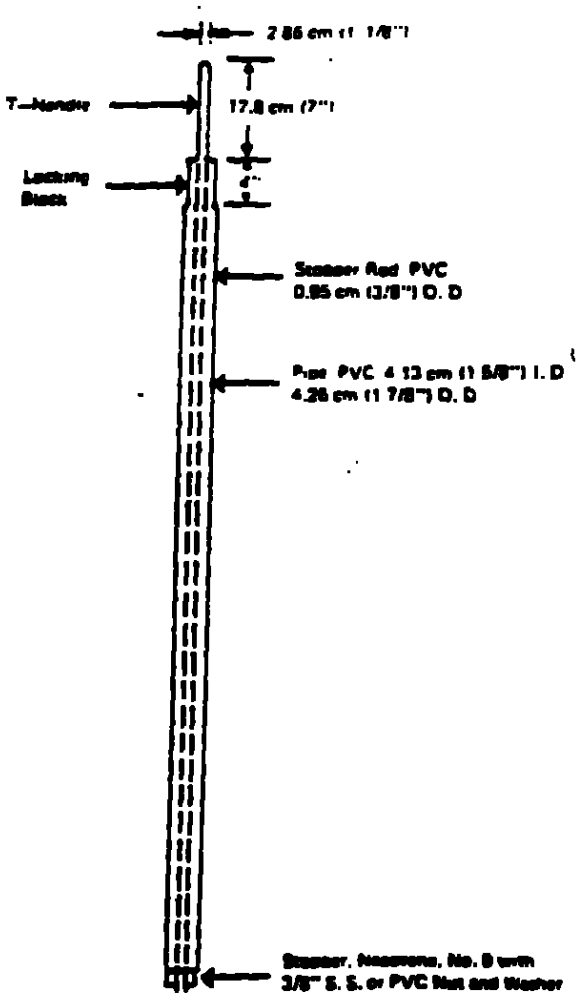
4. When the sampler hits the bottom of the waste container, push sampler tube down to close and lock the stopper by turning the T-handle until it is upright and one end rests on the locking block.

5. Withdraw Coliwasa from waste and wipe the outside with a disposable cloth or rag.

DIAGRAM OF COLIWASA



SAMPLING POSITION



CLOSE POSITION

ATTACHMENT 5
EXAMPLE REQU EST FOR ANALYSIS
AND
CHAIN OF CUSTODY FORMS

REQUEST FOR ANALYSIS

Date: _____

Results by: _____

Copies of Results to:

Submitted By: _____

Charge # _____

Phone: _____

Disposition of Non-Environmental Samples:
Return _____ Dispose _____

Plant Where Sample was Taken: _____

Environmental Sample. YES ____ NO ____

Safety Precautions:

Sample Name:	Sample ID (Date, Number, NB Page, Etc.)

Sample History (Reason for submitting)

Analyze for: Component:	Expected concentration

N.\FO\FORMS\ARF WK3

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CHAIN OF CUSTODY RECORD

Location of Sampling: Producer
Company's Name: Cytec Industries Telephone (504) 431-9511
Address: 10800 River Road, Westwego LA 70094-2040

COLLECTOR'S SIGNATURE:_____Telephone (504) 431-9511

DATE SAMPLED_____

TIME SAMPLED:_____

Type of Process Producing Waste:
_____

Field information: _____

Sample allocation: 100% to Cytec's main lab

OR ____% TO_____

Log-in Information: Plant: = **EFFLUENT**
Sample type = **MUD & MISCELLANEOUS WASTES**

Sample Description_____

Sample Number (from lab computer)_____

CHAIN OF POSSESSION

1. _____ _____ _____
Signature **title** **inclusive dates**

2. _____ _____ _____
Signature **title** **inclusive dates**

3. _____ _____ _____
Signature **title** **inclusive dates**

4. _____ _____ _____
Signature **title** **inclusive dates**

5. _____ _____ _____
Signature **title** **inclusive dates**

6. _____ _____ _____
Signature **title** **inclusive dates**

Appendix O

LAC 33:V.517.F
LAC 33:V.1507

Security Manual

TABLE OF CONTENTS

SECTION	TOPIC	PAGE NUMBER
I.	SAFETY AND SECURITY ORGANIZATION	3
II.	RESPONSIBILITIES AND DUTIES	4
	• Safety Leader	4
	• Safety Specialist	4
	• Shift Leaders - Main Gate Duties	5
	• Guard Sergeant - Main Gate Duties	6
	• Guard - Main Gate Duties	6
	• Guard - Gate #4 Duties	7
	• Plant Chauffeur	8
III.	PROCEDURES - NORMAL OPERATIONS	9
	• Entry and Exit of Employees	9
	• Entry and Exit of Visitors and Vendors	10
	• Entry and Exit of Contractor Employees	11
	• Entry and Exit of Service Company Employees	12
	• Petty Cash Procedures	12
	• Permanent and Temporary Identification Cards	13
	• Transportation Deliveries and Shipments	13
	• Plant Driving Rules	17
IV.	PROCEDURES - MISCELLANEOUS	18
	• Security Patrols - Guards	18
	• FEA Pavilion - Guards	18
	• Vandalism/Thefts/Abotage - Security Force	18
V.	PROCEDURES - EMERGENCY	19
	• Crisis Conditions	19
	• Bomb Threats	19

TABLE OF CONTENTS

SECTION	TOPIC	PAGE NUMBER
VI.	EMERGENCY TELEPHONE NUMBERS	21
	• Regulatory Agencies	21
	• Emergency Operations Team Members	22
	• Cytec Corporate Personnel Notification List	23
	• Fortier Plant Management Team	24
VII.	INCIDENT REPORT FORM	25
VIII.	BOMB THREAT REPORT FORM	26

I. SAFETY & SECURITY ORGANIZATION

JOB TITLE		NAME	EXTENSION
Safety Leader		P. L. Martinez	6251
Safety Specialist		G. Tierney	6558
Shift Leaders:	A Shift B Shift C Shift D Shift	D. Smith D. McCallum J. Ardoin A. Hurtel	6315 6315 6315 6315
Guard Sergeant		E. Ellis	6315
Guard	Gate 4	R. Madere	6355
Plant Chauffeur		D. Sylvain	6315
Shift Guards		Wackenhut Employees	

NOTE: All Emergency Medical Technician (EMT) qualified security personnel report to the plant physician for all medically related concerns and work as EMT's under his authority.

Personnel assignments are subject to change.

II. RESPONSIBILITIES & DUTIES *(FOR SECURITY DEPARTMENT)*

SAFETY LEADER

1. HAS OVERALL RESPONSIBILITY FOR THE SECURITY OF THE FORTIER MANUFACTURING COMPLEX.

2. DIRECTS THE EFFORTS OF THE SAFETY SPECIALIST.

SAFETY SPECIALIST/FIRE CHIEF

1. ASSUMES THE RESPONSIBILITIES AND DUTIES OF THE SAFETY LEADER UPON HIS ABSENCE AND/OR AS DELEGATED.

2. RESPONSIBLE FOR MAINTAINING THE DAY TO DAY SECURITY OF THE FORTIER MANUFACTURING COMPLEX.

3. DEVELOPS AND PUBLISHES SHIFT SCHEDULES FOR ALL GUARD CLASSIFICATIONS WEEKLY.

4. OVERSEES THE DISTRIBUTION OF PETTY CASH AND MEAL VOUCHER PAYMENTS.

5. ARRANGES AND DIRECTS THE TRAINING OF THE SECURITY GUARDS.

6. OVERSEES ALL SPECIAL TRAFFIC SITUATIONS OR REQUIREMENTS THAT MAY DEVELOP IN THE FORTIER COMPLEX.

7. OVERSEES COORDINATION OF MAINTENANCE OF THE PHYSICAL APPEARANCE OF THE COMPLEX'S GATES AND ROADWAYS, INCLUDING SIGNS, BARRIERS, AND THE PAINTING OF ROADWAYS AS APPROPRIATE.

SHIFT LEADERS - MAIN GATE DUTIES

1. SIGNS IN/OUT PROCESSES PAPERWORK FOR TRUCKS MAKING DELIVERIES TO THE FORTIER COMPLEX.

2. SIGNS OUT AND PROCESSES PAPERWORK FOR SHIPMENTS LEAVING THE FORTIER COMPLEX.

3. SIGNS IN/OUT AND ISSUES VEHICLE PASSES.

4. PERFORMS EMERGENCY MEDICAL TECHNICIAN (EMT) FUNCTIONS AS REQUIRED.

5. ACTIVATES AND MANS THE PLANT EMERGENCY SYSTEM DURING A DECLARED CRISIS SITUATION.

6. MONITORS THE ADT FIRE ALARM SYSTEM. REPORTS ALL ALARMS TO SHIFT FIREMAN AS REQUIRED.

7. TESTS THE PLANT EMERGENCY SYSTEM EACH MONDAY AT 1300 HOURS.

8. RELIEVES CONTRACT GUARD FOR LUNCH/BREAKS.

9. PROVIDES SAFETY GLASSES AND EQUIPMENT TO VISITORS. MAINTAINS AN ADEQUATE SUPPLY AT ALL TIMES.

10. SORTS AND PACKAGES HOURLY TIME CARDS.

11. ISSUES HOURLY PAYCHECKS TO EMPLOYEES.

12. CONTROLS THE DISTRIBUTION OF PETTY CASH.

13. DRIVES THE PLANT AMBULANCE AS REQUIRED.

14. NOTIFIES OPERATING DEPARTMENTS CONCERNING ARRIVING TRUCK SHIPMENTS. PERFORMS WEIGH MASTER FUNCTIONS ON TRUCK SHIPMENTS AS REQUIRED.

15. TRACKS AND LOGS WEATHER CONDITIONS AND LOGS EVERY 30 MINUTES.

16. TRACKS TROPICAL STORMS, HURRICANES.

SHIFT LEADERS - MAIN GATE DUTIES CONTINUED:

17. PERFORMS SAFETY TALKS WITH TRUCK DRIVERS.

18. COORDINATE SCHEDULING FOR THE GATE EMPLOYEES.

19. SCHEDULES DAILY ACTIVITIES FOR PLANT CHAUFFER.

20. PERFORMS WEEKLY INSPECTION OF PLANT AMBULANCE.

21. SUPERVISES INSPECTIONS OF PERSONNEL AND VEHICLES AT THE PLANT GATES.

22. INTERFACES WITH THE SHIFT SUPERINTENDENT.

23. PERFORMS ANY ADDITIONAL DUTIES AS DIRECTED.

GUARD SERGEANT - MAIN GATE DUTIES

1. SERVES AS RELIEF TO THE SHIFT LEADERS.

2. PERFORMS ANY ADDITIONAL DUTIES AS DIRECTED.

GUARD - MAIN GATE DUTIES

1. CHECKS ALL EMPLOYEES LEAVING PLANT FOR CYTEC PROPERTY AND/OR CONTRABAND. THIS MAY INCLUDE THE PHYSICAL EXAMINATION OF ALL LUNCH BOXES, BAGS, ETC. CARRIED BY EMPLOYEES.

2. CHECKS ALL VEHICLES LEAVING THE PLANT FOR CYTEC PROPERTY AND/OR CONTRABAND. THIS MAY INCLUDE PHYSICAL EXAMINATION OF ALL VEHICLES, i.e. TRUCKS, CABS, SEATING AREAS AND STORAGE COMPARTMENTS.

3. CHECKS ALL EMPLOYEES, VISITORS, CONTRACTOR EMPLOYEES, SERVICE COMPANY EMPLOYEES, GOVERNMENT OFFICIALS AND TRUCK DRIVERS ATTEMPTING TO ENTER THE FORTIER COMPLEX FOR ADHERENCE TO CYTEC POLICIES.

4. DISTRIBUTES SHIFT SUPERINTENDENT REPORTS.

GUARD- MAIN GATE DUTIES CONTINUED:

5. COLLECTS AND DELIVERS MAIL EACH EVENING AT 1900 HOURS.
6. RAISES/LOWERS FLAGS AT MAIN GATE.
7. UPDATES MAIN GATE CYTEC STATISTICS SIGN BOARD.
8. POSTS BULLETINS AND STATISTICS ON PLANT BULLETIN BOARDS.
9. REMOVES OLD TIME CARDS, INSERTS NEW TIME CARDS DAILY.
10. CONDUCTS SECURITY PATROLS THROUGHOUT THE COMPLEX.
11. PROVIDES TRAFFIC CONTROL AS DIRECTED. SETS UP BARRICADES, CLOSES ROADS, ETC..
12. DOES KEY ROUNDS.
13. DOES GATE 4 DUTIES AS ASSIGNED.
14. UNLOCKS/LOCKS DOORS AS NEEDED (DURING OFF SHIFT).
15. TAKES REPORTS AS NEEDED (i.e. THEFT, DAMAGE VEHICLES, ETC..)
16. PERFORMS ANY ADDITIONAL DUTIES AS DIRECTED.

GUARD - GATE #4 DUTIES

1. SIGNS IN/OUT CONTRACTOR EMPLOYEES.
2. CHECKS CONTRACTOR BADGES AND GNOIEC TRAINING CARDS OF ALL CONTRACTORS ENTERING THE FORTIER FACILITY.
3. CHECKS CONTRACTORS FOR COMPLIANCE WITH CYTEC POLICIES.
4. SIGNS IN/OUT CONTRACTOR VEHICLES. NOTE: ALL CONTRACTOR VEHICLES MUST BE IDENTIFIED WITH THE COMPANY NAME.
5. PRINTS AND ROUTES CONTRACTOR PAPERWORK.
6. PERFORMS ANY ADDITIONAL DUTIES AS DIRECTED.

PLANT CHAUFFEUR

1. DELIVERS MAIL TO AND PICKS UP MAIL DAILY.
2. TRANSPORTS EMPLOYEES AS DIRECTED.
3. PICK-UP OVERTIME MEALS AND BEVERAGES AS DIRECTED.
4. PICK-UP VARIOUS ITEMS FROM LOCAL STORES SUCH AS FILM, KEYS, ETC.. AS REQUIRED.
5. PICK-UP AND DELIVER VIP VISITORS FROM NEW ORLEANS INTERNATIONAL AIRPORT.
6. MAINTAINS MAIN GATE CLEANLINESS.
7. WASHES PLANT AMBULANCE EACH FRIDAY.
8. PERFORMS ANY ADDITIONAL DUTIES AS DIRECTED.

III. PROCEDURES - NORMAL OPERATIONS

ENTRY AND EXIT OF EMPLOYEES

1. CYTEC EMPLOYEES MAY ONLY ENTER AND EXIT THE COMPLEX BY MEANS OF THE MAIN GATE UNLESS DIRECTED BY SECURITY.

2. EMPLOYEES ENTERING AND EXITING THE FORTIER COMPLEX ARE SUBJECT TO SEARCH OF THEIR PERSONAL POSSESSIONS AND/OR VEHICLES FOR COMPANY PROPERTY AND/OR CONTRABAND MATERIAL.

3. EMPLOYEES MUST WEAR SAFETY GLASSES AND APPROVED FOOTWEAR IMMEDIATELY UPON ENTERING THE COMPLEX.

4. CYTEC PROPERTY MAY ONLY BE REMOVED FROM THE FORTIER COMPLEX VIA THE MAIN GATE AND ONLY IF A SIGNED MATERIAL PASS IS PRESENTED TO THE GUARD ON GATE DUTY. (NOTE: PASSES MAY ONLY BE APPROVED BY THE DEPARTMENT MANAGERS).

5. CYTEC FORTIER EMPLOYEES MAY BE ASKED TO PRODUCE THEIR COMPANY I.D. CARD WHILE ENTERING OR EXITING THE FORTIER COMPLEX. IF A VALID I.D. CARD IS NOT PRODUCED, ENTRANCE TO THE COMPLEX MAY BE REFUSED.

6. ONLY CERTAIN CYTEC EMPLOYEES ARE ALLOWED TO ENTER AND EXIT THE PLANT DURING AN EMERGENCY SITUATION. THE EMPLOYEES NOT ALLOWED INTO THE COMPLEX SHALL REMAIN IN THE CRISIS ASSEMBLY AREA AT MEDICAL.

ENTRY AND EXIT OF VISITORS AND VENDORS

1. ALL VISITORS MUST REPORT TO THE MAIN GATE. GUARDS WILL DIRECT VISITORS AS APPROPRIATE.

2. ALL VISITORS AND VENDORS WILL BE FURNISHED A COPY OF THE "FORTIER MANUFACTURING COMPLEX VISITOR GUIDE" AND UNDERSTAND THE INFORMATION PRIOR TO ENTRY AT FORTIER.

3. ALL VISITORS AND VENDORS MUST MEET THE FACIAL HAIR, CLOTHING AND SAFETY EQUIPMENT REQUIREMENTS BEFORE ENTRANCE TO THE FORTIER COMPLEX IS ALLOWED. NOTE: IN QUESTIONABLE CASES, THE HIGHEST RANKING SAFETY/SECURITY EMPLOYEE ON DUTY WILL MAKE THE FINAL DETERMINATION ON WHETHER OR NOT A PERSON IS ALLOWED ENTRANCE TO THE COMPLEX.

4. VISITOR AND VENDORS WHO BRING MATERIAL OR PERSONAL PROPERTY INTO THE FORTIER COMPLEX MUST DECLARE SAID MATERIAL TO THE MAIN GATE GUARD WHILE SIGNING IN. THEY MUST HAVE PROOF OF OWNERSHIP OR A VALID MATERIAL PASS WHEN EXITING THE PLANT.

5. VISITORS AND VENDORS MUST FOLLOW ALL RULES OF THE FORTIER COMPLEX. FAILURE TO DO SO MAY RESULT IN EXPULSION AND/OR BANISHMENT FROM THE COMPLEX.

6. VISITORS AND VENDORS TO THE FORTIER COMPLEX MUST BE ESCORTED TO AND FROM THEIR DESTINATION IN THE COMPLEX. VENDORS ARE NOT TO BE ALLOWED TO WANDER FREELY AROUND THE COMPLEX.

7. VISITORS AND VENDORS ARE <u>NOT</u> ALLOWED TO ENTER THE FORTIER COMPLEX DURING AN EMERGENCY SITUATION.

ENTRY AND EXIT OF CONTRACTOR EMPLOYEES

1. ALL CONTRACTOR EMPLOYEES MUST ENTER THE FORTIER COMPLEX THROUGH GATE #4 UNLESS OTHERWISE DIRECTED BY SECURITY.

2. ALL CONTRACTOR EMPLOYEES WORKING IN OPERATING AREAS OF THE FORTIER COMPLEX MUST SHOW THE CYTEC SECURITY GUARD A VALID GNOIEC (GREATER NEW ORLEANS INDUSTRIAL EDUCATION COUNCIL) TRAINING CARD.

   FAILURE TO SHOW A VALID GNOIEC CARD SHALL LEAD TO REFUSAL OF ADMITTANCE TO THE FORTIER COMPLEX.

3. ALL CONTRACTORS MUST SIGN IN AND ARE ISSUED A CYTEC BADGE. THERE ARE TWO TYPES OF CYTEC CONTRACTOR BADGES:

   A. REGULAR CONTRACTORS (DAILY EMPLOYEES) ARE ISSUED A BADGE TO CLOCK IN AND OUT WITH AND KEEP THESE BADGES WITH THEM WHEN THEY LEAVE FOR THE DAY.

   B. TEMPORARY CONTRACTORS (1-2 DAY JOBS) ARE ISSUED A BADGE DAILY. THEY ARE TO SIGN-IN THE MORNING AND SIGN-OUT AT THE END OF THE DAY AND TURN IN THEIR BADGE.

4. ALL CONTRACTOR EMPLOYEES BEFORE BEING ALLOWED TO WORK IN AN OPERATING UNIT MUST ATTEND A FORTIER SAFETY INDOCTRINATION CONDUCTED BY A MEMBER OF THE SAFETY DEPARTMENT.

5. ALL CONTRACTOR EMPLOYEES MUST MEET THE FACIAL HAIR, CLOTHING AND SAFETY EQUIPMENT REQUIREMENTS BEFORE ENTRANCE TO THE FORTIER COMPLEX IS ALLOWED.

6. ALL EMPLOYEES ARE SUBJECT TO SEARCH OF THEIR PERSONAL POSSESSIONS AND/OR VEHICLES FOR CYTEC PROPERTY AND/OR CONTRABAND MATERIAL UPON ENTERING OR EXITING THE FORTIER COMPLEX.

7. CONTRACTORS WILL <u>NOT</u> BE ALLOWED TO ENTER THE FORTIER COMPLEX DURING AN EMERGENCY SITUATIONS.

ENTRY AND EXIT OF SERVICE COMPANY EMPLOYEES

1. ALL SERVICE COMPANY EMPLOYEES MUST ENTER THE FORTIER COMPLEX THROUGH THE MAIN GATE UNLESS ALTERNATE ARRANGEMENTS ARE SPECIFICALLY MADE WITH SECURITY AHEAD OF TIME.

2. ALL NEW SERVICE COMPANY EMPLOYEES WILL BE FURNISHED A COPY OF THE "FORTIER MANUFACTURING COMPLEX VISITOR GUIDE" AND WILL BE MADE AWARE OF THE INFORMATION CONTAINED IN THE GUIDE PRIOR TO ENTERING THE COMPLEX.

3. ALL SERVICE COMPANY EMPLOYEES MUST MEET THE FACIAL HAIR, CLOTHING AND SAFETY EQUIPMENT REQUIREMENTS BEFORE ENTRANCE TO THE FORTIER COMPLEX IS ALLOWED.

4. ALL SERVICE COMPANY EMPLOYEES ARE SUBJECT TO SEARCH OF THEIR PERSONAL POSSESSIONS AND/OR VEHICLES FOR CYTEC PROPERTY AND/OR CONTRABAND MATERIAL UPON ENTERING AND EXITING THE COMPLEX.

5. ALL SERVICE COMPANY VEHICLES MUST BE SIGNED IN/OUT AT THE MAIN GATE. NOTE: ALL SERVICE COMPANY VEHICLES MUST BE IDENTIFIED WITH THE COMPANY NAME/LOGO.

6. SERVICE COMPANY EMPLOYEES WILL NOT BE ALLOWED TO ENTER THE FORTIER COMPLEX DURING AN EMERGENCY SITUATION.

PETTY CASH PROCEDURES

DESCRIPTION

THE PETTY CASH AND EMERGENCY FUNDS ARE LOCATED WITH, AND ARE THE RESPONSIBILITY OF, THE SHIFT LEADERS AT THE MAIN GATE. THE PURPOSE OF THESE FUNDS IS AS FOLLOWS:

EMERGENCY FUND - TO PROVIDE IMMEDIATE CASH TO EMERGENCY RESPONSE AND INCIDENT MANAGEMENT (ERIM) PERSONNEL FOR UNEXPECTED EXPENSES TO BE INCURRED WHEN THEY ARE CALLED TO RESPOND IMMEDIATELY TO AN INCIDENT.

PETTY CASH FUND - A FIXED AMOUNT OF CASH ON HAND AT THE MAIN GATE TO PAY FOR SUCH THINGS AS OVERTIME MEALS, DRINKS, AND MISC. TRANSPORTATION COST.

PROCEDURES - PETTY CASH

1. THE PETTY CASH FORM IS FILLED OUT BY THE SHIFT LEADER. THE RECEIPT IS ATTACHED TO THE PETTY CASH FORM. THEN BOTH ARE ROUTED TO THE SAFETY SPECIALIST/FIRE CHIEF WITH THE MORNING TIME CARDS.

2. THE COMPLETED PETTY CASH FORMS WILL BE SIGNED BY AN AUTHORIZED SIGNER (SAFETY LEADER OR SAFETY SPECIALIST/FIRE CHIEF) AND BROUGHT TO FINANCIAL SERVICES (CASHIER), WHO WILL THEN REIMBURSE THE SHIFT LEADER FOR THE AMOUNT OF PETTY CASH EXPENDED. IT IS THE RESPONSIBILITY OF THE SHIFT LEADER TO INSURE THAT THE PETTY CASH FORMS ARE SIGNED AND THE FUNDS ARE REPLENISHED ON A DAILY BASIS.

3. THE SHIFT LEADER IS RESPONSIBLE FOR INSURING THAT THE PETTY CASH AND EMERGENCY FUNDS BALANCE DAILY AT THE END OF EACH SHIFT.

PERMANENT AND TEMPORARY IDENTIFICATION CARDS

1. ALL CYTEC EMPLOYEES ARE ISSUED AN IDENTIFICATION CARD.

2. THE SAFETY DEPARTMENT INITIATES THE PROCEDURE FOR AN EMPLOYEE TO OBTAIN AN I.D. CARD.

3. I.D. CARDS ARE MADE BY THE SAFETY DEPARTMENT WHEN AN EMPLOYEE STARTS WORKING AT THE FORTIER MANUFACTURING COMPLEX.

4. I.D. CARDS (OFTEN REFERRED TO AS BADGES) MUST BE AVAILABLE FOR INSPECTION BY SECURITY PERSONNEL ON AN AS REQUIRED BASIS.

TRANSPORTATION DELIVERIES AND SHIPMENTS

FOR DELIVERIES OF BULK CHEMICAL MATERIALS (SUCH AS: SALT, LIME, MEA, ETC.)

1. THE DRIVER ARRIVES AT THE STAGING AREA. CALLS THE MAIN GATE (6315) AND RELAYS ALL PERTINENT INFORMATION ABOUT THE DELIVERY TO THE SHIFT LEADER.

TRANSPORTATION DELIVERIES AND SHIPMENTS CONTINUED:

2. THE SHIFT LEADER DIRECTS THE DRIVER TO THE MAIN GATE AREA AND FILLS OUT A TRIP TICKET AND RECEIVING REPORT (ATTACHMENT 1 & 2).

3. THE TRUCK IS THEN ENTERED INTO THE VEHICLE LOG BOOK AND A VEHICLE PERMIT IS ISSUED TO THE DRIVER.

4. THE TRUCK DRIVER IS GIVEN DIRECTIONS TO THE PROPER UNLOADING AREA AND A SAFETY INDOCTRINATION ON THE FORTIER COMPLEX. THE SHIFT LEADER THEN NOTIFIES THE RECEIVING DEPARTMENT OF THE MATERIAL DELIVERY.

5. THE TRUCK IS THEN WEIGHED IN AT THE PLANT SCALE BEFORE PROCEEDING TO THE RECEIVING DEPARTMENT.

6. THE TRUCK COMPLETES ITS DELIVERY AND PROCEEDS BACK TO THE MAIN GATE VIA THE PLANT SCALE. THE DRIVER SCALES HIMSELF OUT (WHICH IS VERIFIED BY THE SHIFT LEADER AT THE MAIN GATE).

7. THE TRUCK IS LOGGED OUT, THE DRIVER'S VEHICLE PERMIT IS RETURNED AND THE PAPERWORK IS SIGNED BY THE SHIFT LEADER.

8. THE TRUCK EXITS THE FORTIER COMPLEX.

FOR DELIVERIES OF BULK MATERIALS (DRUMS, PARTS, EQUIPMENT ETC.)

1. THE DRIVER ARRIVES AT THE STAGING AREA, CALLS THE MAIN GATE (6315) AND RELAYS ALL PERTINENT INFORMATION ABOUT THE DELIVERY TO THE SHIFT LEADER.

2. THE TRUCK IS DIRECTED TO THE MAIN GATE, ENTERED INTO THE VEHICLE LOG BOOK AND A VEHICLE PERMITS IS ISSUED TO THE DRIVER.

3. THE TRUCK DRIVER IS GIVEN DIRECTIONS TO THE PROPER UNLOADING AREA (BLDG.. 209, 210, CONTRACTOR SITE, OTHER AREA) AND A SAFETY INDOCTRINATION ON THE FORTIER COMPLEX. THE SHIFT LEADER THEN NOTIFIES THE RECEIVING DEPARTMENT OF THE MATERIAL DELIVERY.

4. THE TRUCK COMPLETES ITS DELIVERY AND PROCEEDS BACK TO THE MAIN GATE.

5. THE TRUCK IS LOGGED OUT, THE DRIVER'S VEHICLE PERMIT IS RETURNED AND THE PAPERWORK IS SIGNED BY THE SHIFT LEADER, AND THE TRUCK EXITS THE FORTIER COMPLEX.

SHIPMENT OF BULK CHEMICALS VIA TANK TRUCK - CYTEC PRODUCTS

1. THE DRIVER ARRIVES AT THE STAGING AREA, CALLS THE MAIN GATE (6315) AND RELAYS ALL THE PERTINENT INFORMATION ABOUT HIS PICK-UP TO THE SHIFT LEADER.

2. THE SHIFT LEADER ENTERS THE FOLLOWING INFORMATION ON A TRIP TICKET:

   - WHAT THE MATERIAL TO BE PICKED UP IS
   - WHERE THE FINAL DESTINATION OF THE SHIPMENT IS
   - WHAT THE ORDER OR S.I.D. NUMBER IS

   THIS INFORMATION IS VERIFIED AGAINST THE DAILY TRANSPORTATION SCHEDULE.

3. THE SHIFT LEADER THEN NOTIFIES THE SHIFT SUPERINTENDENT ABOUT THE PICK-UP, VERIFYING THE MATERIAL IDENTITY AND WEIGHT. THE SHIFT SUPERINTENDENT FINDS AND MATCHES THE BILL OF LADING TO SHIPPING ORDER NUMBER, VERIFYING THE ORDER INFORMATION.

4. THE SHIFT LEADER THEN ENTERS THE TRUCK INTO THE VEHICLE LOG BOOK AND ASSIGNS THE DRIVER A VEHICLE PERMIT.

5. THE SHIFT LEADER THEN CALLS THE SHIPPING DEPARTMENT AND REPEATS THE INFORMATION GIVEN TO THE SHIFT SUPERINTENDENT.

6. THE DRIVER IS THEN INSTRUCTED TO PROCEED TO THE MAIN GATE FOR HIS VEHICLE PERMIT, SAFETY INDOCTRINATION AND DIRECTIONS TO THE SHIPPING DEPARTMENT.

7. THE DRIVER PROCEEDS TO THE PLANT SCALE TO WEIGH (IN) EMPTY THEN PROCEEDS DIRECTLY TO THE LOADING AREA.

SHIPMENT OF BULK CHEMICALS VIA TANK TRUCK - CYTEC PRODUCTS (cont'd.)

8. AFTER LOADING HAS BEEN COMPLETED, THE TRUCK RETURNS TO THE PLANT SCALES WHERE IT IS WEIGHED LOADED (OUT) THEN PROCEEDS TO WAREHOUSE 209 STAGING AREA, SHUTS DOWN AND THE DRIVER PROCEEDS TO THE GATE HOUSE WHERE THE SHIFT SUPERINTENDENT VERIFIES THE SHIPMENT INFORMATION AND SIGNS THE PAPERWORK.

9. DRIVER THEN RETURNS TO HIS TRUCK, DRIVES TO THE MAIN GATE WHERE HIS VEHICLE IS CHECKED FOR PROPER PLACARDS, LACK OF PRODUCT LEAKS AND PRESENCE OF A PRODUCT TAG ON THE OUTLET VALVE. IF ALL CONDITIONS ARE ACCEPTABLE, THE SHIFT LEADER SIGNS OUT THE TRUCK ON THE TRIP TICKET AND THE TRUCK LEAVES.

SHIPMENT OF BULK MATERIALS VIA BOX/FLAT TRAILERS - CYTEC PRODUCTS

1. DRIVER CONTACTS THE MAIN GATE FROM THE TRUCK STAGING AREA AND RELAYS TO THE SHIFT LEADER THE INFORMATION ON THE LOAD HE IS HERE TO PICK-UP.

2. THE SHIFT LEADER LOGS THE INFORMATION INTO THE VEHICLE LOG BOOK AND ASSIGNS A VEHICLE PERMIT TO THE TRUCK DRIVER.

3. THE TRUCK IS THEN ISSUED THE VEHICLE PERMIT AND DIRECTED TO THE PICK-UP LOCATION, EITHER WAREHOUSE 210, MELAMINE BAGGING, OR WAREHOUSE 209.

4. THE TRUCK MAKES THE PICK-UP AND RETURNS TO THE MAIN GATE AND GIVES A COPY OF HIS BILL OF LADING TO THE SHIFT LEADER.

5. VEHICLE PERMIT IS RETURNED TO THE GATE GUARD AND THE TRUCK LEAVES THE FORTIER COMPLEX.

PLANT DRIVING RULES

1. PEDESTRIANS AND BICYCLES ALWAYS HAVE THE RIGHT OF WAY IN THE FORTIER COMPLEX.

2. BICYCLES SHOULD BE RIDDEN FACING TRAFFIC. ALL APPROPRIATE HAND SIGNALS SHOULD BE USED WHEN OPERATING A BICYCLE, INCLUDING STOPPING AT STOP SIGNS.

3. PLANT SPEED LIMIT FOR ALL VEHICLES OPERATED IN THE FORTIER COMPLEX IS 19 7/8 MILES PER HOUR (MPH). THE ROADWAY TO AND FROM RIVER ROAD TO THE MAIN GATE HAS A POSTED SPEED LIMIT OF 30 MPH.

4. THERE IS NO PASSING IN THE PLANT OR ON THE ROAD BETWEEN RIVER ROAD AND THE MAIN GATE.

5. THE PLANT AMBULANCE, FIRE TRUCKS AND CRISIS VEHICLES HAVE PRIORITY IN THE PLANT (IN THAT ORDER). IN EMERGENCY SITUATIONS, ALL OTHER VEHICLES MUST MAKE WAY FOR THESE VEHICLES.

6. VEHICLES MUST FOLLOW ALL TRAFFIC DIRECTIONS SUCH AS; STOP SIGNS, YIELD SIGNS, NO PASSING SIGNS AND NO PARKING SIGNS.

7. "TICKETS" MAY BE ISSUED FOR ALL MOVING/NON-MOVING VIOLATIONS UP TO AND INCLUDING REMOVAL OF ALL PLANT DRIVING PRIVILEGES.

8. CRANES SHALL MOVE AT A SAFE SPEED WITH THEIR BOOM SECTIONS IN THE HORIZONTAL POSITION WHENEVER POSSIBLE.

9. OUT RIDERS WILL BE PROVIDED (BY THE COMPANY/DEPARTMENT) INVOLVED FOR SLOW MOVING, WIDE VEHICLES TO FACILITATE VEHICLE MOVEMENT AND SAFETY.

10. CHERRY PICKERS, CRANES, PICK-UPS, ETC. THAT CARRY MATERIALS INSIDE THE FORTIER COMPLEX MUST DO SO IN A SAFE MANNER. MATERIALS MUST BE SECURED TO THE VEHICLE AND NOT ALLOWED TO SWING FROM SIDE TO SIDE. THIS MAY NECESSITATE THE USE OF OUTRIDERS WITH ROPES TO KEEP THE LOAD FROM SWINGING.

11. VEHICLES MUST STOP FOR PEDESTRIANS AT CROSSWALKS.

IV. PROCEDURES - MISCELLANEOUS

SECURITY PATROLS - GUARDS

1. RANDOM, ROVING SECURITY PATROLS OF THE FORTIER COMPLEX WILL BE CONDUCTED PERIODICALLY BY THE GUARD FORCE ON ALL SHIFTS.

2. ON OFF SHIFTS (1800-0600 AND ALL DAY ON WEEKENDS/HOLIDAYS) THE SECURITY GUARDS WILL MAKE THREE KEY ROUNDS PER SHIFT.

FEA PAVILION - GUARDS

1 THE SHIFT LEADER IS RESPONSIBLE FOR MONITORING THE ALARM SYSTEM FOR THE FEA PAVILION.

2. THE GUARDS ARE RESPONSIBLE FOR LOCKING AND UNLOCKING THE FEA PAVILION BEFORE AND AFTER EVENTS ARE HELD THERE. IN ADDITION THEY ARE RESPONSIBLE FOR INCLUDING THE FEA PAVILION IN THEIR ROUTINE, RANDOM, SECURITY PATROLS.

VANDALISM/THEFT/SABOTAGE - SECURITY FORCE

1. EACH INCIDENT WILL BE HANDLED ON A CASE BY CASE BASIS. ALL INCIDENTS WILL BE INVESTIGATED BY A MEMBER OF THE SAFETY/SECURITY DEPARTMENT AND A REPORT WRITTEN.

   NOTE: THE INCIDENT REPORT FORM LOCATED IN *SECTION VIII, PAGE 26* SHALL BE UTILIZED FOR VANDALISM, THEFT AND SABOTAGE INCIDENTS.

2. ALL INCIDENTS WILL BE REPORTED TO THE SHIFT SUPERINTENDENT FOR IMMEDIATE DISPOSITION. SECURITY PERSONNEL WILL PERFORM WHATEVER ACTIONS THE SHIFT SUPERINTENDENT DIRECTS.

V. PROCEDURES - EMERGENCY

CRISIS CONDITIONS

IN GENERAL, WHEN A PLANT CRISIS IS SOUNDED, THE MEMBERS OF THE PLANT SECURITY DEPARTMENT WILL TAKE DIRECTION FROM THE EMERGENCY OPERATIONS CENTER (EOC) AND/OR THE SHIFT SUPERINTENDENT.

1. THE SHIFT LEADER SHALL INITIATE AN ACTIVATION OF THE PLANT ALARM SYSTEM IF NOTIFIED BY THE SHIFT SUPERINTENDENT AND/OR DIRECTLY BY TELEPHONE OR ALARM.

2. ONCE A CRISIS IS DECLARED. THE SHIFT LEADER WILL DIRECT THE GUARDS AT ALL GATES TO STOP ALL TRAFFIC INTO THE PLANT AND THEN REFOCUS HIS ATTENTION ON PERFORMING CRISIS RELATED DUTIES AS INSTRUCTED IN THE FORTIER COMPLEX EMERGENCY PROCEDURES MANUAL AND AS ADDITIONALLY DIRECTED.

3. THE SHIFT LEADER WILL ANNOUNCE AN "ALL CLEAR" NOTIFICATION WHEN INSTRUCTED TO DO SO BY THE SHIFT SUPERINTENDENT AND/OR EOC. AT THAT TIME, TRAFFIC INTO AND OUT OF THE PLANT MAY RESUME UNLESS INSTRUCTED OTHERWISE.

4. THE SECURITY FORCE WILL PERFORM ANY ADDITIONAL DUTIES DIRECTED BY THE EOC AND/OR THE SHIFT SUPERINTENDENT.

BOMB THREATS

BOMB THREATS MAY BE RECEIVED BY EITHER THE SHIFT SUPERINTENDENT OR THE SHIFT LEADER.

1. WHOEVER TAKES THE CALL WILL ATTEMPT TO OBTAIN AS MUCH INFORMATION AS POSSIBLE, SUCH AS:

   NAME OF PERSON CALLING
   TIME OF DAY
   WEATHER CONDITIONS
   TYPE OF DEVICE
   WHERE PLANTED
   TIME SET TO DETONATE
   MOTIVE BEHIND THE ATTEMPT

BOMB THREATS CONTINUED:

IN ADDITION, ANY PERSONAL INFORMATION ABOUT THE CALLER THAT THE EMPLOYEE CAN DISTINGUISH, SUCH AS:

ACCENT (IF IT CAN BE DETERMINED)
NATIONALITY (IF IT CAN BE DETERMINED)
DISTINGUISHING CHARACTERISTICS OF SPEECH (SLURRED WORDS, LISP, ETC..)
MALE OR FEMALE
APPROXIMATE AGE
FORMER EMPLOYEE
STATE OF MIND (EXCITED, CALM, RAVING, ETC..)
NOISE OR SOUNDS IN THE BACKGROUND OF THE CALLER

2. SHIFT LEADER WILL RELATE ALL INFORMATION RECEIVED TO THE SHIFT SUPERINTENDENT FOR A DETERMINATION ON A COURSE OF ACTION.

3. THE SECURITY FORCE WILL THEN BE PUT ON STANDBY AWAITING THE INSTRUCTIONS OF THE SHIFT SUPERINTENDENT AND WILL TAKE ACTION AS DIRECTED.

4. THE BOMB INCIDENT REPORT FORM LOCATED ON PAGE *26* SHALL BE USED TO RECORD ALL BOMB THREAT CALLS.

5. IN ADDITION, ALL BOMB THREATS RECEIVED AT THE FORTIER COMPLEX ARE TO BE COMMUNICATED TO THE GENERAL MANAGER OF OPERATIONS AND THE SAFETY LEADER.

VI. EMERGENCY TELEPHONE NUMBERS

Louisiana Department of Environmental Quality (LDEQ) 24 Hour Release Reporting Air Quality Division Hazardous Waste Division Water Resources Division	 9-504-342-1234 9-504-765-0219 9-504-765-0355 9-504-765-0634
Lower Mississippi River Warning Network	DAY: 9-504-826-2400 NIGHT: 9-504-586-7747 and key beeper number 5066, 5070 or 5068
Jefferson Parish Waterworks District I	East Bank: 9-838-4305 West Bank: 9-349-5080
Sewage and Water Board of New Orleans	Carrollton Plant: 9-861-0331 9-861-4955 Algiers Plant: 9-361-4331 9-362-7210
National Response Center* *If no answer contact EPA Region VI	9-800-424-8802 9-202-267-2675 9-214-665-2222
Department of Natural Resources (Deepwells)	9-504-342-5515
U. S. EPA Dallas Region VI	ANYTIME: 8-214-665-6595 DAYTIME: 8-214-665-6470 8-214-665-6475 8-214-665-6450 8-214-665-6455
U. S. Coast Guard - Marine Safety Officer	9-504-589-7171
New Orleans International Airport	9-504-464-2688
Kenner Fire Department	9-504-467-2211
Jefferson Parish Dept. Of Emergency Management	911
St. Charles Parish Emergency Operations Center	St. Charles Parish Hotline @ Main Gate and EOC
Louisiana State Police	1-504-925-6595

EMERGENCY OPERATIONS TEAM MEMBERS

If an Emergency occurs, or the SHIFT SUPERINTENDENT requests that the EOC be placed into operation on an off-shift, weekend, or holiday, the following persons are to be called by the EOC Chief.

POSITION	PRIMARY	ALTERNATE
Safety Specialist	G. Tierney 656-7757	P. Martinez 537-3151
Safety Leader	P. Martinez 537-3151	R.Masson 837-0435
Process Owner-PSM/RMP	R. Masson 837-0435	R. Hernandez 431-2911
Director of Manufacturing	J. Gill 652-4795	J. Schneller 283-8443
Director of Safety, Environmental and Technology	J. Schneller 283-8443	A. Junker 468-7703
Environmental Services Leader	A. Junker 468-7703	O. Tanner 945-3760
Operating Support Services Manager	R. Busfield 764-8319	M. Roy 785-0070
Director Employee Relations	J. Marosits 764-1772	R. B. Johnson 764-0595
Community & Government Affairs Manager	J. F. Dutcher 785-6405	R.B. Johnson 764-0595
Environmental Services Leader	A. Junker 468-7703	O. Tanner 945-3760
SAFER Operator	M. Clay 340-8944	A. Hicks 366-7384
Technical Representative	P. Knieper 737-3761	B. Skeeles 394-8091
Plant Nurse	Joan Troutman 785-0054	Pat Lutrell 785-2782

CYTEC CORPORATE PERSONNEL NOTIFICATION LIST

In the event of a significant plant incident such as a serious fire, major spill, explosion, or serious injury notification should be made to the **Cytec Safety, Health & Emergency Response Group** in West Paterson, NJ. via the Emergency HOT LINE numbers.

1-800-647-3746

1-800-647-ERIM

Non-Emergency 1-813-979-0626

Fax: 1-813-979-4620

Please provide the following information to the Cytec Guard/Receptionist:

1. The name of the plant - **FORTIER PLANT**
2. The name of the Caller - **YOUR NAME**
3. The **Call back number** to the Plant - the number of the telephone you are calling from.
4. The nature of the Emergency - **Fire, Spill, Injury, etc.**

NOTE: **Mr. Joe Caporossi**, Director of the Safety, Health & Emergency Response Group will when contacted by the ERIM guard/Receptionist make further notifications to Company Management as required by the nature of the occurrence.

Cytec Management

	Work Telephone No.	Home Telephone No.
J. Leman Vice-President/General Manager	(201) 357-3302	(201) 334-5963
J. C. Caporossi Director, SHER	(201) 357-3347	(201 728-0867

FORTIER PLANT MANAGEMENT TEAM

Team Member	Phone Number
Barrett, L.	682-7608
Bass, J.	340-4460
Becnel, E.	785-0699
Busfield, R.	764-8319
Bywater, R.	652-3324
Case, J.	764-6903
Deis, G.	586-9813
Diaz, V.	455-5241
Dutcher, J.	785-6405
Friloux, C.	785-2485
Gaudet, M.	482-1487
Gelbwaks, P.	484-6579
Gill, J.	652-4795
Goletz, F.	391-0767
Hannula, B.	469-0715
Heslin, R.	764-1092
Johnson, R.	764-0595
Junker, A.	468-7703
Knieper, P.	737-3761
Lincoln, R.	641-4757
Marosits, J.	764-1772
Marsiglia, K.	785-9989
Martin, J.	885-8854
Martinell, F.	347-0640
Martinez, P.	537-3151
Masson, R.	837-0435
Matthews, A.	831-3150
Meisch, R.	725-0796
Mikesell, P.	785-0225
Prsybylski, D.	764-6684
Roy, M.	785-0070
Saul, B.	392-7640
Schneller, J.	283-8443
Taylor, M.	764-2025
Tierney, G.	656-7757
Troutman, J.	785-0054
Williams, H.	785-8604

VII. INCIDENT REPORT FORM

SECURITY DEPARTMENT - INCIDENT REPORT FORM	
THEFT ☐ SABOTAGE REPORT ☐ UNUSUAL INCIDENT ☐ OTHER ☐	
DESCRIPTION OF INCIDENT:	
MODEL NO:	SERIAL NO:
DATE:	TIME:
VALUE OF EQUIPMENT/PROPERTY DAMAGED:	
ADDITIONAL COMMENTS:	
NAME & COMPANY OF PERSON INTERVIEWED:	
INCIDENT INVESTIGATED BY:	
TITLE:	
RESOLUTION:	

VIII. BOMB THREAT REPORT FORM

BOMB THREAT REPORT FORM	
INFORMATION ABOUT THE THREAT	
NAME OF PERSON OR GROUP CALLING:	
TIME & DATE OF CALL:	☐ AM ☐ PM
WEATHER CONDITIONS:	
TYPE OF EXPLOSIVE DEVICE:	
TIME SET TO DETONATE:	☐ AM ☐ PM
WHERE IS THE DEVICE PLANTED:	
MOTIVE BEHIND THE ATTEMPT:	
INFORMATION ABOUT THE CALLER	
NOTE: IF YOU ARE ABLE TO DISTINGUISH ANY O THE BELOW LISTED INFORMATION ABOUT THE CALLER - COMPLETE THE FOLLOWING SECTION:	
DISTINGUISHING SPEECH CHARACTERISTICS:	
☐ SLURRED SPEECH ☐ LISP ☐ STUTTER ☐ ACCENT _____	
APPROXIMATE AGE (IF YOU CAN DETERMINE):	☐ MALE ☐ FEMALE
STATE OF MIND: ☐ EXCITED ☐ RAVING ☐ CALM ☐ OTHER _____	
REPORT TAKEN BY:	
REPORT GIVEN TO SHIFT SUPERINTENDENT FOR ACTION:	☐ YES ☐ NO
COMMENTS:	

Appendix P

LAC 33:V.517.G
LAC 33:V.1509.G

Inspection Plan

Cytec Industries Fortier Plant	Dept: Environmental	Number: ES-03
	Date: 5/29/98	Issue No. 1
	Title: Hazardous Waste Facilities Inspection Plan	Supersedes: New Page: 1 of 7

Prepared by: Stacy Foret	Reviewed by: Anita Junker	Approved by: John Schneller
Stacy Foret	Anita Junker	John Schneller / R.L. Martin
Process Owner - Hazardous Waste	Environmental Team Leader	Director of Safety, Environmental and Technology

Update Responsibility : Process Owner - Hazardous Waste
Implementation Responsibility: Responsible Care Coordinators

Distribution List

Copy No.	Location
1	SET Department
Copies can be access through the Cytec Fortier Plant Intranet	

Reference Documents: LAC 33:V.1509
File: R:\HW\PERMIT\INSP_PLN.DOC

**** Blue Stamp Indicates a Controlled Document.***

TABLE OF CONTENTS

		PAGE
1.	INTRODUCTION	3
1.1	PURPOSE	3
1.2	SCOPE	3
1.3	DEFINITIONS	3
2.	PROCEDURE	3
2.1	ITEMS WHICH MUST BE	3
2.2	PERFORMANCE OF INSPECTIONS	4
2.3	SCHEDULE	4
2.4	DOCUMENTATION	5
2.5	CORRECTIVE ACTION	5
3.	RECORD RETENTION	6
4.	RESPONSIBILITIES	6
5.	REFERENCE	7

ATTACHMENT I - Facility Inspection List

ATTACHMENT II - General Inspection Schedule

1. INTRODUCTION

1.1 PURPOSE

The purpose of this standard is to establish a written plan and schedule for inspecting the hazardous waste handling facilities at Fortier for malfunctions and deterioration, operator errors, and discharges which may be causing or may lead to a release of hazardous waste or a threat to human health.

1.2 SCOPE

This standard applies to tanks, filters, piping, monitoring equipment, safety and emergency equipment, security devices, and other operating and structural equipment (such as dikes and sump pumps) that are important to preventing, detecting, or responding to environmental or human health hazards associated with Fortier=s hazardous waste handling facilities.

1.3 DEFINITIONS

Annual – Once each calendar year (January through December)

Daily – Once each 24 hour period.

Hazardous waste facilities
or equipment - Facilities or equipment which handle material which is RCRA hazardous waste (i.e., falls under the regulatory definitions of hazardous waste in 40 CFR 261.3 and LAC 33:V.109)

Monthly – Once each calendar month.

Weekly – Once each calendar week (Sunday through Saturday).

2. PROCEDURE

2.1 ITEMS WHICH MUST BE INSPECTED

Attachment I identifies specific hazardous waste management facilities which must be inspected. Monitoring equipment, safety and emergency equipment, security devices, and other equipment associated with operation of the facilities listed in Attachment I must also be inspected as indicated on Attachment II.

2.2 PERFORMANCE OF INSPECTIONS

2.2.1 All hazardous waste facilities and associated equipment must be inspected for equipment malfunction and deterioration, operator error, and unusual discharges on a regular basis. In addition to these general inspections requirements, all hazardous waste facilities and associated equipment must also be inspected for the specific malfunctions and conditions listed in Attachment II and any other unusual conditions, at the specified inspection frequency.

2.2.2 All facility and equipment inspections must be performed by operating, supervisory or technical personnel who work in the physical or subject area involved and who have been trained in proper inspection procedures, location of equipment, equipment operation, and possible malfunctions.

2.3 SCHEDULE

2.3.1 Appendix II specifies a schedule which must be followed for inspecting hazardous waste system monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment (such as dikes and sump pumps) that are important to preventing, detecting, or responding to environmental or human health hazards associated with Fortier's hazardous waste handling facilities.

2.3.2 The frequency of inspection for the items on the schedule in Appendix II may be revised as necessary. Inspection frequency should be based on the rate of possible deterioration of the equipment and the probability of an environmental or human health incident if the deterioration or malfunction or any operator error goes undetected between inspections. Inspections must be conducted often enough to identify problems in time to correct them before they harm human health or the environment.

2.3.3 Hazardous waste system components (including tanks, filters, pumps, valves, and piping) and areas subject to spills, such as loading and unloading areas, must be inspected daily when in hazardous waste service.

2.3.4 Hazardous waste container storage areas must be inspected weekly when in hazardous waste service.

2.3.5 Pumps in hazardous waste service managing a waste stream with greater than 10% volatile organics must be visually inspected weekly. These pumps must also be monitored using an organic vapor analyzer (Method 21) or equivalent monthly.

2.3.6 Valves in hazardous waste service managing a waste stream with greater than 10% volatile organics must be monitored using an organic vapor analyzer (Method 21) or equivalent quarterly.

2.3.7 Flanges and other connections in hazardous waste service managing a waste stream with great than 10% volatile organics must be monitored using an organic vapor analyzer (Method 21) or equivalent annually.

2.3.8 Hazardous waste system ancillary equipment without secondary containment must receive a leak test or other integrity assessment at least annually. A record of the results of the integrity assessment must be kept on file in accordance with the requirements of Section 3.

2.3.9 The fixed roof and closure devices of tanks in hazardous waste service managing a waste stream with greater than 500 ppm volatile organics must be visually inspected annually.

2.3.10 The readings from each monitoring device on the Acrylonitrile flare must be inspected at least once each operating day.

2.3.11 Containers in hazardous waste service managing a waste stream with greater than 500 ppm volatile organics must be visually inspected initially after being placed into hazardous waste service.

2.4 DOCUMENTATION

2.4.1 Inspections and inspection findings for hazardous waste facilities and associated equipment specified in Attachments I and II must be documented. As a minimum all inspection records must include:
the date and time of the inspection; and
the name of the inspector; and
a notation of the observations made (The observation section should not be left blank.); and
the date and nature of any repairs or other remedial actions.

2.4.2 Personal protective equipment (PPE) (e.g., safety glasses, gloves, and boots) are to be inspected at least daily by the owner prior to use. PPE not suitable for use is to be replaced immediately. Documentation of inspection or replacement of Personal Issue PPE is not required.

2.5 CORRECTIVE ACTION

2.5.1 Any deterioration or malfunction of equipment or structures obsserved during the inspection

must be corrected.

2.5.2 For problems which result in a spill of hazardous waste or other imminent or actual hazard, the Shift Superintendent must be immediately notified, then proceed with control and remedial actions in accordance with the environmental incident response procedures, as revised.

2.5.3 For problems which have no immediate detrimental effects or problems which have been temporarily controlled, corrective measures must be scheduled without undue delay, but in all cases soon enough to ensure that the problem does not lead to an environmental or human health hazard.

2.5.4 The date and nature of corrective measures (leak repair, maintenance, or other) must be noted in the appropriate operating log and the correction verified on the next inspection.

3. RECORD RETENTION

3.1 A copy of the inspection plan and schedule must be maintained at the Fortier Plant.

3.2 All inspection records identified in Section 2.4 must be kept for at least three years from the date of inspection.

4. RESPONSIBILITIES

4.1 Process Owner - Review and update this plan as necessary to reflect changes in facilities, equipment, regulations, and technology; provide regulatory information and guidance in cases of waste release or other problems.

4.2 Responsible Care Coordinator - Maintain files of area equipment inspection records; coordinate required inspections by Inspection Department and other groups; assist in coordination of response to cases of waste release or equipment problems.

4.3 Manufacturing Supervisor Train operators in inspection methods and requirements; maintain operator log files; coordinate response and corrective action to waste releases or other problems including initiation of corrective action work orders and informing Shift Superintendent of releases.

4.4 Operator - Perform and document inspections as directed; inform Manufacturing Supervisor of waste releases or other problems observed during inspections; perform corrective actions as directed.

5. REFERENCE

LAC 33:V.517.G requires the inspection schedule to be submitted with Part II of the facility hazardous waste permit application. The LDEQ will evaluate the schedule along with the rest of the application to ensure that it adequately protects human health and the environment. As part of this review, the LDEQ may modify or amend the schedule as may be necessary.

ATTACHMENT I

FACILITY INSPECTION LIST

CYTEC FORTIER
HAZARDOUS WASTE FACILITIES INSPECTION LIST

ACYRLONITRILE INSPECTION AREA

1) **WWCB Injection Well Pretreatment System Consisting of:**
   a) Catalyst Settling Tank TA-403
   b) Primary Filter Feed Tank TA-404
   c) Secondary Filter Feed Tank MF-307
   d) WWCB Well Injection Tank TA-402
   e) WWCB Backwash Tank - North TA-501 A
   f) South WWCB Backwash Tank TA-501 B
   g) WW Primary Filters (2) F-401 A and B
   h) WW Secondary Filters (2) F-401 C and D
   i) WW Cartridge Filters (4) CF-401 A, B, C, and D

2) **RCB Injection Well Pretreatment System Consisting of:**
   a) RCB / MET Backwash Tank 100-6 *
   b) RCB Filters (3) 100-5 A, B, and C

3) **Miscellaneous Effluent (MET) Well Pretreatment System Consisting of:**
   a) MET Injection Tank T-500
   b) MET Filters (4) HRD-V50 A, B, C, and D

4) **Underground Injection Wells**
   a) Well No. 1
   b) Well No. 2
   c) Well No. 3
   d) Well No. 4
   e) Well No. 5

UTILITIES INSPECTION AREA

1) Impound No. 1 (Closed Unit)
2) Impound No. 3 (Closed Unit)
3) Miscellaneous Effluent Tank 1 MET-1
4) Miscellaneous Effluent Tank 2 MET-2
5) Container Storage Building

ACRYLAMIDE INSPECTION AREA

1) Ancillary piping associated with the Miscellaneous Effluent (MET) header

METHYL METHACRYLATE INSPECTION AREA

1) MMA Lab Collection Tank 101-52
2) Ancillary piping associated with the Miscellaneous Effluent (MET) header

* Tank is shared between the RCB and Miscellaneous Effluent Pretreatment systems.

Note:All units may also accumulate hazardous waste in containers subject to 90-day storage limitations under RCRA.

ATTACHMENT II

FORTIER PLANT GENERAL INSPECTION SCHEDULE

Cytec Fortier Plant General Inspection Schedule

Type of Equipment **Structural**

Specific Item	*Type of Problem*	*Inspection Frequency*	*Inspection Procedure*
Tanks, filters (external)	Proper operation, leaks, level, signs of corrosion, condition of monitoring equipment, valve alignment, actual vs. monitoring equipment readings	Daily	Visual
Tanks (internal)	Corrosion, erosion, cracks, leaks, plugged lines, residues, condition of coating or lining	During Tank Cleanout	Visual
Tank containment areas	Leaks, cracks, gaps, erosion, or other deterioration	Daily	Visual
Pumps, sumps	Leaks, signs of wear, noise, actual vs. monitoring equipment readings, power interruption, pump cavitating, seals and seal water adequate	Daily when in operation	Visual
Piping, valves, flanges	Corrosion, valve position vs. transmitter position, packing needing adjustment, leaks	Daily	Visual
Hazardous Waste Valves (>10% VOC)	Leaks, Instrument reading > 1000 ppm	Quarterly	Reference Method Screening
Hazardous Waste Tank System Ancillary Equipment without Secondary Containment	Lack of integrity, Leaks, Corrosion, Out of service	Annually	Visual
Hazardous Waste Tank fixed roofs and closure devices (>500 ppm VOC)	Defects resulting in air pollutant emissions (visible cracks, holes, gaps; broken, cracked or otherwise damaged seals or gaskets; broken or missing hatches, access covers, caps or other closure devices)	Annually	Visual
Hazardous Waste Pumps (>10% VOC)	Leaks	Weekly	Visual
Hazardous Waste Pumps (>10% VOC)	Leaks, Instrument reading > 1000 ppm	Monthly	Reference Method Screening
Hazardous Waste Flanges and Other Connections (>10% VOC)	Leaks, Instrument reading > 1000 ppm	Annually	Reference Method Screening

Type of Equipment Structural

Specific Item	*Type of Problem*	*Inspection Frequency*	*Inspection Procedure*
Closed Impoundments Nos. 1 and 3	Settling, erosion, in need of mowing, storm damage	Daily	Visual
Acrylonitrile Flare	No pilot flame	Daily	Visual of monitoring records

Type of Equipment Storage

Specific Item	*Type of Problem*	*Inspection Frequency*	*Inspection Procedure*
Hazardous Waste Containers, Bins	Proper arrangement, stacking, aisle spacing, segregation, condition, leaks, corrosion, labeling, spills, run-on accumulation, incompatible wastes, accumulation dates, containers closed	Weekly	Visual
Hazardous Waste containers, bin covers, closure devices (>500 ppm VOC)	Visible cracks, holes, gaps	Initially upon placing waste in the container or bin	Visual

Type of Equipment Security Devices

Specific Item	*Type of Problem*	*Inspection Frequency*	*Inspection Procedure*
Warning signs, lighting	Visibility, damage, obstructions, power	Daily	Visual
Patrols, key rounds	Suspicious activity, unauthorized persons	Several times daily	Visual
Gates (remote control and manual), locks	Corrosion, ease of movement, remote control operation	Several times daily	Visual
Fences, barriers	Corrosion, holes, evidence of misuse	Daily	Visual
Communications (two-way radios, telephone PA system)	Operating condition, voice distortion, free of interference, electrical or battery signal OK	Weekly	Visual and Audible

Type of Equipment Safety and Emergency

Specific Item	*Type of Problem*	*Inspection Frequency*	*Inspection Procedure*
Telephone system	Proper operation, dial tone, power failure back-up operation, ringing loud enough to be heard, free of static, crisis phone operable, telephone numbers accessible	Weekly	Visual and Audible
Safety showers, eyewash stations, first aid kits, stretchers	Proper operation, adequate water pressure, cleanliness, proper drainage, easy access, missing items, useable condition	Weekly	Visual
Public address (loudspeaker paging) systems	Proper operation, clearly heard, no distortion, speakers located properly, power failure condition	Weekly	Audible
Emergency response equipment	Proper operation, missing items, damage or deterioration, proper location	Weekly	Visual
Emergency lighting, signs, alarms	Proper operation, power failure condition, proper location, easily seen or heard, no obstructions, adequate warning	Weekly	Visual and Audible

Type of Equipment Personal Protection Equipment

Specific Item	*Type of Problem*	*Inspection Frequency*	*Inspection Procedure*
Safety glasses, goggles, face shields	Visibility, proper fit, scratches or cracks, suitable for intended use	As Required	Visual
Protective clothing, rain gear, coveralls, gloves, hard hat, safety shoes, rubber boots	Proper fit, signs of wear or deterioration, suitable for intended use	As Required	Visual
Ear protection, ear plugs, ear muffs	Fit, clean, deterioration, suitable for intended use	As Required	Visual
Cartridge respirators, breathing air masks	Proper operation, air supply, free of dirt and cracks, proper location, recharge needed, missing items, suitable for intended use	Weekly	Visual

Type of Equipment **Monitoring**

Specific Item	*Type of Problem*	*Inspection Frequency*	*Inspection Procedure*
Temperature transmitters, alarms, gauges, recorders	Transmitter signal, indicator bulb burned out, interrupted instrument air supply, electrical circuit or alarm/recorder reading vs. gauge reading/visual reading	Daily	Visual
Pressure transmitters, alarms, gauges, recorders	Transmitter signal, indicator bulb burned out, interrupted instrument air supply, electrical circuit or alarm/recorder reading vs. gauge reading/visual reading	Daily	Visual
Level transmitters, alarms, gages, recorders	Transmitter signal, indicator bulb burned out, interrupted instrument air supply, electrical circuit or alarm/recorder reading vs. gauge reading/visual reading	Annually	Visual
Groundwater monitoring wells	Condition of concrete pad and protective posts, evidence of contamination around well, cover on wells, locks	Semiannually	Visual
Flow transmitters, alarms, gauges, recorders	Transmitter signal, indicator bulb burned out, interrupted instrument air supply, electrical circuit or alarm/recorder reading vs. gauge reading/visual reading	Daily	Visual

Type of Equipment **Fire Protection**

Specific Item	*Type of Problem*	*Inspection Frequency*	*Inspection Procedure*
Sprinkler systems, foam systems	Leaks, pressure, needs changing, room heat, drip test, condition	Weekly	Visual
Sprinkler systems, foam systems	Alarm tested, drainage	Quarterly	Visual
Sprinkler systems, foam systems	Trip test	Annually	Visual
Post indicator valves, curb boxes	Valve position, sealed, inspect condition	Monthly	Visual
Post indicator valves, curb boxes	Full travel flow test	Annually	Visual
Fire trucks tires, brakes, lights, horns, leaks of engine, hydraulic, brake fluid	Malfunction	Daily	Visual
Fire truck engine condition	Proper setting and operation	Monthly	Mechanical
Fire pumps (electric and diesel)	Flow rate and head, start/stop time, pressure, battery check, operating condition, missing items	Weekly	Visual
Fire monitor nozzles	Nozzle condition, leaks, corrosion	Monthly	Visual
Fire monitor nozzles	Full travel flow test	Annually	Visual
Fire hydrants, hoses, hose houses, hose reels, hose racks	Clear access, condition, cracks, missing items, amount of hose available	Monthly	Visual
Fire extinguishers	Inoperable, used, proper location	Monthly	Visual
Fire alarm system (ADT), generators	Pull boxes tested, proper alarm code sounded, alarm heard, circuit open	Semiannually	Visual and Audible
Emergency siren system	Interrupted power failure operation	Weekly	Visual

Appendix Q

LAC 33:V.517.I
LAC 33:V.1513

Contingency Plan

CONTINGENCY PLAN

General

State and federal regulations require that a Contingency Plan be developed for Treatment, Storage, Disposal (TSD) facilities which provides procedures that must be carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents which could threaten human health of the environment. The Fortier Plant has in place a number of plantwide and departmental procedures designed to protect human health and the environment in the event of a crisis situation. The procedures established are applicable to any type of upset condition including emergencies resulting from hazardous waste operations. Each department has also developed procedures for hazardous chemical spills or releases which are included in their departmental operating procedures. These procedures are designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface waters.

EMERGENCY PROCEDURES FOR TSD FACILITIES

If hazardous waste tanks, filters, containers, bins or associated equipment are found to be leaking, overflowing, or otherwise malfunctioning:

1) Take appropriate action to avoid a potential crisis situation by shutting down operations, cutting off waste feed, using containment methods, or using any other available means to control the situation.
2) After temporary corrective measures have been instituted, notify an environmental representative of the problem and potential effects.
3) For problems which result in a spill of a hazardous waste material, notify the appropriate unit personnel and proceed according to the current Fortier spill procedures.
4) For problems which have no immediate detrimental effects or problems which have been temporarily controlled, corrective measures must be scheduled immediately and instituted without undue delay. An environmental representative will be available for consultation and support.
5) Dates that the problem occurs and continues, and dates of completion of corrective measures (maintenance or otherwise) must be documented on hazardous waste inspection logs.

If the severity of the crisis requires additional assistance outside of the operating area, plant alarms are activated and notification is made using the steps outlined in the Fortier Plant Safety Standard No. S-8 -

Emergency Procedures which are included in Attachment I.

The Fortier Plant Safety Standard No. S-8 - Emergency Procedures (Attachment I) contains information on reporting a "crisis", determining its severity, establishing a control center, deploying personnel to alleviate the condition, and notifying neighbors, Cytec employees and outside authorities. The Fortier Plant Safety Standard No. S-8 - Emergency Procedures (Attachment I) also contains the Firefighting Plan, Department Specific Emergency Plans and Bomb Threat Proceduress identified as Appendices A, B, and C, respectively. Additionally, Hurricane Procedures have been established for Fortier since the plant is located in an area subject to such disturbances. These procedures are included in Attachment II.

Emergency Procedures

Emergency situations will be responded to as outlined in the Fortier Plant Safety Standard No. S-8 - Emergency Procedures included in Attachment I. It is anticipated that the Fortier Plant Fire Department and Emergency Response and Incident Management (ERIM) Team will be capable of handling any emergency situation. However, additional assistance can be obtained from local industries and other public and private entities through mutual aid. The Fortier Plant Safety Standard No. S-8 - Emergency Procedures (Attachment I) identifies the local police departments, fire departments, hospitals, contractors and state and local emergency response teams and the corresponding services that each would be expected to provide if called upon during an emergency situation.

Emergency Coordinator

The designated emergency coordinator is the Fortier Plant Shift Superintendent. A Shift Superintendent is on duty 24 hours per day on a rotating shift basis. Fortier Plant Safety Standard No. S-8 - Emergency Procedures (Attachment I) lists the names, addresses, and office and home phone numbers of the Shift Superintendents. This list is updated as necessary to ensure that the information is accurate. Furthermore, the list identifies the primary and alternate emergency coordinators in the order in which they will assume responsibility.

Emergency Equipment

Emergency equipment within hazardous waste TSD areas consists of fire extinguishing systems, spill control equipment, communications and alarms, and decontamination equipment. In general, the information provided in this secton focuses on equipment most readily available at the TSD areas.

Fire Extinguishing Systems

The Fortier Plant fire protection system includes a network of hose houses, fire hydrants and fixed and portable monitor nozzles. Fortier Plant Safety Standard No. S -8 - Addendum A Fire Fighting Plan (Attachment I), identifies the location, physical description, and capabilities of the major fire fighting equipment, as well as general instructions for plant fire fighting. The system is maintained at 120 psig by two electric driven jockey pumps with automatic start controls and an electric fire pump and a diesel fire pump at the river dock which supply river water in event of an emergency. There is also a diesel fire pump on stand-by at the settling basin to pump water from this area in case of a power failure. In addition, portable fire extinguishers are located within the hazardous waste facilities to permit immediate reaction to small fires. The following is a list of the fire equipment located nearest the TSD units:

H.W. Unit Locations	Fire Extinguisher Location	Hose House/Hydrant/Monitor Location(1)
Acrylonitrile Plant Waste Disposal Area	1. NW corner of waste disposal area (SW of Flare Stack) 2. South of Flare Stack in Oxazole Area 3. Injection Well Pretreatment Area	1. HH40 - South of Corrosion Lab 2. M40 - West of Flare Stack 3. M48 - Northwest of Catalyst Settling Tank 4. M72 - South of WW Dike Area
Utilities Department Miscellaneous Effluent Tank (MET) System	Waste water pump decks on north dike wall	1. H5 - North of MET2 2. H37 - Southeast of MET2 3. M52 - North of MET1 4. M53 - Southwest of MET1
Utilities Department Container Storage Building (CSB)	1. Inside building (4) 2. Inside flammable storage area (1) 3. N of building (2)	1. HH4 - Southeast of CSB 2. M64 - North of CSB
AMD Plant	1. NE of Rail Car Loading Area 2. Upper Deck of Railcar Loading Area.	1. HH12 - West of Railroad racks 2. H32 - North of Loading Area 3. M36 - East of Loading Area
MMA Plant	East of North/South Pipe Rack	1. HH41 - Northwest corner of MMA Plant 2. H27 - Northeast corner of MMA Plant 3. M14 - East of North/South Piperack

(1) Maps depicting locations of Hose Houses, Hydrants, and Monitors are included in the Fortier Plant Safety Standard No. S-8, Addendum A.

The Safety Department has a fireman on duty 24 hours per day and regular rounds are made approximately every two hours to check for fire hazards and assure equipment is operating properly. Weekly inspections are conducted of all curb box and post indicator valves, fire extinguishers, monitor nozzles, hydrants and hose houses, sprinkler systems, hose reels, fire pumps, foam generators, hose racks and fire engines to make sure they will be ready in an emergency.

General Plant	Location
Foam Pumper Truck (~1,000 gpm) Pumper Truck (~500 gpm) Foam (~750 gallons on truck)	Fire Station Fire Station Fire Station

Spill Control Equipment

Spill control equipment and materials available at Fortier include a D-9 Caterpillar, a tractor with front-end loader/backhoe and a road maintainer, all of which could be used to construct dikes, berms, levees or dams on short notice. Absorbent pads and booms are kept at the hazardous waste Container Storage Building, and in the plant warehouse. In general, small quantities of spill control equipment, including absorbent pads, are also maintained throughout the plant in operating and maintenance areas. However, the primary inventory will be located in the plant warehouse. Vapor suppressant foam is also kept on hand at the Fire Department and various other locations for emission control from spills of volatile liquids. A listing of the spill control equipment generally available is as follows:

General Plant	Location
Granular Spill Absorbent Absorbent Blankets Absorbent Pads Absorbent Boom	Warehouse Warehouse Warehouse/Container Storage Building Warehouse

Communications and Alarm Systems

Communications and alarm systems, both internal and external, are described in the Fortier Plant Safety Standard No. S-8 - Emergency Procedures in Attachment I.

The following is a list of the fire alarm pull-boxes located near the TSD units:

H.W. Unit Location	Fire Alarm Pull-Box Location
Acrylonitrile Plant Waste Disposal Area	1. North side of control room 2. Northeast corner of purification section 3. Southwest corner of reactors
Utilities Department Miscellaneous Effluent Tank (MET) System	Southwest corner of EOP Building
Utilities Department Container Storage Building (CSB)	Southwest corner of EOP building
AMD Plant	West of Truck Wash Area
MMA Plant	1. West of MMA Control Room 2. East of MMA Control Room

The following is a list of the primary phone numbers located nearest the TSD units

H.W. Unit Location	Telephone Extension Location
Acrylonitrile Department Waste Disposal Area	1. 6419 AN Control Room (Emergency) 2. 6420 AN Control Room 3. 6429 Propylene Storage 4. 6425 Waste Disposal
Utilities Department Miscellaneous Effluent Tank (MET) System	1. 6481 EOP Control Room 2. 6570 EOP/MET Office Trailer 3. 6610 Utilities Control Room
Utiliites Department Container Storge Building	1. 6681 Container Storage Building 2. 6570 EOP/MET Office Trailer
AMD Plant	6393 AMD Control Room
MMA Plant	6394 MMA Control Room Room

Each operating department is also equipped with a FM radio to be used in case the crisis causes a failure of the plant telephone system. The FM radios are located in each plant's control room and a radio check is made weekly to assure they will be operating when needed. Under normal circumstances, radios will be operated on specific production area channels. During an emergency situation, radios will be operated on Channel 1 which is the Emergency Coordinator (i.e., Shift Superintendent) channel.

In the event that assistance outside the Fortier complex is required, a direct line from the Main Guardhouse to the St. Charles Parish Civil Defense Headquarters has been provided to expedite communication. Jefferson Parish Civil Defense is contacted through a direct 911 number. The Fortier Plant Safety Standard No. S-8 - Emergency Procedures provide the names and telephone numbers of various local and regional authorities to notify if the situation warrants.

Decontamination Equipment

Decontamination equipment such as safety showers and eyewash stations are located in each department throughout the plant. The following is a list of safety showers and eyewash stations located closest to the TSD units:

H.W. Unit Location	Shower and Eyewash Location
Acrylonitrile Plant Waste Disposal Area	1. By Propylene Sphere 2. By Catalyst Settling Tank 3. In Injection Well Pretreatment System Area 4. N of Crude Storage Area
Utilities Department Miscellaneous Effluent Tank (MET) System	1. E of waste water pump deck, N wall of dike 2. W of waste water pump deck, N wall of dike 3. pH platform, S of MET-1, on dike wall
Utilities Department Container Storage Building	1. S of building 2. E of building 3. W of building
AMD Plant	NE of Rail Car Loading Area
MMA Plant	NE of North/South Piperack

Other decontamination equipment includes portable hydroblasters with varying pressure ranges and water supplied by connections to either the fire water header or the clarified Mississippi River water header. Equipment decontamination should be performed in areas where there is adequate concrete secondary containment and the drainage is routed to the hazardous waste tank system. The following is a list of areas that provide adequate secondary containment and are associated with the hazardous waste tank system suitable for decontamination activities:

H.W. Unit Location	Secondary Containment Area
Acrylonitrile Plant Waste Disposal Area	1. Secondary Filter Feed Tank Dike 2. South Wastewater Dike 3. RCB Dike 4. North Wastewater Dike 5. MET Injection Dike
Utilities Department Miscellaneous Effluent Tank (MET) System	MET 1 and 2 Tank Dike

Evacuation Plan

Evacuation will take place from each crisis assembly area when a situation is severe enough to warrant evacuation. Crisis Assembly Areas are designated to account for personnel in the plant. The Crisis Assembly Areas and procedures for evacuation of facility personnel are included in the Fortier Plant Safety Standard No. S-8 - Emergency Procedures (Attachment I).

Evacuation will be made only when instructed by the Emergency Coordinator or his alternate to prevent unnecessary risk to human health and assure orderly movement of personnel. The procedures for informing

and/or evacuting neighbors are also included in Fortier Plant Safety Standard No. S-8 - Emergency Procedures included as Attachment I.

Distribution

Copies of this Contingency Plan should be distributed to LDEQ, local fire and police departments, hospitals, and emergency response teams which are subject to respond in the event of a crisis. These entities are specifically identified in the Fortier Plant Safety Standard No. S-8 - Emergency Procedures in Attachment I

Amendment

The Contingency Plan is reviewed and revised when necessary to insure that the information is accurate. At a minimum, the Contingenc Plan is revised:

- Each time the TSD facility operations are changed due to expansion, change in type or quantity of waste handled, or other changes which effect the degree or type of possible emergency situation;
- when the facility permit is revised;
- when the plan fails in an emergency involving the TSD units;
- when applicable regulations are revised;
- when the TSD facility changes its design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions, or releases of hazardous wasste or hazardous waste consitutuents, or changes the response necessary in an emergency;
- when the list of emergency coordinators changes; or
- when the list of emergency equipment associated with the TSD units changes.

Attachment I

FORTIER PLANT SAFETY STANDARD NO. S-8
Emergency Procedures

Addendum A - Fire Fighting Plan

Addendum B - Department Specific Emergency Plans

Addendum C - Bomb Threat Procedures

Cytec Industries	Dept. : SAFETY	Number : S-8
	Date : 01/19/98	Issue No. : 6
Fortier Plant Waggaman, La.	Title : Fortier Plant Safety Standard - Emergency Procedures	Supersedes: 09/01/97 Sheet 1 of 69

Prepared by:	Reviewed by:	Approved by:
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Update Responsibility : Safety Leader
Implementation Responsibility: Safety Leader

Distribution List

Copy No.	Title / Location
1	Administrative Assistant/ Safety Department
2 Thru 12	See Distribution List with Master Copy

Required Review Date is 01/19/99.
Reference Documents:

Blue Stamp Indicates a Controlled Document.

TABLE OF CONTENTS

		PAGE
1.0	INTRODUCTION	6
2.0	PURPOSE	6
3.0	DEFINITIONS	6
	3.1 Unusual Event	6
	3.2 Alert	7
	3.3 Site Area Emergency	7
	3.4 General Emergency	7
	3.5 Emergency Operations Center (EOC)	7
	3.6 Emergency Operations Team (EOT)	7
	3.7 Emergency Response Team (ERT)	8
4.0	ABBREVIATED EMERGENCY PROCEDURE	8
	4.1 What Happens in a Crisis?	8
5.0	EMERGENCY ASSEMBLY AREA - HEADCOUNT PROCEDURES	8
	5.1 Purpose	8
	5.2 Procedure	8
	5.3 Crisis Assembly Areas	9
	5.4 Staging Area	10
6.0	RESPONSE AND NOTIFICATION PROCEDURES	10
	6.1 Duties of the Person Recognizing an Emergency	10
	6.2 Duties of the Guard at the Main Gate when receiving an Emergency Call	11
	6.3 Duties of the Guard at the Main Gate when an emergency is either upgraded or downgraded	12
	6.4 General Instructions for Notification of Outside Authorities	12
	6.5 Community and Governmental Agencies to be Contacted	13

TABLE OF CONTENTS

		PAGE
	6.6 Other Agencies	14
7.0	OPERATIONS	15
	7.1 EOC Operations	15
	7.2 EOC Staff	15
	7.3 Responsibilities of Emergency Operations Team Members - (Personnel Roles and lines of Authority)	16
	7.3.1 Role of Facility Safety Specialist and alternates.	16
	7.3.2 Shift Superintendent	17
	7.3.3 Additional Duties of the Shift Superintendent per LAC 33: V.1513	19
	7.3.4 Primary Emergency Coordinator- Shift Superintendent	20
	7.3.5 Emergency Coordinator Alternates	20
	7.3.6 MMA Plant Representative	23
	7.3.7 Medical Team	24
	7.3.8 EOC Chief	25
	7.3.9 Director of Manufacturing	26
	7.3.10 Operating Support Services Manager	26
	7.3.11 Director, Safety, Environmental and Technology	26
	7.3.12 Community and Government Affairs Manager	27
	7.3.13 Director, Employee Relations	27
	7.3.14 Environmental Services Leader	27
	7.3.14 Safer Operator	28
	7.3.15 Technical Representative	28
	7.4 Emergency Response Team	28
	7.5 Emergency Supplies/Equipment	29
	7.6 Hazardous Materials Technicians	29

TABLE OF CONTENTS

		PAGE
	7.7 Headcount Procedure	29
	7.7.1 Purpose	29
	7.7.2 Policy	30
	7.7.3 Specific Instructions for the Incident Area	30
	7.8 Site Security and Control	30
	7.9 Transportation	30
8.0	COMMUNITY WARNING SYSTEMS	31
	8.1 St. Charles Parish Siren Warning System	31
	8.2 Siren Warnings for Nearby Communities	32
9.0	COMMUNITY ALERT NOTIFICATION (CAN) SYSTEM	32
	9.1 Pre-Recorded Messages	33
	9.2 Steps to Access C.A.N.	34
	9.3 Personnel Authorized to Activate C.A.N.	35
	Specific Details to Initiate C.A.N. Form	36
10.0	OUTSIDE AGENCIES AND CORRESPONDING EMERGENCY SERVICE	37
11.0	PROCEDURE FOR HANDLING MEDIA REPRESENTATIVES	37
12.0	MEDIA RESPONSIBILITIES OF THE COMMUNITY & GOV'T. AFFAIRS MANAGER	38
13.0	COOPERATION WITH LOUISIANA STATE POLICE	38
14.0	COOPERATION WITH LOCAL POLICE OFFICERS	39
15.0	TESTING THE PLAN	39
16.0	UPDATING THE PLAN	40
17.0	EMERGENCY RESPONSE CRITIQUE AND FOLLOW-UP	40

TABLE OF CONTENTS

PAGE

APPENDICES

Appendix A - Community Warning and Evacuation Levels and Permissible Exposure Limits 41

Appendix B - Crisis Assembly Area Map 42

Appendix C - Emergency Operations Team Members 43

Appendix D - Other Key Personnel 44

Appendix E - Training 46

Appendix F - Emergency Recognition and Prevention 50

Appendix G - CYTEC Emergency Personnel 51

Appendix H - Neighbors List 52

Appendix I - CYTEC Corporate Personnel Notification List 55

Appendix J - Fortier Plant Leadership Team 56

Appendix K - Beeper List 57

Appendix L - Shift Superintendent Environmental Incident Report 60

Appendix M - Emergency Information and Notification Record 62

Appendix N - Decontamination Procedures 65

Appendix O - Standard Operating Procedures for Respiratory Protection Devices 66

Appendix P - Self Contained Breathing Apparatus 68

Appendix Q - Kappler Suit Manual 69

ADDENDUM

Addendum A - Fire Fighting Plan

Addendum B - Department Specific Emergency Plans

Addendum C - Bomb Threat Procedure

1.0 INTRODUCTION

The Fortier Plant Emergency Plan has been developed in accordance with the guidelines presented in the "Hazardous Materials Emergency Planning Guide" published in November, 1986, by the National Response Team. These guidelines were developed by the National Response Team in compliance with Section 303(f) of the "Emergency Planning and Community Right-to-Know Act of 1986", Title III of the "Superfund Amendments and Reauthorization Act of 1986" (SARA).

In addition, the requirements listed in 29 CFR 1910.119 (n) entitled Emergency Planning and Response have been addressed.

2.0 PURPOSE

This manual is intended to provide plant employees with the guidelines necessary to insure the orderly flow of information, personnel and equipment in the event of an Emergency situation. The procedures outlined herein include the means for reporting an emergency, for determining the severity of the emergency (extent of injury, property damage, and/or environmental harm, etc.), the manning and operation of the Emergency Operation Center (EOC) located adjacent to the plant Cafeteria, the deployment of an Emergency Operation Team (for medical, firefighting, EOC duties), and if necessary, the notification of plant employees, neighbors, Cytec Officials, and outside authorities.

3.0 DEFINITIONS

3.1 UNUSUAL EVENT - Any incident that is non-routine. It could be an injury, a small release of material, a loud noise, even a steam relief valve relieving if it attracts notice. In general, any incident which results in the implementation of the plant Emergency Procedures and the sounding of the plant Emergency Alarm System would be considered an Unusal Event.

3.1.1 In the plant: All personnel report to the nearest **CRISIS ASSEMBLY AREA.**

3.1.2 At the local government offices: The notification is logged, but no other action is taken unless the plant specifically requests.

NOTE: Plant areas not involved in the "**UNUSUAL EVENT**" may return personnel to their work assignments after being accounted for in the Crisis Assembly Area Headcount, and, if in the opinion of area supervision they are not in danger.

3.2 **ALERT** - An incident in which there is some likelihood of material(s) escaping the plant boundaries that is of a nature and quantity that specific action on the part of the community is probable, or the incident has, or very likely will, involve one or more additional operating units.

3.2.1 In the plant: All personnel report to the nearest **CRISIS ASSEMBLY AREA** and remain there until instructed otherwise.

3.2.2 At the local government offices: Implementation of their Emergency Plans begins by calling out members of their EOC staffs.

3.3 **SITE AREA EMERGENCY** - An incident in which a high probability of material escaping the plant boundaries exists and specific action(s) on the part of some members of the community would be required.

3.3.1 In the plant: All personnel report to the nearest **CRISIS ASSEMBLY AREA** and await further instructions.

3.3.2 At the local government offices: Planning for evacuation will begin. Preliminary steps to open shelters will be taken, potentially impacted areas will be defined, etc.

3.4 **GENERAL EMERGENCY** - An incident in which material has escaped, is escaping, or is virtually certain will escape the plant boundaries and is of a nature and quantity that action(s) on the part of some members of the community would be required.

3.4.1 In the plant: All personnel report to the nearest **CRISIS ASSEMBLY AREA** and await further instructions.

3.4.2 At the local government offices: Notification will begin to the impacted or potentially impacted members of the community to shelter in place, evacuate or take other actions as directed.

3.5 **EMERGENCY OPERATIONS CENTER (EOC)**: An area where plant management and support personnel assemble to direct the efforts of handling the plant emergency; it also serves as the emergency communications center.

3.6 **EMERGENCY OPERATIONS TEAM (EOT)**: Specifically designated Cytec employees with assigned responsibilities for mitigating or managing the mitigation of an emergency situation.

3.7 EMERGENCY RESPONSE TEAM (ERT): A group of Cytec employees specially trained in firefighting, spill control, medical emergencies, etc., who support the plant in handling any emergency situation.

4.0 ABBREVIATED EMERGENCY PROCEDURE

PLANT EMERGENCY PHONE EXT. 6511

4.1 WHAT HAPPENS IN A CRISIS?

4.1.1 Plant horn blast for 15 seconds.

4.1.2 Guards announce nature, location and the level of emergency. They give wind direction and velocity. (This announcement is repeated.)

4.1.3 Operating units switch portable radio (walkie-talkie) to the Shift Superintendents channel.

4.1.4 Personnel report to the nearest Crisis Assembly Area.

4.1.5 Personnel remain alert for instructions, updates and situation changes.

4.1.6 The guards will announce "All Clear" when appropriate. (This announcement is repeated.)

5.0 CRISIS ASSEMBLY AREA - HEADCOUNT PROCEDURES

5.1 PURPOSE

To insure that all plant and contractor employees are accounted for at the designated **CRISIS ASSEMBLY AREAS.**

5.2 PROCEDURE

5.2.1 Headcount information will be collected at each Crisis Assembly Area for all emergencies. Crisis Assembly Areas involved in the emergency will forward this information immediately to the Shift Superintendent at the emergency scene, highlighting those personnel not accounted for and their last known whereabouts.

5.2.2 All Crisis Assembly Areas not involved in the emergency will maintain a current list of personnel present or absent at their respective Crisis Assembly Area. The EOC will request this information from each Crisis Assembly Area if needed.

5.2.3 The highest ranking person is responsible for personally checking and accounting for all persons in his/her area.

5.3 CRISIS ASSEMBLY AREAS

Location	Extension
Melamine Maintenance	6435
Melamine Control Room	6417
Melamine Technical (2nd Fl.)	6214
Melamine Satellite Control Room	6699
Urea Satellite Control Room	6404
Urea Maintenance	6466
Warehouse 210	6639
YPS Shop	6307
AMD Control Room	6393
IMC Contractor Area	6212
Acid Maintenance	6470
Acid Control Room	6519
Acrylonitrile Maintenance	6426
Acrylonitrile Control Room	6419
Acrylonitrile & MMA Technical (2nd Floor)	6232
MMA Control Room	6394
Methanol Technical	6505
Acrylo Project/Construction	6625
Kellogg Control Room	6351
Kellogg Maintenance	6366
River Dock Operator's Shack	6430
Corrosion Lab	6362
MMA Maintenance	6383
Garage	6220

Fire Station	6557
Building 219	6608
Main Lab	6350
Machine Shop	6239
Instrument/Electric II Shop	6236
Building 208	6390
Warehouse 209	6257
Boiler Maintenance	6219
Boiler Control Room	6308
Training Center	6725
Kellogg Technical Offices	6455
Building 240	6608
Main Administration Building	6375
Cafeteria	6206
Medical	6333

5.4 The staging area for outside emergency service units is the parking area north of the FEA Building. Information packages are located with Security at the Main Gate.

6.0 RESPONSE AND NOTIFICATION PROCEDURES

6.1 DUTIES OF THE PERSON RECOGNIZING AN EMERGENCY:

6.1.1 Activate the nearest fire alarm box and/or telephone extension **6511**.

NOTE: Activating the fire alarm box alone is **NOT** enough, it must be supplemented by calling Ext. **6511**.

6.1.2 Give the following information to the person answering Ext. **6511**:

- Your name and the extension number you are calling from;
- That an emergency exists;
- The general nature of the Emergency;
- The exact location of the Emergency;
- Any personnel injuries (be as specific as possible).

6.1.3 Repeat **all** the information given in Section **6.1.2** above.

6.1.4 Remain on the phone until instructed to hang up by the person answering.

6.2 **DUTIES OF THE GUARD AT THE MAIN GATE WHEN RECEIVING AN EMERGENCY CALL:**

6.2.1 Determine from the caller all information stated on the "EMERGENCY NOTIFICATION FORM". (Appendix M)

6.2.2 Contact the Shift Superintendent and inform him of the Emergency situation.

6.2.3 When directed by the Shift Superintendent, sound the Alarm Siren and Plant Air Horn for 15 seconds.

6.2.4 Announce the location and nature of the Emergency in a clear, distinct voice over the Executone System and Emergency radio channel. State the level of the emergency; Unusual Event, Alert, Site Area Emergency or General Emergency.

(REPEAT THIS MESSAGE)

NOTE: Upon hearing the alarm horn/siren, at least one radio in each area should switch to and monitor the emergency radio channel or Shift Superintendent's channel for additional information.

6.2.5 Announce the wind direction and the velocity.

6.2.6 Advise all personnel to report to the nearest Crisis Assembly Area.

6.2.7 Restrict all incoming traffic at gates; allow entry of personnel and vehicles only with approval of EOC Chief or Shift Superintendent.

6.2.8 Screen incoming calls and forward only those relating to the Emergency and of an urgent nature.

6.2.9 Continue to relay information over the Paging System and the Emergency Radio Channel based on messages received from the Emergency area until the EOC is in operation.

6.2.10 Sound the "**ALL CLEAR**" signal over the Paging System and the Emergency Radio Channel when instructed to do so by the EOC Chief or the Shift Superintendent.

(REPEAT THIS MESSAGE)

6.3 **DUTIES OF THE GUARD AT THE MAIN GATE WHEN AN EMERGENCY IS EITHER UPGRADED OR DOWNGRADED**:

6.3.1 Announce the location and nature of the Emergency in a clear, distinct voice, over the Executone System and Emergency Radio Channel.

6.3.2 Announce the wind direction and velocity.

(REPEAT THE MESSAGE)

6.3.3 Sound the "**ALL CLEAR**" signal over the Executone System and the Emergency Radio Channel when instructed to do so by the EOC Chief or the Shift Superintendent.

(REPEAT THIS MESSAGE TWICE)

6.4 **GENERAL INSTRUCTIONS FOR NOTIFICATION OF OUTSIDE AUTHORITIES**

As required by Federal and State Law, agreements with local authorities and Cytec policies, various governmental agencies must be notified when:

6.4.1 An incident occurs which will impact in the community; it could be an unusual sound (even the plant emergency alarm), an unusual odor or vapor cloud, whether or not potentially harmful, or any other unusual type or level of activity.

6.4.2 Certain substances are released in high enough concentrations to cause harm to people outside the plant boundaries.

6.4.3 Certain substances are released to land, air or water in excess of specified amounts whether or not they leave the plant boundaries.

NOTE: 1. At each emergency level, the plant is expected to advise the local Community EOC of recommended protective action guidelines. The local Community EOC are not bound by these recommendations and consequently may order or implement actions more or less conservative than those recommended if, in their judgement, they are warranted.

2. Whenever a call is made to one of the local Community EOC's, the plant's Emergency Action Level should be stated at the beginning of the report, even if it is unchanged from an earlier report.

3. A response from the local Community EOC which is required at a higher level than the incident warrants may be requested. For example, if there were a large fire which does not involve any hazardous materials and thus is not expected to have any impact on the community but it is expected that large quantities of supplies (such as firefighting foam) will be needed to manage the emergency, or several plant employees have been injured and several ambulances will be needed as well as coordination of hospitals, the plant could request that the EOC Staff be called out for support without actually elevating the incident to the ALERT LEVEL.

6.5 COMMUNITY & GOVERNMENTAL AGENCIES TO BE CONTACTED:

COMMUNITY & GOVERNMENTAL AGENCIES TO BE CONTACTED	
Jefferson Parish Department of Emergency Management	Contact 911 from Guardhouse or Jefferson Parish Hotline in EOC
St. Charles Parish Department of Emergency Management	Use Industrial Hotline in the Guardhouse or EOC telephone and dial 9+783-5050 or 9+466-1990
City of Kenner Fire Department	9+467-2211
LA State Emergency Response Commission**	Day 1-504-925-6113 24 Hour 1-504-925-6595
**THIS CALL MUST BE MADE AS SOON AS POSSIBLE, BUT NO MORE THAN 30 MINUTES AFTER THE SITUATION IS NOTED.	

6.6 **OTHER AGENCIES:**

As needed, depending on the specific material involved and the quantity released or spilled. **(NOTE: Dial 9 to reach an outside plant phone line).**

Louisiana Department of Environmental Quality (LDEQ) 24 Hour Release Reporting Air Quality Division Hazardous Waste Division Water Resources Division	 9-504-342-1234 9-504-765-0219 9-504-765-0355 9-504-765-0634
Lower Mississippi River Warning Network	DAY: 9-504-826-2400 NIGHT: 9-504-586-7747 and key beeper number 5066, 5070 or 5068
Jefferson Parish Waterworks District I	East Bank: 9-838-4305 West Bank: 9-349-5080
Sewage and Water Board of New Orleans	Carrollton Plant: 9-861-0331 9-861-4955 Algiers Plant: 9-361-4331 9-362-7210
National Response Center* *If no answer contact EPA Region VI	9-800-424-8802 9-202-267-2675 9-214-665-2222
Department of Natural Resources (Deepwells)	9-504-342-5515
U. S. EPA Dallas Region VI	ANYTIME: 8-214-665-6595 DAYTIME: 8-214-665-6470 8-214-665-6475 8-214-665-6450 8-214-665-6455
U. S. Coast Guard - Marine Safety Officer	9-504-589-7171
New Orleans International Airport	9-504-464-2688
Kenner Fire Department	9-504-467-2211
Jefferson Parish Dept. Of Emergency Management	911
St. Charles Parish Emergency Operations Center	St. Charles Parish Hotline @ Main Gate and EOC

7.0 OPERATIONS

7.1 EOC OPERATIONS

Emergency Operations Center is located next to the Cafeteria. The purpose of the EOC is to provide a central plant-wide decision-making and communications center for use during an Emergency situation.

The EOC will be placed in operation during every Emergency situation.

NOTE: Communication of emergency information should be telephoned into the EOC using extension 6511. Other communications to the EOC should be made utilizing extensions **6605**, **6606**, and **6609**. Extension 6511 should be kept clear for emergency information only.

7.2 EOC STAFF

7.2.1 Employees holding the following positions (or designated alternates) are assigned to the EOC during an emergency:

Director of Manufacturing
Director, Safety, Environmental and Technology
Operating Support Services Manager
Community and Government Affairs Manager
Safety Leader
Director, Employee Relations
Environmental Services Leader
MMA Representative (See Note #3)
Production Services Representative
Melamine Representative
SAFER Operator

NOTE #1 - The senior representative arriving at the EOC will assume the position of EOC chief until relieved by a more senior member of management.

NOTE #2 - A Technical Representaive may be called in to support the EOC Chief (at his discretion) and will be assigned to the St. Charles EOC if so requested by St. Charles Office of Emergency Management.

NOTE #3 - In the event the emergency occurs on an off-shift, the MMA Supervisor will immediately report to the EOC and assume the duties of EOC Chief until properly relieved by a management representative from the list above.

NOTE #4 - In the event the emergency is at the MMA Plant on the off-shift, the security shift leader will assume the duties of EOC chief until properly relieved as stated in Note #3 above.

In addition, one representative from each of the below listed departments will report to the main gate for EOC duties as directed by the Shift Superintendent. These duties will include but are not limited to the following:

- retrieving emergency supplies and equipment
- carrying messages
- ferrying people as needed
- notify truck drivers and people in FEA Building area

Utility Operator	1 employee
Acrylonitrile Department	1 employee
MMA Department	1 employee
Acrylamide Department	1 employee
Production Services	1 employee
Methanol Department	1 employee
AMEL Department	1 employee
Ammonia Department	1 employee
Sulfuric Acid Department	1 employee
Main Lab	1 employee
Maintenance	2 employees

7.3 RESPONSIBILITIES OF EMERGENCY OPERATIONS TEAM MEMBERS - (Personnel Roles and Lines of Authority)

7.3.1 The Facility Safety Specialist and alternates are the "Incident Commanders" during all emergency response activities. Their role is to coordinate all emergency activities of the facility Emergency Response Team with activities of the local Fire Department, Police Department, medical facilities and regulatory agencies.

The Facility Safety Leader reports directly to the Director of Safety, Environmental, and Technology of the Facility. The Organization Chart for Emergency Response is found below.

EMERGENCY RESPONSE

7.3.2 Shift Superintendent

7.3.2.1 Upon notification from the Duty Guard, proceed to the reported Emergency scene and assume incident command until relieved by the Safety Specialist or alternate. (Do NOT put yourself at risk, proceed to the emergency scene by a safe route).

7.3.2.2 Verify that Departmental Emergency procedures have been activated in the plant(s) affected.

7.3.2.3 Determine the seriousness of the situation and take necessary actions:

- activate Emergency procedure as necessary

- deploy the ERT if necessary

- if the area outside the plant boundaries will be affected, advise the EOC to implement outside notification procedures.

- if a Reportable Quantity of any material has been released, arrange for proper notifications of regulatory agencies.

- if additional help is needed, activate the CAN System to alert Cytec emergency personnel. All incoming personnel will report to the EOC for assignments. (Refer to Section 9.0)

7.3.2.4 Direct the ERT

- record names and badge numbers of ERT members reporting to the scene.

- relinquish incident command to the Plant Safety Specialist or his designee upon his arrival.

7.3.2.5 Determine the extent of injury to personnel and/or damage to property.

7.3.2.6 If the incident will affect any Emergency Assembly Area, direct persons in that area to evacuate to the furthest assembly area perpendicular and away from the determined wind direction by using the Plant Public Address System, portable radio communication or emergency telephone system. If personnel are evacuated from the Fortier Plant, they will <u>assemble at the Jefferson Playground in Waggaman, down river from the Fortier Plant, LA 18 east (down river) or the Monsanto Park in Luling, LA 18 West (up river)</u>. Refer to map on page 42 for evacuation routes.

7.3.2.7 In consultation with the ERT Leader and/or departmental supervision, determine when the situation is under control and advise the EOC.

7.3.2.8 Perform duties of Primary Incident Coordinator until relieved.

7.3.3 ADDITIONAL DUTIES OF THE SHIFT SUPERINTENDENT PER LAC 33:V. 1513

7.3.3.1 At all times, there will be at least one employee either on the Cytec Industries, Fortier Plant premises or on call (i.e., able to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. This emergency coordinator will be thoroughly familiar with all aspects of Fortier's Emergency Plan, all operations and activities at the facility, the location and characteristics of the waste handled, the location of all records within the facility, and the facility layout. In addition the emergency coordinator has the authority to commit the resources needed to carry out the Emergency Plan.

7.3.3.2 As a result of the above-denoted Louisiana hazardous waste regulation, the Shift Superintendent has been designated as the Fortier Plant Emergency Coordinator. The Shift Superintendents and their work telephone, home telephone, and home address information are listed below for notification purposes. A listing of emergency coordinator alternate information is also included.

7.3.4 PRIMARY EMERGENCY COORDINATORS

Shift	Name	Home Address	Home Telephone	Work Telephone
A	Frank Marocco	2505 Sonora Via Harvey, LA 70058	367-7752	431-6353
B	Rick Rich	2301 Beck Street New Orlenas, LA 70131	392-2735	431-6353
C	Gary Eliser	4209 HWY 1 Raceland, LA. 70394	537-6677	431-6353
D	Tom Mundy	3817 Redbud Lane Harvey, LA 70058	347-7137	431-6353
	Gene Tierney	310 Sarah Victoria Drive Belle Chasse, LA 70037	656-7757	431-6558
	Pete Martinez	111 Elm Street Raceland, LA 70394	537-3151	431-6251
	Rick Masson	1105 Waltham Street Metairie, LA 70001	837-0435	431-6565

7.3.5 EMERGENCY COORDINATOR ALTERNATES

POSITION	PRIMARY	ALTERNATE
Director of Mfg.	J. Gill 652-4795	J. Schneller 283-8443
Director of Safety Env. & Tech.	J. Schneller 283-8443	A. Junker 468-7703

NOTE: Should a release, fire or explosion involving hazardous waste occur at the Fortier Plant, the Emergency Coordinator shall have the following additional responsibilities, per LAC 33:V.1513:

7.3.5.1 Whenever there is an imminent or actual emergency situation, the Emergency Coordinator (or his/her designee when the Emergency Coordinator is on call) must immediately:

- Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel; and

- Notify appropriate State or Local agencies with designated response roles if their help is needed.

7.3.5.2 Whenever there is a release, fire or explosion, the Emergency Coordinator must immediately identify the character, exact source, amount, and a real extent of any released materials. He/She may do this by observation or review of facility records or manifest, and, if necessary, by chemical analysis.

7.3.5.3 Concurrently, the Emergency Coordinator must assess possible hazards to human health or the environment that may result from the release, fire, or explosion. This assessment must consider both direct and indirect effects of the release, fire or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface run-off from or chemical agents used to control fire and heat-induced explosions).

7.3.5.4 If the Emergency Coordinator determines that the facility has had a release, fire or explosion which could threaten human health or the environment outside the facility, he/she must report his/her findings as follows:

- If his/her assessment indicates that evacuation of local areas may be advisable, he/she must immediately notify appropriate local authorities. He/she must be available to help appropriate officials decide whether local areas should be evacuated; and

- He/She must immediately notify the State official

  designated as the on-scene coordinator for that geographical area and provide:

- Name and telephone number of reporter

- Name and address of facility

- Time and type of incident (e.g., release, fire, etc.)

- Name and quantity of material(s) involved, to the extent known

- The extent of injuries, if any

- The possible hazards to human health or the environment, outside the facility.

7.3.5.5 During an emergency, the Emergency Coordinator must take all reasonable measures necessary to ensure that fires, explosions and releases do not occur, recur or spread to other hazardous wastes at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released wastes, and removing or isolating containers.

7.3.5.6 If the facility stops operations in response to a fire, explosion or release, the Emergency Coordinator must monitor for leaks, pressure buildup, gas generation or ruptures in valves, pipes or other equipment, wherever this is appropriate.

7.3.5.7 Immediately after an emergency, the Emergency Coordinator must provide for treating, storing or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire or explosion at the facility. Unless the owner or operator can demonstrate that the recovered material is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements.

7.3.5.8 The Emergency Coordinator must ensure that in the affected area(s) of the facility:

- No waste that may be incompatible with the released material is treated, stored or disposed of until cleanup procedures are completed: and

- All emergency equipment listed in the Emergency Plan is clean and fit for its intended use before operations are resumed.

7.3.5.9 The owner or operator must notify the Administrative Authority and appropriate State and Local authorities that the facility is in compliance with LAC 33:V.1513.F.8. before operations are resumed in the affected area(s) of the facility.

7.3.5.10 The owner or operator must note in the operating record the time, date and details of any incident that requires implementation of the Emergency Plan.

7.3.5.11 Within 15 days after the incident, he/she must submit a written report on the incident to the Administrative Authority which includes:

- Name, address, and telephone number of the owner or operator;
- Name, address, and telephone number of the facility;
- Date, time, and type of incident (e.g., fire, explosion, etc.);
- Name and quantity of material(s) involved;
- An assessment of actual or potential hazards to human health or the environment, where this is applicable; and
- Estimated quantity and disposition of recovered material that resulted from the incident.

7.3.6 <u>MMA Plant Representative</u>

7.3.6.1 When advised of an Emergency, proceed immediately to the EOC.

7.3.6.2 Primary responsibility will be to make government, company and plant notifications as directed by the EOC Chief.

7.3.6.3 In the event the Emergency is in the MMA Department, the MMA Representative will stay at MMA and the Acid Representative will report to the E.O.C. and assume the E.O.C. Operations duties as directed by the Shift Security Leader.

NOTE: On off-shifts MMA Plant will assume the EOC Chief duties until properly relieved.

7.3.7 Medical Team

7.3.7.1 The Medical Team consists of the Contract Physician, the Plant Nurses and assigned EMT's.

7.3.7.2 Upon notification of an Emergency, all available members (except those assigned other duties within this Plan) of the Medical Team will report to the Medical Department. One of the EMT's will drive the ambulance to the Main Gate.

7.3.7.3 Upon notification of injury or illness, members of the Medical Team, as necessary, will respond to the scene of the injury/illness and render emergency care as appropriate.

7.3.7.4 Injured or ill persons will be transported to the Medical Department by the safest route and given a thorough examination.

7.3.7.5 If hospitalization is found necessary, the EOC will be contacted to obtain transportation; the name, type of injury, illness and destination of the person being transported will be reported to the EOC for record purposes.

West Jefferson General Hospital is the primary care facility for Cytec employees. If WJGH is unable to handle the patients, the alternate is **East Jefferson General Hospital.**

7.3.7.6 If outside medical assistance is needed, the Medical Team director will advise the EOC as to the quantity and type assistance needed.

7.3.7.7 If the condition of the injured person warrants, the appropriate member of the Medical Team will contact the Manager of Industrial Relations, to notify an appropriate clergyman and/or the employee's family.

7.3.8 EOC CHIEF

7.3.8.1 Coordinate activities of all personnel.

7.3.8.2 Assure that all positions in the EOC are filled or initiate action to secure personnel to fill them.

7.3.8.3 Establish and maintain communications with the ERT Leader and Shift Superintendent at the scene.

7.3.8.4 Interpret conditions and actions communicated from the scene for other members of the EOC staff.

7.3.8.5 Advise other members of EOC staff concerning appropriate actions to be taken.

7.3.8.6 Maintain a log of all activities related to the incident, i.e. information from the scene, radio communications, injuries, damage, etc.

7.3.8.7 Assure that necessary and proper communications are made to proper agencies.

NOTE: The Cytec Safety Health and Emergency Response Group may be notified by the emergency HOT Line **1-800-647-3746 (1-800-647-ERIM)**.

Please provide the Guard/Receptionist the following information:

1. This is the Cytec Industries Fortier Plant.
2. Give your name.
3. The nature of the emergency.
4. Our call back number (504) 431-6315.

7.3.9 DIRECTOR OF MANUFACTURING

7.3.9.1 Continue role of overall responsibility for all plant activities.

7.3.9.2 Participate in all discussions concerning impact on plant operations, the community and the environment.

7.3.9.3 Review with the Community and Government Afffairs Manager all news releases and other information being released.

7.3.9.4 Contact Cytec management, as necessary and appropriate, with information concerning the incident and update as information becomes available from the scene.

7.3.10 OPERATING SUPPORT SERVICES MANAGER

7.3.10.1 Collect information from the incident area and advise others in the EOC of the impact of the incident on the incident area as directed by the EOC Chief.

7.3.10.2 Determine impact of the incident on other areas and advise supervision in other areas of necessary actions as directed by the EOC Chief.

7.3.10.3 Take required steps to procure necessary materials to manage the incident and contact required personnel as directed by the EOC chief.

7.3.10.4 Participate in discussions concerning the impact of the incident on plant operations, the community and the environment.

7.3.11 DIRECTOR, SAFETY, ENVIRONMENTAL AND TECHNOLOGY

7.3.11.1 Participate in discussions concerning the impact of the incident on plant operations, the community and the environment.

7.3.11.2 Provide support from personnel in technical departments to others as needed to manage the incident and to expedite recovery from it.

7.3.12 COMMUNITY & GOV'T. AFFAIRS MANAGER

7.3.12.1 Participate in discussions concerning the impact of the incident on plant operations, the community and the environment.

7.3.12.2 Prepare news releases and other material for issue to representatives of the news media.

7.3.12.3 Meet the representatives of the news media when they arrive at the plant, provide information to them and escort them to the scene of the incident, if appropriate. Refer to Section 11.0, page 37.

7.3.12.4 Provide EOC Support.

7.3.13 DIRECTOR EMPLOYEE RELATIONS

7.3.13.1 Maintain contact with the Medical Team through the EOC Chief regarding the names of any injured and the extent of injuries.

7.3.13.2 Arrange for notification of a clergyman if the condition of any injured person warrants it.

7.3.13.3 Arrange for the notification of the families of any injured persons and for transportation of family members to a hospital, etc., as appropriate.

7.3.13.4 Act as back-up for Community and Government Affairs Manager.

7.3.14 ENVIRONMENTAL SERVICES LEADER

7.3.14.1 Participate in discussions concerning the impact of the incident on plant operations, the community and the environment.

7.3.14.2 Review data generated by the SAFER system and from field observations and make recommendations to the EOC Chief and plant management concerning Protective Action Guidelines for plant personnel and the community.

7.3.14.3 Advise the EOC Chief concerning proper notifications to regulatory agencies and arrange for such notifications to be made.

7.3.15 SAFER OPERATOR

7.3.15.1 Set up SAFER system.

7.3.15.2 Verify meteorological data input.

7.3.15.3 Enter data from the field concerning the incident.

7.3.15.4 Advise the personnel in the EOC of the projection of the SAFER system.

7.3.15.5 Evaluate various projections of incident development during the incident and report the results.

7.3.15.6 Primary SAFER Operator
M. Clay 340-8944 (Home) 431-6448 (Work)

Alternate SAFER Operator
A. Hicks 392-1055 (Home) 431-6509 (Work)

7.3.16 TECHNICAL REPRESENTATIVE

7.3.16.1 Primary Technical Representative:
P. J. Knieper 737-3761 (Home) 431-6562 (Work)

Alternate Technical Representative:
P. Davis 785-1523 (Home) 431-6377 (Work)

7.4 EMERGENCY RESPONSE TEAM

7.4.1 Respond to fires as per the Fortier Fire Fighting Plan.

7.4.2 Respond to hazardous materials emergencies in a defensive mode at the first responders operations level.

7.4.3 Act as the decontamination team and set up zones and equipment as outlined in the Decontamination Procedures.

7.5 EMERGENCY SUPPLIES/EQUIPMENT

7.5.1 The following emergency supplies/equipment is available for use during an emergency situation:

Fire Hose and Fire Supplies	Fire Station
Fire Fighting Foam	Tank Farm House
	Whse. 210
	Bldg. 270 Utilities
Road Barricades	Fire Station
Cones	White trailer at Main Gate

7.5.2 Hazardous Materials Equipment

Class A Responder Suits
SCBA
Over Pack Drums
Soda Ash
Assorted Tools
ERIM Trailer

7.6 HAZARDOUS MATERIALS TECHNICIANS

7.6.1 Hazardous Materials Technicians handling an offensive response will be Pete Martinez or Gene Tierney. They will be backed up by technicians who are also assigned to the ERIM Team.

H. Vegas	P. Minet
C. Friloux	C. Dufrene

7.7 HEADCOUNT PROCEDURE

7.7.1 Purpose

To provide a procedure for the collection of headcount information at each Emergency Assembly Area.

7.7.2 Policy

Headcount information will be collected at each Emergency Assembly Area for all emergencies. Emergency Assembly Areas involved in the emergency will forward this information immediately to the Shift Superintendent at the emergency scene, highlighting only those personnel not accounted for and their last known whereabouts.

All Emergency Assembly Areas not involved in the emergency will maintain a current list of personnel present or absent at their respective Emergency Assembly Area. The EOC will request this information form each Emergency Assembly Area if needed.

7.7.3 Specific Instructions for the Incident Area

7.7.3.1 The highest ranking person is responsible for personally checking and accounting for all persons in the area.

7.7.3.2 Upon arrival of the Shift Superintendent, the person responsible for headcount will immediately report to him those accounted for and those missing with their last known whereabouts.

7.8 SITE SECURITY AND CONTROL

7.8.1 During an emergency, the security service retained by the Company will prevent all unauthorized personnel from entering the Facility. The Emergency Response Team will establish a primary security perimeter about the affected area, and only authorized emergency responders will be allowed within this perimeter. The area will be secured and marked by using cones, barricades, tape or personnel.

7.9 Transportation

The following vehicles are designated as **CRISIS VEHICLES** and are to be brought to the Main Gate if an Emergency situation should occur.

1. Security - Pickup Truck # 39 & Van # 7
2. Corrosion Lab - Pickup Truck # 10
3. Main Lab - Pickup Truck # 33

NOTE: These vehicles will be used for the following:

1. Transport of Emergency Team Members.
2. Transport employees to warn neighbors.
3. Transport employees to set up road blocks.
4. Transport supplies as directed.
5. Perform other functions as directed by the EOC.

8.0 COMMUNITY WARNING SYSTEMS

8.1 St. Charles Parish Siren Warning System

While the plant is located in Jefferson Parish, it is very close to the boundary of St. Charles Parish and some of the closest neighbors are residents of that Parish.

Within St. Charles Parish, about fifteen miles upriver from the plant, in Taft, Louisiana, the Louisiana Power and Light Company has constructed an electric generating plant powered by a fixed nuclear reactor, called Waterford 3. As a result, by Federal law, L.P.&L. has funded a number of improvements to the Emergency Preparedness System of St. Charles Parish.

Among these improvements is a parish-wide siren warning system consisting of 33 sirens located so that residents of all but a very few parts of the Parish can be alerted. The system is controlled in the St. Charles Parish Emergency Operations Center and is designed so that any combination of one or more sirens can be activated by officials there. Use of the sirens is not restricted to emergencies involving Waterford 3; they may be used for any emergency requiring rapid notification of large numbers of people: severe weather, transportation accidents, etc.

The system is available to be used should it be necessary to notify neighboring residents of the Cytec plant of an emergency at this plant requiring some action on their part. It is necessary only for an official of Cytec to call the St. Charles Parish EOC and recommend that specific action be taken and that the sirens be sounded to alert the residents: residents are instructed to tune to certain radio or television stations for specific instructions and information when they hear the sirens sound.

8.2 Siren Warnings for Nearby Communities

In order to ensure that all neighboring communities have been alerted, Cytec has funded the installation of one additional siren in the Fortier Heights subdivision, west of the plant, to supplement the St. Charles Parish system.

This siren can be sounded in either the Cytec plant EOC or the St. Charles Parish EOC. Once again, residents would be instructed to tune to radio or television stations for specific, detailed information and instructions.

9.0 COMMUNITY ALERT NOTIFICATION (CAN) SYSTEM

In the unlikely event that siren systems were not functional and to provide an additional means to communicate more detailed information, Cytec has joined Community Alert Network System (C.A.N.). The C.A.N. System is a computer based, automatic telephone notification system.

Community Alert Network (CAN), maintains the lists of personnel telephone numbers provided. CAN can maintain any number of special lists, i.e. emergency response personnel, building tenants, handicapped, media, etc., to be called in specific instances.

When an incident occurs, or appears imminent, a pre-authorized individual is informed and alerts or activates CAN by giving his/her individual security code or access code to th CAN operator. CAN's flexible response can assist in giving information about a wide range of emergency situations such as fires, explosions, hazardous materials incidents, or the need for in-place sheltering or evacuation routines, etc. Following the event CAN may be used to check on the status of families of emergency response personnel, etc.

The pre-authorized official, i.e., the person activating the CAN service, identifies who is to be called and either dictates the incident specific message, or specifies a pre-recorded message to be disseminated.

The message delivered may be designed to direct specific repsonse activity, i.e., respond immeidately, report to a specific location(s), prepare to respond, call-in for further instructions, etc.)

The CAN computers begin calling the requested phone numbers and delivering the designated message from the CAN Operation Centers in New York and California. CAN uses any or all the major long distance carriers. i.e. AT&T, MCI, Sprint. The telephone rings and the message is delivered when the phone is answered. Upon completion of calls requested, CAN FAXes a report of each number called; the time called, and if the message was delivered, busy or no answer, etc. A summary of the results of all the calls made is also provided.

Your contract with **Community Alert Notification**, makes available this unique computer driven telecommunications service to assist when emergency notification is needed. CAN is a tool to be used by safety officials for delivering critical information in affected areas, thus saving valuable time and allowing officials to concentrate on mitigation of the incident.

There are two **PHONE LISTS**. Currently these lists are used as follows:

1. Cytec Emergency Personnel (Appendix E)
2. Neighbors (Appendix F)

9.1 Pre-Recorded Messages

9.1.1 **CYTECLA1**

This is the Cytec Fortier Plant. The Cytec Fortier Plant is currently experiencing operational difficulties resulting in loud noises emitting from the facility. There has been no chemical release. No action is required of you. If you understand the message, and are using a touchtone phone, press 8. If you don't understand the message, press 4.

9.1.2 **CYTECLA2**

This is the Cytec Fortier Plant. This is an alert notification. Shelter in place by staying indoors, closing windows and shutting down all ventilation until further notice. If you understand this message, and are using a touchtone phone, please press 8 now. If you do not understand the message, press 4.

9.1.3 **CYTECLA3**

This is the Cytec Fortier Plant. This is an alert notification. Evacuate immediately. If you understand this message, and are using a touchtone phone, please press 8 now. If you do not understand the message, press 4.

9.1.4 CYTECLA4

This is the Cytec Fortier Plant. This is an alert notification. The Fortier Plant is experiencing an emergency. Please report for duty immediately. If you are able to respond, and are using a touchtone phone, please press 9 now. If you are unable to respond, please press 6 now.

9.2 Steps to Access CAN

9.2.1 **ORGANIZE THE DETAILS OF YOUR EMERGENCY REQUEST!** (Refer to page , "Specific Details to Initiate CAN" form and use as a guide.) Then call the CAN Hotline (518-382-8030 or 800-522-4226)

BACKUP PROCEDURE - A

In the event a pre-authorized official attempting to activate CAN system does not make contact with a CAN Operator, that official should immediately call (800) 992-2331. Inform the person answering the phone that "This is a CAN emergency" ...give name and telepone call-back number. You will be transferred to the Operations Staff or they will be contacted and immediately contact the official desiring to activate CAN. This procedure is to be used only in the event of a malfunction of the primary system.

BACKUP PROCEDURE - B

If you have received a computer prompt, wait for the tone and leave the information listed in Section "A" of your "Specific Details to Access CAN." The official requesting activation of the CAN System should remain at the call-back phone until the Community Alert Network (CAN) operator calls back. Do not use the telephone.

9.2.2 **Notify CAN operations center immediately when an incident occurs, or appears imminent, advising that activation of the Community Alert Network is being considered. CAN Hotline (518) 382-8030.** (This allows the CAN Operator to begin preparation to activiate the service for your specific use. Telephone numbers can be downloaded plus specific lists identified and made ready).

9.3 Personnel Authorized to Activate CAN

Name	Callback Number
Gill, J.	504-431-6315
Dutcher, J.	504-431-6315
Eliser, G.	504-431-6315
Johnson, B.	504-431-6315
Junker, A.	504-431-6315
Marocco, F.	504-431-6315
Marosits, J.	504-431-6315
Martinez, P.	504-431-6315
Masson, R.	504-431-6315
Mundy, T.	504-431-6315
Rich, R.	504-431-6315
Schneller, J.	504-431-6315
Tierney, G.	504-431-6315

SPECIFIC DETAILS TO INITIATE C.A.N. FORM

Date:	**Time:**
Caller's Name/Position:	
Contract Holder (Company Name): CYTEC INDUSTRIES	
Verification (Password/Code/Callback Phone #, etc.):	

FIXED LIST

LIST NUMBER	PRE-RECORDED MESSAGE NO.
1. Cytec Emergency Personnel	1. Operational difficulties causing loud noises (Neighbors)
2. Neighbors	2. Shelter in Place (Neighbors)
	3. Evacuate (Neighbors)
	4. Cytec Emergency Personnel Report to the Plant

SPECIAL INSTRUCTIONS

Repeat Option Activated	_____ **Yes**	_____ **No**
Response Option Activated	_____ **Yes**	_____ **No**

Initiate calls IMMEDIATELY ☐ or at _____AM _____ PM (Local Time)

Number of attempts to reach the party _____

FAX REPORT to - 504-431-6378

Mail Report To: **Cytec Industries**
10800 River Road
Westwego, LA 70094

All calls to CAN hotline are recorded and archived.

10.0 OUTSIDE AGENCIES AND COORESPONDING EMERGENCY SERVICE

SERVICE	ORGANIZATION/AGENCY	TELEPHONE NO.
Emergency Medical Services	West Jefferson Hospital	9-504-347-5511
Enforcement Services	Louisiana State Police Troop B	24 Hrs. 9-504-925-6595 9-504-568-5751 After Hrs. 9-643-2990
Fire Fighting & Evacuation Services	City of Kenner Fire Dept. Chief M. Zito	9-504-467-2211
Fire Fighting Services	Live Oak Manor Chief Elvis Smith	911
Fire Fighting Services	Wilkshire, Kennedy, Brady (WKB) Chief Juan Shelby	911
Spill Clean-Up Response	CET Environmental Services Inc. Pat Touchard	9-504-254-3555
	Industrial Cleanup Inc. Al Baker, Jack Torres	9-504-436-0883 9-800-436-0883
	Oil Mop Inc. Ken Boutte	9-504-394-6110 9-800-645-6671

11.0 PROCEDURE FOR HANDLING MEDIA REPRESENTATIVES

Upon arrival of representatives from the news media:

- Stop persons for identification

- Log the name(s) of the person(s) and the organization(s) they represent

- Contact the EOC to arrange for escort to a safe staging area or to the media center (normally the cafeteria)

- Await the arrival of the Community & Government Affairs Manager (or alternate) or the Director of Manufacturing to discuss the situation with them.

NOTE: ALL PLANT PERSONNEL ARE TO BE COURTEOUS TO ALL REPRESENTATIVES OF THE NEWS MEDIA BUT ARE NOT TO DISCUSS THE INCIDENT OR ANY ASPECT OF PLANT OPERATIONS WITH THEM NOR ALLOW THEM TO ENTER THE PLANT, PERSONNEL BUILDING OR MEDICAL WITHOUT THE COMMUNITY & GOV'T. AFFAIRS MANAGER, DIRECTOR EMPLOYEE RELATIONS OR THE DIRECTOR OF MANUFACTURING.

12.0 MEDIA RESPONSIBILITIES OF THE COMMUNITY & GOV'T. AFFAIRS MANAGER

- Prepare news releases and other material for issue to representatives of the news media

- Meet with representatives of the news media when they arrive at the plant, provide information to them and escort them to the scene of the incident, if appropriate

-Notify Director of Public Relations (8-357-3319)

13.0 COOPERATION WITH LOUISIANA STATE POLICE

NOTE: Troopers of the Louisiana State Police have the right under State law to enter any facility during an emergency incident which might endanger public safety. Their role is to assure themselves that all reasonable measures are being taken to protect the public safety, to suggest other steps that might be taken, to offer and arrange for other available resources, and to verify information released by management; they will not attempt to take charge of controlling the situation unless the facility operator demonstrates an inability to manage the situation.

13.1 Upon the arrival of a State Police Trooper, the Guard will note his name and unit number on the Visitor Log.

13.2 The Guard will advise the EOC Chief that the Trooper is at the gate.

13.3 The EOC Chief will send an escort to greet the Trooper, take him to an office in the Personnel Building and brief him on the situation. The Trooper should be allowed the use of a telephone in the office.

13.4 The escort, EOC chief or Director of Manufacturing will keep the Trooper advised of the progress in managing incident.

13.5 As soon as practical, the Trooper should be escorted to a safe vantage point to view the incident and measures being taken to manage it.

14.0 COOPERATION WITH LOCAL POLICE OFFICERS

NOTE: Unlike the State Police, local Sheriff's Deputies do not have the right under State law to enter a premises during an emergency situation. However, it is policy to extend them the same courtesies and information offered the State Police.

- Upon the arrival of a Sheriff's Deputy, the Guard will note his name and unit number on the Visitor Log.

- The Guard will advise the EOC Chief that the Deputy is at the gate.

- The EOC Chief will send an escort to greet the Deputy, take him to an office (same office as used for the State Police Trooper) in the Personnel Building and brief him on the situation. The Deputy should be allowed the use of a telephone in the office.

- The escort, EOC Chief or Director of Manufacturing will keep the Deputy advised of the progress in managing the incident.

- As soon as practical, the Deputy should be escorted to a safe vantage point to view the incident and measures being taken to manage it.

15.0 TESTING THE PLAN

The Plan will be tested quarterly through an in-plant drill planned and executed by the Safety Department. This drill may be a "table-top" communications drill or may involve all plant personnel, at the discretion of the Safety Leader.

As part of the planning for each drill or exercise, a list of objectives for the exercise and a set of checklists for the various aspects of the Plan being tested will be prepared. After the drill or exercise is complete, the Safety Leader will review the results of the drill or exercise and the various checklists to determine if revisions to the Emergency Plan are necessary.

The mutual aid aspects of the Plan are tested through quarterly communications drills and an annual rolling drill.

16.0 UPDATING THE PLAN

Those sections of the Emergency Plan containing names, addresses and telephone numbers of people and agencies will be reviewed at least annually.

The entire Emergency Plan will be reviewed by the Safety Specialist at least annually.

All revisions will be issued to Plan holders to be included in their copy of the Plan. As part of periodic Safety and Housekeeping Inspections, Emergency Plan Documents will be checked to be sure they are up-to-date.

17.0 EMERGENCY RESPONSE CRITIQUE AND FOLLOW-UP

It is the policy of the Company to provide a debriefing and critique of all emergency response activities performed at the facility. This debriefing is led by the Site Safety and Health Leader or his designate and is attended by all members of the Emergency Response Team. If outside agencies participated in the response, they are invited to attend the debriefing. As needed, modifications will be made to all emergency plans, based on an evaluation of the debriefing meeting.

APPENDIX A

TABLE I
COMMUNITY WARNING AND EVACUATION LEVELS AND PERMISSIBLE EXPOSURE LIMITS

Final Community Standards		Cytec Public Emergency Exposure Limits						NIOSH		NRC[1]		Cytec Workplace Exposure Limits					
OHC[1] Date	Material CAS #	Notification* Level		Warning* Level		Evacuation* Level		IDHL		EEGL[1]		PEL		STEL		CEIL	
		ppm	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³
07/25/86	Acrolein (107 02 8)	0 1	0 25	0 2	0.5	2.5	5 8	5	12 5	0 05	0 125	0 1	0 25	0 3	0 8		
12/19/86	Acrylonitrile (107-13-1)	2	4.7	20	47	100	235	4000	--	--	--	2	--	10	.	1A	
12/19/86	Ammonia (7664-41-7)	5	3.8	25	18 9	50	37.8	500	385	--	--	25	18	35	27		.
07/25/86	Chlorine (7782-50-5)	0 5	1.45	1.0	2.90	13	37.7	25	72.5	3	8.7	--	--			1	3
07/25/86	Formaldehyde (50-00 0)	0 1	0.12	1	1 2	10	12.3	100	CA[1]	120	--	--	1	--			
03/04/88	Hydrazine (302 01-2)	0 1	0.1	0.1	0.1	1	1	--	--	--	--	0.1	.				
07/25/86	Hydrogen Chloride (7647-01-0)	1	1.5	5	7.6	50	75.8	100	150	--	--	---	--	--	--	5	7
07/25/86	Hydrogen Cyanide (74 90 8)	0.58	0 70	10	12 0	50	60	54.6	60	--	--	--	--	--		10	10
07/25/86	Hydrogen Sulfide (7783-06-4)	0.05	0.07	10	14	50	71	300	420	10 (24 hr)	14 (24 hr.)	10	14	15	21	50	70
12/19/86	Sulfur Dioxide (7446 09-5)	2	5 7	2	5 7	10	28.5	100	200	10	20	2	5	5	10		
	Nitrogen Dioxide (10102-44-0)	--	--	--	--	--	--	--	--	--	--	3	6	--	--	5	9
	Sulfur Trioxide (7446-11-9)	--	--	--	--	--	--	--	--	--	--	--	--	--	.	.	

Footnotes

1A = Action Level
ICA = NIOSH recommends that this substance be treated as a potential human carcinogen
[1]EEGL - National Research Council (EEG) is defined as the maximum airborne concentration of a material which, it is believed, nearly all individuals could tolerate for about one hour without incurring permanent health effects or symptoms which would interfere with their ability to take appropriate action.

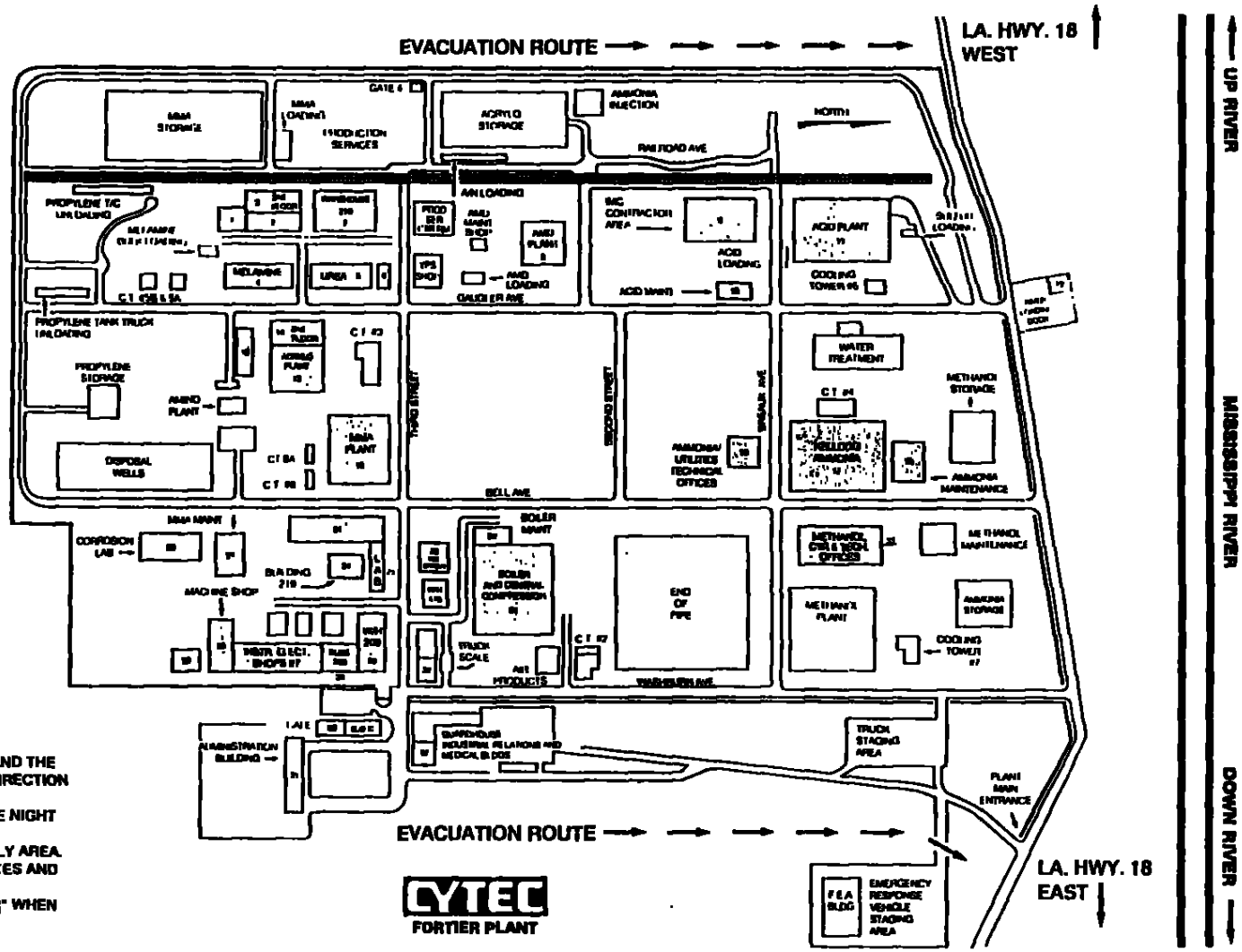
* Community Exposure Duration Guideline

Warning and evacuation levels established by the OHC assume a 30 minute or greater duration of exposure to the community. Notifications levels in many instances are based on odor and irritation; therefore, the duration of exposure for notification levels is usually substantially less than 30 minutes and should be determined by each plant based upon the characteristics of each substance.

REVISED 1997

CRISIS ASSEMBLY AREAS

1. Melamine Maintenance
2. Melamine Control Room
3. Melamine Technical (2nd Floor)
4. Melamine Satellite Control Room
5. Urea Satellite Control Room
6. Urea Maintenance
7. Warehouse 210 [illegible] Areas
8. AMD Control Room
9. IMC Contract Area
10. Acid Maintenance
11. Acid Control Room
12. Acrylonitrile Ma[illegible]
13. Acrylonitrile Co[illegible]
14. Acrylonitrile & MMA Technical (2nd Floor)
15. MMA Control Room
16. Ammonia / Utilities Technical Offices
17. Kellogg Control Room
18. Kellogg Maintenance
19. River Dock Op[illegible] Track
20. Corrosion Lab
21. MMA Maintenance
22. Garage
23. Fire Station
24. Building 219
25. Main Lab
26. Machine Shop
27. Instrument Electric Shop
28. Building 208
29. Warehouse 209
30. Boiler Maintenance
31. Boiler Control Room
32. Training Center
33. Methanol Control Room & Technical Offices
34. Building 240 (Safety / Environmental)
35. Administration Building
36. Cafeteria
37. Medical



CYTEC
FORTIER PLANT

WHAT HAPPENS IN A CRISIS

1. PLANT HORN BLAST FOR 15 SECONDS.
2. GUARDS ANNOUNCE NATURE, LOCATION AND THE LEVEL OF EMERGENCY. THEY GIVE WIND DIRECTION AND VELOCITY. (REPEATED)
3. OPERATING UNITS SWITCH A RADIO TO THE NIGHT SUPERINTENDENT'S CHANNEL.
4. REPORT TO THE NEAREST CRISIS ASSEMBLY AREA.
5. REMAIN ALERT FOR INSTRUCTIONS, UPDATES AND SITUATION CHANGES.
6. THE GUARDS WILL ANNOUNCE "ALL CLEAR" WHEN APPROPRIATE. (R[illegible]ED)

APPENDIX C
EMERGENCY OPERATIONS TEAM MEMBERS

If an Emergency occurs. or the Shift Superintendent requests that the EOC be placed into operation on an off-shift. weekend or holiday, the following persons are to be called by the EOC Chief.

POSITION	PRIMARY	ALTERNATE
Safety Specialist	G. Tierney 656-7757	P. Martinez 537-3151
Safety Leader	P. Martinez 537-3151	R.Masson 837-0435
Process Owner-PSM/RMP	R. Masson 837-0435	R. Hernandez 431-9211
Director of Manufacturing	J. Gill 652-4795	J. Schneller 283-8443
Director of Safety, Environmental and Technology	J. Schneller 283-8443	A. Junker 468-7703
Environmental Services Leader	A. Junker 468-7703	O. Tanner 945-3760
Operating Support Services Manager	R. Busfield 764-8319	M. Roy 785-0070
Director Employee Relations	J. Marosits 764-1772	R. B. Johnson 764-0595
Community & Government Affairs Manager	J. F. Dutcher 785-6405	R.B. Johnson 764-0595
Environmental Services Leader	A. Junker 468-7703	O. Tanner 945-3760
SAFER Operator	M. Clay 340-8944	A. Hicks 366-7384
Technical Representative	P. Knieper 737-3761	B. Skeeles 394-8091
Plant Nurse	Joan Troutman 785-0054	Pat Lutrell 785-2782

APPENDIX D
OTHER KEY PERSONNEL

NOTE: This list is not a part of the CAN system. It is provided here for convenience in notifying other, selected personnel during an emergency situation.

POSITION	PRIMARY	ALTERNATE
Financial Services	R. Heslin 764-1092	P. Gelbwaks 861-3036
Acrylamide Team Leader	L. Barrett 682-7608	T. Naquin 764-1706
Acrylamide Tech. Representative	L. Ong 725-1605	D. Cook 725-1509
Acrylonitrile Team Leader	D. Smith 725-1073	R. Deeters 341-3247
Acrylonitrile Tech. Representative	A. Lanoix 764-1030	J. Rudel 725-1033
Ammonia-Kellogg Manufacturing Supervisor	F. Martinell 347-0640	R. Johnson 469-6675
Ammonia-Kellogg Tech. Representative	G. Deis 764-1817	R. Clay 467-7341
Data Processing	T. Petit 785-6379	L. Pate 888-2861
Technical and Analytical Services Leader	V. Diaz 455-5241	D. Denson 879-3291
Medical Team Contract Physician	Dr. Tucker 581-2581 (Home)	J. Troutman 785-0054
Melamine/Urea Manufacturing Supervisor	E. Becnel 785-0699	H. Madere 785-0111
Melamine/Urea Tech representative	A. Mathews 831-3150	S. Owcarz 785-9922
Methanol Manufacturing Supervisor	D. Prsybyliski 764-6684	B. Saul 392-7640

APPENDIX D
OTHER KEY PERSONNEL (cont'd.)

Methanol Tech. Representative	R. Simmons 764-9243	
MMA Team Leader	J. Bunn 737-2162	N. Roussel 785-0485
MMA Tech. Representative	J. Case 764-6903	W. Zinck 885-6115
Distribution Services Leader	C. Friloux 785-2485	K. Marsiglia 785-9989
Security	G. Tierney 433-4581	Pete Martinez 537-3151
Materials Leader	W. Howes 537-3365	M. Rich 467-854
Regen Manufacturing Supervision	R. Bywater 652-3324	B. Meisch 928-0396
Sulfuric Acid Tech. Representative	A. Betts 861-7119	A. Seawell 433-9086
Utilities Manufacturing Supervisor	B. Hannula 469-0715	H. Williams 785-8604
Utilities Tech. Representative	L. Ong 725-1605	R. Thompson 347-2973

APPENDIX E - TRAINING

1.0 Awareness Level

1.1 Understand and identify the hazardous material at Fortier and the risks associated with the following:

1.1.1 Acrylonitrile
1.1.2 Aminonitrile
1.1.3 Methylmethacrylate
1.1.4 Methanol
1.1.5 Acetone
1.1.6 Sulfuric Acid
1.1.7 Ammonia

1.2 What kinds of emergencies can result.

1.2.1 Fire
1.2.2 Liquid Spills
1.2.3 Vapor Releases
1.2.4 Pressure Release
1.2.5 Exothermic Reactions

1.3 Know How to Institute Emergency Plan.

1.3.1 Call 6511
1.3.2 Pull Fire Alarm
1.3.4 Notify Superior
1.3.4 Radio Channel 1

2.0 Operations Level

2.1 Know basic hazard and risk associated with:

2.1.1 Acrylonitrile
2.1.2 Aminonitrile
2.1.3 MMA
2.1.4 MEOH
2.1.5 Acetone
2.1.6 Sulfuric Acid
2.1.7 Ammonia

2.2 Know how to use and select proper PPE available:

2.2.1 SCBA
2.2.2 Bunker Gear
2.2.3 Class B Responder

APPENDIX E - TRAINING (cont'd.)

2.3 Understand Basic Haz Mat Terms

2.3.1 Hazardous Waste
2.3.2 Hazardous Substance
2.3.3 Permissible Exposure Limit (PEL)
2.3.4 Short Term Exposure Limit (STEL)
2.3.5 Immediately Dangerous to Life and Health (IDLH)
2.3.6 Health Hazard
2.3.7 Oxygen Deficiency

2.4 Basic Decontamination

2.4.1 Equipment
2.4.2 Zones
2.4.3 PPE
2.4.4 Containment

2.5 Understand Plant Emergency Procedures

2.5.1 Levels of Emergencies
2.5.2 Headcount Procedures
2.5.3 Crisis Assembly Areas
2.5.4 Recognizing an emergency and calling in an emergency
2.5.5 Termination of an emergency

3.0 <u>Technician Level</u>

3.1 Know how to implement Fortier's Emergency Procedures.

3.2 Know classification of materials on Plant Side and be able to use O_2 monitors, draeger tubes and pumps, explosion meters.

3.3 Function within Fortier's Incident Command System.

3.3.1 EOC
3.3.2 Command Post
3.3.3 Operations
3.3.4 Safety Officer
3.3.5 Staging Areas
3.3.6 Resource Pools
3.3.7 Mutual Aid

APPENDIX E - TRAINING (cont'd.)

3.4 Select and Use Proper PPE

3.4.1 SCBA
3.4.2 Class A Responder
3.4.3 Level B. C. D equipment
3.4.4 See PPE Program

3.5 Understand and Implement Decon Procedures

3.5.1 Zones
3.5.2 Pools. Pads
3.5.3 See Decon Procedures

3.6 Termination of Incident

3.6.1 Reduction of Level
3.6.2 Secure Area
3.6.3 Clean-up
3.6.4 Notify EOC
3.6.5 Notify Fortier Employees by Executone
3.6.6 Critique

3.7 Understand Basic Chemical and Toxicological Terminology and Behavior

3.7.1 PEL
3.7.2 IDLH
3.7.3 STEL
3.7.4 Exposure Symptoms

4.0 <u>On Scene Incident Commander</u>

4.1 Know how to Implement Incident Command System for Fortier.

4.1.1 EOC Operations
4.1.2 Command Post
4.1.3 Operations
4.1.4 Staging
4.1.5 See Incident Command System Procedures

4.2 Know how to implement Emergency Response Plan.

4.2.1 6511
4.2.2 Alarm System
4.2.3 Radio - Channel 1

APPENDIX E - TRAINING (cont'd.)

4.3 Knows and understands hazards and risks associated with chemical protective clothing.

4.3.1 Proper PPE for each level of protection. See PPE Program.

4.4 Knows how to implement local Emergency Response Plan.

4.4.1 911

4.5 Know State and Federal plans

4.5.1 Strike Teams
4.5.2 State Police

4.6 Know and understand Decon Procedures.

4.6.1 See Decon Procedures for Fortier.

5.0 Refresher Training

5.1 Awareness level employees receive refresher training annually through their department safety meetings.

5.2 Operations level employees receive 8 hours of operations level training annually at Jefferson Parish or equivalent.

5.3 Technician level employees receive 8 hours of technician level training annually at Jefferson Parish or equivalent.

5.4 Incident Commanders

5.4.1 Demonstrate competency annually by handling mock emergencies and rolling drills throughout the year.

APPENDIX F

EMERGENCY RECOGNITION AND PREVENTION

F-1 Emergency recognition is contained in Emergency Response Procedure Section 3 and on Emergency Procedure pocket cards.

F2 Emergency Prevention is addressed in the Spill Plans prepared by each operating unit.

APPENDIX G

CYTEC EMERGENCY PERSONNEL
C.A.N. LIST NO. 1

J. Gill	504-652-4795
J. Schneller	504-283-8443
R. Busfield	504-764-8319
A. Junker	504-468-7703
G. Tierney	504-656-7757
P. Martinez	504-537-3151
R. Masson	504-837-0435
B. Johnson	504-764-0595
J. Dutcher	504-785-6405
J. Marosits	504-764-1772
V. Diaz	504-455-5241
R. Heslin	504-764-1092

APPENDIX H
C.A.N. LIST NO. 2

NAME	ADDRESS	CITY/STATE/ ZIP	PHONE NO.	SPECIAL NEEDS
		EAST NEIGHBORS		
Scott Nace	107 Moss Lane	Waggaman, LA 70094	431-9052	
Victor Bostick	111 Moss Lane	Waggaman, LA 70094	431-2640	
Jason Duhe	115 Moss Lane	Waggaman, LA 70094	431-1404	
Marie Bostick	10535 River Road	Waggaman, LA 70094	431-9031	
Tisdale Snow	10629 River Road	Waggaman, LA 70094	431-0613	
		WEST NEIGHBORS		
Adam Matthews	119 Fortier Heights	Ama, LA 70031	431-7858	
Ester Murphy	124 Fortier Heights	Ama, LA 70031	431-7415	Emphysema
Carlie Petit	125 Fortier Heights	Ama, LA 70031	431-8179	
Monty Smith	126 Lauve Lane	Ama, LA 70031	431-9311	
Dell Lauve	132 Lauve Lane	Ama, LA 70031	431-8038	
Ned Lauve	140 Lauve Lane	Ama, LA 70031	431-9701	
Leonard Troxler	148 Lauve Lane	Ama, LA 70031	431-7965	
Tommy Troxler	156 Lauve Lane	Ama, LA 70031	431-8732	
Jesse Lauve	164 Lauve Lane	Ama, LA 70031	431-8978	Deaf
Royal Champagne	180 Lauve Lane	Ama, LA 70031	431-7281	
Richard Pintado	188 Lauve Lane	Ama, LA 70031	431-8478	
Connie Granier	196 Lauve Lane	Ama, LA 70031	431-7311	
Sterling Fonseca	204 Lauve Lane	Ama, LA 70031	431-8890	
Peggy Friloux	204B Lauve Lane	Ama, LA 70031	431-8762	
Michael Melancon	220 Lauve Lane	Ama, LA 70031	431-2711	
Elson Adams	124 Petit Lane	Ama, LA 70031	431-8401	
T. J. Lavergne	119 Alice Street	Ama, LA 70031	431-8593	
Cammi Troxler	119 Alice Street	Ama, LA 70031	431-8593	
Kent Petit	128 Alice Street	Ama, LA 70031	431-8701	
Minerva Champagne	129 Alice Street	Ama, LA 70031	431-9685	
Kenneth Robert	134 Alice Street	Ama, LA 70031	431-7054	
Irby Petit	146 Alice Street P. O. Box 138	Ama, LA 70031	431-9647	

APPENDIX H
C.A.N. LIST NO. 2

NAME	ADDRESS	CITY/STATE/ ZIP	PHONE NO.	SPECIAL NEEDS
WEST NEIGHBORS (cont'd.)				
Betsy Zeringue	151 Alice Street	Ama, LA 70031	431-9531	
Laura Adams	159 Alice Street	Ama. LA 70031	431-8160	
Mona Bourgeois	160 Alice Street	Ama. LA 70031	431-9378	
Charles Gaubert	168 Alice Street	Ama. LA 70031	431-7877	
Chris Server	171 Alcie Street	Ama, LA 70031	431-3249	
David Louviere	177 Alice Street	Ama. LA 70031	431-8968	
Kerry Petit	190 Alice Street	Ama, LA 70031	431-9081	
Charles Bailey	210 Alice Street	Ama. LA 70031	431-9096	
Mary Hebert	210 Alice Street	Ama, LA 70031	431-9096	
Rick Troxler	229 Alice Street	Ama, LA 70031	431-7053	
Charles King	230 Alice Street	Ama, LA 70031	431-8715	
Dale Petit	242 Alice Street	Ama, LA 70031	431-7611	
Lisa Ranatza	258 Alice Street	Ama, LA 70031	431-9419	
Ched Robert	272 Alice Street	Ama, LA 70031	431-7156	
Randy Petit	292 Alice Street	Ama, LA 70031	Unlisted	
Todd Petit	302 Alice Street	Ama, LA 70031	431-7667	
Chris Canaski	322 Alice Street	Ama, LA 70031	431-8688	
John Raia	327 Alice Street	Ama, LA 70031	431-9146	
Ulrch Muller	334 Alice Street	Ama. LA 70031	431-7419	
L. Hamilton	339 Alice Street	Ama, LA 70031	431-7198	
Ricky Breaux	350 Alice Street	Ama. LA 70031	431-0244	
Lester Badeaux	351 Alice Street	Ama. LA 70031	431-3027	
Rusty Eusea	353 Alice Street	Ama, LA 70031	431-2811	
Carl Cantrelle	360 Alice Street	Ama. LA 70031	431-9794	
Lee Petit	366 Alice Street	Ama. LA 70031	431-0853	
Darren Roberts	368 Alice Street	Ama. LA 70031	431-0798	
Dolores Robert	10011 Alice Street	Ama. LA 70031	431-9438	
Sandra Ward	10017 Alice Street	Ama. LA 70031	431-8415	
Amay Lauve	11701 River Road	Westwego, LA 70094	431-8978	Deaf

APPENDIX H
C.A.N. LIST NO. 2

NAME	ADDRESS	CITY/STATE/ ZIP	PHONE NO.	SPECIAL NEEDS
WEST NEIGHBORS (cont'd.)				
Larry Nicholas	11717 River Road	Westwego, LA 70094	431-9207	
Randy Nicholas	11729 River Road	Westwego, LA 70094	431-2428	
Dora Zeringue	100 P.M. Lane	Ama. LA 70031	431-0529	
Larry Landry	102 P.M. Lane	Ama. LA 70031	431-7024	
Marion Zeringue	104 P.M. Lane	Ama. LA 70031	431-9058	
Morris Zeringue	108 P.M. Lane	Ama. LA 70031	431-7574	
Steve Zeringue	116 P. M. Lane	Ama. LA 70031	431-7743	Back trouble, cannot walk
Troy Pintado	122 P.M. Lane	Ama. LA 70031	431-8232	

APPENDIX I
CYTEC CORPORATE PERSONNEL NOTIFICATION LIST

In the event of a significant plant incident such as a serious fire. major spill, explosion. or serious injury notification should be made to the **Cytec Safety, Health & Emergency Response Group** in West paterson, NJ. via the Emergency HOT LINE numbers.

1-800-647-3746

1-800-647-ERIM

Non-Emergency 1-813-979-0626

Fax: 1-813-979-4620

Please provide the following information to the Cytec Guard/Receptionist:

1. The name of the plant - **FORTIER PLANT**
2. The name of the Caller - **YOUR NAME**
3. The **Call back number** to the Plant - the number of the telephone you are calling from.
4. The nature of the Emergency - **Fire, Spill, Injury, etc.**

NOTE: **Mr. Joe Caporossi.** Director of the Safety. Health & Emergency Response Group will when contacted by the ERIM guard/Receptionist make further notifications to Company Management as required by the nature of the occurrence.

Cytec Management

	Work Telephone No.	Home Telephone No.
J. Leman Vice-President/General Manager	(201) 357-3302	(201) 334-5963
J. C. Caporossi Director. SHER	(201) 357-3347	(201 728-0867

APPENDIX J
FORTIER PLANT LEADERSHIP TEAM

Team Member	Phone Number
Barrett. L.	682-7608
Bass. J.	340-4460
Becnel. E.	785-0699
Busfield. R.	764-8319
Bywater. R.	652-3324
Case. J.	764-6903
Deis. G.	586-9813
Diaz. V.	455-5241
Dutcher. J.	785-6405
Friloux. C.	785-2485
Gelbwaks. P.	484-6579
Gill. J.	652-4795
Goletz. F.	391-0767
Hannula. B.	469-0715
Heslin. R.	764-1092
Johnson. R.	764-0595
Junker. A.	468-7703
Knieper. P.	737-3761
Lincoln. R.	641-4757
Marosits. J.	764-1772
Marsiglia. K.	785-9989
Martin. J.	885-8854
Martinell. F.	347-0640
Martinez. P.	537-3151
Masson. R.	837-0435
Matthews. A.	831-3150
Meisch. R.	725-0796
Mikesell. P.	785-0225
Prsybylski. D.	764-6684
Roy. M.	785-0070
Saul. B.	392-7640
Schneller. J.	283-8443
Schneller. J.	283-8443
Smith. D.	724-1073
Tierney. G.	656-7757
Troutman. J.	785-0054
Williams. H.	785-8604

APPENDIX K
BEEPER LIST

RADIOFONE PAGERS

SERIAL#	PHONE NUMBER	INDIVIDUAL	DEPARTMENT
7675003	489-1746	Stephen Schmill	522
7138550	527-4361	Ernie Becnel	522
7138882	596-8312	H. Madere	522
7076202	461-1079	Des Cooke	555
7024686	584-4556	Terald Naquin	555
7041645	584-8947	Louis Barrett	555
7671303	569-5382	Jim Bunn	570
0980088	461-2345	Bob Meisch	590
7022355	596-7855	Rick Bywater	590
7511172	521-3189	Fred Martinell	601
7233638	528-5397	Gene Aucoin	620
7335980	538-5679	Paul Mikesell	620
7644472	547-9385	Eric Bailey	620
7555803	550-7859	Paul Minet	620
7305690	550-8143	Al Lanoix	620
7326123	550-8567	Ronnie Deeters	620
7078019	584-7088	Coral Falgout	620
7676310	538-5906	Duane Smith	620
7058355	595-0598	Acrylo Weekend Duty	620
7212465	477-1696	Mike Gaudet	660
7275102	576-8866	Bob Saul	660
7275088	576-8871	John Lejeune	660
7275098	576-8878	Frank Goletz	660
A0041940	551-1347	Methanol Extra	660
7597809	576-8880	Roger Simmons	660
7275062	576-8881	Dave Vaishnav	660
7230205	576-9718	Anthony Fregosi	660

SERIAL#	PHONE NUMBER	INDIVIDUAL	DEPARTMENT
7202535	576-9724	Dennis Przybylski	660
7305545	595-9541	Chauffeur	4199
7305854	550-4046	Tiki Petit	8760
7303566	595-0616	Larry Pate	8760
7651824	584-4283	Ken Marsiglia	8860
1105237	576-9368	Hunter Vegas	8860
7073276	584-4541	Kent Finger	8860
A0040820	538-3547	Chris Friloux (Local)	8860
7615875	527-2690	Micky Ashcraft	8860
7023115	569-5349	Bob Widmer	8880
7675075	663-9395 (SWAP)	Purchasing (W/E Duty)	8910
7304228	471-5421	John Schneller	9010
7204366	582-9063	Patty Vowell (W/E Duty)	9010
7687110	888/460-4630	Jas Gill	9010
7644472	565-1035	Zona Gibson (W/E Duty)	9110
7584166	1/800/759-8888 289-4345	Pete Martinez	9210
7584181	1/800/759-8888 Pin 537-7118	Gene Tierney	9210
7305987	566-2970	Dave Denson	9415
7074320	596-8102	Vince Diaz	9415
7078627	582-9048	Chris Shaw	9422
7644472	800/759-7243 547-7471	Subha Ramiah	9423
7020674	582-9768	Terry von Bargen	9428
7300031	550-0774	Viki Henry (Rotates)	9506
7645718	576-1291	Vicki Henry (Rotates)	9506
7325892	582-9714	Vicki Henry (Rotates)	9506
7089493	584-7789	Pete Ciccio (IMC)	9506
7670733	599-3646	Bob Busfield	9506
7127543	595-7114	M. Roy (Eagle)	9506
7021724	582-0902	Barry Hannula	9601

SERIAL#	PHONE NUMBER	INDIVIDUAL	DEPARTMENT
7026205	584-6392	Leon Verda	9601
7075061	584-7517	Harold Williams	9601
7024567	595-0967	Rhosus Eckles	9601
7675070	663-9397	Bob White	9601

ENVIRONMENTAL INCIDENT REPORT (EIR)

REV.12/30/96

LOG NO.: _____

Cytec form: eir.wk3

TYPE OF NOTIFICATION: Complaint (for several, use space on back) Incident

INITIAL REPORT:

Caller: Phone: Received by: Time:

Caller Location: Reported to: Time:

Date reported: Day:

Time detected: a.m. p.m. Date detected: Day:

CALLER'S DESCRIPTION:

What:

Where:

For complaints, what type?

Odor Noise Auto Property Health Other:

WEATHER CONDITIONS:

Wind from the Cloud cover

Wind speed in mph Humidity in %

Temperature in F Precipitation type

IMMEDIATE INVESTIGATION:

Environmental incident; identified source Confirmed complaint; unidentified source

Confirmed complaint; identified source Unconfirmed complaint; unidentified source

ADDITIONAL INVESTIGATION REQUIRED: Yes No

IDENTIFIED SOURCE:

Unusual event Spill Emission Excursion

Plant

Location

Source

Cause

Remedial activity

Material(s)

Quantity(s)

Injury

Damage

RELEASE TO (CHECK ALL THAT APPLY):

Soil Air Water Concrete, etc.

WERE NOTIFICATIONS MADE? yes no **IF YES, COMPLETE REVERSE.**

UNIDENTIFIED SOURCE: Plant activities at the time and precautions taken were:

Kellogg

Acid

Utilities

AN/Amino

AMEL

MMA

AMD

Methanol

Prod. Svcs.

Maintenance

Other

Log No.

ADDITIONAL IDENTICAL COMPLAINTS:

Received by:	Received by:
Time: Date: Day:	Time: Date: Day:
Reported to:	Reported to:
Time Date: Day:	Time: Date: Day:
Caller: Phone:	Caller: Phone:
Location:	Location:
What:	What:
Where:	Where:
When: Date: Day:	When: Date: Day:
Received by:	Received by:
Time: Date: Day:	Time: Date: Day:
Reported to:	Reported to:
Time: Date: Day:	Time: Date: Day:
Caller. Phone:	Caller: Phone:
Location:	Location:
What:	What:
Where:	Where:
When: Date: Day:	When: Date: Day:

IF MORE COMPLAINTS, HOW MANY MORE? **ATTACH INFORMATION ON MORE COMPLAINTS.**

NOTIFICATIONS:

Notifying Person: Date:

Environmental Contact:

Other Plant Contact(s):

Check Agencies Notified:	Phone		Time	Official	Report #
State Police (SARA, RTK)	1-504-925-6595				
Jefferson (SARA)	911				
St. Charles (easterly wind)	783-5050				
Kenner (southerly wind)	467-2211				
DEQ (CERCLA, SARA, excursion)	1-504-342-1234				
National Response Center (CERCLA)	1-800-424-8802				
Jeff Waterworks (river)	838-4327	(main)			
[Call in order until contacted.]	838-4322	(supt.)			
	838-4305	(lab)			
	652-1441	(home)		Blaine Elstrott	
	469-2440	(home)		Wayne Koffskey	
Public Health (river)	826-2400	(day)			
[Call in order until contacted.]	568-5100	(day)			
	833-1853	(home)		Effie Michalos	
	595-4987	(beeper)		Effie Michalos	
	288-3953	(home)		Fred Corlis	
	527-1471	(beeper)		Fred Corlis	
	835-0215	(home)		Doug Vincent	
	595-4433	(beeper)		Doug Vincent	
	282-7896	(home)		Jay Ray	
EPA (water permit)	1-214-665-6595				
DNR (deepwells)	1-504-342-5515				

FOLLOWUP: List on morning report. Fax to environmental manager and manager of responsible area.

APPENDIX M
EMERGENCY INFORMATION & NOTIFICATION RECORD

DATE:_____ TIME:_____AM___PM___

NAME OF THE PERSON RECEIVING THE CALL:_____

NAME OF PERSON CALLING:_____EXT._____

LOCATION OF EMERGENCY:_____

NATURE OF EMERGENCY:_____

ARE ANY OTHER AREAS AFFECTED?: YES__NO__
WHICH?_____

ARE THERE INJURED?: YES__NO__ HOW MANY?_____

IS GAS___ OR LIQUID___ BEING RELEASED?

WHAT IS IT?_____

WIND DIRECTION___ WIND SPEED___ RAIN?___ FOG?___

UNUSUAL EVENT DECLARED BY_____AT_____
A.M./P.M.

ALERT DECLARED BY_____AT_____
A.M./P.M.

SITE AREA EMERGENCY DECLARED BY_____AT_____
A.M./P.M.

GENERAL EMERGENCY DECLARED BY_____AT_____
A.M./P.M.

ALL CLEAR DECLARED BY_____AT_____
A.M./P.M.

JEFFERSON PARISH NOTIFIED? YES__NO__ NAME_____

ST. CHARLES PARISH NOTIFIED? YES__NO__ NAME_____

LA. STATE POLICE NOTIFIED? YES__NO__ NAME_____

CITY OF KENNER NOTIFIED? YES__NO__ NAME_____

OTHER_____ YES__NO__ NAME_____

OTHER_____ YES__NO__ NAME_____

OTHER_____ YES__NO__ NAME_____

SIGNED_____

APPENDIX M CONTINUED:
PLANT MANAGEMENT CONTACTS

J. GILL	652-4795
J. SCHNELLER	283-8443
R. BUSFIELD	764-8319
P. MARTINEZ	537-3151
G. TIERNEY	656-7757
J. DUTCHER	785-6405
R. JOHNSON	764-0595
J. MAROSITS	764-1772

AREA MANAGERS

P. MIKESELL	785-0225
A. JUNKER	468-7703
F. GOLETZ	391-0767
P. KNIEPER	737-3761

CORPORATE NOTIFICATION

J. LEMAN	201-334-5963
J. CAPOROSSI	201-728-0867

APPENDIX M
EMERGENCY INFORMATION & NOTIFICATION RECORD

COMMENTS/NOTES:

APPENDIX N

DECONTAMINATION PROCEDURES

(see attached)

CONTROLLED COPY

FORTIER PLANT

DECONTAMINATION GUIDELINES FOR EMERGENCY RESPONSE TEAMS

CYTEC

CONTROLLED COPY

FORTIER

DECONTAMINATING INJURED PERSONS

If time allows, decontamination of injured persons should be accomplished before they reach the COLD ZONE. In some incidents, decontamination actually becomes part of the life-saving first aid administered to an individual.

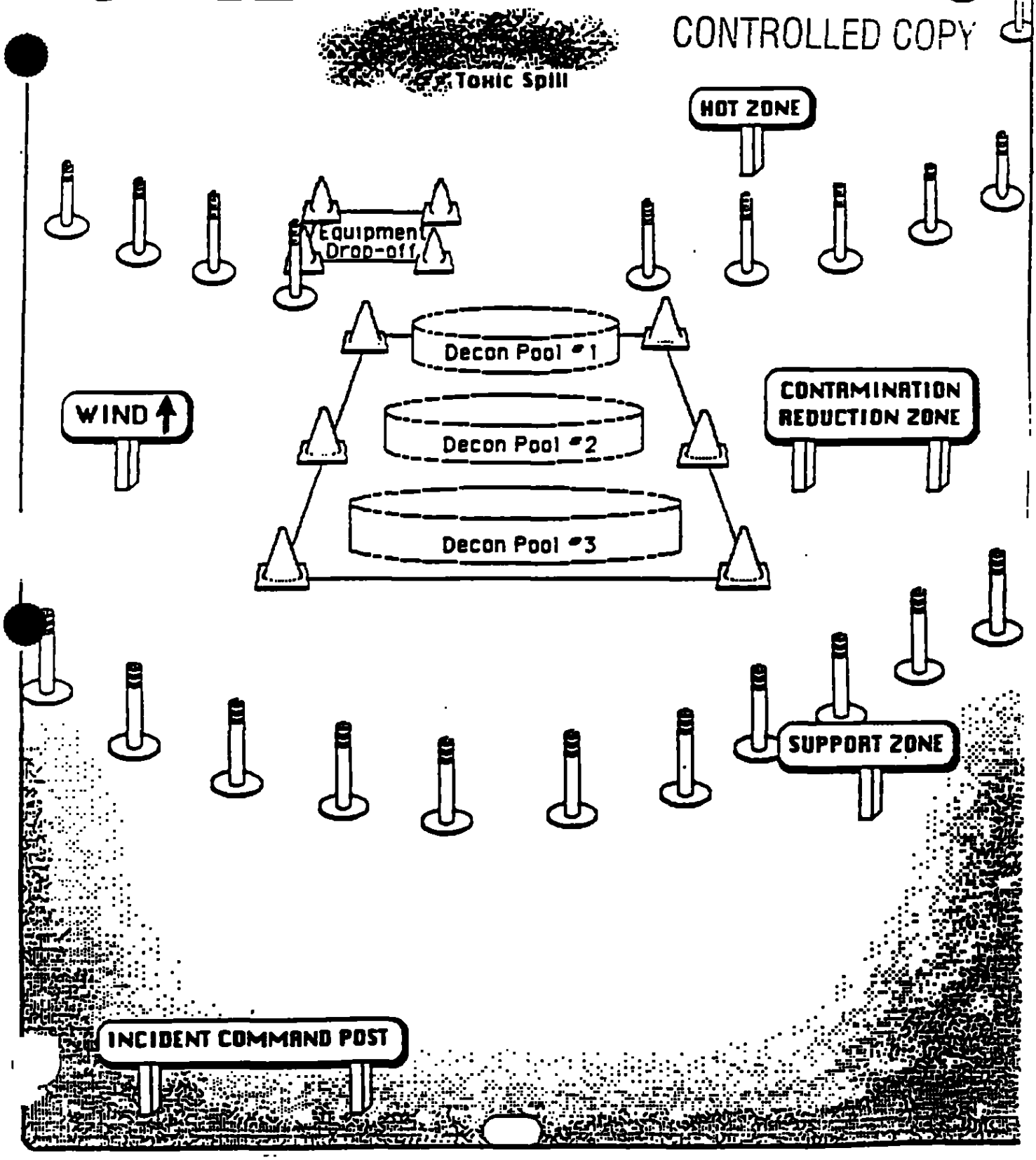
If a victim has to be transported, he should be decontaminated prior to being put into the ambulance.

SAFETY SHOWERS

Safety showers on plant should be used whenever possible for decon, since the run-off will be routed to the plant containment system.

DECONTAMINATION SET-UP

CONTROLLED COPY



CONTROLLED COPY

I. INTRODUCTION

The hazardous materials response team divides the control of hazardous materials incidents into three (3) basic functions, which consist of:

- Identification and research of materials involved
- Development and tactical application of an action plan
- Decontamination of personnel and equipment

It is necessary during most incidents involving chemicals to decontaminate personnel and equipment. Contamination reduction should be considered an important function of any incident where personnel are exposed to chemicals. Decontamination, when correctly and thoroughly completed, reduces the chance of exposure to personnel and confines contamination to a specific area. Damage to protective clothing by chemicals is also reduced during this process.

II. CONTAMINATION REDUCTION

Categories

Primary Decontamination

Primary decontamination is the on-scene initial decontamination of personnel and equipment leaving the HOT ZONE with the utilization of the Contamination Reduction Zone.

Secondary Decontamination

Secondary decontamination consists of monitoring and inspection of exposed protective equipment and tools that have undergone primary decontamination and further cleaning may be required.

Emergency Decontamination

Emergency decontamination is the immediate removal of contamination from personnel without establishing formal decontamination zones. Usually performed in endangerment to life or health situations.

Protection Levels

The level of protection used by the approach team shall directly apply for decontamination personnel unless conditions warrant a higher or lower level of protection.

When response activities are conducted where atmospheric contamination is known or suspected to exist, personnel protective equipment must be worn. Personnel protective equipment is designed to prevent/reduce skin and eye contact as well as inhalation or ingestion of the chemical substance.

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Personnel equipment to protect the body against contact with known or anticipated chemical hazards has been divided into four categories:

1. Level A protection should be worn when the highest level of respiratory, skin, eye and mucous membrane protection is needed.

   a. Personal Protective Equipment

      - Positive-pressure (pressure demand), self contained breathing apparatus (MSHA/NIOSH approved).
      - Fully-encapsulating chemical resistant suit.
      - Gloves, inner, chemical resistant.
      - Gloves, outer, chemical resistant.
      - Boots, chemical resistant, steel toe and shank (depending on suit boot construction, worn over or under suit boot).
      - Underwear, cotton, long-john type.*
      - Hard hat (under suit).*
      - Coveralls (under suit).*
      - Two-way radio communications (intrinsically safe).

* Optional

2. Level B protection should be selected when the highest level of respiratory protection is needed, but a lesser level of skin and eye protection. Level B protection is the minimum level recommended on initial site entries until the hazards have been further identified and defined by monitoring, sampling, and other reliable methods of analysis, and personnel equipment corresponding with those findings utilized.

   a. Personal Protective Equipment

      - Positive-pressure (pressure-demand), self contained breathing apparatus (MSHA/NIOSH approved).
      - Chemical resistant clothing (overalls and long sleeved jacket, coveralls, hooded two piece chemical splash suit, disposable chemical resistant coveralls.)
      - Coveralls (under splash suit).*
      - Gloves, outer, chemical resistant.
      - Gloves, inner, chemical resistant.
      - Boots, outer, chemical resistant, steel toe and shank.
      - Boots, outer, chemical resistant.*
      - Two-way radio communications (intrinsically safe).
      - Hard hat.*

* Optional

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3. Level C protection should be selected when the type of airborne substance is known, concentration measured, criteria for using air-purifying respirators met, and skin and eye exposure are unlikely. Periodic monitoring of the air must be performed.

   a. Personal Protective Equipment

      - Full-face, air-purifying respirator (MSHA/NIOSH approved).
      - Chemical resistant clothing (one-piece coverall, hooded two-piece chemical splash suit, chemical resistant hood and apron, disposable chemical resistant coveralls).
      - Gloves, outer, chemical resistant.
      - Gloves, inner, chemical resistant.*
      - Boots, steel toe and shank, chemical resistant.
      - Boots, outer, chemical resistant.*
      - Cloth coveralls (inside chemical protective clothing).*
      - Two-way radio communications (intrinsically safe).
      - Hard hat.*
      - Escape mask.*

   * Optional

4. Level D is primarily a work uniform. It should not be worn on any site where respiratory or skin hazards exist.

III. PRIMARY DECONTAMINATION PROCEDURES

CONTAMINATION REDUCTION ZONE

Definition

The Contamination Reduction Zone (CRZ) provides assurance that physical transfer of contaminating substances on personnel, equipment, or in the air is limited through a combination of decontamination, distance between the Hot Zone and Support Zone, air dilution, zone restrictions and work functions.

Zone Activation

Identification and research of materials involved must be accomplished to justify a need for decontamination, identify the level of protective clothing worn by the CRZ personnel and type of degradation solution to be used.

The CRZ shall be activated and prepared to decontaminate personnel and equipment prior to entry of approach team into the Hot Zone.

The CRZ shall be operated with at least two qualified personnel.

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Location

The CRZ shall be located between the Hot Zone and Support Zone, upwind of the incident on level ground away from drainage to prevent runoff. Obtain a secure area with limited access to spectators if possible.

Zone Restrictions

The CRZ shall be the only exit out of the Hot Zone. Anybody leaving the Hot Zone will go through decontamination for evaluation.

Access to the CRZ shall be limited only to decontamination personnel and approach team members. The CRZ is restricted to all others.

Decontaminated personnel shall exit the CRZ into the Support Zone for medical evaluation and rest.

No food, drink or smoking shall be allowed in the CRZ.

Decontamination personnel will be using LEVEL C protection as a standard.

This level of protection consists of:

- Saranex chemical suit.
- Rubber chemical resistant boots or turn-out boots.
- Rubber chemical gloves.
- Positive Pressure SCBA or cartridge respirator.

Breathing apparatus shall be available to all personnel working in the CRZ and Support Zone on all "Level A" and most "Level B" incidents in the case of incident deterioration or wind shift.

METHODS OF DECONTAMINATION

Degradation

Decontamination by chemical degradation is accomplished by applying a chemical solution to react with and neutralize contaminants by altering the chemical structure of the material.

Dilution

Dilution is used to reduce the concentration of a hazardous material to a point where it is no longer harmful. This can be accomplished by using large amounts of water to flush away materials from protective clothing and equipment. Advantages of water dilution are speed and economy; disadvantages are the possibility of reactivity with some materials and the control of large amounts of water runoff into the environment. The application of water to most hazardous materials generally reduces concentration; in many cases, it will not change the material chemically.

CONTROLLED COPY

Absorption

Absorption is the process of absorbing or "picking-up" the hazardous material to prevent enlargement of the contamination area. This technique is used primarily for decontaminating equipment and property. It has limited application for decontamination of personnel.

The advantage of absorption techniques is their ability to minimize surface areas of the spill when liquids are involved. The application of absorbant materials is limited to flat surfaces such as the ground. It is important to remember that the contaminants in absorbants remain chemically unchanged and retain their hazards.

Isolation and Disposal

Contaminated equipment waiting for decontamination must be located in a designated area until thoroughly cleaned. It may become more economical to dispose of protective clothing and equipment rather than attempting to decontaminate them.

DECONTAMINATION SET-UP

1. Establish physical barriers displaying the locations of the Hot Zone line and Contamination Reduction Zone line (ex. flagging tape, road cones, etc.). When these perimeters are in service, all personnel shall comply with the restrictions as outlined above in the definition of each area.

2. Determine proper location for decontamination area. Take into consideration:

   - Wind direction - up-wind
   - Level ground; prevent decon wash from entering drainage
   - A location that will reduce the spreading of contaminants by personnel leaving the spill and traveling through the Hot Zone on their way to the decontamination area.

Example: If the incident is in a building; the decontamination area should be outside the door with the most advantageous access to the spill. This will prevent personnel from "tracking" contaminants through uninvolved portions of the building.

3. Decon Areas Set-Up:

   - Layout visqueene (10' x 20' plastic sheeting) on ground at the entrance to decontamination. This will be the only exit from the Hot Zone. The visqueene provides protection from ground permeation of contaminants. Use weighted road cones to secure the visqueene from the wind. To minimize potential runoff from the decontamination area, cover adjacent drains or manholes, and dike sloped edges of visqueene with dirt or absorbant.

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- Inflate three wading pools. Place them on the visqueene close enough together to allow personnel to step from one pool to another. Water can be put into the pools to hold them in place from the wind.

- Set-up decontamination equipment:

  - Prepare decontamination solution.
  - Brushes, sponges, rags.
  - Large plastic bags (body bags) for decontaminated equipment.
  - Decon shower. Secure water source.
  - Provide boots for personnel that have completed decontamination.

DECONTAMINATION OPERATION

Decontamination operates with a minimum of two personnel. Members of the crew work together washing, scrubbing and showering. They then help the emergency response team members remove all protective garments and place them into plastic bags. Decon Officer may be designated to be available to add more equipment and supplement manpower where needed.

PREPARATION - Activate CRZ:

- Set-up Contamination Reduction Zone.
- Don protective clothing. When the approach team is in the Hot Zone, decon personnel should be prepared to perform decontamination within 60 seconds, they can be at half dress.
- Personnel safety equipment check.
- CRZ personnel take positions when approach team displays signal for decontamination.

TRIAGE CONTAMINATED PERSONNEL by the following priority order:

- Damaged suits, interior contamination or injured personnel
- Low air SCBA situation
- Exterior contamination - least contaminated person
- Exterior contamination - most contaminated person

EQUIPMENT Leaving Hot Zone: Place contaminated equipment on the equipment drop-off pad or in plastic bags for cleaning after completion of personnel decontamination.

FIRST POOL:

Rub on Decon solution with a sponge or cloth from head to toe in a systematic fashion. Give special attention to the gloves and boots. Use the scrub brush only on the boots, it could damage the acid suit. Rinse with the shower, maintain a low flow to prevent splashing and overflowing the pool. Step to the next pool.

SECOND POOL:

Use a soap solution to remove the Decon solution used in the first pool. Each of the Decon solutions we use would deteriorate the acid suits if not removed. Rinse head to toe including soles of the boots. Step to the next pool.

THIRD POOL:

This step is used to determine the effectiveness of the Decontamination. Instrumentation is used to detect possible left-over contaminants on the suits. If contaminants are found Decon is continued; if not, proceed to bagging.

Note: A Safety Shower draining into a chemical waste collective system may be substituted for wading pools.

BAGGING SUITS AND EQUIPMENT:

A *Decon crew* member has prepared a plastic bag for the protective garment and a pair of boots for the HURT member to step into. The person being decontaminated steps from the third pool into the plastic bag. The suit is removed and placed into the bag.

The Decon crew members are wearing protective garments - they will handle the outside surface of the protective suit being removed. The person from whom the protective is being removed will only touch the inside surface of the suit. This prevents transfer of possible contaminants between the exterior of the suit, the interior surface and the wearer.

Equipment is decontaminated in a similar manner. All equipment that leaves the Hot Zone is decontaminated and bagged. Disposable equipment is set aside in bags for proper disposal.

ADDITIONAL

If a decon pool should fill-up, place a new pool next to it and continue in the decontamination process.

If more than four people will be operating in the Hot Zone at one time, the decontamination operation will need to be enlarged. There should be another set of pools in service with a second Decon crew available.

TERMINATION of the Contamination Reduction Zone Decontamination shall not be terminated until the incident has been released to the responsible party or upon approval of the Incident Commander.

- Bag all decontaminated equipment for secondary decontamination.
- Disposable equipment, pools and solutions must be disposed of according to all applicable state, federal and local environmental regulations.

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DECONTAMINATION OF DECON TEAM

Upon termination of the decontamination operation, the Decon Team must decontaminate and bag each others equipment.

- Use the decon pool with the least amount of contamination (or use a new pool).
- Apply decon solution; concentrate on the arms and front of suit. These areas will have the most contamination.
- Shower off decon solution.
- Assist each other removing SCBA and bagging suits, gloves and boots.
- Enter Support Zone for Medical Evaluation and rest.

POST INCIDENT

For personal hygiene, take a shower as soon as possible.

IV. SECONDARY DECONTAMINATION

Primary decontamination is performed at the incident; all suits, gloves and instruments are bagged after decontamination and then returned to the station. All Bagged equipment is out of service. Secondary Decontamination involves checking for possible contaminating product within the bags, another scrub down if needed and returning the equipment back into service.

Equipment returned from an incident in plastic bags should be monitored to determine if there is any detectable contaminants. If the test is positive, the equipment should be decontaminated using proper protective gear; take into consideration collecting the contaminated run-off. The decon procedure should be continued until the monitoring tests negative. If the equipment can not be decontaminated, it should be sent out for professional cleaning or it should be discarded.

When the monitoring tests negative, the equipment can be handled without concern for special protective gear. Before the equipment can be returned to in-service, it must be checked for wear and tear. Acid suits should be cleaned inside and out for hygiene. The suit should be subjected to the inspection procedure recommended by the manufacturer. The interior of the suit should be cleaned with MILD soapy water and thoroughly rinsed. If all of the soap residue is not removed, we could experience problems from slippery surfaces between the fabric and the occupant's skin or problems from rashes. The suit should be dried inside first. At this point the suit can be considered in-service.

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V. DECONTAMINATION SOLUTIONS

Decontamination solutions should be designed to react with and neutralize the specific, potential contaminants involved in an incident. However, since the contaminants at an incident may be unknown in some cases, it is necessary to use a decontamination solution that may be effective for a variety of contaminants. Several of these general purpose decontamination solutions are listed below. Technical service should always be obtained prior to attempting decontamination by chemical degradation.

Hazard Suspected:	Suggested Solution:
Inorganic acids metal processing wastes, Heavy Metals Mercury, lead cadium, etc.	Solution A
Pesticides, fungicides, Chlorinated phenols, dioxins, PCPs, cyanides, ammonia and other non-acidic inorganic wastes	Solution B
Solvents and organic compounds ex. Trichloroethylene, chloroform and toluene, PBB's and PCB's	Solution C (or solution A)
Oily, grassy unspecified wastes	Solution C
Inorganic bases, alkali and caustic waste	Solution D
General cleaning, removal of previous hazardous decon solution (This method is preferred by EPA and should be sufficient in most cases).	Solution E

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SOLUTION A: A solution containing 5% sodium carbonate (Na_2CO_3) and 5% trisodium phosphate (Na_3PO_4):

To two gallons of water, add one pound of sodium carbonate (soda lime) and one pound of trisodium phosphate. Stir until evenly mixed.

SOLUTION B: A solution containing 10% calcium hypochlorite ($Ca(ClO)_2$):

To two gallons of water, add two pounds of calcium hypochlorite. Stir with a wooden or plastic stirrer until evenly mixed.

SOLUTION C: A solution containing 5% trisodium phosphate (Na_3PO_4):

To two gallons of water, add one pound of trisodium phosphate. Stir until evenly mixed.

SOLUTION D: A dilute solution of hydrochloric acid (HCl):

To two gallons of water, add one-third cup of concentrated Hydrochloric acid. Stir with a wooden or plastic stirrer.

SOLUTION E: A solution containing dishwashing liquid, or other household detergent such as Tide.

APPENDIX O

STANDARD OPERATING PROCEDURES FOR RESPIRATORY PROTECTION DEVICES

The following subsections define standard operating procedures for air purifying respirators and self-contained breathing apparatus.

1.0 Cleaning and Disinfecting Air Purifying Respirators (APR)

1.1 APRs in routine use should be cleaned and disinfected at least daily. Where respirators are used only occasionally, or when they are in storage, the cleaning interval, as appropriate.

2.0 After Routine Use in Exclusion Hot Zone

2.1 The steps to be followed for cleaning and disinfecting in the field are as follows:

2.1.1 The mask may be washed/rinsed with soap and water.

2.1.2 At a minimum, the mask should be wiped with disinfectant wipes (benzoalkaloid or isopropyl alcohol), and allowed to air dry in a clean area.

3.0 APR Inspection and Checkout

3.1 Visually inspect the entire unit for any obvious damages, defects, or deteriorated rubber.

3.2 Make sure that the facepiece harness is not damaged. The serrated portion of the harness can fragment which will prevent proper face seal adjustment.

3.3 Inspect lens for damage and proper seal in facepiece.

3.4 Exhalation Valve - pull off plastic cover and check valve for debris or for tears in the neoprene valve (which could cause leakage).

3.5 Inhalation Valves (two) - screw off cartridges/canisters and visually inspect neoprene valves for tears. Make sure that the inhalation valves and cartridge receptacle gaskets are in place.

3.6 Make sure a protective cover lens is attached to the lens.

3.7 Make sure the speaking diaphragm retainer ring is hand tight.

3.8 Make sure that you have the correct cartridge.

APPENDIX O

STANDARD OPERATING PROCEDURES FOR RESPIRATORY PROTECTION DEVICES

3.9 Don and perform negative pressure test.

4.0 Self Contained Breathing Apparatus

See attached MSA procedures.

APPENDIX P

SELF CONTAINED BREATHING APPARATUS (SCBA)

See attached MSA procedures.

Ultralite® II
Ultralite® II Dual-Purpose
Custom 4500® II
Custom 4500® II Dual-Purpose

air mask

instructions
and Level I Maintenance

⚠ WARNING

This manual, including the warnings and cautions inside must be read and followed carefully by all persons who have or will have the responsibility for using or servicing the product. These masks will perform as designed only if they are used and serviced according to the instructions. Otherwise, they could fail to perform as designed, and persons who rely on these apparatus could sustain serious personal injury or death.

This SCBA is certified by the National Institute of Occupational Safety and Health (NIOSH) and is specifically designed to comply with National Fire Protection Association (NFPA) standards for use in firefighting applications. Failure to follow this warning may result in serious personal injury or death.

The warranties made by MSA with respect to the product are voided if the product is not used and serviced according to the instructions in this manual. Please protect yourself and your employees by following the instructions. Please read and observe the WARNINGS and CAUTIONS inside. We encourage our customers to write or call for a demonstration of this equipment prior to use, or for any additional information relative to use or repairs. During regular working hours, call 1-800-MSA-2222. After working hours or during emergencies, call 1-800-MSA-5555.

Manufactured by
MSA MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

TAL 598(L) Rev. 6

804010

Ultralite® II
Ultralite® II Dual-Purpose
Custom 4500® II
Custom 4500® II Dual-Purpose

Table of Contents/Important Notice

Description Page
IMPORTANT NOTICE 3
DESCRIPTION 4
Air Cylinder 4
Carrier and Harness Assembly 4
Audi-Larm Audible Alarm 4
High-Pressure Hose 4
Pressure Demand Regulator 4
Facepiece and Breathing Tube 5
Neckstrap 5
Facepiece Accessories 5
DONNING THE AIR MASK (SCBA) 5
Over-the-Head Method 5
Vest Method 5
Regulator and Audi-Larm Checks 6
Donning the Ultravue Facepiece 7
Air-Tightness Test 7
Final Hook-up 8
Service Life 8
Emergency Operation 8
Cold Weather Operation 8
USING THE AIR MASK 9
Donning a Dual-Purpose Air Mask 9
Quick-Fill System 9
Removing the Air Mask 12
Changing Cylinders 12
CLEANING AND SANITIZING 13
INSPECTION 14
Recordkeeping 14
Components and Inspection Check Points (After each use) 14
Cylinder 14
Facepiece and Breathing Tube 15
Regulator 15
Audi-Larm Audible Alarm 16
Carrier 16
Components and Inspection Check Points (At least monthly) 17
LEAK-TESTING 18
Cylinder Valve 18
Cylinder Neck 18
Pressure Gauge 18
Audi-Larm Assembly 18
High-Pressure Hose Assembly 19
Regulator Aspiration 19
Regulator Admission Valve 19
Regulator Main-Line and By-Pass Valves 19
Regulator Body 19
Dual-Purpose Air-Line Connector 20
REGULATOR REPAIR 21
Replacing the Diaphragm Assembly 21
Replacing the Regulator Pressure Gauge 21
Replacing the 90 Degree Elbow 22
Replacing the Sintered Filter 23
Replacing the High Pressure Hose 23
Replacing the 45 Degree Elbow 24
Replacing the Relief Valves 25
Low Pressure 25
High Pressure 25
AUDI-LARM REPAIR 26
Replacing the Insert O-Ring 26
Replacing the Bell 26
Replacing the Coupling Nut 26
CYLINDER REPAIR 27
HARNESS REPAIR 27
Replacing Shoulder Pads Only 27
Replacing Friction Buckles and Chest Strap 27
Replacing Adjustable Pull-Straps Only 27
Replacing the Waist-Strap 28
Replacing the Backpad 28
Replacing the Cylinder Band and Latch Assembly 28
Installing Carrier Assembly Decals 28
FACEPIECE, BREATHING TUBE AND CARRYING CASE REPAIR 28
Ultravue Facepiece 29
Replacing the Harness Headstrap 29
Replacing the EZ-Don Harness 29
Replacing the Lens and Ring 30
Replacing the Speaking Diaphragm Housing 30
Replacing the Inhalation Disc Valve 31
Replacing the Exhalation Valve 32
Breathing Tubes 32
Replacing the Tube or Inserts 32
Replacing the Threaded Insert 32
Checking the Breathing Tube for Leaks 33
Carrying Case Latch 33
ACCESSORIES 33
SCBA CYLINDERS 34
QUICK-FILL SYSTEM 34
Ultra Elite Facepiece 37
Removing/Installing EZ-Don Harness 37
Cleaning and Sanitizing 37
Removing/Installing Component Housing Cover 38
Removing/Installing Facepiece Lens and Ring 38
Removing/Installing Component Housing Assembly 39
Replacing Inlet Gasket and Disc Valve 40
Removing/Installing Pressure Demand Exhalation Valve 40
Replacing Speaking Diaphragm 41
Installing Spectacle Kit 41
Installing Nosecup or Air Baffle 42
TROUBLESHOOTING 43
RECORDKEEPING 44

Before you begin, get the appropriate illustrated Parts List for your: Ultralite II and Ultralite II Dual-Purpose, and the Custom 4500 II and Custom 4500 II Dual-Purpose breathing apparatus.

Important Notice for Respiratory Protection Program Administrators

1. An adequate respiratory protection program must include knowledge of hazards, hazard assessment, selection of proper respiratory protective equipment, instruction and training in the use of equipment, inspection and maintenance of equipment, and medical surveillance. [See OSHA regulations, Title 29 CFR, Part 1910. 134, Subpart 1, Par. 1910. 134 (b).]
2. This SCBA will perform as designed only if used and maintained according to the manufacturer's instructions. The Program Administrator and the users must read and understand these instructions before trying to use or service this product. We encourage our customers to write or call for information on this product before using it.
3. This SCBA may be used only after proper instruction and training in its use as specified in NFPA-1500 (1987 edition) and OSHA regulations Title 29 CFR, Part 1910. 134, Subpart 1, Par. 1910. 134 (b) (3).
4. If the SCBA does not perform as specified in this manual, it must not be used until it has been checked by authorized personnel.
5. Under no circumstances should the SCBA be used as an underwater device.
6. Do not alter, modify, or substitute any components without the approval of the manufacturer. Such alterations will void the NIOSH/MSHA approval.
7. Inspect the SCBA regularly and

maintain it according to the manufacturer's instructions. Repairs must only be made by properly trained personnel. Any additional repairs NOT covered by this manual must be done only by Certified Level II and/or Level III personnel.

For more information on self-contained breathing apparatus use and performance standards, please consult the following publications: NFPA Standard 1500 (1987 edition), Fire Department Occupational Safety and Health Programs (Chapter 5) and NFPA Standard 1981 (1992 edition), SCBA Performance.

Both publications are available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 22269.

ANSI Standard Z88. 5, Practices for Respiratory Protection for the Fire Service; and, ANSI Standard Z88. 2, Practices for Respiratory Protection.

Both publications are available from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

OSHA Safety and Health Standards (29 CFR 1910) (see specifically Part 1910. 134), available from the Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

DESCRIPTION

The Ultralite II and Custom 4500 II Air Masks and their Dual-Purpose models are pressure-demand, self-contained breathing apparatus (SCBA) certified by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA) for use in atmospheres immediately dangerous to life or health (IDLH):

> "Immediately dangerous to life or health" means conditions that pose an immediate threat to life or health or conditions that pose an immediate threat of serious exposure to contaminants, such as radioactive materials, which are likely to have adverse cumulative or delayed effects on health.

These SCBA are designed to comply with the NFPA-1981 Standard (1992 edition).

NIOSH/MSHA certifications allow the wearer to:

- enter or exit a dangerous area using only the cylinder in applications such as emergency rescue;
- work within the area for a limited time using the cylinder air;
- work within the area for an extended time using air from the air-supply hose.

A self-contained breathing apparatus consists of the following sub-assemblies:

- air cylinder and valve
- carrier and harness
- audible alarm
- pressure demand regulator
- facepiece and breathing tube

Air Cylinder

The air cylinder consists of a tank or bottle and a cylinder valve. The cylinder valve includes a valve body, valve inlet tube, safety valve (burst disc), and pressure gauge.

Ultralite II cylinders are classified as low-pressure vessels, color-coded yellow (2216 psig) or gray (3000 psig), and rated at 30-minute service.

Custom 4500 II cylinders are classified as high pressure vessels, and are color-coded green. High pressure cylinders are designed to hold air at 4500 psig when full.

They are rated at 30-minute or 60-minute service, depending on the cylinder capacity: 45 or 88 cubic feet, respectively.

Ultralite II cylinder valves are black anodized aluminum. Custom 4500 II cylinder valves are gray anodized aluminum.

The pressure gauge continuously shows the air pressure in the cylinder. The gauge is calibrated in 100 psig increments. For example, a gauge reading of 20 is read as 20 x 100 or 2,000 psig. A handwheel is used to open or close the cylinder valve.

Type	Capacity Cubic Ft.	Pressure psig	Rated Svc. Life (Min.)
Composite	45	4500	30
Composite	88	4500	60
Composite II	45	2216	30
Steel	45	2216	30
Composite III	60	3000	30

Carrier and Harness Assembly

The carrier consists of a backplate, a cylinder band and latch assembly to hold the cylinder, and a harness assembly, consisting of shoulder pads, chest strap, adjustable pull-straps, backpad, and a waist-strap.

Audi-Larm Audible Alarm

The audible alarm rings when 80 percent of the air in the cylinder has been used. This gives users approximately 20 percent of the cylinder capacity to return to fresh air. The alarm also rings briefly when the cylinder valve is opened to pressurize the system.

Cylinder	Rings At	Approx. Remaining Svc.Time
30 min 2216 psig	540 psig	7 min.
30 min. 3000 psig	540 psig	7 min
30 min 4500 psig	1000 psig	7 min
60 min. 4500 psig	1000 psig	14 min.

A high-pressure hose delivers air at cylinder pressure from the alarm to the regulator. A replaceable nylon spiral cover protects the hose from abrasion. Hose end-fittings are compression-to-hex threads.

Pressure Demand Regulator

The regulator is a two-stage device A balanced first stage provides a uniform pressure to the second stage admission valve. The second stage provides air at a breathable flow rate to the user.

The regulator has two distinctly-shaped, hand-operated valves. The gold, knurled knob operates the main-line valve. This valve lets air flow from the regulator to the facepiece. The valve is quick-acting, requiring only 1/4 turn to obtain full air flow.

Once opened, the valve remains open until the release button is pressed and the knob is turned clockwise.

The red, hex-head knob operates the by-pass valve. The valve knob's distinctive red color and hex shape permit quick identification. The by-pass valve is used only if the main-line valve fails or the regulator fails while the apparatus is in use.

The regulator body and components are color-coded: Black for low pressure (Ultralite II models) and gray for high-pressure (Custom 4500 II models).

Donning the Air Mask

- **Over the Head Method**
- **Vest Method**

The Dual-Purpose Air Mask regulator (supplied with a Foster or Hansen connector) allows the user to receive air from either the cylinder or a secondary air source. With no air-supply hose connected to the regulator, the user receives air from the Air Mask cylinder. When an external air-supply hose is connected to the regulator, the user receives air from the air source. **If the air supply from this line is interrupted, the user must disconnect the air-supply hose to receive air from the Air Mask cylinder.**

Facepiece and Breathing Tube
The Ultralite II and Custom 4500 II Air Masks and their Dual-Purpose counterparts use the Ultravue facepiece, which is available in rubber or silicone. The Ultravue facepiece is available in three sizes; the lens ring is color-coded: Small (gray), medium (black), or large (gold).

The breathing tube carries air from the regulator to the facepiece. The regulator end of the tube has a metal coupling nut and a black anodized insert to guide the coupling nut into the regulator outlet. The facepiece end of the breathing tube has a plastic threaded insert to match the facepiece coupling nut.

Neckstrap
Your facepiece is equipped with a PBI Neckstrap (P/N 801156), and Ring (P/N 473288). The neckstrap holds the facepiece in a "ready" position where there is little possibility that water or debris can collect in the facepiece. Installation instructions are located on page 33.

FACEPIECE ACCESSORIES
The following accessories are available for use with the Ultravue facepiece.

Nosecup Kit is required if the Air Mask is used in temperatures below 32 degrees to reduce lens fogging. The Nosecup Kit is available in three sizes. Small, P/N 471710. Medium, P/N 471711; and Large, P/N 471712. See installation instructions on page 34.

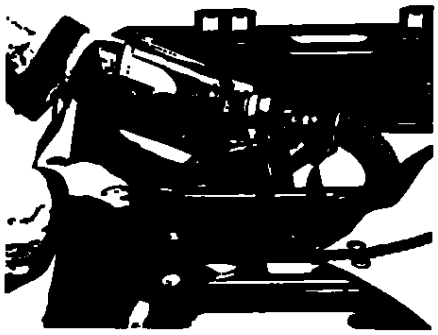
Spectacle Kit (P/N 454819) includes the support assembly, frame guide, and the spectacle frame. Prescription lenses can be obtained locally or through MSA. See installation instructions on page 34.

EZ-Don™ Facepiece Harness Kit (P/N 486939) may be used in place of the standard rubber headstrap harness on the Ultravue facepiece. The harness is made of flame and heat resistant (FHR) Nomex* III fabric.

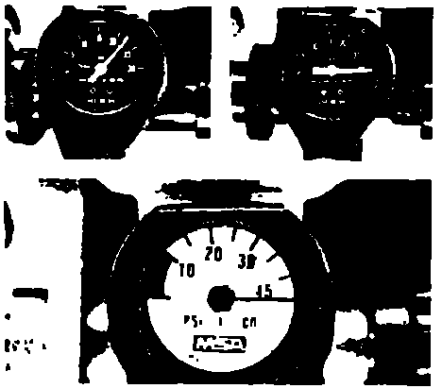
The VARI-Clear™ Personal Communication System is a battery-powered communication system designed for use with SCBA. The VARI-Clear system combines voice amplification (VA) for local, short-range communication and radio interface (RI) for two-way radio communication in one unit. VARI-Clear is compatible with most two-way radios, including Motorola, General Electric, Maxon, Kenwood, Uniden, Midland, Icom, Tad, and King brands.

DONNING THE AIR MASK (SCBA)

1. Remove the facepiece and breathing tube assembly and place it out of the way so that no dirt or water get inside.



2. Check the pressure reading on the cylinder gauge. The needle should be on the color band mark (2216 psig or 3000 psig) for Ultralite II; 4500 psig for the Custom 4500 II). If it isn't, install a fully-charged cylinder before you use the SCBA. Remember, a pressure reading lower than the color band pressure (2216, 3000 or 4500 psig) will result in a reduced service time.



3. To don using the **over-the-head** method:
   a. Reach inside the shoulder pads and grasp the middle of the cylinder with both hands.

   b. Bend forward slightly at the hips. Lift the apparatus straight up and over your head and rest it on your back.

   c. Attach the chest strap to the latch-holder. **Note:** The use of the chest strap is optional.

4. To don using the **vest method**
   a. Put your arms through the shoulder pads.
   b. Bend forward slightly at the hips so the cylinder rests on your back.
   c. Attach the chest strap to the latch-holder. **Note:** The use of the chest strap is optional.

*Nomex is a trademark of the duPont Co.

5 Grasp the adjustable pull-straps. Pull them out while moving to an upright position. Do a slight body twist to hike the harness up onto your shoulders, like a knapsack.

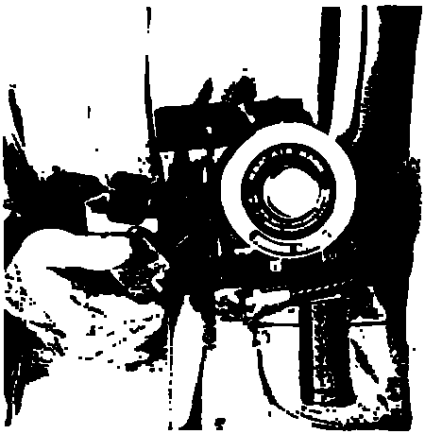
6. Fasten the seat-belt type buckle on the waist-strap over the adjustable pull-straps and pull the waist-strap tight for a snug fit. The shoulder straps and waist strap ends must be tucked in and lay flat across the body.

7. Position the belt-mounted regulator so you can easily reach the main-line valve and by-pass valve and read the regulator pressure gauge.

Regulator and Audi-Larm Checks

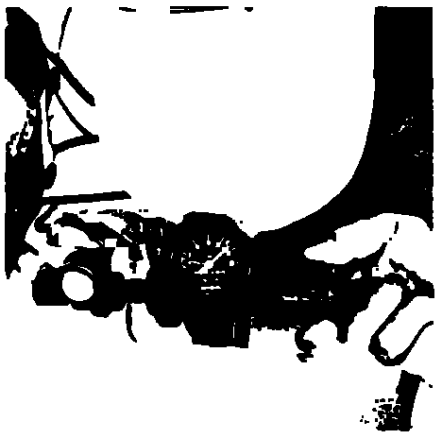
Once the harness is properly adjusted you must check to make sure the assembly is leak tight and that the Audi-Larm assembly works properly. To do this:

1 Make sure both the main-line valve and by-pass valve are closed. Just turn them clockwise (away from your body).



2. Place the rubber outlet cover over the regulator opening. Use your left hand to hold the cover in place to be sure that the outlet cover is not leaking.

3 Reach behind with your right hand and open the cylinder valve fully. The Audi-Larm must ring briefly to indicate that it is cocked.



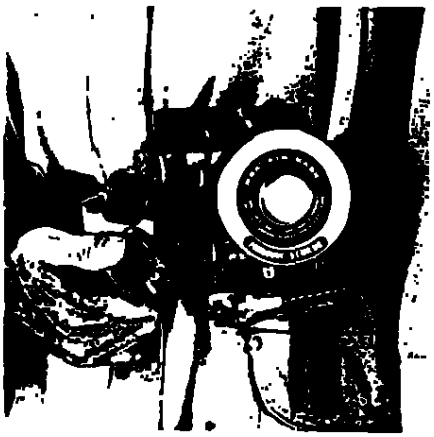
4 Turn the main-line valve 1/4 turn counter-clockwise. The quick-acting valve requires only a 1/4 turn for full air flow. Check the pressure gauge on the regulator. It should be within 220 psig for 2216 psig cylinders, 300 psig for 3000 psig cylinders; or 450 psig for 4500 psig cylinders.

5 Then, with your right hand and the rubber outlet cover still in place, close the cylinder valve.

6. Watch the regulator gauge. If the regulator assembly is leak-tight, the gauge needle will not move. **If the needle drops more than 100 psig in 10 seconds, do not use the SCBA until it has been checked out by a person certified to repair MSA apparatus.**

7. Very slowly uncover the regulator outlet and watch the needle drop. When the pressure reaches approximately 540 psig for 2216 psig or 3000 psig cylinders; or approximately 1000 psig for Custom 4500 II cylinders, the Audi-Larm should start to ring.

The alarm should continue to ring until the air in the high-pressure hose is at least 200 psig. Close the main-line valve by pressing in the release button and turning the valve clockwise.



Donning the Air Mask

- Donning the Ultravue Facepiece
- Using EZ-Don Harness
- Air-Tightness Test

Donning the Ultravue Facepiece

⚠ WARNING

Do not wear eyeglasses under the facepiece. The temples or sidebars on eye glasses will prevent an air-tight seal. If you must wear glasses, install the spectacle kit. Failure to follow this precaution may cause inhalation of contaminated air, resulting in serious respiratory injury or death.

1. Loosen the harness head straps on the facepiece so the end-tabs are at the buckles.
2. Place the neckstrap around your neck.
3. Hold the facepiece by the straps and put your chin in first

4. Then, pull the harness back over your head.

5. Tighten the lower (neck) harness straps first, by pulling them straight back, **not out**. Tighten the temple straps the same way. Tuck in the ends of the straps so that they lay flat across the head.

6. Push headband pad towards neck and repeat step 5. If necessary, tighten the front strap for best visibility and fit. Tuck in the ends of the straps so they lay flat across the head

To Use the EZ-Don Harness

1. Loosen the neck straps so the end-tabs are at the buckles
2. Insert your chin into the facepiece.
3. Pull the harness "net" over the crown of your head
4. Tighten the neck straps. There are no temple or front strap adjustments. Tuck in the straps so that they lay flat across the head

Air-Tightness Test

The Air-Tightness Test must be performed each time the facepiece is donned. You must know the face-to-facepiece seal is good before you enter any hazardous area. To do this:

1. Block off the breathing tube with either the palm of your hand, or by placing your thumb over the opening inside the breathing tube coupling nut.

2. Breathe in and hold your breath for 10 seconds. If the seal is good, the facepiece will collapse and remain collapsed against your face.

3. If the facepiece does not remain collapsed, or you notice any leakage, readjust the straps and test again. **If this does not correct the leak, do not use the facepiece.**
4. Test the exhalation valve by exhaling. If the valve is stuck, you will feel a heavy rush of air around the facepiece.

You may need a sharp exhalation at first to "crack" the valve. If this does not release the valve **do not use the facepiece.**

⚠ WARNING

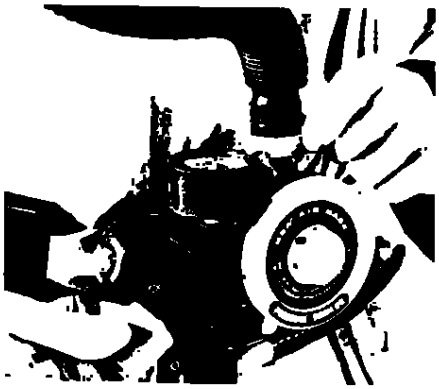
This device may not seal properly with your face if you have a beard, gross sideburns or similar physical characteristics (see NFPA-1500 (1987 Edition); see also, ANSI Z88.2-1980. An improper facial seal may allow contaminated air to leak into the facepiece, reducing or eliminating respiratory protection. If such conditions exist, You the user, assume all risks of respiratory injury or death which may result. The face-to-facepiece seal must be tested before each use.

Donning a Dual-Purpose Air Mask

• Final Hook-up
• Service Life
• Emergency Operation
• Cold Weather Operation

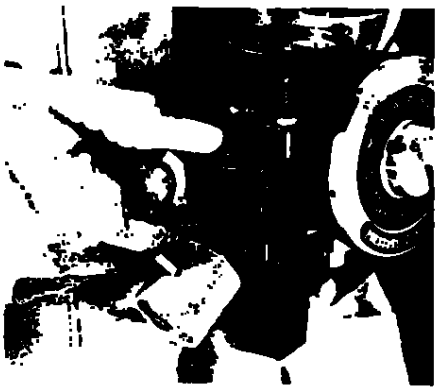
Final Hook-up

1. Open the cylinder valve fully.
2. Connect the breathing tube to the regulator while fully opening the main-line valve. Test the complete system for air flow from the cylinder to the facepiece by breathing normally. Pull firmly on the breathing tube to assure a secure connection to the regulator.



The regulator should follow your breathing pattern and supply air only during inhalation.

3. Slowly "crack" the by-pass valve to make sure it delivers a continuous flow of air.



4. Close the by-pass valve.
5. If the unit checks out, you are ready to enter a hazardous atmosphere. Remember, you must make these tests every time **before** you enter the hazardous atmosphere. **If the unit fails to meet any of the tests, the condition(s) must be corrected before using the apparatus.**

Service Life

Check the regulator pressure gauge from time to time to see how much air is left in the cylinder. An SCBA with a fully-charged 2216 psig cylinder has a 30-minute rated service life, based on government tests. A fully charged 4500 psig cylinder has a 30-60 minute rated service life, based on government tests, depending on the cylinder in use. However, if your work is more strenuous, or your breathing rate is greater than the tests used for approval, the service life may be shorter (up to one-half of the rated service life). Factors which may affect how long the air supply lasts include:

- how hard you're working
- your physical condition
- your training and experience with the air mask
- excitement
- the condition of your SCBA

The audible alarm sounds a continuous, loud warning for about four to six minutes when the cylinder pressure reaches about 540 psig (Ultralite II models) or about 1000 psig (Custom 4500 II models).

Cylinder	Rings At	Approx. Remaining Svc.Time
30 min. 2216 psig	540 psig	7 min.
30 min 3000 psig	540 psig	7 min.
30 min 4500 psig	1000 psig	7 min.
60 min 4500 psig	1000 psig	14 min

Emergency Operation (Standard SCBA)

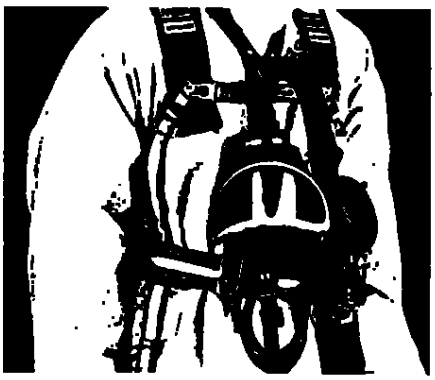
You must know what to do automatically if the regulator fails to function, or if the pressure gauge is damaged! To receive air from the cylinder to the facepiece under Emergency conditions:

1. Open the by-pass valve slowly. This will give you a constant flow of air directly from the cylinder through a separate by-pass port in the outlet of the regulator.
2. Push in the release and close the Quick-Acting main-line valve (clockwise) to prevent air leakage through damaged parts.
3. Adjust the by-pass valve for a controlled air flow from the cylinder to the facepiece.
4. Return to fresh air immediately! Your air supply is greatly reduced in such an emergency.

Suggested Procedures for Cold Weather Operation

Water can cause problems in Air Masks if it freezes. Although most likely to occur in cold weather, moisture can freeze even if the surrounding air is above freezing. Air pressure drops rapidly from cylinder pressure to nearly atmospheric as it flows from the cylinder through the regulator. As its pressure drops, the air expands and gets colder. The surrounding air may be above freezing, but the temperature inside the regulator may be lower. Moisture inside may freeze and reduce air flow.

1. To prevent moisture from entering the regulator, keep the breathing tube connected. If it is disconnected, cover the regulator immediately with the rubber outlet cover supplied with each new Air Mask.
2. Use the ring and neckstrap supplied with each new Air Mask. They keep the facepiece upside down around the user's neck so water does not collect in the facepiece. If not used correctly, the facepiece can act as a funnel, catching and directing water into the regulator.



3. When the Air Mask is away from heat, water spray can freeze on the regulator surface. Ice can build up and cover the cap vent holes. If they are completely blocked, the regulator will not operate. Ice also can freeze the main-line and by-pass valves. Before entering or re-entering a hazardous atmosphere, make sure the vent holes are open and that both the main-line and by-pass valves are ice-free and operating properly. During use, periodically check the by-pass valve to ensure that it is operating properly.
4. Water can collect on the cylinder valve and coupling nut when cylinders are changed. The Quick-Fill System from MSA can reduce this problem. (Keep the dust cover in place on the Quick-Fill coupling). Water can contaminate the system or freeze the coupling nut to the cylinder valve. Remove ice on these fittings. Dry the coupling nut and cylinder valve before unthreading them.
5. ANSI/NFPA-1500 requires cylinder air to be a minimum of Grade D (CGA G7.1) with a water vapor concentration of less than 25 ppm. Tests show that if air with a low moisture content (less than 25 ppm) is used, the SCBA performs well at

the NIOSH-approved - 25 degree F surrounding temperature. Low dew point air also prevents cylinder corrosion.

6. NIOSH certification requires a nosecup at temperatures below 32 degrees F. The nosecup reduces lens fogging and must be used whenever freezing conditions are encountered.
7. Thoroughly dry the facepiece **and** regulator after cleaning and sanitizing. The facepiece can trap water, which could enter the regulator.
8. During clean-up at the station, disconnect the regulator from the facepiece before cleaning and sanitizing.
9. Be careful to keep water from entering the Air Mask facepiece or regulator when washing fire trucks.

Emergency Operation (Dual-Purpose Apparatus with Foster Connection)

1. Slide your left hand along the air-supply hose to the regulator and remove the quick-disconnect socket from the regulator. Air will begin to flow from the cylinder. Attach the dust cap
2. If the air still does not flow, open the regulator by-pass valve
3. Adjust the valve for a comfortable flow of air.
4. Close the main-line valve
5. Leave the contaminated area immediately

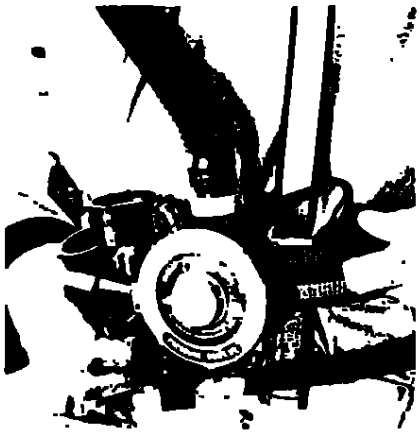
Emergency Operation (Dual-Purpose Apparatus with Hansen Connection)

The main-line valve is always closed when using the air-line (you must open the lmain-line valve to receive air from the cylinder).

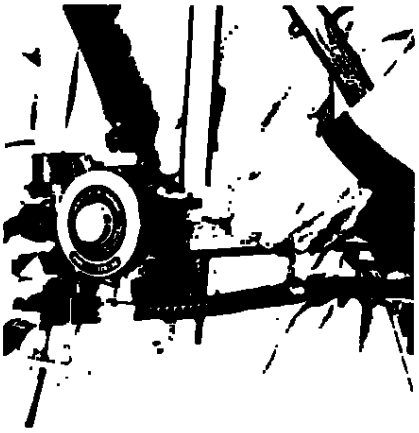
DONNING A DUAL-PURPOSE AIR MASK

Dual-Purpose Air Masks combine a self-contained breathing apparatus with the capabilities of an air-line respirator in one unit.

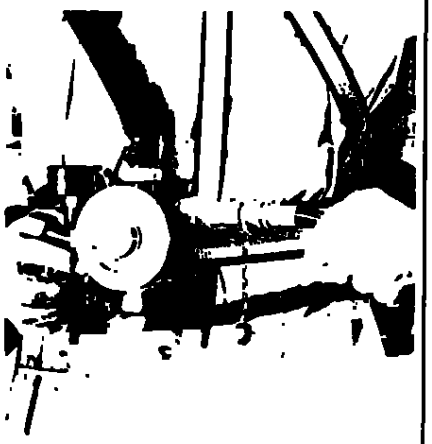
1. Follow all of the Donning steps as described so far in this manual.
2. Make sure the air-line source is Grade D breathable air, with an inlet pressure between 85-90 psig. Air-supply hose must be between 8-300 ft. in length and must be from MSA. A maximum of twelve sections of air-supply hose may be used.
3. Turn on the primary air source for use with the air-line.
4. Remove the attached dust cap



Connect the air-line adapter socket to the male quick-disconnect plug on the Dual-Purpose regulator



Pull on the adapter to be sure that the socket has snapped into place



NOTE

If a Foster quick-disconnect is used the air-line will supply the regulator with air. The regulator will no longer demand air from the cylinder when the air-line adapter is connected to the regulator. If a Hansen quick-disconnect is used, the main-line valve also must be closed

⚠ CAUTION

NIOSH/MSHA limitations for this device require that not more than 20 percent of cylinder air be used during entry before connecting to the air-line.

USING THE AIR MASK

⚠ WARNING

If the apparatus does not perform as specified, it must not be used until it has been checked by authorized personnel.

Wear impermeable protective clothing for exposure to gases and vapors which can poison by skin absorption.

Have standby personnel present with rescue equipment if the device is used in an atmosphere immediately dangerous to life and health (IDLH).

Return to fresh air immediately if you experience unusual sensations (nausea, dizziness, eye irritation, unusual odor or taste, excessive fatigue, or difficulty breathing).

Failure to follow the above warnings may result in serious personal injury or death.

Quick-Fill System Operation

The Quick-Fill System should be used only by qualified, trained personnel who have carefully read and understood these instructions, cautions, and warnings

NIOSH/MSHA approvals of Air Masks from MSA are maintained while transfilling air ONLY if appropriate Quick-Fill hose assemblies from MSA are used

Do not use any transfilling hose assembly or fittings other than those supplied by MSA specifically for the Quick-Fill System Use of any other transfilling hose assembly and/or fit-

ting may result in serious personal injury or death, and will void NIOSH/MSHA approval. Quick-Fill hose assemblies and fittings are rated for a maximum working pressure of 4500 psig.

Do not use the Quick-Fill System for applications other than transfilling fully-wound composite or steel SCBA air cylinders from MSA.

Do not lubricate the Quick-Fill fittings. Do not permit oil, grease, or other contaminants to come in contact with the Quick-Fill fittings. The Quick-Fill hose assemblies and fittings are designed to be used with Quality Verification Level (Grade D) or better air as defined by ANSI/CGA G-7.1.-1989.

Transfilling Air From A Secondary Air Source

NOTE

A secondary air source stores compressed breathing air until needed to refill SCBA air cylinders. Secondary air source pressure must be greater than air mask cylinder pressure.

Examples of air sources include: Cascade air cylinder refilling systems; high pressure compressor systems with a fixed reservoir, and an SCBA air cylinder which is not installed on an Air Mask.

⚠ WARNING

Do not use the Quick-Fill System with 3000 psig cylinders because the pressure relief valve on the Quick-Fill System vents at approximately 2350 psig.

Do not connect a Quick-Fill equipped Ultralite II Air Mask to a secondary air source with a pressure greater than 2216 psig. The Quick-Fill equipped Ultralite II Air Mask is rated for a maximum working pressure of 2216 psig. As an additional safety feature, the black inlet fitting has a relief valve which automatically vents at 2350 psig.

Do not connect a Custom 4500 II Air Mask to a secondary air source with a pressure greater than 4500 psig. The Custom 4500 II is rated for a maximum working pressure of 4500 psig.

⚠ WARNING

Failure to follow the above warnings may result in serious personal injury or death.

The user is responsible for the air source, which must meet the requirements of Compressed Gas Association Specification ANSI/G-7 1, Quality Veri-fication Level (Grade D) Gaseous Air or better, with a moisture dew point of not greater than - 65 degrees F (15 ppm water vapor, nominal) Pressures at the inlet of the Quick-Fill hose must not ex-ceed that of the SCBA (2216 psig or 4500 psig).

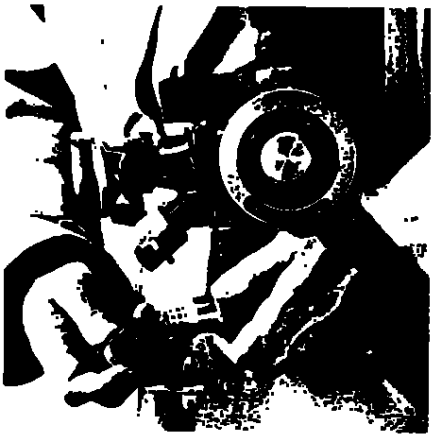
The user also is responsible for connecting the Quick-Fill hose to an appropriate secondary air source.

1. To install the Quick-Fill hose (P/N 485391 Quick-Fill fitting installed on the air source).
   a. Push the female fitting on the male fitting until it snaps in place. Pull on the hose to be sure the fitting snapped into place.
   b. Turn the air source on.

⚠ CAUTION

If there are serious leaks from either female fitting, or along the hose, de-pressurize the hose and correct the problem. Slight leakage from the unconnected female fitting is acceptable.

2. To attach the Quick-Fill hose to the SCBA regulator:
   a. Remove the rubber dust cap from the male inlet fitting on the regulator. Be sure that the cylinder valve is fully opened.



NOTE

The main-line valve may be either open or closed, depending on whether the Air Mask is donned

   b. Remove the rubber dust cap from the female fitting on the Quick-Fill hose

   c. Push the female fitting on the male fitting until it snaps in place. Pull on the hose to be sure the fitting snapped into place.

Transfilling begins when the female fitting is snapped on the regulator's male fitting.

NOTE

If the main-line valve is open don the facepiece with the breathing tube connected to the regulator outlet or place the rubber cover on the regulator outlet to prevent the loss of breathing air

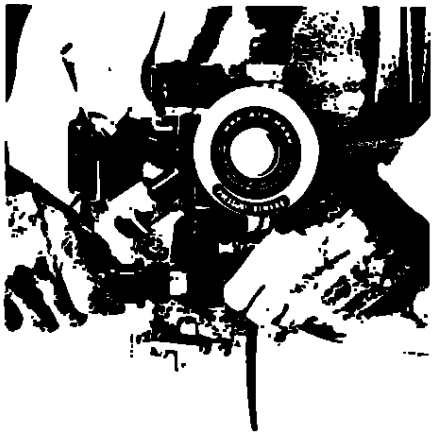
After approximately 45-60 seconds, pressure between the secondary air source and the Air Mask cylinder will be equal.

Quick-Fill Operation

NOTE

If the secondary air source does not have a sufficient volume of air the Air Mask cylinder will not reach full service pressure

3. Compare the Air Mask pressure gauge reading to the secondary air source pressure gauge reading If the readings are the same, pressure is equal.
4. To disconnect the Quick-Fill hose after transfilling, pull the gray sleeve back.



The hose fitting and the regulator will separate A hiss or pop may be heard as the fittings separate and the high pressure air is sealed off

5. Immediately install the dust cover on the male fitting.

If you are transfilling in fresh air and the dust cover will not stay on the regulator male fitting because air is leaking, correct the condition before using the Air-Mask

If you are transfilling in a contaminated atmosphere and the dust cover will not stay on the regulator male fitting because air is leaking

a Immediately reconnect the Quick-Fill hose to seal off the leak and return to fresh air.
b. If you can not reconnect the hose, reach behind and close the cylinder valve Air pressure in the regulator will drop, and the leak will slow down.
c Quickly replace the protective dust cap on the male regulator fitting. This will form a redundant seal.
d Open the cylinder valve and return to fresh air immediately. The dust cover prevents dirt, water, and debris from entering the fitting, and acts as a redundant seal.

6. The Air Mask cylinder is ready for service if the cylinder pressure gauge is on the color band.

⚠ CAUTION

Cylinder temperature will increase by approximately 45 degrees F. The pressure gauge may show FULL immediately after transfilling, but cylinder pressure may decrease by as much as 190 psig after the cylinder cools to room temperature. Actual service time may be reduced accordingly.

Transfilling Between SCBA From MSA (Emergency Escape Breathing Support System)

NOTE

The SCBA with the higher pressure reading is the **donor**. The SCBA with the lower pressure is the **receiver**.

Transfilling between users of SCBA should be performed only during life-threatening emergencies, or simulated training exercises. Both **donor** and **receiver** must return to fresh air immediately following the procedure

Do not perform a transfill procedure using breathing apparatus from MSA if the donor's audible alarm is ringing.

⚠ WARNING

Do not transfill if the donor's audible alarm is ringing. Failure to follow this warning may result in shorter escape time to return to fresh air, causing serious personal injury or death.

The audible alarm begins ringing to indicate that the pressure in the cylinder has been reduced to 20-25% of its rated working pressure. Remaining service time must be used for escape to fresh air. If the **donor's** audible alarm begins ringing during transfilling, the **donor** should disconnect and preserve his escape time.

1. If the **donor's** alarm is not ringing and you have sufficient air to transfill air to a **receiver**. (greater than 1000 psig for Ultralite II Air Masks and greater than 2000 psig for Custom 4500 II Air Masks), follow the steps below:
   a Remove the 3 foot emergency transfill hose from its protective pouch.
   b. Remove the rubber dust cover from both female fittings on the Quick-Fill hose assembly.
   c. Remove the rubber dust cover from the male fitting on each pressure demand regulator.
   d. Push the female fittings on to the male fittings until they click in place. Pull on the hose to be sure it snapped in place.

⚠ WARNING

If serious leakage is noticed from either of the two female fittings, or anywhere along the hose, disconnect the female fittings and return to fresh air immediately. Failure to follow this warning may result in serious personal injury or death.

   e. After approximately 30-60 seconds, pressure between the SCBA cylinders will be equal. Actual time is dependent on the pressure in the cylinders. However, pressures should be equal within 60 seconds, even with the widest pressure difference.
   f. Disconnect the Quick-Fill hose from both regulators by pulling the gray sleeve back on both ends. A hiss or pop may be heard as the fittings separate and the high pressure air is sealed off.
   g. Immediately install the dust cover on the regulator male fitting. The dust cover prevents dirt, water, and debris from entering the fitting, and acts as a redundant seal. If the dust cover will not stay on the regulator male fitting because air is leaking:
      - Immediately reconnect the Quick-Fill hose to seal off the leak and return to fresh air.
      - If you can not reconnect the hose, reach behind and close the cylinder valve. Air pres-

sure in the regulator will drop, and the leak will slow down.
- Quickly replace the protective dust cap on the male regulator fitting. This will form a redundant seal.
- Open the cylinder valve and return to fresh air immediately.

2 Preparing the Quick-Fill System for Storage.
   a. Press in on the center of the quick-disconnect dust cap to release any pressure in the Quick-Fill hose.
   b. Roll up the hose and place it in its protective pouch.

NOTE

Only persons trained in MSA Level II or Level III Maintenance are authorized to repair or disassemble the Quick-Fill System. If repairs are required, contact your nearest MSA office. Call 1-800-MSA-2222.

REMOVING THE AIR MASK

1. Close the cylinder valve and disconnect the breathing tube.

The remaining air in the system is released automatically if the main-line valve is left open.

2. When the Audi-Larm assembly stops ringing, press in the release button and close the main-line valve
3. To loosen the facepiece, insert your thumbs under each of the head-band buckles and fully extend the headbands.

NOTE

If using the EZ-Don head harness, only the lower straps are adjustable. The lower straps must be fully loosened before removing the facepiece.

4 Grasp the speaking diaphragm assembly, and pull the facepiece up and away from your face.

Place the facepiece in a clean area.

5 Unbuckle the chest strap and waist-strap. Slow the chest strap on the shoulder pad

6 To loosen the adjustable pull-straps, place your thumbs under the lower friction buckle assembly and push up and out at the same time

7. Then remove the apparatus.
8. Do not store the apparatus with an empty or partly-filled cylinder. Always install a fully-charged cylinder so that the apparatus is ready for use.

Complete Inspection and Cleaning and Sanitizing procedures outlined in this manual. Ensure complete apparatus is clean and dry. Ensure facepiece head harness straps and harness adjustment straps are fully extended. Place the complete apparatus in the storage case or suitable storage location so it can be easily reached for emergency use

CHANGING CYLINDERS

The cylinder should be changed when the pressure gauge needle on the regulator is in the **red** region or when the Audi-Larm has sounded. The cylinder may be changed while the Air Mask is being worn.

⚠ WARNING

Ultralite II Air Mask cylinders are color-coded yellow or gray. These colors mean "low" pressure. The maximum (FULL) pressure is 2216 psig for yellow cylinders or 3000 psig for gray cylinders. Do not charge the cylinder to a higher pressure.

Custom 4500 II Air Mask cylinders are color-coded green. This color means "high" pressure. Both the 88- and 45-cubic foot cylinders have a maximum (FULL) pressure of 4500 psig. Do not charge the cylinder to a higher pressure. Do not try to connect a low pressure (2216 psig or 3000 psig) Air Mask to a high pressure cylinder. Higher pressures may damage or destroy components. Failure to follow this precaution may result in serious personal injury or death.

Do not try to connect a high-pressure (4500 psig) cylinder to a low-pressure apparatus. Even though the coupling nut will not thread all the way on the cylinder valve, and bleed holes in the cylinder valve will

Cleaning and Sanitizing

⚠ WARNING

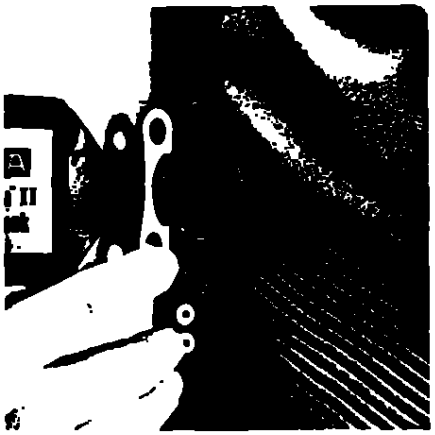
let the air escape and not enter the system, this is a dangerous condition.

Do not remove the apparatus facepiece or disconnect the breathing tube in a contaminated atmosphere. Always return to fresh air.

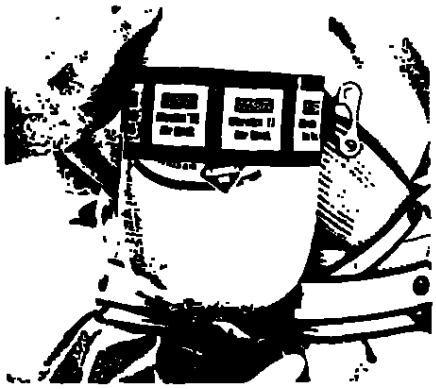
Failure to follow the above warnings may cause inhalation of the contaminant and result in serious respiratory injury or death.

1 To change a cylinder, follow steps 1 and 2 under "Removing the Air Mask."
2. Check that the regulator pressure gauge indicates zero
3 Unthread the Audi-Larm coupling nut

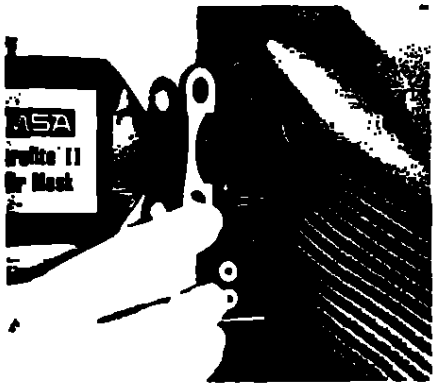
4. Lift and turn the latch wing to loosen the cylinder band.



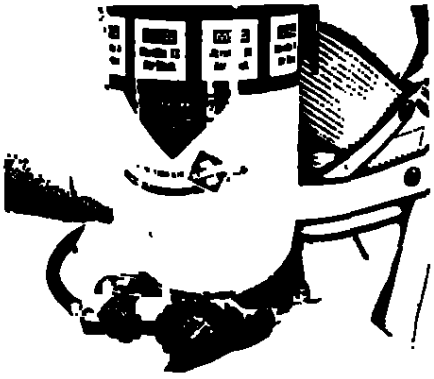
5. Slide the cylinder up and out.



6. It is important that the stainless steel lock tab on the carrier be fully engaged in the appropriate cylinder band slot position.
7. Slide a fully-charged cylinder into the band. The pressure gauge should face out.
8. Turn the latch wing clockwise to lock the cylinder in place. If the latch is operating properly, the ratchet mechanism will "click" as you turn the wing. Flip the latch wing over so that the side with the retro-reflective label marked "THIS SIDE OUT" faces out



9. Place one hand on the triangular backpad. Grasp the cylinder valve with the other hand. Try to pull the cylinder and valve assembly away from the carrier to make sure the cylinder is secure in the carrier



10 Check that the o-ring is inside the Audi-Larm coupling nut. If the o-ring is damaged it must be replaced before the alarm is used
11 Thread the Audi-Larm coupling nut on the cylinder valve. The nut has a fine thread. Handtighten the nut.

⚠ CAUTION

Do not use tools to tighten the coupling nut. It has been designed to be hand-tightened. Failure to follow this caution may result in damage to the coupling nut or the cylinder valve.

12 Open the cylinder valve fully. Listen for the Audi-Larm alarm. It must ring to indicate that it is operating
13 If the cylinder is being worn, perform the Regulator and Audi-Larm Checks (page 6). If the facepiece has been removed, perform the Air-Tightness Test (page 7). Perform the appropriate Emergency Operation tests (page 9)

CLEANING AND SANITIZING

Depending on the cleaning policy adopted, either a designated person or the user should clean the Air Mask after each use. ANSI standards suggest that users should be trained in the cleaning procedure. Non-sudsing Cleaner-Sanitizer™ II Powder from MSA (P/N 34337) is recommended. It cleans and sanitizes in one operation.

NOTE

If Cleaner-Sanitizer II Powder is not used, the parts should be washed in a mild cleaning solution and rinsed thoroughly. The facepiece is then submerged in a germicide solution for the time recommended by the manufacturer (usually about two minutes), and then thoroughly rinsed in clean water. Dry thoroughly

1. Add a package of Cleaner-Sanitizer II Powder to one gallon of warm water, at a temperature of not more than 120 degrees F to avoid overheating and/or distorting of parts. Cleaner-Sanitizer II Powder retains its germicidal efficiency in hard water to inhibit the growth of bacteria. It will not deteriorate rubber, plastic, glass, or metal parts.

⚠ CAUTION

Alcohol should not be used as a germicide because it may deteriorate rubber parts.

2. Remove the breathing tube from the facepiece. DO NOT lose the gasket inside the breathing tube coupling nut.
3. Thoroughly wash the facepiece in the Cleaner-Sanitizer II solution. A soft brush or sponge can be used to scrub the soiled facepiece.
4. Rinse the facepiece thoroughly inside and out in plain warm water (Maximum 120° F). Thoroughly dry the facepiece

NOTE

Do not force-dry the parts by placing them in a heater or in direct sunlight The rubber will deteriorate. When the facepiece is thoroughly dry, store the facepiece in the plastic bag that it was shipped in

5. Use rubber stopper (P/N 50998) to close both ends of the breathing tube. Thoroughly wash the outside of the breathing tube in Cleaner-Sanitizer II Solution, thoroughly rinse the outside of the breathing tube with plain warm water (Maximum 120°F).

NOTE

The inside of the breathing tube should be cleaned and sanitized annually or as needed, to remove any contaminant from inside it. If washing the inside of breathing tube, use Cleaner-Sanitizer II Solution. Thoroughly rinse inside of breathing tube in plain warm water (Maximum 120°F).

⚠ CAUTION

If not rinsed thoroughly, the residue of cleaning agents may irritate the wearer's skin.

6. Stretch the breathing tube slightly to remove water from the corrugations (inside or outside) Hang it up to dry **thoroughly** inside and outside.

NOTE

Do not force-dry the parts by placing them near a heater or in direct sunlight. the rubber will deteriorate.

7. To clean the pressure demand exhalation valve (long disc stem), open the valve by pressing in on the stem, and flush the valve with clean water. Air-dry the exhalation valve thoroughly. Do not exceed 120 degrees F.
8. Clean the harness assembly. A soiled harness is an open invitation for eventual deterioration and may reduce the life of the SCBA A mild soap or commercial cleaning detergent should be used on the harness.
   a. Wipe off all surface dirt with a sponge dampened (not soaking) with water. Rinse the sponge and squeeze it dry
   b. Work up a thick lather on the sponge with mild soap or commercial detergent. Thoroughly wash the harness with the lathered sponge, being careful to use the lather only
   c. Wipe dry with a clean cloth.
   d. Let the harness air-dry.
9. The carrying case should be cleaned, also. Turn it upside-down and tap both the back and lid to loosen debris Wipe the inside of the case with Cleaner-Sanitizer II.
10. Inspect the entire apparatus as you reassemble it. Follow the instructions given below.
11. Thoroughly dry the facepiece and regulator after cleaning and sanitizing. The facepiece can trap water, which could enter the regulator.

INSPECTION

Inspect the entire SCBA by sight and sound for normal operation after it has been cleaned and sanitized. Check all connections to be sure they are tight.

Recordkeeping

Following the inspection, the date and initials of the designated person should be recorded on an inspection tag. A more detailed record of the operations performed can be noted in an inspection and maintenance log. Inspection tags and inspection and maintenance logs are available from MSA. When the inspection data has been recorded, the breathing apparatus is stored in a ready position

The inspection tag from MSA contains a checklist which outlines the procedures for conducting the inspections that must be made on breathing apparatus After Each Use and Monthly, as prescribed by NFPA-1500 (1987 Edition).

The tag may be attached to the backplate of the breathing apparatus for easy reference. The back of the tag may be used to record both Monthly inspections and individual use of the apparatus. In addition, permanent logs are available from MSA for use in recording the Weekly, After Each Use, and Monthly inspections The log can be kept in the files, separate from the apparatus. This letter-size log is a handy check-off list to use when making inspections of breathing apparatus. A serial number on the regulator can be used to identify each unit.

NFPA-1500 (1987 Edition), as well as ANSI Standards Z88.2 and Z88.5, describe three levels of inspection procedures which are to be performed.

⚠ WARNING

Do not inspect the apparatus before cleaning if there is a danger of contacting hazardous contaminants. Clean and sanitize first, then inspect. Failure to follow this precaution may cause inhalation or skin absorption of the contaminant and result in serious personal injury or death.

After Each Use

1. Cylinder
   a. Be sure that the gauge needle and the gauge face are visible and not bent.
   b. Inspect the cylinder body for cracks, dents, weakened areas, or signs of heat-related damage.
   c. Inspect the cylinder valve for signs of damage. If it is less than FULL: 2216 psig for steel, or Composite I or Composite II cylinders; 2216-3000 psig for Composite III cylinders; 4500 psig for 4500 psig cylinders, charge the cylinder before storage. Cylinder air must be Grade D (or better) respirable air.

d. Breathing apparatus cylinders should be recharged as soon as possible after use. Cylinders should not be stored partially charged for two reasons.
   - If used without recharge, the service life of the apparatus is reduced.
   - The cylinder burst disc vents excess pressure if a full cylinder is over-exposed to fire or heat. If the cylinder is not full, it may be damaged before the burst disc vents.

NOTE

ANSI Z88.5 recommends checking cylinder pressure weekly.

e. Inspect the cylinder valve for signs of damage. The valve may be opened slightly to be sure it operates properly. Be sure to fully close the valve.

f. Inspect the cylinder body for cracks, dents, weakened areas, or signs of heat-related damage. If the cylinder is damaged return it to an MSA Service Center. Call 1-800-MSA-2222 for instructions on return procedures.

NOTE

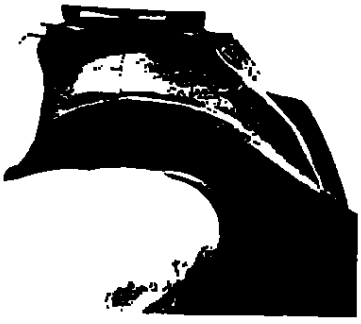
Check the hydrostatic test date on the cylinder approval sticker located on the cylinder neck. Composite cylinders must be tested every three years. Steel cylinders must be tested every five years.

2. Facepiece
   a. Inspect the facepiece for rubber distortion, dirt, cracks, tears, holes, or tackiness.
   b. Check the harness headstraps for breaks, loss of elasticity, missing buckles or straps.

c. Check the strap serrations for signs of wear.

d. Inspect the lens for cracks, scratches and a tight seal with the facepiece rubber.

e. The exhalation valve must be clean and operate easily. To check operation, reach into the facepiece and press in on the valve stem. The valve must move off the seat and return to its original size and location (in the center of the cover and valve body) when released. If the valve and spring do not perform in this way, the entire exhalation valve must be replaced.



f. Inspect the exhalation valve spring, to make sure it is seated and centered in the exhalation valve.

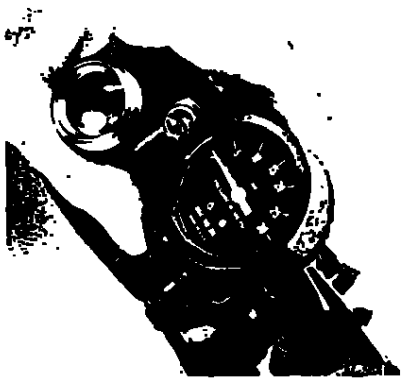
g. Inspect the [illegible] coupling nut for damaged threads. Also check to be sure the gasket is present.

3. Breathing Tube
   a. Inspect the breathing tube closely for perforations, small cracks, or signs of wear, especially along the corrugations.

Breathing tubes may have marks at the base of each corrugation which appear to be cracks. These marks were created during the molding of the tube. If there are marks in areas other than the base of the corrugations (or perforations, cuts, or other signs of wear), replace the breathing tube.

   b. Check the breathing tube for leaks:
      - Close one end with a solid rubber stopper (P/N 50998).
      - Close the other end with a rubber stopper which has an 1/8 inch hole in it (P/N 630386).
      - Stretch the breathing tube 10-12 inches beyond its normal length and cover the hole in the stopper with your finger.
      - With the hole still covered, release the tension on the breathing tube. The air inside the tube will compress to about 3 psi.
      - Submerge the breathing tube in water. Bubbles will indicate leaks.

4. Regulator
   a. Be sure the diaphragm cap is hand-tight. Check that the cap is not dented or deformed. Be sure that the small air holes around the outer edge of the cap are not blocked.
   b. Inspect the pressure gauge:
      - Be sure the gauge needle and face are visible through the lens. Also be sure the gauge stem is not bent.



      - Check the gauge with the regulator pressurized to be sure that the needle operates.
      - Compare the gauge reading with the cylinder gauge. It should be within 220 psig for 2216 psig cylinders, 300 psig for 3000 psig cylinders; or 450 psig for 4500 psig cylinders.
   c. Check the regulator outlet. Look for stripped or damaged threads.

5. Audible Alarm
   a. Check that the alarm rings briefly when the cylinder valve is opened. This test assures that the alarm is operating.
   b. Check that the bell is on tightly and properly aligned

   c. If the bell is loose, remove the unit from service. See Replacing the Bell, page 26.
   d. Close the cylinder valve completely. Be sure that nothing blocks the regulator outlet.
   e. Open the main-line valve slowly to release any trapped air.
   f. Close the main-line valve

⚠ WARNING

Do not disconnect the Audi-Larm coupling nut when pressure is shown on the regulator gauge. Release all pressure from the regulator by opening the main-line valve. Removing the coupling nut with the regulator pressurized may result in serious personal injury, death, or damage to equipment.

   g. Unscrew the Audi-Larm coupling nut from the cylinder valve. It is hand-tightened and should not require tools
   h. Inspect the coupling nut for thread damage. Also be sure there is an o-ring and that it is not damaged.

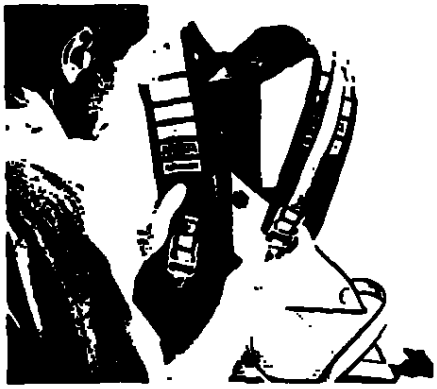
   i. Replace the o-ring if it is damaged
6. High Pressure Hose
   a. Check the outer cover on the high-pressure hose between the alarm and the regulator. Look for cuts or serious abrasions. Peel off several turns of the cover spiral and inspect the hose for damage. Regardless of the condition of the outer cover, the high-pressure hose should be checked monthly.

   b. The hose fittings should be tight and not turn by hand.

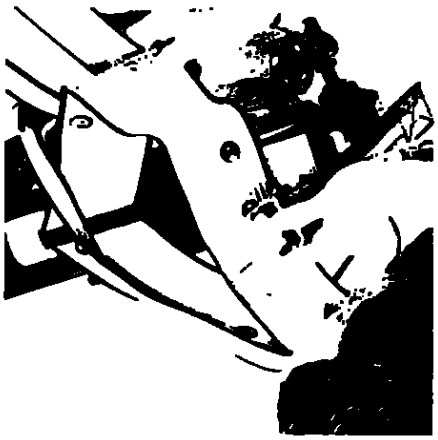
⚠ WARNING

Do not disconnect the Audi-Larm coupling nut when pressure is shown on the regulator gauge. Release all pressure from the regulator by opening the main-line valve. Removing the coupling nut with the regulator pressurized may result in serious personal injury, death, or damage to equipment.

7. Carrier
   a. Inspect the harness shoulder pads, adjustable pull-straps, and chest-strap for cuts, tears, abrasion or signs of heat- or chemically-related damage. Check that tee nuts, washers, and screws are secure.



b. Inspect the waist-strap and back-pad for cuts, tears, abrasion or signs of heat-related damage. Check that tee nuts, washers and screws are secure. Work the waist-strap buckle several times to be sure the parts operate properly. Check both buckle halves for bends or other signs of damage.



c. Check the backplate where the shoulder pads and waist-strap are attached.

Look for cracks or splits which may indicate metal fatigue. Check that tee nuts, washers, and screws are secure. Also look for bends in the length of the backplate which may interfere with the proper fit of the backplate against the user's back.

d. Inspect the cylinder band and latch wing.

Operate the latch wing to be sure that it opens and closes properly and that it holds a cylinder securely. If the cylinder band is locked, the latch wing should not turn.

At Least Monthly

1. **Check that the diaphragm works properly. The regulator outlet should be sanitized before and after testing.**
   a. Check that the cylinder and regulator valves are closed, and that the system is not pressurized.
   b. Gently inhale through the regulator outlet and hold your breath for about 10 seconds. If the negative pressure is maintained, there is no leakage.
   c. Gently exhale through the regulator outlet for about 10 seconds. If the positive pressure is maintained, there is no leakage.
   d. Do not use the apparatus if air flow through the regulator is detected in either test. Return the regulator to a Certified Level II/III repair person.
2. **Inspect the main-line valve, and by-pass valve.**
   a. With the regulator pressurized, open and close each valve to be sure it operates. Venting of pressure relief valves (or a continuing flow of air through the regulator when the user is not inhaling) indicates that the regulator needs to be repaired.
   b. Listen to the regulator. Any unusual sounds, such as whistling, chattering, clicking, or rattling mean that the regulator should be checked further.
   c. If any of these symptoms occur, the apparatus must be removed from service. Return the regulator to a Certified Level II/III repair person.
3. Audi-Larm Audible Alarm Ring
   a. MSA recommends that the function of the Audi-Larm warning device be checked by observing the regulator gauge pressure at which the alarm rings. This test should be performed with a minimum cylinder pressure of 1,200 psig for the Ultralite II Air Mask, and 2,000 psig for the Custom 4500 II Air Mask.
   b. Pressurize the system by opening the cylinder valve for a moment, then close it. The alarm should ring, indicating it has cocked.
   c. Place your hand or the rubber protective cover over the regulator outlet to block it leak-tight.
   d. Open the main-line valve.
   e. Slowly remove your hand or the rubber protective cover from the regulator outlet. Watch the drop in pressure on the regulator gauge and the point at which the Audi-Larm begins to ring.

Cylinder Pressure	Alarm Rings at
2216 psig	540 psig
3000 psig	540 psig
4500 psig	1000 psig

   f. The alarm should continue until the air pressure is approximately 200 psig or less. **If the Audi-Larm does not function properly, the apparatus must be removed from service.**
   g. Close the main-line valve.
4. Audi-Larm Body
   a. Check that the bell is on tightly and is in the proper alignment.
   b. Close the cylinder valve completely. Be sure that nothing blocks the regulator outlet.

⚠ WARNING

Do not disconnect the Audi-Larm coupling nut when pressure is shown on the regulator gauge. Release all pressure from the regulator by opening the main-line valve. Removing the coupling nut with the regulator pressurized may result in serious personal injury, death, or damage to equipment.

   c. Open the main-line valve slowly to release trapped air.
   d. Close the main-line valve.
   e. Unscrew the Audi-Larm coupling nut from the cylinder valve. It is hand-tight and should not require tools.

f. Inspect the coupling nut for threae. Also be sure there is an o-ring and that it is not damaged.
g. Replace the o-ring if it is damaged.

Yearly Inspection
Check the hydrostatic test date on the cylinder approval sticker located on the cylinder neck. The cylinder must be tested every 3 years for Composite cylinders; 5 years for steel cylinders. MSA recommends that the regulator and Audi-Larm alarm be flow tested annually and overhauled every three years at which time all o-rings should be replaced. This must be done by Level III certified repair personnel.

Level I Maintenance
The inspection and maintenance procedures authorized in this manual are classified Level I Maintenance. Level I is limited maintenance. No special training is required, although the user must have a thorough understanding of the apparatus. Additional, advanced training (Level II and Level III) is available. Contact your MSA representative for details.

⚠ WARNING

Do not attempt repairs beyond those specified in this manual. Only trained or certified personnel, authorized by MSA, are permitted to maintain and repair this apparatus. Breathing apparatus must not be repaired beyond the manufacturer's recommendations. 29 CFR Part 1910.134, Par. (f) (4) makes these requirements clear:

Replacement or repairs shall be done only by experienced persons with parts designed for the respirator. No attempt shall be made to replace components or to make adjustment or repairs beyond the manufacturer's recommendations. Reducing or admission valves or regulators shall be returned to the manufacturer or to a trained technician for adjustment or repair. Failure to follow this warning may result in serious personal injury or death.

LEAK-TESTING
The SCBA must "hold" system pressure without leaks to provide adequate protection. Perform the Level I "Air-Tightness Test" as a first step in trouble-shooting. Perform the following component leak-tests to be sure you do not have a slow leak. Leak-testing quickly identifies components which need repair or replacement. Use P/N 600920 leak-test solution, or prepare a soapy water solution. Be sure to use enough soap to produce bubbles.

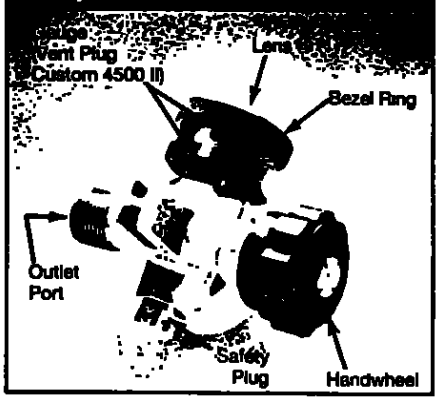
NOTE
Many procedures include the statement "remove the component from service." This means that no further Level I maintenance is possible. Return the component to a Level II repairperson, or to a certified Level III service center.

⚠ WARNING

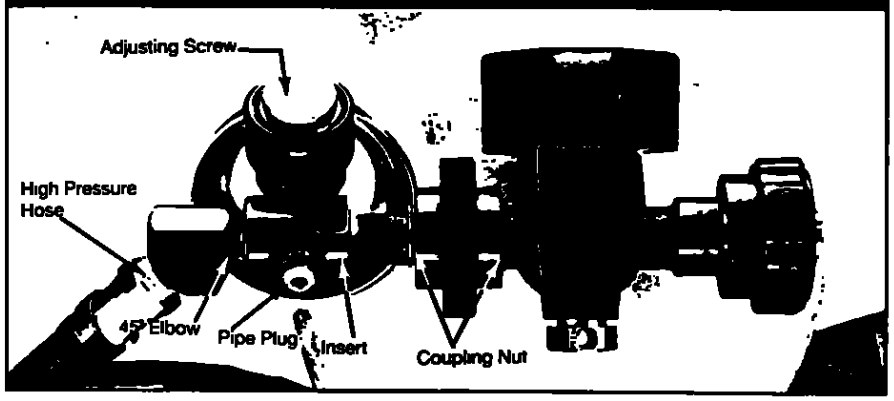
Do not tighten fittings or connectors when the system is pressurized. Close the cylinder valve. Be sure nothing blocks the regulator outlet. Relieve pressure from the system by slowly opening the main-line valve. Failure to follow this warning may cause fittings or connectors to rupture, resulting in serious personal injury or death.

1. Cylinder Valve
   a. Outlet Port (coupling nut connection)
      - Be sure that the cylinder valve handwheel is completely closed.
      - Draw a bubble of leak-test solution across the valve outlet port. Use your fingers to cover the two bleed holes in the threads.
      - If the bubble expands, there is an air leak through the valve. It must be repaired by a Level II repair person.
   b. Cylinder Neck
      - Apply leak-test solution to the cylinder neck.
      - If bubbles appear, remove the cylinder from service.
   c. Cylinder Valve Handwheel and Safety Plug
      - Apply leak-test solution to the cylinder handwheel and safety plug.
      - If bubbles occur at the cylinder handwheel, or the safety plug, there is an air leak through the valve. Remove the cylinder from service.
   d. Pressure Gauge
      - Remove rubber gauge guard. Apply leak-test solution to the pressure gauge stem.
      - If bubbles appear, there is an air leak through the valve. Remove the cylinder from service.
      - On Custom 4500 II pressure gauges, apply leak-test solution to the rubber vent plug also. If bubbles appear, there is an air leak through the valve. Remove the cylinder from service.
2. Audible Alarm
   Connect the alarm coupling nut to the cylinder and hand-tighten until it can go no further. Check that the regulator main-line and by-pass valves are completely closed. Then, fully open the cylinder valve.

1. Cylinder Valve



2. Audi-Larm Audible Alarm



a. Coupling Nut
- Apply leak-test solution to the front and back of the coupling nut.
- If bubbles appear, relieve pressure and further hand-tighten the coupling nut.
- Continuation of bubbles indicates a leak at the insert o-ring.
- Close the cylinder valve and relieve pressure from the system. Be sure nothing blocks the regulator outlet Then, slowly open the main-line valve.
- Remove the coupling nut and check that the o-ring on the insert is in position. To re-place the o-ring, see page 26.

b. Audi-Larm Insert
Apply leak-test solution to the Audi-Larm Insert pipe threads. If bubbles appear, there is an air leak around the valve threads. See page 26.

c. 45 Degree Elbow
Apply leak-test solution where the elbow threads into the alarm. If bubbles appear, see page 24.

d. Audi-Larm Adjusting Screw
- Apply leak-test solution to the adjusting screw and the pipe plug
- If bubbles appear, return the alarm to a certified Level III MSA Air Mask Service Center.

e. Audi-Larm Bell
If the bell is loose or missing see page 26.

3. High-Pressure Hose
a Hose Fittings
- Apply leak-test solution to both hose end-fittings at each joint.
- If bubbles appear, see page 23

b 90 Degree Elbow
- Apply leak-test solution to the elbow threads or the Quick-Fill fitting at the regulator.
- If bubbles appear, see page 22.

4. Regulator Valve Leak Test
a. Main-line and by-pass valve.
- Remove the diaphragm cap, spring and diaphragm
- Close both the main-line and by-pass valves, open the cylinder valve completely.
- Draw a bubble over the regulator outlet. Place one finger over the aspirator hole and fully depress the lever assembly The bubble must not expand or break within 15 seconds If it does, remove the regulator from service
- Repeat the previous step with the lever assembly free. Air bubbles indicate a leak. Remove the regulator from service.

b. Admission Valve
- Fully open the main-line valve.
- Draw a bubble over the regulator outlet. Place a finger over the aspirator hole. Do not depress the lever arms.
- The bubble must not expand or burst for at least 15 seconds. A leak indicates that the admission valve must be replaced. Remove the regulator from service

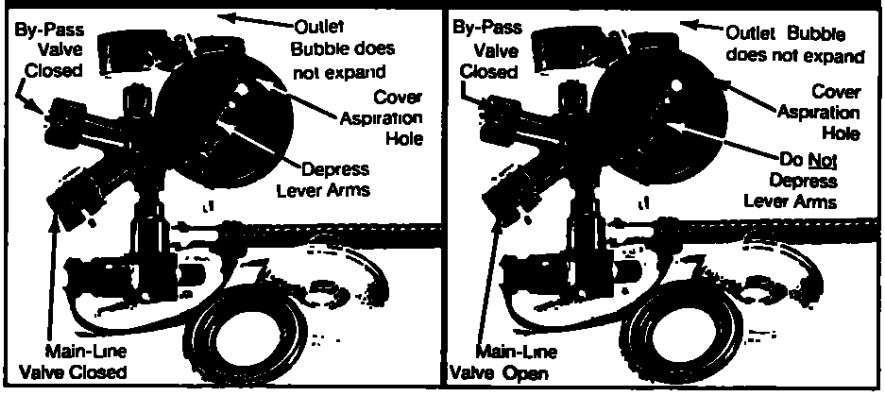
5. Regulator Body Leak Tests
a. Main-Line and By-Pass Valves
- Fully open the main-line valve.
- Apply leak-test solution around the main-line valve handwheel If bubbles develop, remove the regulator from service
- Close the main-line valve
- Place the soap solution around the by-pass valve handwheel.
- Open the by-pass valve 1/8 turn. Do not block the regulator outlet while the by-pass valve is open.
- Bubbles indicate there is an air leak through the valve.
- Close the by-pass valve. Remove the regulator from service.

b. Regulator Body

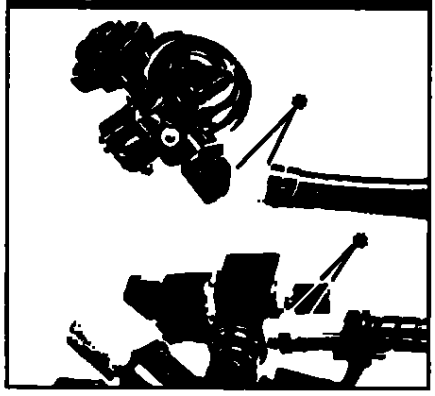
NOTE
Be sure that the main-line valve is fully open. Be sure that the by-pass valve is fully closed

- Apply leak-test solution to the pressure gauge threads. Also check the rubber vent plug on Custom 4500 II pressure gauges

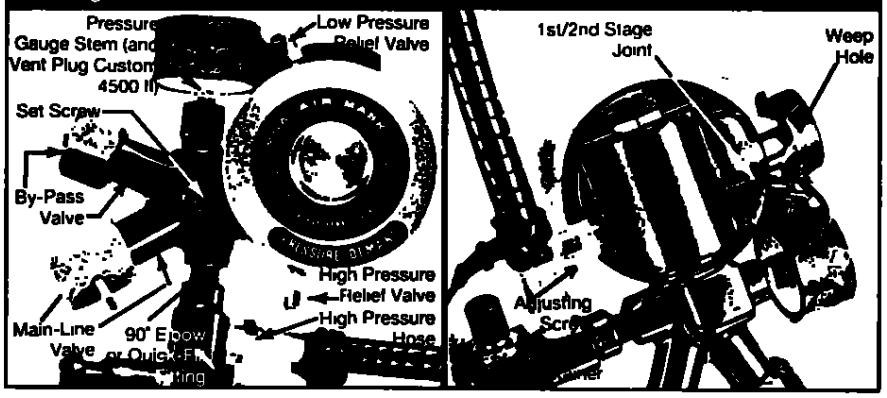
4. Regulator Valve Leak Test and Admission Valve Tests



3. High Pressure Hose



5. Regulator Leak-Tests



- If bubbles appear, remove the regulator from service
- Apply leak-test solution to the following locations on the outside of the regulator body: Reducing valve (first stage connection); Weep hole, Bellows retainer and adjusting screw; Set screw (below the pressure gauge); High Pressure Relief Valves.
- If bubbles appear at any of these locations, the regulator must be returned to a Certified Level III MSA Air Mask Service Center.

c. To leak-test the low pressure relief valve (P/N 626501).

⚠ WARNING

Do not try to adjust or repair the low pressure relief valve. Tampering may cause the relief valve to fail to operate, resulting in serious personal injury, death, or damage to equipment.

- Cover the regulator outlet with the rubber outlet protector and place your hand over top of the outlet cover to be sure the cover is not leaking.
- Open the main-line valve slowly.
- Apply leak-test solution to the cap.
- If bubbles appear, remove the regulator from service

d. After all components have been leak-tested close the cylinder valve. Be sure that nothing blocks the regulator outlet Relieve pressure from the system by gently pressing down on the lever arm assembly. Do not use the by-pass valve to relieve pressure.

- Use a clean, lint-free cloth to wipe the regulator body dry.
- Check that the lever assembly is correctly positioned Small arm on top.
- Hold the regulator cap and place the spring in the hub. Place the diaphragm hub on top of the spring so that the words "this side down" face you
- Press the yellow diaphragm ring into the cap. Insert the assembly and screw the cap into the regulator body and hand-tighten
- Close the main-line valve.

6. Leak-Testing the Dual-Purpose Regulator Air-Line Inlet:
   a. Connect the regulator and Audi-Larm to a cylinder that is pressurized to a minimum of 1200 psig, Ultralite II, 2000 psig, Custom 4500 II.
   b. Be sure that the by-pass and main-line valves are closed.

NOTE

Unscrew the diaphragm cap and remove the spring. Replace the diaphragm cap.

   c. Open the cylinder valve fully.
   d. Open the main-line valve fully.
   e. Apply leak-test solution around the inlet. If bubbles appear, relieve pressure from the system. Remove the regulator from service.
   f. Apply leak-test solution to the end of the air-line inlet. If bubbles appear in less than 5 seconds, remove the regulator from service.
   g. Install an approved quick-disconnect on the plug.
   h. Draw a bubble across the quick-disconnect. The bubble must not expand or break within 5 seconds. If bubbles appear, remove the quick-disconnect. Remove the regulator from service.

NOTE

Be sure to re-install the diaphragm spring after performing the leak-tests.

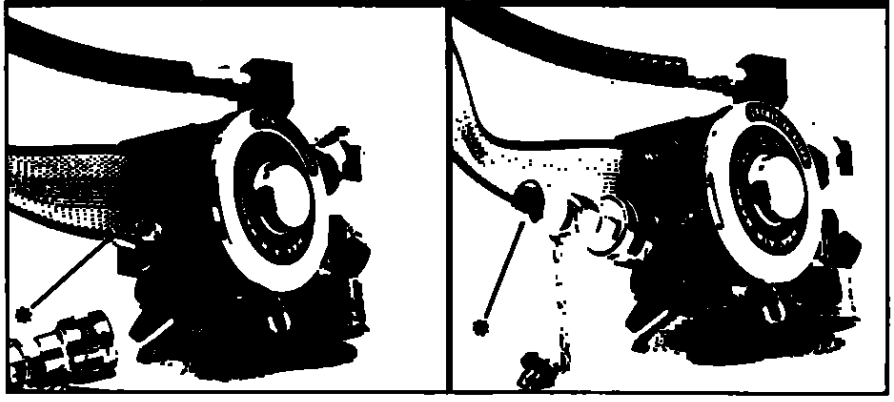
7. Leak-Testing the Quick-Fill System
   a. Pressurize the regulator by attaching the audible alarm to a fully-charged cylinder (2216 psig for Ultralite II Air Masks; 4500 psig for Custom 4500 II Air Masks).

⚠ CAUTION

Do not connect an Ultralite II Air Mask to a 4500 psig cylinder. Although the Ultralite II audible-alarm has vent holes to prevent pressurization, connecting to a 4500 psig cylinder is a dangerous and potentially unsafe condition.

   b. Open the Air Mask cylinder valve, fully pressurizing the regulator and audible alarm.
   c. Place the palm of your hand over the regulator outlet.
   d. Open the regulator main-line valve fully. The regulator gauge should indicate the pressure in the cylinder
   e. Close the cylinder valve and watch the pressure gauge on the regulator. There should be no drop in pressure If there is noticeable deflection of the needle, check the Quick-Fill coupling for leaks (using leak-testing solution). Find and correct any leaks before continuing.
   f. Be sure that the cylinder valve is fully closed, that all pressure is relieved from the system, and that the main-line valve is fully closed.
   g. Install the dust cover on the male Quick-Fill coupling The Air Mask is now ready for service Read and be sure that you fully understand the instructions for operating the Quick-Fill System

6. Leak-Testing the Dual-Purpose Regulator Air-line Inlet



Regulator Repair

- Remove Regulator & Audi-Larm
- Diaphragm
- Pressure Gauge

REGULATOR REPAIR

Remove the regulator from the SCBA waist-strap and remove the Audi-Larm from the air cylinder before you repair them

1. Be sure that the cylinder valve is completely closed
2. Be sure that nothing blocks the regulator outlet.
3. Open the main-line valve slowly to release any trapped air.
4. Close the main-line valve fully.

⚠ WARNING

Do not disconnect the Audi-Larm coupling nut when pressure is shown on the regulator gauge. Always be sure that you have released all pressure from the regulator. Close the cylinder valve fully. Be sure that nothing blocks the regulator outlet. Open the main-line valve fully to release any trapped air. Removing the coupling nut with the regulator pressurized may result in serious personal injury, death, or damage to equipment.

⚠ CAUTION

Use eye protection when servicing the product.

5. Unscrew the Audi-Larm coupling nut from the cylinder valve.
6. Remove the two screws, washers, and tee nuts holding the female belt buckle to the waist-strap. Then, slide the regulator and mounting bracket off the waist-strap

NOTE 1

Lubricate all o-rings with a very thin film of Krytox (P/N 601593) just before they are installed. Do not store parts after lubricating them. Krytox may collect dirt and/or contaminants. Krytox is compatible with brass and aluminum.

⚠ WARNING

Do not use Fluorolube* lubricant (P/N 27913). It is not compatible with aluminum. Failure to follow this warning may result in serious personal injury or death.

NOTE 2

Pipe-sealing tape is used on the threads of the following parts before they are reassembled:

- regulator pressure gauge
- 90 degree elbow
- 45 degree elbow
- high-pressure hose (both ends).
- Audi-Larm coupling nut threaded insert.

Wrap 1 to 1-1/2 turns of the tape in a clockwise direction (looking into the threaded end of the fitting)

Start at the second thread. Do not put tape on the first thread. Pieces of tape can break off and reduce air flow. Apply a thin film of Krytox to the tape before threading it into the fitting.

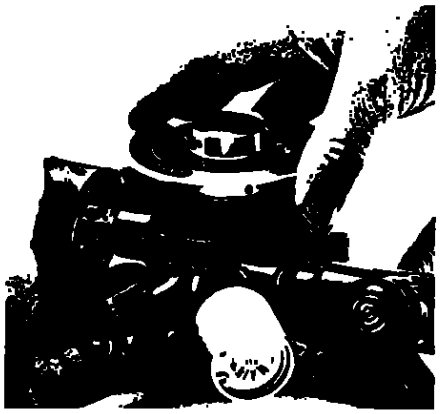
Diaphragm

1. If the regulator diaphragm is torn or has any visible damage, the diaphragm must be replaced, as follows:
   a. Remove the regulator cap and spring.
   b. Lift out the diaphragm by grasping the yellow ring.

2. If the tape holding the yellow ring to the diaphragm is loose, frayed, or partially peeled away from the yellow ring and diaphragm, the diaphragm must be replaced
3. Using a new diaphragm, reassemble the low pressure side of the regulator. Use a clean, lint-free cloth to wipe the regulator body dry.
   a. Check that the lever assembly is correctly positioned: Small arm on top.

   b. Hold the regulator cap and place the spring in the cap. Place the diaphragm hub on top of the spring with the words "this side down" facing you

   c. Press the yellow diaphragm ring into the cap. Insert the assembly and screw the cap into the regulator body and hand-tighten.



   d. Close the main-line valve

Pressure Gauge

P/N 95278 Ultralite II (2216 psig)
P/N 95278 Ultralite II (3000 psig)
P/N 473250 Custom 4500 II

*Fluorolube is a trademark of Hooker Chemical and Plastics Company

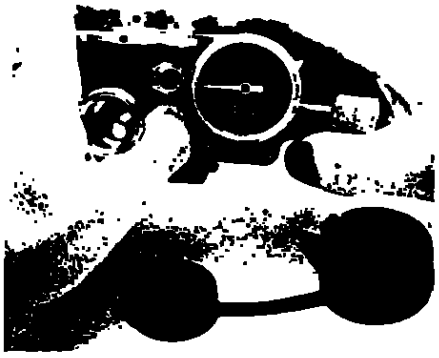
1. Fold the rubber gauge protector back over the relief valve. Unthread the bezel ring and bezel counter-clockwise

2. Stretch the "U" shaped rubber around the relief valve, and pull it out from between the gauge and the relief valve.
3. To remove the pressure gauge place an open-end wrench on the pressure gauge flats. Position the regulator with the gauge dial facing down so that any debris falls out as the gauge is removed. With the gauge dial facing down, turn the wrench to loosen. Remove the gauge and throw it away. Be sure to remove any tape from the regulator port
4. To install a pressure gauge:
   a Apply pipe-sealing tape to the gauge threads See Note 2, page 21.
   b. Check that the two screws on the back of the pressure gauge are tight Then apply one drop of Loctite #222 to each screw.

⚠ CAUTION

Do not over-tighten or you may damage the regulator body or the pressure gauge threads.

c. Screw the gauge stem into the regulator and tighten with an open-end wrench The dial should point in the position shown **Do not over-tighten or you may damage the regulator body or the pressure gauge threads.** Leak-Test the gauge

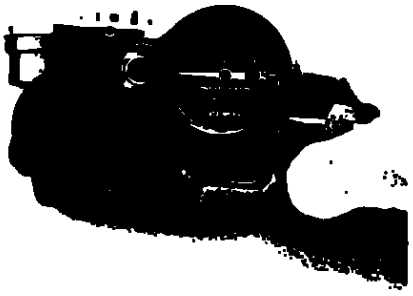


5. Replacing the bezel assembly:

⚠ CAUTION

Do not touch the gauge needle. If it is bumped it may not give an accurate reading.

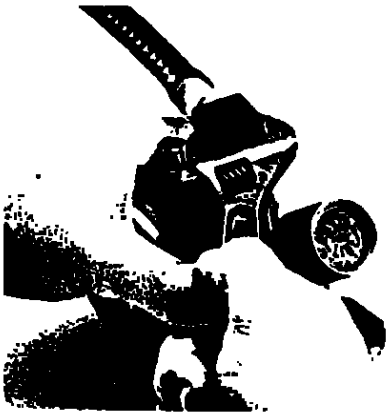
a. Remove the bezel ring and bezel.
b To install the rubber gauge protector, position the new gauge protector (P/N 801143) so that the "U" shape side straddles the low pressure relief valve Stretch the rubber and slip it between the gauge and the relief valve
c. Pull the gauge protector back over the relief valve. Place the lens on the gauge and screw the bezel ring clockwise until it is hand-tight only.



d. Stretch the gauge protector over the bezel ring and the gauge.
e. Tap the gauge lens lightly with your finger to make sure it is secure Place the dust cover over the regulator outlet as you would do for normal storage and regulator protection.

90 Degree Elbow

1. To remove the 90 degree elbow:
   P/N 473577 Ultralite II
   P/N 473248 Custom 4500 II
   a Remove regulator mounting bracket (P/N 473420 for SCBA; P/N 475909 for Dual-Purpose) from the regulator by removing three mounting screws and washers
   b. Hold the regulator firmly Place a wrench on the elbow flats and unscrew it



Be sure to remove all pipe-sealing tape from the regulator port threads.

NOTE

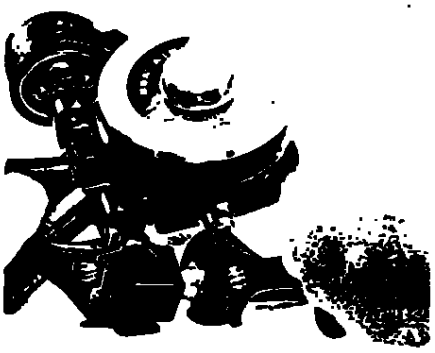
If the sintered filter (P/N 476441) has been removed, replace the filter before installing the 90 degree elbow, see page 23.

c. Use a 6" adjustable wrench to remove the hose fitting from the 90 degree elbow.
2. Apply pipe-sealing tape to the threads of the new elbow. See Note 2, page 21
   a. Check that the high-pressure hose end-fitting is clean. Remove any tape debris.
   b. Apply pipe-sealing tape to the end-fitting threads
   c. Thread the hose end-fitting into the 90 degree elbow and tighten, using a 6" adjustable wrench on the hose fitting and a wrench on the elbow flats.

Remove the Regulator and Audi-Larm from the cylinder before any repair. See page 21.

Regulator Repair

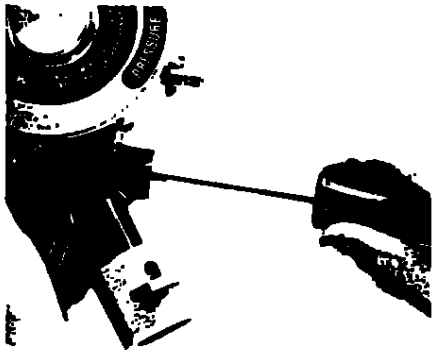
- **Sintered Inlet Filter**
- **High Pressure Hose**



d Thread the 90 degree elbow into the regulator and tighten, using a wrench on the elbow flats. Check that the 90 degree elbow is aligned as shown below. **Do not over-tighten or you may damage the elbow or the end-fitting threads.** Leak-Test to check all connections.

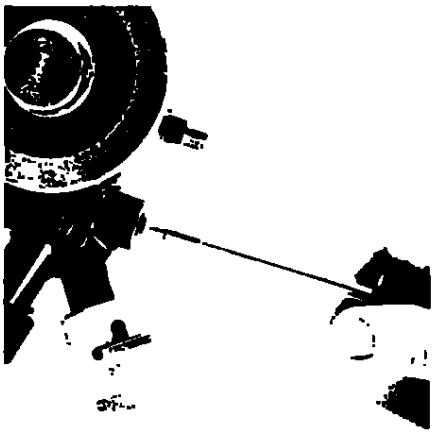
Sintered Inlet Filter
(located at the base of the 90 degree elbow port of the regulator).

1. Remove the 90 degree elbow.
2. To remove the sintered filter:
   a Turn the regulator upside down (filter faces down)
   b. Place a 3/16" nut driver on the filter and unthread (counter-clockwise)



3 To replace the bronze sintered filter
   a. Hold the filter in one hand with the filter flange (larger diameter) end down.

   b Slide the non-threaded end of filter holder on the filter.
   c. Insert the filter and holder into a 3/16" nut driver so that the filter flange end is up.

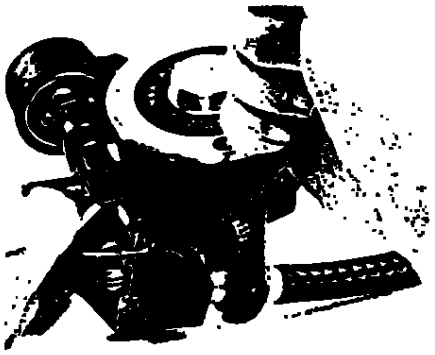


NOTE
Use a nut driver, not a socket and ratchet wrench. If the filter is overtightened it will snap off

   d Turn the regulator so that the threaded hole for the 90 degree elbow is facing down. Insert the filter holder, filter, and nut driver into the hole. Tighten the filter holder finger-tight only.

High-Pressure Hose

1. Turn the regulator so that the 90 degree elbow is down.
   a. Place a wrench on the flats of the 90 degree elbow. Place a second wrench on the hex hose fitting at the 90 degree elbow and unthread the hose



   b. Remove all tape debris from the threads inside the 90 degree elbow.
   c. Turn the 45 degree elbow at the Audi-Larm end of the hose so that the elbow is down
   d. Place a wrench on the flats of the 45 degree elbow. Place a second wrench on the hex flats of the hose end-fitting and unthread the hose. Remove all tape debris from the threads inside the 45 degree elbow.
2. To install a new hose, apply pipe-sealing tape to the threads of both hose end-fittings See Note 2, page 21.
   a. Thread the hose end-fitting into the 45 degree elbow first and tighten, using one wrench on the hex flats of the hose and a second wrench on the flats of the 45 degree elbow. **Do not over-tighten or you may damage the elbow or the end-fitting threads.**

Remove the Regulator and Audi-Larm from the cylinder before any repair. See page 21.

b. Check that the assembly is lined-up properly.

3. Thread the Audi-Larm onto the 45 degree elbow and tighten so that the striker that hits the bell is pointed up.

a. Check that the narrowest flat (about 1/8" wide) lines up with the wrench flat on the coupling nut side of the alarm

⚠ WARNING

You must check the 45 degree elbow alignment. If the elbow is not positioned as shown, stress on the high pressure hose may be increased. Failure to follow this warning may cause the hose to leak or break and result in serious personal injury or death.

b Thread the other end of the hose end-fitting into the 90 degree elbow and tighten, using a wrench on the hose hex flats and a second wrench on the flats of the 90 degree elbow. **Do not over-tighten or you may damage the elbow or the end-fitting threads.**

c. Check that the elbow is lined up as shown Leak-Test to check all connections

45 Degree Elbow

1. To separate the Audi-Larm and 45 degree elbow, place a 3/4" wrench on the Audi-Larm body flats. Place a wrench on the flats of the 45 degree elbow Unthread the elbow.
2 Place a wrench or a 7/8" wrench on the flats of the elbow. Place a second wrench on the hex flats of the hose end-fitting and unthread the hose.

3. Remove all tape debris from the hose end-fitting threads.
4. Turn the elbow so that the hose end is down and remove all tape debris from the threads
5. To install the 45 degree elbow:
   a. Apply pipe-sealing tape to the hose end-fitting threads. See Note 2, page 21
   b. Thread the hose end-fitting into the 45 degree elbow and tighten, using one wrench on the hex flats of the hose and a second wrench on the flats of the 45 degree elbow. **Do not over-tighten or you may damage the elbow or the end-fitting threads.**
   c. Apply pipe-sealing tape to the elbow threads.
   d. Thread the 45 degree elbow into the Audi-Larm and tighten, using a 7/8" wrench on the flats of the 45 degree elbow, and a wrench on the Audi-Larm body. **Do not over-tighten or you may damage the elbow or the end-fitting threads.**
6. Hold the Audi-Larm body so that the striker that hits the bell is pointed up.

Remove the Regulator and Audi-Larm from the cylinder before any repair. See page 21.

Regulator Repair

- **Low Pressure Relief Valve**
- **High Pressure Relief Valve**

7. Check that the narrowest flat of the elbow (about 1/8" wide) lines up with the wrench flat on the coupling nut side of the alarm. Leak-Test the 45 degree elbow.

⚠ WARNING

You must check the 45 degree elbow alignment. If the elbow is not positioned as shown, stress on the high pressure hose may be increased. Failure to follow this precaution may cause the hose to leak or break and result in serious personal injury or death.

Low Pressure Relief Valve

⚠ WARNING

Do not try to adjust or repair the low pressure relief valve. Discard it. Tampering may change the relief valve setting, resulting in serious personal injury, death, or damage to equipment.

1. Place a wrench on the hex flats of the valve. Unthread and remove the valve.

2. Apply one drop of Loctite #290 (P/N 600469) to the new valve threads. Rub the Loctite #290 into the valve threads.
   a. Thread the new valve into the regulator body. With the diaphragm cap, spring, and diaphragm removed, check that the valve does not extend through the inside of the regulator body by more than 1 to 2 threads.
   b. Set the regulator aside. Loctite #290 must cure (harden) for 4 to 8 hours.
3. To replace the diaphragm spring, and diaphragm cap
   a. Hold the regulator cap and place the spring in the hub. Place the diaphragm hub on top of the spring with the words "this side down" facing you.

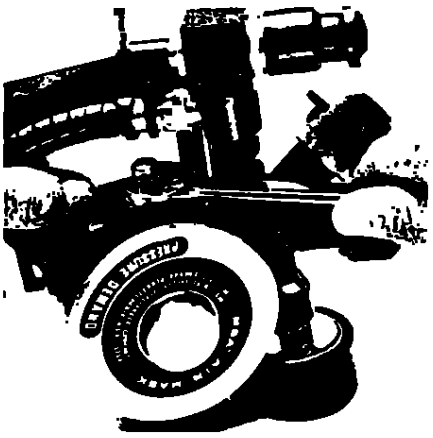
   b. Press the yellow diaphragm ring into the cap. Insert the assembly and screw the cap into the regulator body and hand-tighten.

High Pressure Relief Valve
P/N 481999 Ultralite II, Ultralite II Dual-Purpose
P/N 482000 Custom 4500 II, Custom 4500 II Dual-Purpose

⚠ WARNING

Do not try to adjust or repair the high pressure relief valve. Discard it. Tampering may change the relief valve setting, resulting in serious personal injury, death, or damage to equipment.

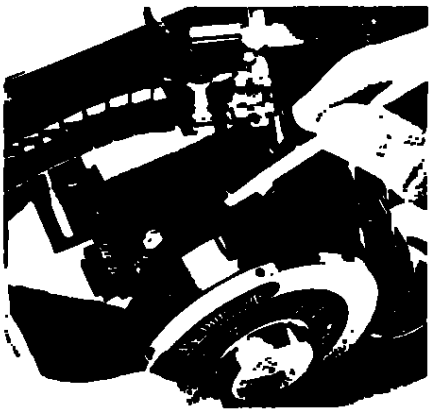
1. Place a wrench on the flats at the base of the valve and loosen it.



⚠ WARNING

Do not place a wrench on the silver locknut. Any adjustment of the relief valve may cause the relief valve setting to be changed, and result in serious personal injury, death, or damage to equipment.

2. Remove the gasket from the valve port.
   New P/N 42911 Gasket (Ultralite II and Dual Purpose)
   New P/N 473246 Gasket (Custom 4500 II and Dual-Purpose)
3. Install the new gasket so that it is flat on the bottom of the valve port.



4. Thread the new high pressure relief valve into the regulator body.
5. Place a wrench on the flats at the **base** to the valve and tighten it against the gasket. Leak-Test to be sure there are no air leaks.

⚠ CAUTION

If the relief valve continues to leak, the regulator must be returned to a certified Level III Air Mask Service Center for repair.

Remove the Regulator and Audi-Larm from the cylinder before any repair. See page 21.

AUDI-LARM REPAIR
P/N 473590 Ultralite II and Ultralite II Dual-Purpose
P/N 470878 Custom II 4500 and Custom 4500 II Dual-Purpose

The Audi-Larm must be disconnected from the apparatus cylinder. See page 21.

Insert O-Ring

1. Insert your fingernail or the dental pick under o-ring (P/N 66835) and remove it. Be careful not to scratch the Audi-Larm o-ring groove.

2. Apply a light film of Krytox to the **new** o-ring.
3. Roll the new o-ring over the end of the insert and seat it into the o-ring groove. If the o-ring is not seated, air may leak

Bell

1. Remove screws, lock-washers, and bell

2. When installing a new bell, align the slot in the bell with the raised boss on the alarm body. If the edge of the bell touches the body, the bell will not ring as loud
3. Apply one drop of Loctite #222 to the screws to keep the bell from loosening. Install the lockwashers and screws and tighten.

Coupling Nut
P/N 473568 for Ultralite II, Ultralite II Dual-Purpose
P/N 470874 for Custom 4500 II and Custom 4500 II Dual-Purpose

1. To remove the coupling nut and insert:
   a. Place a wrench on the alarm body flats to secure the body. Place a wrench on the insert flats.
   b. Turn the wrench counter-clockwise to loosen and remove the insert.
   c. Check the alarm housing body threads to be sure they contain no pipe-sealing tape residue.
   d. Use retaining-ring pliers to remove the retaining ring.

   e. Slide the coupling nut off the "back" end of the insert.
   f. Remove washer (P/N 93031) from inside the coupling nut.
2. To reassemble the coupling nut and insert:
   a. Slide the washer on the back end of the insert.

NOTE
Replace the washer if it shows signs of wear.

   b. Slide the coupling nut on the back end of the insert.
   c. Install the retaining ring on the insert to secure the coupling nut. Use Tru-arc pliers. Be sure that the ring is in the slot in the insert.
   d. Apply pipe-sealing tape to the threads of the insert See Note 2, page 21
   e. Thread the coupling nut and insert assembly into the Audi-Larm body and tighten, using wrenches. Perform the appropriate Leak-test.

CYLINDER REPAIR
Cylinder Pressure Gauge
The pressure gauge has a male thread which is threaded into the cylinder valve body. The cylinder valve does not have to be disassembled

⚠ WARNING

Before removing the cylinder gauge, all air must be bled from the cylinder. Open the cylinder valve handwheel 1/2 turn and leave it open until all air has been exhausted. Wear hearing protection if this is done in an enclosed area to avoid possible hearing damage. Do not attempt to replace the gauge if pressure is shown on the cylinder pressure gauge.

If pressure cannot be relieved by opening the cylinder valve handwheel, the cylinder valve must be repaired by a Level II repair person. Failure to follow this precaution may result in severe personal injury or death.

1. Removing the cylinder pressure gauge
   a. Remove the rubber gauge guard.
   b. Position the cylinder valve so that the gauge is upside-down. Place a wrench on the gauge flats. Turn the gauge counter-clockwise and remove it from the cylinder valve body.
   c. Clean out the threads in the cylinder valve body to be sure no tape residue remains.
2. Installing a new pressure gauge
   a Place pipe-sealing tape on the gauge threads. Refer to NOTE 2, page 21.
   b. Place the gauge wrench on the gauge flats. Turn the gauge clockwise to tighten. Position the gauge so that it can be read in the "as-worn" position. Do not over-tighten.

Remove the Regulator and Audi-Larm from the cylinder before any repair. See page 21.

c. Replace the rubber gauge guard.
d. Leak-Test all connections.

This completes the cylinder gauge replacement procedure.

HARNESS REPAIR

The harness assembly consists of carrier, waist-strap, pull-straps, and shoulder pads. Refer to the exploded view below for the location of parts.

Shoulder Pads

Right and left shoulder pads are different. The left pad is one with the chest strap attached.

1. To remove shoulder pads, lift up on the adjustable pull-strap friction buckle and slide the pull-strap back through the friction buckle to free the pull-strap from the shoulder pad.
2. Remove the top screw, washer, tee nut, and wear pad from the backplate ring. Remove the shoulder pad from the backplate ring.
3. To replace friction buckles and chest strap see below.
4. To reassemble shoulder pads, check that the pad is the correct one for the right or left side.
5. Attach the pad to the top of the backplate. Be sure to place the wear pad between the shoulder pad and backplate. Install fasteners so that the tee nut faces outward.

NOTE

Apply one drop of Loctite #222 thread sealant (P/N 29787) to the threads of each screw before installing the washers and tee nuts.

6. To re-attach the adjustable pull-strap to the shoulder pad, check that the pull-strap is straight (no twists). Check that the shiny side of the strap is facing down.

NOTE

If the shiny side is not facing down, the pull-strap is attached to the backpad incorrectly.

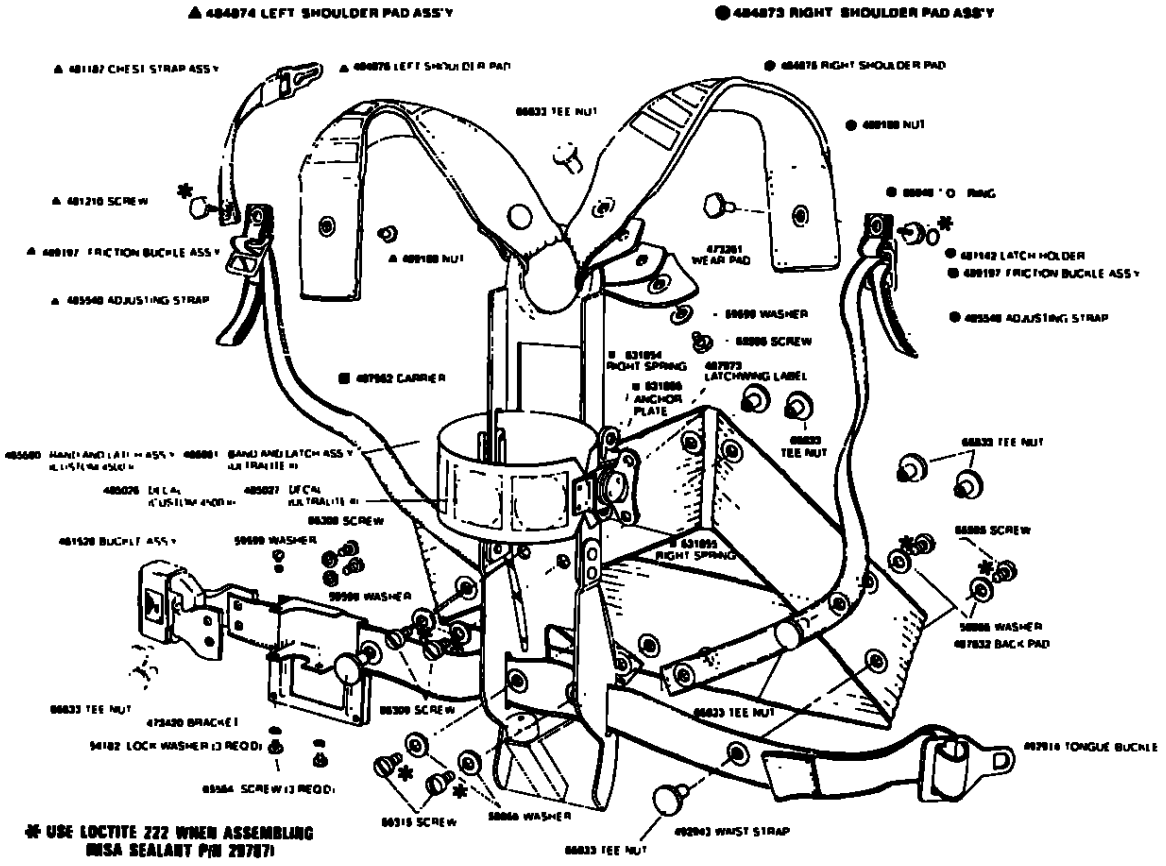
7. Thread the strap through the top opening of the bottom buckle and top buckle. Thread the strap over the top buckle and down through the top opening of the bottom buckle.

Friction Buckles and Chest Strap

1. Remove old buckles using two adjustable wrenches. Remove the nut and screw on the left shoulder pad. Use two adjustable wrenches to remove the nut and latch holder on the right shoulder pad.
2. Install new buckles by inserting the screw (P/N 481210) through the eyelet in the chest strap, buckle, and through the eyelet in the left shoulder pad. Install the nut and tighten.
3. Place an o-ring on the new latch holder. Insert the latch holder (P/N 481142) in the eyelet of the right shoulder pad and buckle.
4. Apply one drop of Loctite #222 into the nut, then slide the hole of the snap ring over the nut. Install the nut and tighten.
5. To install the adjusting strap (P/N 485540) through the friction buckle:
   a. Thread the adjusting strap through the first opening of the bottom buckle and top buckle.
   b. Thread the strap over the first buckle and through the first opening of the bottom buckle. Be sure that the shiny side of the strap is face-up.

Adjusting Straps

1. Remove the two adjusting straps by slipping one end through the shoul-



der friction buckle assembly and removing the screws, washers, and tee nuts that secure one or both adjusting straps to the backpad.
2. Discard old screws, and tee nuts Keep the washers.
3. Loosen and remove the screws, washers, and tee nuts which secure the waist-strap and adjusting straps to the bottom of the carrier and backpad.
4. From inside of the backpad (side in contact with the user), center the adjusting strap grommets.
5. Install two new #10-1/2" long screws (with leather and flat washers) through the backpad grommet.
6. Attach the adjusting strap to the backpad using the new tee nuts. Before tightening, place one drop of Loctite #222 thread sealant on the screw threads.
7. Secure the end of the adjusting strap to the bottom of the carrier frame with the two new #10-3/4" long screws, washers and tee nuts.The pull-strap is sandwiched between the backpad and the carrier frame. Use one drop of Loctite #222 thread sealant on the screw threads before tightening.
8. Using a large screwdriver, tighten the screws securely.
9. Weave the other end of the adjusting strap through the friction buckle assembly on the shoulder pad.
10. Don the apparatus and be sure that the adjusting straps operate smoothly.

Waist-Strap

The Ultralite II and Custom 4500 II waist-straps are one-piece assemblies which slide through the backplate (as viewed from the cylinder-band side).

1. To remove a waist-strap from the backpad and backplate:
   a. Remove the two screws, washers and tee nuts that hold the waist-strap to the backpad.
   b. Remove the two screws, washers and tee nuts that hold the waist-strap to the backplate.
   c. Remove the female buckle assembly by removing the two screws, washers and tee nuts. Save these parts.
   d. Slide the regulator bracket off the waist-strap.
   e. Slide the waist-strap from the backplate. Pull from the right.
   f. Remove the male tongue buckle (P/N 492914) Save these parts for assembly.

NOTE

Before tightening, place one drop of Loctite #222 thread sealant on all screws.

2. To install a new waist-strap assembly (P/N 492943):
   a. Thread the waist-strap through the backplate. The edge of the waist-strap closest to the grommets should face down.
   b. Install the two screws (P/N 66315) through the waist-strap, backplate, adjusting strap, and backpad. Secure with tee nuts.
   c. Install screws and washers through the waist-strap. Secure to the backpad with tee nuts.
   d. Thread the waist-strap through the front of the tongue buckle, over the roll bar, and down through the back of the tongue buckle.
   e. With the backplate laying flat, slide the regulator bracket on the left side of the waist-strap. The leather pad on the bracket should be at the bottom and face away from you.
   f. Attach the female buckle release to the waist-strap. Push the bottom side up using two screws, washers and tee nuts.

NOTE

Apply one drop of Loctite #222 thread sealant (P/N 29787) to the threads of each screw before installing the washers and tee nuts.

Backpad

(P/N 487832) or (P/N 485539)

1. To remove the backpad remove the screws, washers, and tee nuts from the bottom of the backplate (cylinder side). These fasteners also secure the waist-strap.
   a. Remove the screws, washers, and tee nuts that secure the backpad to the backplate at the center of the backplate.
   b. Remove the screws and tee nuts that secure the pull-strap to the backplate and the waist-strap to the backpad.
2. To install a new backpad, line-up the waist-strap with the bottom of the adjusting-strap and the backpad.

NOTE

Before tightening screws, place one drop of Loctite #222 thread sealant on each screw.

   a. From the inside of the backplate, using screws, sandwich the adjusting strap between the backpad and backplate and secure
   b. Secure the waist-strap to the backpad from the front side of the backpad with a screw, washer, and tee nut.
   c. Secure the top backpad from inside of the backplate with screws, washers, and tee nuts.
   d. Secure the adjusting-strap from the front side of the backpad with screws, washers, and tee nuts.

Cylinder Band and Latch

P/N 485861 Ultralite II Air Mask
P/N 485860 Custom 4500 II Air Mask

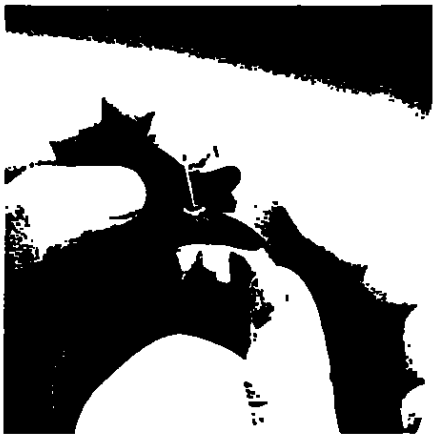
1. Remove the cylinder from the carrier.
2. Facing the backplate from the cylinder side, depress the tab. Pull the cylinder band all the way out of the backplate.
3. Use pliers to grasp the top spring (P/N 631854). Squeeze the spring and lift it out. Repeat the procedure for the bottom spring (P/N 631855).
4. To install a new cylinder band and latch:
   a. Facing the backplate from the cylinder side, insert the band and latch between the anchor plate sides. Use pliers to grasp and compress the spring, then insert the top spring into the hole in the latch and anchor plate
   b. Repeat the procedure for the bottom spring.
5. Insert the cylinder band in the appropriate backplate slot for the cylinder size in use.

Carrier Decals

1. To install the Ultralite II Air Mask (yellow) or Custom 4500II Air Mask (green) decals, check that the cylinder band is clean and dry. Peel the decals from the strip and press them into place on the band.
2. Press one side into place, then move your finger smoothly across the decal to remove wrinkles or bubbles.

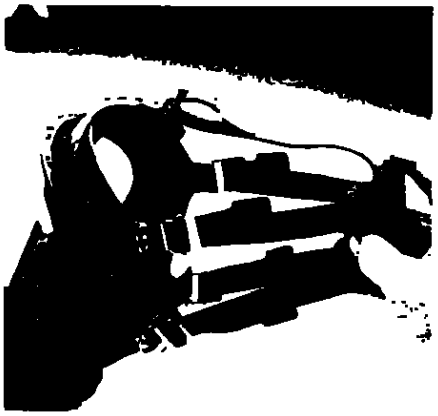
FACEPIECE REPAIR-
Rubber Head Harness

1. To remove a damaged headstrap from the facepiece, lay the facepiece on a table or other flat surface.
   a. Pull the back of each buckle away from the headstrap, then pull slightly so the headstrap end-tab is at the buckle.
   b. Fold the end-tab sides together,then pull each end-tab through its buckle.



2. To install a new rubber headstrap lay the new headstrap flat. The MSA logo should be right-side up. Each strap is labeled. Pick the headstrap up by the strap labeled "FRONT."
   a. Fold the end-tab sides together
   b. Push the headstrap end-tab under the wire roller
   c. Pull the wire roller down against the strap
   d. Re-fold the end-tab and push it through the buckle again, this time passing over the wire roller.

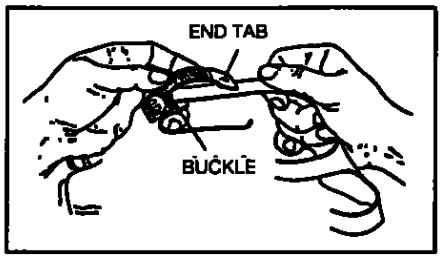
   e. Repeat steps a through d for each remaining strap. Check that the headstrap is not twisted.



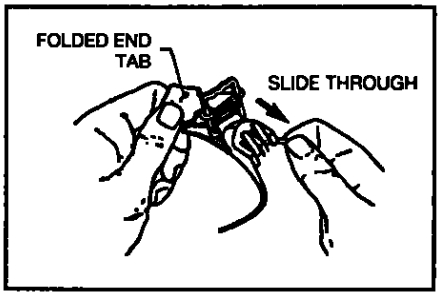
3. Don the facepiece and check the face-to-facepiece seal. Follow the steps in the Air-Tightness test, page 7.

EZ-Don Harness

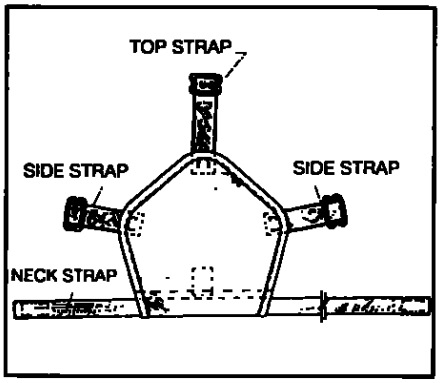
1. Remove the rubber head harness from the Ultravue facepiece according to the following procedure:
   a. Lay the facepiece on a table or other flat surface.
   b. Pull the back of each buckle away from the rubber harness and pull slightly so the rubber harness end-tab is at the buckle.



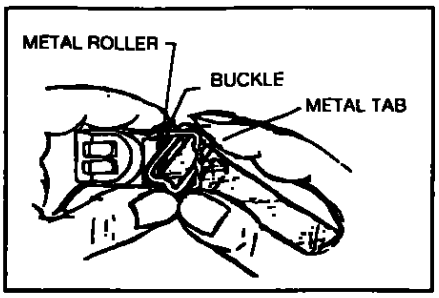
   c. Fold the end-tab sides together, then slide each tab through its buckle.



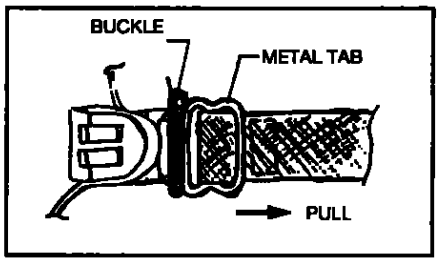
2. Head Harness Installation
   a. Lay the head harness flat so that the three elastic straps are positioned under the backing.
   b. Select the metal tab located at the top of the head harness.



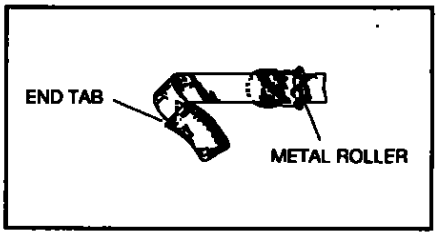
   c. Slide the metal tab under the top buckle with metal roller pushed toward front of buckle until metal tab is completely through.



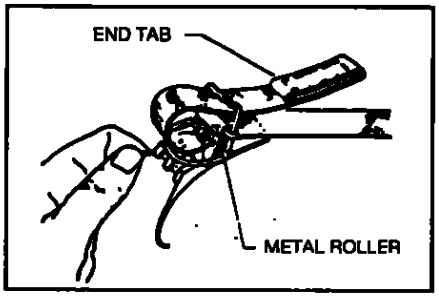
Then pull tab in opposite direction until metal tab is flush on the surface of the buckle.



   d. Repeat steps b and c for the two side metal tabs.
   e. To attach the left bottom strap to the left neck buckle, push the end-tab under the metal roller. Pull the metal roller down against the strap.

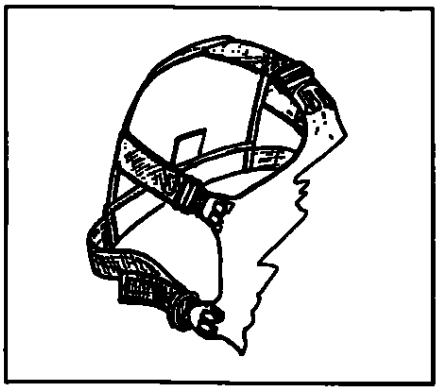


3. Push the end-tab through the buckle again, this time passing over the metal roller.



   a. Repeat steps 1-3 for right strap.

b. Check that the installed head harness is not twisted.



Before each use, check the head harness for tears, split threads, etc. **Do not use a damaged harness.** If the head harness is damaged in use, or if the material becomes torn, blistered, or abraided, it must be replaced.

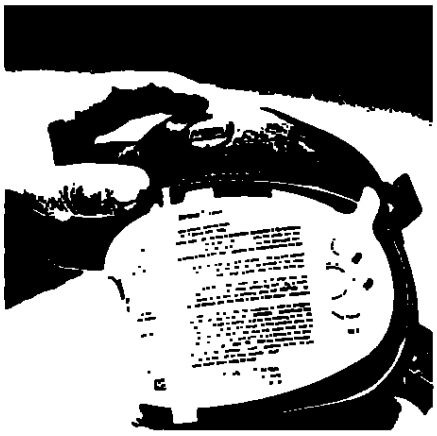
Machine wash with warm water with a mild detergent. Temperatures should not exceed 120 degrees F. Dry by hanging in open area. **Do not dry clean.** Do not bleach or use abrasive cleaners Do not fold or store when wet.

Lens and Ring

1. Loosen and remove the screw and nut from each side of the retaining ring.

2. Remove both retaining rings.
3. Fold the facepiece flange rubber back and pull the lens out of the groove.

4. Remove any dirt lens fragments, or other debris from the groove. Line up the new lens center-line marks (top and bottom) with the facepiece centerline mark then insert the lens into the groove. Work the facepiece rubber flange around the lens to fully seat the lens in the groove.



⚠ CAUTION

Use the proper Lens Ring Kit (small, medium, or large). Do not use lens clips from older facepieces.

5. Install a new lens. **The protective papers on the lens should not be taken off until the lens is completely assembled in the facepiece.** Line up a lens ring centerline with a facepiece rubber flange centerline mark. Press the ring in place Mount the other ring half in the same way

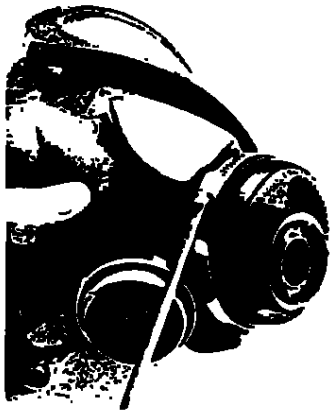
6. Press the ring halves together at the top and bottom of the facepiece so that the ends mate.
7. Place a nut in each slot and install a screw on each side. Start the screws. They should thread easily. If not, remove and re-install the screws to avoid cross-threading. Maintain hand pressure on both ring halves
8. As the ring halves come together, alternate tightening the left and right screws to be sure the ring seats thoroughly on the rubber flange. **Do not over-tighten. Rubber must not show between the lens ring ends at the joint. If this happens, reassemble.**
9. Remove all lens protective papers from the new lens.
10. Don the facepiece and check the face-to-facepiece seal. Follow the steps in the Air-Tightness Test, page 7.
11. Install a cover lens to protect the facepiece polycarbonate lens during storage.

⚠ CAUTION

Do not use a cover lens in a high-temperature environment, such as firefighting. High temperatures may distort the cover lens. Or, moisture trapped between a cover lens and the facepiece lens may condense and distort vision. Always remove the cover lens before donning the facepiece.

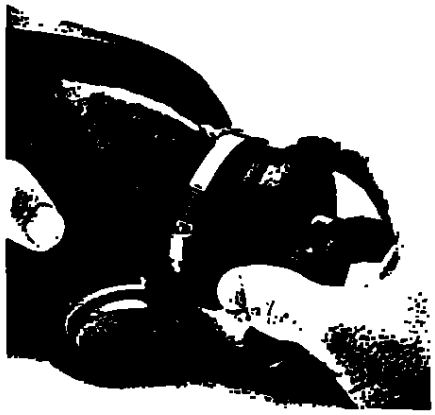
Speaking Diaphragm Housing

1 Loosen the band clamp screw to remove the entire Inlet (P/N 470039)



Remove the clamp and pull the assembly out of the facepiece.

2. To reassemble the entire speaking diaphragm housing in the facepiece:
   a. Slide the band clamp over the inlet.
   b. Slide the assembly into the facepiece. Check that the air ducts in the inlet are lined up with the ducts in the facepiece.



   c. Be sure that the assembly is pressed completely into the facepiece.
   d. The band clamp must be positioned so that the screw is at the 5 or 7 o'clock position. The screw head must be to the left so that it will not rub the facepiece rubber.
   e. Tighten the band clamp until the inlet is secured. Be sure that the band clamp will not pull the facepiece rubber away from the assembly. Do not over-tighten. If the facepiece rubber "bulges" out through the slots in the clamp, the clamp is too tight and must be loosened and re-tightened.
3. Don the facepiece and check the face-to-facepiece seal. Follow the steps in the Air-Tightness Test, page 7.

Speaking Diaphragm

1. Unscrew the retainer ring, using the facepiece spanner wrench (P/N461828).

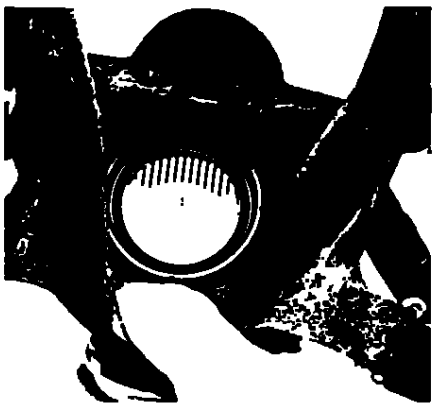
2. Turn the facepiece upside down and shake out the metal speaking diaphragm.
3. Check the speaking diaphragm for damage. Replace it if it is worn or damaged.
4. Check the speaking diaphragm gasket or o-ring. Replace the gasket or o-ring if either is worn or damaged.

⚠ WARNING

The flat gasket (used on old-style facepieces) and the o-ring (used on the new design) are not interchangeable.

Replace the gasket with the P/N 83630 gasket only. Replace the o-ring with the P/N 629935 o-ring only. Failure to follow this warning may cause inhalation of contaminant and result in serious respiratory injury or death.

5. To reassemble the speaking diaphragm, place the gasket or o-ring in the groove of the speaking diaphragm housing.

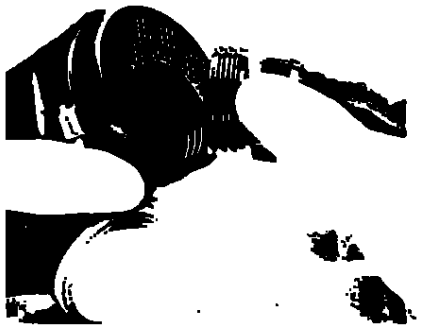


6. Place the speaking diaphragm in the housing so that the rolled lip rests on the gasket or o-ring.

   Be sure that the crimped side of the speaking diaphragm is facing up (away from the gasket or o-ring).
7. Replace the retainer ring and tighten, using the spanner wrench.
8. Don the facepiece and check the face-to-facepiece seal. Follow the steps in the Air-Tightness Test, page 7.

Inhalation Disc Valve

1. Push in on the facepiece coupling nut and turn it until its tabs fit into the slots in the adapter.
2. Twist the coupling nut counter-clockwise (left) to unscrew the adapter assembly.



3. Lift the spider gasket out of the coupling nut housing by its tab

4. Remove the valve disc from the coupling nut housing. If you cannot grasp the disc with your fingers, use a blunt object, such as a ballpoint pen to lift one edge, then remove the disc. Be careful not to tear the soft disc.
5. Inspect the disc for tears or punctures. The disc should be very soft and pliable. Install a new disc if it is damaged or hardened.
6. To install the inhalation disc valve:
   a. Press the valve disc on the pin in the coupling nut housing
   b. Carefully tuck all edges of the disc under the housing lip.

   c. Replace the spider gasket (tab up) and press it on the pin
   d. Thread the coupling nut adapter into the coupling nut housing and hand-tighten
   e. Remove the gasket from the coupling nut and check it for tears or cuts. Replace it with a new gasket if it is damaged. Press the gasket in place in the coupling nut.

Pressure Demand Exhalation Valve

1. Temporarily fold the headstraps back over the front of the facepiece lens.
2. Pull the facepiece chin cup out so that you can see the inside of the exhalation valve
3. Use the facepiece spanner wrench to loosen the valve retaining nut

4. Unscrew and remove the retaining nut. Then, grasp the valve cover and gently pull the valve out from the underside of the facepiece.

NOTE

The pressure demand exhalation valve is replaced as a unit. No replacement parts are available. All components of each valve must be maintained as a unit. When cleaning the valve, do not interchange parts.

5. Installing the pressure demand exhalation valve in the facepiece
   a. Inspect the facepiece rubber for tears or cracks. Replace the facepiece if it is damaged. Clean the area around the facepiece mounting hole if necessary

NOTE

Rub a small amount of Never-Seez (P/N 29527) on the valve threads.

   b. Line up the exhalation valve threads with the facepiece mounting hole. Place one hand inside the facepiece and stretch the hole slightly
   c. Push the valve threads into the facepiece. Use a "threading" motion to insert the valve until the valve body rests against the facepiece rubber

NOTE

The "MSA" logo on the exhalation valve cover does not have to be aligned to any special position

   d. Pull the facepiece chin cup back so that you can see the valve, then thread the retaining nut on.
   e. Tighten the retaining nut, using the spanner wrench (P/N 461828). Reposition the facepiece headstrap.

⚠ CAUTION

Do not store the facepiece with the headstraps stretched over the lens. Doing so may distort the sealing surface and affect the facepiece seal.

6. Don the facepiece and check the face-to-facepiece seal. Follow the steps in the Air-Tightness Test, page 7.

BREATHING TUBE REPAIR

Tube or Inserts

1. Place a small screwdriver under the clamp and twist it to pry the clamp off.

2. Remove the threaded insert, breathing tube insert, and coupling nut.

Threaded Insert on the Facepiece End of the Breathing Tube

1. Slide an open clamp over the cuff of the breathing tube.
2. Moisten the insert and push it into the breathing tube.

NOTE

The coupling nut must be placed on the breathing tube insert before the insert is installed in the breathing tube.

3. Position the clamp and tighten it using pliers.

Close the clamp as tightly as possible and be sure that the locking tongue is aligned and engaged.

4. Hold the fitting and firmly pull on the tube to be sure that the connection is tight. Use the same procedures on the opposite end of the tube.
5. Check the breathing tube for leaks. (see page 15)

CARRYING CASE REPAIR

The MSA carrying case is identical for all versions of Ultralite II and Custom 4500 II apparatus. Only decals and internal spacers change from one apparatus to another.

Case Latch

1. Insert a flat-blade screwdriver under the latch at the top inside corner of the latch.
2. Pry the latch free.
3. Position the horizontal hinge pins of the latch under the case lid tabs
4. Press up on the latch pins with your thumbs while swinging the latch upwards to engage the pins in the tabs.

ACCESSORIES

Neckstrap and Ring

(P/N 473288 Ring; P/N 801156 Neckstrap)

1. To install the neckstrap and ring, remove the breathing tube from the facepiece
2. Collapse the third breathing tube corrugation (from the facepiece coupling nut end) Force the ring into the third corrugation

3. Snap the ends of the neckstrap on the ring. Make sure the neckstrap is straight and not twisted
4. Reattach the breathing tube

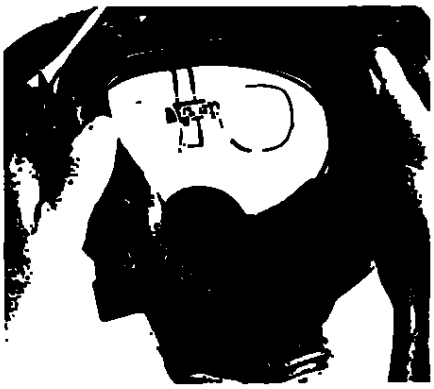
Nosecup Kit is available in small, medium, and large sizes

1. Position it as shown

2. Start at the front of the facepiece and push the rubber ring of the nosecup under the retainer ring of the speaking diaphragm assembly.
3. Continue stretching the nosecup ring and work it securely into place

Spectacle Kit (P/N 45-1819)

1. To install the spectacle kit hold the support assembly so that the coated arms are up and the rubber block is toward the facepiece lens.



2. Pull the arms together and insert the support assembly into the facepiece
3. Place the arms against the lens and release them. The ends of the arms also must be against the lens.
4. To move the spectacles closer to your face, pull the frame prongs out of the rubber block

5. To move the spectacles farther from your face, push the frame prongs into the rubber block
6. To move the spectacles up or down, slide the rubber block up or down on the support arms

SCBA Cylinders

Breathing apparatus cylinders should be recharged as soon as practicable after use. Cylinders should not be stored partially charged for two reasons:

1. If used without recharge, the duration of the apparatus is reduced.
2. The cylinder burst disc is designed to vent the air from a full cylinder when the cylinder is exposed to fire or heat. If the cylinder is not full, damage to the cylinder's strength may occur before the burst disc vents when exposed to fire or heat.

For maximum safety the cylinders should be stored full or empty (pressure above ambient but less than 100 psig).

Before recharging, cylinders must be examined externally for evidence of high heat exposure, corrosion, or other evidence of significant damage.

⚠ WARNING

Cylinders which show evidence of exposure to high heat or flame, e.g., paint turned to a brown or black color; decals charred or missing; gauge lens melted; or elastomeric materials distorted, shall be removed from service and re-hydrostatic tested before recharging.

If there is any doubt about the suitability of the cylinder for recharge, it should be returned to a certified hydrostatic test facility for expert examination and retesting.

Failure to follow this precaution may result in serious personal injury or death.

Additional information of value when performing external inspections of cylinders may be found in CGA Pamphlet C-6, "Standards for Visual Inspection of Compressed Gas Cylinders" and/or CGA Pamphlet C-6.2-1982, "Visual Inspection for Fiberglass Reinforced High Pressure Cylinders," available from the Compressed Gas Association, Inc., 1235 Jefferson Davis Highway, Arlington, VA 22202.

Always check to be sure the retest date is within the prescribed period and that the cylinder is properly labeled to indicate its gaseous service. New labels are restricted items which are not available except through certified hydrostatic test facilities.

Establish the service pressure of the cylinder. Type 3AA steel cylinders that bear a plus (+) sign after the latest retest date may be recharged to a pressure 10% greater than the stamped service pressure, i.e., a cylinder stamped 3AA 2015 with a (+) sign after the latest test date may be recharged to 2215 psig. All other cylinders which are not type 3AA shall be filled to the designated service pressure only (as found on the DOT approval label).

Appropriately connect the cylinder to the filling recharge system and refill. Terminate the filling when the pressure reaches service pressure, and allow the cylinder to cool to room temperature. If necessary, top-off the cylinder such that service pressure is attained with the cylinder at a temperature of 70 degrees F. Also see Inspection After Each Use, page 14.

Quick-Fill® System

INSTRUCTIONS

Under no circumstances should the Quick-Fill System be used except by qualified, trained personnel who have carefully read and understood these instructions, warnings and cautions.

WARNINGS FOR ALL APPLICATIONS:

⚠ WARNING

1. **NIOSH/MSHA approvals of MSA air masks are maintained while transfilling air ONLY if appropriate MSA Quick-Fill hose assemblies are used.**
2. **Do not attempt to transfill using any hose assemblies or fittings other than those supplied by MSA specifically for the Quick-Fill system. Attempted use of any hose assembly other than those supplied by MSA could result in serious personal injury or death. MSA Quick-Fill hose assemblies and Quick-Fill fittings are rated for a maximum working pressure of 4500 psig.**
3. **Never attempt to transfill air from one MSA breathing apparatus to another MSA breathing apparatus if the donor's audible alarm is ringing.**
4. **Transfilling between two users of SCBA should only be attempted during life-threatening emergency situations, or during simulated training exercises. After transfilling, both donor and receiver must return to fresh air immediately.**
5. **Never attempt to use the Quick-Fill System for any application other than its intended use: transfilling of MSA fully-wound composite or steel SCBA air cylinders.**
6. **Never attempt to lubricate the Quick-Fill fittings. Never allow oil, grease, or other contaminants to come in contact with the Quick-Fill fittings. The Quick-Fill hose assemblies and fittings are designed to be used with Grade "D" or better air as defined by CGA G-7.1.**

Failure to adhere to these warnings may result in serious personal injury or death.

Secondary Air Source

A secondary air source is any air source where compressed breathing air is stored. Generally, a secondary air source is used for refilling self-contained breathing apparatus air cylinders. Examples of a secondary air source include a "cascade" air cylinder refilling system, a high pressure compressor system with a fixed reservoir, or any SCBA air cylinder when not installed on a self-contained breathing apparatus.

To transfill from a Secondary Air Source:

1. Be sure that the secondary air source pressure is greater than the pressure in your MSA air mask cylinder.
2. **Do not** connect an Ultralite II Air Mask (2216 psig) to a secondary air source which would result in the equalization pressure exceeding 2216 psig. The Ultralite II Air Mask is rated for a maximum working pres-

sure of 2216 psig As an additional safety feature, MSA equips the black anodized Ultralite II inlet fitting with a relief valve which automatically vents at 2350 psig. Exceeding this pressure could result in serious personal injury or death.

Similarly, **never** connect a Custom 4500 Air Mask to a secondary air source which would result in the equalization pressure exceeding 4500 psig. The Custom 4500 II is rated for a maximum working pressure of 4500 psig. Exceeding this pressure could result in serious personal injury or death.

3. It is the user's responsibility to supply gaseous air meeting the requirements of the Compressed Gas Association Specification G-7.1, Grade D Gaseous Air (or better), having a moisture dew point of not greater than -65 degrees F (approximately 15 ppm water vapor) at pressures that do not exceed 2216 psig for the Ultralite II Air Mask or 4500 psig for the Custom 4500 II Air Mask at the inlet of the Quick-Fill hose.
4. It is additionally the user's responsibility to properly connect one end of the Quick-Fill hose to an appropriate secondary air source. To assist users in properly connecting the Quick-Fill hose to a secondary air source, the following components are available:

MSA P/N	Description
485391	Male stainless steel quick-disconnect with SAE-10 thread, complete with dust cover (for use as a fitting for customized refilling systems)
	25-Foot Quick-Fill Hoses Note: Female quick-disconnect fittings include dust covers
485332	With two female quick-disconnects
487906	With a female quick-disconnect on one end and a SAE-4 fitting on the other
487907	With a female quick-disconnect on one end and a CGA-347 (4500 psig) outlet on the other
487908	With a female quick-disconnect on one end and a CGA-346 (2216 psig) outlet on the other
487909	With a female quick-disconnect on one end and a CGA-347 (4500 psig) coupling nut on the other
487910	With a female quick-disconnect on one end and a CGA-346 (2216 psig) coupling nut on the other

5. Connect one end of the Quick-Fill hose to an appropriate secondary air source, assuring that the connection is secure, that only Grade D air or better is being supplied, that the moisture content does not exceed -65 degrees F, and that the proper pressure is supplied to the inlet, either 2216 psig or 4500 psig.
6. Now pressurize the system, including the Quick-Fill hose.

If your secondary air source is equipped with a Quick-Fill fitting, P/N 485391, you can pressurize the Quick-Fill hose by properly aligning the male and female fittings and pushing the female fitting onto the male fitting until a "click" is heard. When the female hose fitting is properly attached, a green anodized ring will be visible directly behind the gray anodized sleeve. The "click" is to provide an audible indication of connection and the green ring is to provide a visual indication of connection

⚠ CAUTION

The hose assembly is now pressurized. If serious leakage is noticed from either of the two "female" fittings, or anywhere along the hose length, depressurize the hose assembly and correct the problem. Slight leakage from the unconnected "female" fitting is acceptable.

7. Remove the rubber dust cap from the "male" Quick-Fill fitting located on the inlet elbow of the MSA pressure demand regulator. Be sure that the cylinder valve is fully opened. The Quick-Acting main-line valve may be either open or closed, depending on whether the air mask is being breathed on by the user.
8. Remove the rubber dust cap from the "female" Quick-Fill fitting on the pressurized Quick-Fill hose
9. Properly align the male and female fittings and push the female fitting onto the male fitting until a "click" is heard. When the female hose fitting is properly attached, a green anodized ring will be visible directly behind the gray anodized sleeve. The "click" is to provide an audible indication of connection and the green ring is to provide a visual indication of connection.
10. Pressurization and transfilling of air will begin the instant that the female fitting is "clicked" on the the regulator's male fitting.
11. If the main-line valve is opened, be sure that either a facepiece and breathing tube is donned and attached to the regulator outlet, or that the rubber outlet cover is in place to prevent the loss of breathing air.
12. After approximately 45-60 seconds, equalization of pressure will occur between the secondary air source and the air mask cylinder.
13. If the secondary air source does not have a sufficient volume of air stored in it, the air mask cylinder will not achieve full service pressure · Check the air mask pressure gauge reading and compare it to the secondary air source pressure gauge reading. If the two readings are the same, equalization of pressure has occured.
14. Disconnect the female hose fitting from the regulator Quick-Fill fitting by pulling back on the gray anodized sleeve. An audible "hiss" or "pop" may be heard as the two fittings are separated and the high pressure air is sealed off.
15. **Important:** Immediately re-install the dust cover on the "male" fitting. The dust cover serves to not only prevent dirt, water, and debris from entering the fitting, but also provides a redundant sealing feature. **Always install the dust cover immediately after disconnecting**

from the Quick-Fill Hose Assembly.

16 The air mask is now ready for service, provided the cylinder pressure gauge reads "full."

⚠ CAUTION

Due to the rapid compression of air within the cylinder, a slight increase in cylinder temperature willl be noticed (approximately 45 degrees F). Although the pressure gauge may indicate that the cylinder is full immediately after transfilling air, the cyinder pressure may decrease by as much as 190 psig after the cylinder cools to room temperature. Actual service time of apparatus may be reduced accordingly.

Transfillig Air from one SCBA to another SCBA (Emergency Escape Breathing Support System EEBSS)

1. NIOSH/MSHA approvals of MSA air masks ar maintained when transfilling air from one MSA air mask to another when equipped with fully-wound composite cylinders or steel cylinders
2. Transfilling between users of SCBA should only be attempted during life-threatening emergency siutations, or during simulated training exercises

⚠ WARNING

Never attempt to transfill air from one MSA breathing apparatus to another MSA breathing apparatus if the donor's audible alarm is ringing. Failute to adhere to this warning may result in serious personal injury or death.

To transfill from one MSA SCBA to another MSA SCBA:

1. When transfilling air from one MSA air mask to another, the air mask with the higher pressure is referred to as the **"donor"** air mask and the air mask with the lower pressure is referred to as the **"receiver"** air mask
2. Do not attempt to transfill air if the donor's audible alarm is ringing because transfilling of air to a receiver when your audible alarm is ringing will result in shorter egress times for you to escape to fresh air. The audible alarm begins ringing to indicate that the pressure in the cylinder has been reduced to 20-25% of its rated working pressure. This equates to a rated service time remaining of about 5-7 minutes for an Ultralite II or Custom 4500 II with 30 minute cylinder and about 12-15 minutes for a Custom 4500 II with 60 minute cylinder. **This time must be used for escape to fresh air. If the donor's audible alarm begins ringing during the transfilling, the donor should disconnect and preserve his rated escape time.**
3. If your alarm is not ringing and you have sufficient air to transfill air to a "receiver" air mask ("sufficient" means greater than approximately 1000 psig for Ultralite II Air Masks and greater than approximately 2000 psig for Custom 4500 II Air Masks), transfilling of air can be accomplished as follows.
4. Remove the 3 foot emergency transfill hose from its protective pouch.
5. Remove the rubber dust covers from both "female" fittings on the EEBSS hose assembly and the "male" fittings on the MSA pressure demand regulators.
6. Properly align the male and female fittings and push the female fitting onto the male fittings until a "click" is heard. When the female hose fitting is properly attached, a green anodized ring will be visible directly behind the gray anodized sleeve. The "click" is to provide an audible indication of connection and the green ring is to provide a visual indication of connection

⚠ CAUTION

The hose assembly is now pressurized. If serious leakage is noticed from either of the two "female" fittings or anywere along the hose length, disconnect the female fittings and abort the attempted transfill.

7. After approximatley 30-60 seconds, equalization of the two MSA air mask cylinders will occur. Actual equalization time is dependent on the pressure in the receiver's cylinder and in the donor's cylinder. Even with the widest pressure range, equalization should occur within 60 seconds.
8. Disconnect the female fittings from the male fittings by pulling back on the gray anodized sleeve. An audible "hiss" or "pop" may be heard as the two fittings separate and the valves seal off high pressure air.
9. **Important:** Immediately re-install the dust cover on the "male" fitting. The dust cover serves to not only prevent dirt, water and debris from entering the fitting, but also to provide a redundant sealing feature. **Always install the dust cover immediately after disconnecting from the EEBSS hose assembly.**

   Important: If the "male" fitting is leaking excessively when you disconnect the EEBSS hose from it and you cannot replace the dust cover, follow this important procedure.

   First, attempt to immediately reconnect the hose to the male fitting. This will seal off the leak.

   Second, if the leakage is too great for you to reconnect the hose, reach behind you and close your cylinder valve. As air pressure in the regulator assembly *is reduced, the leak in the* male fitting will also slow down. Quickly replace the rubber protective dust cap onto the male Quick-Fill fitting. This will form a redundant seal. Open your cylinder valve and proceed to fresh air immediately.
10. Once you have reached fresh air, it is important to note that there is air pressure inside the 3 ft. length of hose that was used for transfilling. With your thumb or forefinger, depress the center of one of the rubber dust caps that covers the quick-disconnects on each end of the EEBSS hose. This will vent the trapped air pressure. Roll-up the hose assembly and place it in its protective pouch. Also see page 9.

⚠ WARNING

Do not attempt to repair any of the male or female Quick-Fill fittings, or the relief valve assembly supplied on MSA Air Masks.

If repairs are required on these components, contact your nearest MSA *office toll free at 1-800-MSA-2222.*

Failure to follow this precaution may result in serious personal injury or death.

Ultra Elite Facepiece Repairs (Waist-Mounted)

Replacing the Rubber Headstrap

NOTE

To replace the standard rubber headstrap (the one with rollers and end-tabs), refer to pages 28-29

To replace the standard rubber headstrap if the buckle assemblies are damaged, or to install the EZ-Don Harness, follow the steps below

1 To remove a damaged rubber head strap from the facepiece, lay the facepiece on a table or other flat surface.
   a. Grasp the facepiece lug with the thumb and forefinger of one hand Grasp the headstrap metal buckle with the thumb and forefinger of the other hand.
   b. Pry the metal buckle up with your thumb as you stretch the facepiece lug

   c. Turn the facepiece and switch hands to pry up on the other side of the metal buckle.
   d Pull the facepiece lug out of the metal buckle.
   e Repeat steps a through d for each remaining strap.
   f. If you removed the headstrap to install the EZ-Don Harness, go to column 2 Installing the EZ-Don Harness
2 To install a new rubber headstrap, lay the new headstrap flat. The MSA logo should be right-side up. Each strap is labeled Pick the headstrap up by the strap labeled "Front".
   a. Insert the facepiece lug into the metal buckle
   b Hold the buckle down against the facepiece lug with the thumb and forefinger of one hand while gripping the end of the lug with the thumb and forefinger of the other hand
   c. Pull the buckle and lug in opposite directions while twisting them from side to side to work the buckle down until it snaps in place over the lug

   d. Repeat steps a through d for each remaining strap Check that the installed headstrap is not twisted.
3 Don the facepiece and check the face-to-facepiece seal Follow the Air-Tightness test procedure found on page 7.

Removing the EZ-Don Harness

1 To remove a damaged EZ-Don harness from the facepiece, lay the facepiece on a table or other flat surface
2 Follow Replacing the Rubber Headstrap, steps 1a-d for each of the top three straps.
3. To remove the bottom buckles, pull the back of the buckle away from the rubber strap and pull slightly so the rubber harness end-tab is at the buckle.
4. Fold the end-tab sides together, then slide each tab through its buckle.
5. Repeat steps 3 and 4 for the other buckle

Installing the EZ-Don Harness

NOTE

The white harness label should be facing toward the inside of the facepiece. Install the top strap first

1. Follow Replacing the Rubber Headstrap, steps 2a-c.
2. Repeat steps 2a through c for each of the three straps
3. To attach the bottom straps, fold the end-tab sides together and push the end-tab under the metal roller. Pull the metal roller down against the strap.
4. Fold and push the end-tab through the buckle again this time passing over the metal roller The serrations should be facing up where the strap passes over the roller
5. Repeat steps 3 and 4 for the remaining strap.
6. Check that none of the straps on the installed head harness is twisted.

7. Don the facepiece and check the face-to-facepiece seal. Follow the Air-Tightness Test procedures on page 7.

Before each use, check the head harness for tears, split threads, etc **Do not use a damaged harness.** If the head harness is damaged in use, or if the material becomes torn, blistered, or abraded, it must be replaced

CLEANING AND SANITIZING

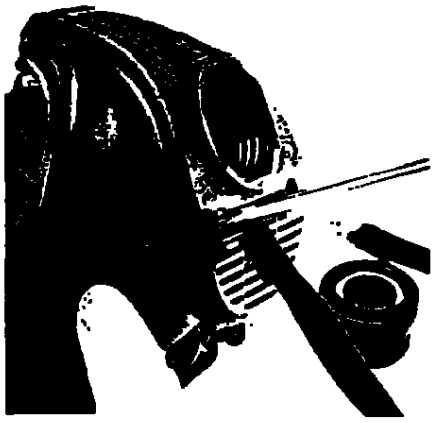
Machine wash in warm water (maximum 120 degrees F) with a mild detergent. Hang the harness in an open area to air-dry. **Do not dry clean.** Do not bleach or use abrasive cleaners. Do not fold or store when wet

Ultra Elite Facepiece Repairs (Waist-Mounted)

Removing the Component Housing Cover

1 Unthread and remove the adapter assembly

2 Remove the two component housing cover screws and the neckstrap



3 Lift up on the cover release hook, located forward of the adapter assembly opening. Once the release is lifted, you can remove the cover by pulling it away from the housing.

⚠ CAUTION

Be careful that you do not damage internal parts of the component housing assembly (exhalation valve, spring, retainer, or speaking diaphragm) once the cover is removed.

To Install the Component Housing Cover:

1. Place the component housing cover over the housing.
2. Insert the tab on the top of the cover into the slot in the bottom of the lens ring.
3. Press in on the front of the cover until the cover hook snaps in place.
4. Line up the screw holes in the cover with the threaded inserts in the housing.
5. Place the neckstrap retaining brackets in the component housing cover sockets. Install the Philips screws and tighten to secure the housing and neckstrap.
6. Insert the adapter assembly in the facepiece and hand-tighten.
7. Don the facepiece and check the face-to-facepiece seal. Follow the Air-Tightness test procedure on page 7.

Removing the Facepiece Lens and Ring

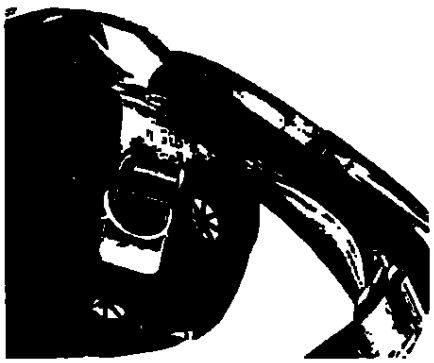
⚠ CAUTION

The protective papers on the lens should not be taken off until the lens is completely assembled in the facepiece.

NOTE

Remove the adapter assembly and component housing cover.

1. Using a Philips screwdriver, loosen and remove the screw from each side of the facepiece lens retaining ring.



2 Remove the upper and lower lens retaining rings

3. Fold the facepiece flange rubber back and pull the lens out of the groove

Installing the Facepiece Lens and Ring

1. Remove any dirt, lens fragments, or other debris from the groove. Line up the new lens center-line marks (top and bottom) with the facepiece center-line mark. Insert the top of the lens into the groove. Work the facepiece rubber flange around the lens to fully seat the lens in the groove. When installed correctly, the bottom lens center-line mark lines up with the bottom facepiece center-line mark.

2. Moisten the facepiece housing area and the inside of the housing ring.

3. Install the bottom ring Insert the tab at the top of the component housing into the slot at the bottom center of the lower lens ring The tab should snap into place.

4. Line up the top lens ring center-line with the facepiece rubber flange center-line mark. Press the ring into place
5. Press the ring halves together at the top an bottom of the facepiece so that the ends mate.
6. Install a screw on each side. Start the screws They should thread easily. If not, remove and re-install the screws to avoid cross-threading Keep hand pressure on both ring halves
7. As the ring halves come together, alternate tightening the left and right screws to be sure the rings seat completely on the rubber flange.

⚠ CAUTION

Do not overtighten. Rubber must not show between the lens ring ends at the joint. If this happens, reassemble.

8. Remove all lens protective papers from the new lens.
9. Re-install the component housing and the adapter assembly
10. Don the facepiece and check the face-to-facepiece seal. Follow the Air-Tightness test procedure on page 7
11. Install a cover lens to protect the facepiece polycarbonate lens during storage

⚠ CAUTION

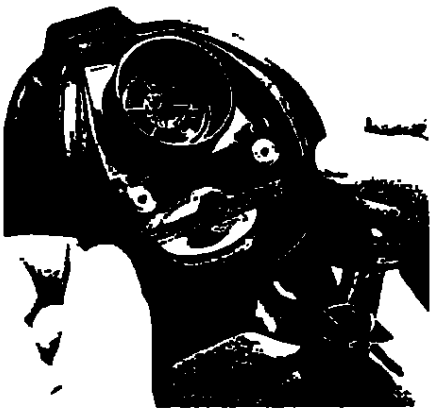
Do not use a cover lens in a high-temperature environment. High temperatures may distort the cover lens. Or, moisture trapped between a cover lens and the facepiece lens may condense and distort vision. Always remove the cover lens before donning the facepiece.

Removing the Component Housing Assembly

NOTE

Remove the adapter assembly and the component housing cover

1. Using a small Philips screwdriver, remove the component housing ring screw. Grasp the ring with the thumb and forefinger of each hand. Gently spread the ring halves apart at the bottom



2. When the facepiece rubber is out of the ring groove, lift the ring up away from the facepiece. You may need to pull the housing down slightly to allow enough room to remove the ring from between the housing and the lower lens ring

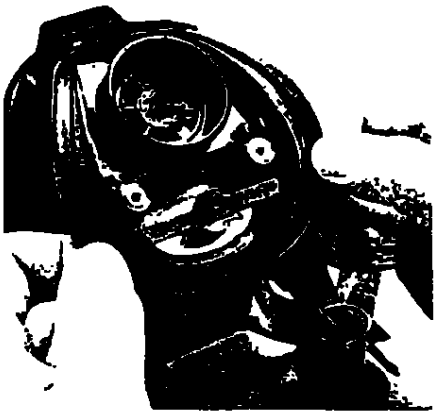
3. Remove the facepiece rubber from the component housing and pull the housing and nosecup (if installed) out of the facepiece

Installing the Component Housing Assembly

1. Slide the housing into the front of the facepiece
2. Starting at the top (narrow end) of the housing, place the housing in the facepiece groove. Work the rubber all the way around the housing. Check that the housing is completely captured inside the groove and the center-lines are lined up

3. Moisten the facepiece housing area and the inside of the housing ring.
4. Insert the narrow end of the ring into the space between the lower lens ring and the facepiece housing area.
5. Line up the component housing ring mark with the facepiece centerline.

6. Starting at the top, work the housing ring down on the facepiece to capture the facepiece rubber in the ring groove. Work your way down each side of the ring until the facepiece rubber is completely captured inside the ring.

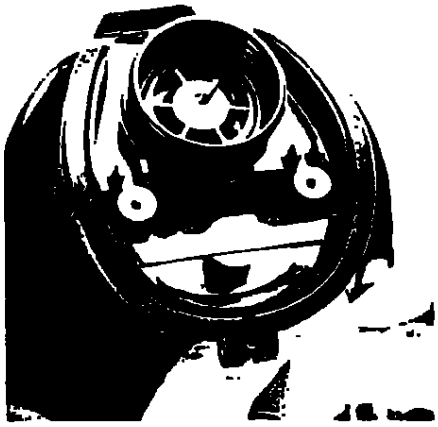


7. Gently squeeze the ring halves together at the bottom of the housing. Watch the facepiece rubber at the top as you do this. If you see any bulges or wrinkles in the facepiece rubber, it is not captured in the groove. Rework the ring around the facepiece rubber until there are no bulges or wrinkles.

⚠ WARNING

Bulges or wrinkles mean that the facepiece rubber is not seated correctly in the ring. Re-install the ring to seat it correctly. Failure to follow this precaution may cause the facepiece to leak and result in serious personal injury or death.

8. When the housing ring appears to be seated, grasp the outside of the ring and the inside of the housing at the top between your thumb and forefinger and squeeze them together. Then do the same with the ring halves at the bottom.
9. Install the screw and tighten using a small Philips screwdriver.



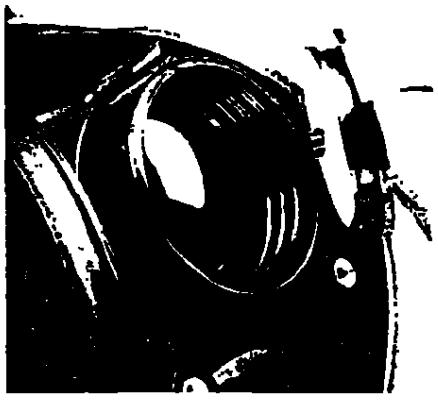
⚠ CAUTION

Rubber must not extrude between the component housing ring ends at the joint. If this happens, reassemble.

10. Re-install the nosecup or air baffle (if used) in the facepiece.
11. Re-install the component housing cover and adapter assembly.
12. Don the facepiece and check the face-to-facepiece seal. Follow the Air-Tightness test procedure on page 7.

Replacing the Inlet Gasket and Disc Valve

1. Push in on the facepiece coupling nut and turn it until its tabs fit into the slots in the adapter.
2. Twist the coupling nut counterclockwise (left) to unscrew the adapter assembly.
3. Remove the inlet gasket and disc valve by pulling on the gasket pull-tab.
4. Remove the disc from the gasket and inspect both for wear. The disc should be very soft and pliable. Install a new disc valve if it is damaged or hardened.
5. To install the inhalation disc valve:
   a. *Gently*, stretch the hole in the center of the disc valve over the gasket stem.
   b. Note that the inlet gasket has a groove around its inside.
   c. With the pull-tab facing you, insert the gasket into the facepiece at an angle so that its groove captures the housing rim.



NOTE

You may have to bend the gasket slightly to work the groove under the rim all the way around. When installed correctly, the gasket will lay flat in the housing, and none of the spokes will be bent.

   d. Thread the coupling nut adapter into the component housing and hand-tighten.
   e. Don the facepiece and check the face-to-facepiece seal. Follow the Air-Tightness test procedure on page 7.

Removing the Pressure Demand Exhalation Valve

1. Unthread and remove the adapter assembly.
2. Remove the two component housing cover screws and the neckstrap.
3. Lift up on the cover release, located forward of the adapter assembly opening. Once the release is lifted, you can remove the cover by pulling it away from the housing.
4. Slide the spring retainer to one side, then *carefully* push the retainer down into the component housing just enough to free it from the slot in the housing. Lift the retainer and the spring out of the component housing.

5. Inspect the retainer and spring. If either appears to be damaged or distorted replace the damaged part. Only the last coil of the spring should be held by the lugs on the spring retainer.
6. Turn the facepiece upside down and tap the valve stem with your finger. The exhalation valve should drop out of the component housing.

⚠ WARNING

Be careful not to damage the valve seat in the housing. If the valve seat is damaged, the entire component housing must be replaced.Also be careful not to damage the soft rubber surface of the valve.

7. Inspect the exhalation valve for tears, punctures, deformations, and brittleness. The rubber valve stem should be soft and pliable. The valve boss also must be free of damage, as this is the surface the spring works against. Install a new valve if it is damaged. The plastic stem must be firmly seated and properly aligned in the valve. If the stem does not seat firmly because the valve is damaged, use a new valve.

Installing the Pressure Demand Exhalation Valve

1. Inspect the exhalation valve seat in the component housing for damage. Replace the component housing if the seat is damaged. Clean the exhalation valve seat with a soft cloth.
2. Insert the exhalation valve stem into the stem guide hole in the component housing.
3. Ensure that the spring is secured to the spring retainer. Only one coil turn should be under the retainer lugs. Place the free end of the spring over the exhalation valve boss.

NOTE

The retainer ends are beveled. The shorter end goes down (toward the wide part of the component housing). In this position, the part number on the retainer reads upside down.

4. Insert one end of the spring retainer all the way into the slot on one side of the component housing. Place the other end of the retainer against the side of the housing above the slot, then slide the retainer toward the bottom of the housing until the retainer snaps into place.

5. Place the component housing cover over the housing.
6. Insert the tab on the top of the cover into the slot in the bottom of the lens ring.
7. Press in on the front of the cover until the cover hook snaps into place.
8. Line-up the screw holes in the cover with the threaded inserts in the housing.
9. Place the neckstrap retaining brackets in the component housing cover sockets. Install the Philips screws and tighten to secure the housing and neckstrap.
10. Insert the adapter assembly in the facepiece and hand-tighten.
11. Don the facepiece and check the face-to-facepiece seal. Follow the Air-Tightness test procedure on page 7.

Replacing the Speaking Diaphragm

1. Remove the nosecup or air baffle (if installed) from inside the facepiece.
2. Unscrew and remove the speaking diaphragm retaining ring.

3. Turn the facepiece upside down and shake out the metal speaking diaphragm and gasket assembly.
4. Check the speaking diaphragm and gasket assembly for damage. Replace it if it is worn or damaged.
5. Be sure that the gasket is on the diaphragm assembly. Place the diaphragm in the retaining ring. Be sure that the gasket side of the speaking diaphragm will be facing the component housing.
6. Replace the retaining ring and hand-tighten.
7. Re-install the nosecup (if used) in the facepiece.
8. Don the facepiece and check the face-to-facepiece seal. Follow the Air-Tightness test procedure on page 7.

Installing the Spectacle Kit
(P/N 80-1638)

The spectacle kit is designed to be used by people who wear glasses. The temple bars of conventional glasses extend beyond the sealing edge of a full facepiece and prevent a proper seal. The kit includes the support assembly, a rubber block, and the spectacle frame. Prescription lenses can be obtained locally or through MSA. To install the kit:

1. **Temporarily** stretch the head harness over the facepiece lens.
2. Hold the support assembly so that the "coated" arms are up and the rubber block is toward the facepiece lens.
3. Squeeze the arms together and insert the kit into the facepiece.
4. Place the arms against the lens and release them. The ends of the arms also must be against the lens.
5. Adjust the wire frame so it lines up with the small rubber lugs at the top of the lens.

6. To move the spectacles closer to your face, pull the frame prongs out of the rubber block.
7. To move the spectacles farther from your face, push the frame prongs into the rubber block.
8. To move the spectacles up or down, slide the rubber block up or down on the support arms.
9. Return the head harness to its normal position.

Installing the Nosecup or Air Baffle
The nosecup is used with the Ultra Elite facepiece to reduce lens fogging caused by high humidity or temperatures below 32°F.

1. **Temporarily** stretch the head harness over the facepiece lens.
2. Pull the facepiece chin seal back.
3. Place the nosecup (or air baffle) into the facepiece so the groove on the large round hole is toward the speaking diaphragm. The smaller egg-shaped hole should be down, toward the exhalation valve.
4. Stretch the groove over the speaking diaphragm retainer. Be sure the retainer is captured in the groove all the way around.
5. Look into the lens to be sure the nosecup is lined up so that the narrow bridge is centered and points up.
6. Run your forefinger around the exhalation valve to work the egg-shaped hole around the exhalation valve groove.
7. On the nosecup only, be sure that the nosecup chin seal is folded down so the facepiece chin seal lays on top.
8. Return the head harness to its normal position.

Nosecup Assemblies		
495188 Medium, Black	810408 Medium, Blue	
810412 Medium, Gray	495189 Large, Black	
810409 Large, Blue	810413 Large, Gray	
Air Baffle Assemblies		
805018 Black	809857 Blue	809858 Gray

NOTE
If you are going to install the spectacle kit as well, do it first. This makes both kits easier to install.

Troubleshooting Guide

Trouble	Probable Cause	Remedy
High-pressure hose is leaking.	1. If leak is from the end-fittings, hose may need tightened.	1. Tighten hose into 90° elbow or 45° elbow (where ever leak is present): see pages 23 or 25. If the leak is from underneath the crimped end-fitting, the hose must be replaced, see page 24
	2. If leak is from under the hose cover, the hose inner tube may have been pinched.	2. Remove the spiral hose cover and check for leaks; if leak persists, then the hose must be replaced; see p. 24 If the leak does not continue, then the leak may have been due to a slight amount of gas permeation through the hose This is a normal physical characteristic of all elastomers The hose does not need replaced. If hose integrity is still doubtful, then replace the hose.
Regulator gauge shows different pressure from cylinder valve gauge.	1. Main-line valve may not be fully open.	1. Fully open main-line valve.
	2. Gauge needle may be stuck.	2. Tap lightly on the gauge lens. If gauge reading does not change, check to be sure indicator needle is not bent or damaged.
	3. Gauge accuracy is out of tolerance.	3. Gauges are required by NIOSH to be accurate to ± 5% of full scale. If the cylinder valve gauge has a +5% accuracy and the regulator gauge a -5% accuracy, then a compared reading between the two gauges may differ by 10% (220 psig for 2216 psig cylinders, 300 for 3000 psig cylinders, and 450 for Custom 4500 II psig cylinders). If the gauges are within this requirement, then they are acceptable. To replace a regulator gauge see p. 22. Cylinder valves must be replaced by a Level II repair person or by a Certified Level III Service Center.
Regulator main-line valve and handwheel are leaking.	1. Valve stem gasket is worn out.	1. May need to replace valve stem gasket. Return to a Level II/III repair person.
	2. Packing gland is too tight.	2. May need to be replaced Return to a Level II/III repair person
Regulator gauge shows unacceptable pressure drop.	1. Leak at high pressure hose or coupling nut.	1. Check the hand-tight coupling nut to be sure it's tight. If leak continues, leak-test the high pressure connections and tighten those that are leaking
	2. By-pass valve is not fully closed.	2. Tighten the by-pass valve handwheel.
	3. Leak through the regulator.	3. Completely leak-test the regulator; see p. 18.
Regulator has low flow performance.	1. Cylinder valve not fully open or cylinder does not contain minimum pressure.	1. Fully open cylinder valve handwheel and be sure to use a cylinder charged to at least 1200 psig, Ultralite II, 2000 psig, Custom 4500 II..
	2. Main-line valve not fully open.	2. Fully open main-line valve handwheel
		3. If low flow continues, return to a Level II or Level III repairperson.

INSPECTION & MAINTENANCE CHECK LIST FOR SELF-CONTAINED BREATHING APPARATUS SERIAL NO._____ LOCATION _____ IDENTIFICATION _____

WEEKLY INSPECTION

DATE INSPECTED	CYLINDER PRESSURE	CYLINDER CHANGED	DATE INSPECTED	CYLINDER PRESSURE	CYLINDER CHANGED	DATE INSPECTED	CYLINDER PRESSURE	CYLINDER CHANGED	DATE INSPECTED	CYLINDER PRESSURE	CYLINDER CHANGED

MONTHLY INSPECTION

DATE INSPECTED	CYLINDER PRESSURE	CYLINDER CHANGED	REGULATORS OK	FACEPIECE & BREATHING TUBE OK	CLEANED AND SANITIZED	ENTIRE APPARATUS OK	REMARKS	INSPECTED BY

All inspections should be made in accordance with ANSI Standard Z88.2 & Z88.5

NOTE. This check list is offered only as a general guide for the inspection and maintenance of the MSA Pressure Demand Air Masks. Under no circumstances should these products be inspected and maintained except by qualified trained personnel and not until the instructions, labels, or other literature accompanying the products have been carefully read and the precautions therein set forth are followed. Only they contain the complete and detailed information concerning these products.

INSPECTION AFTER EACH USE

DATE USED	CYLINDER PRESSURE	CYLINDER CHANGED	FACEPIECE & BREATHING TUBE OK	ENTIRE APPARATUS OK	CLEANED AND SANITIZED	CONNECTIONS OK	REMARKS	INSPECTED BY	DATE INSPECTED

NOTE
Users may photo-copy Maintenance Logs and Tags.

MSA Air Mask Maintenance

CHECK LIST

1 Mask and Hose — Examine for contamination damage and deterioration

2 Stretch Hose — Check for tightness of assembly and cracking

3 Examine Harness for wear and function of hardware

4 Test unit as worn (Regulator hooked up to cylinder)

a Check cylinder gage for full indication (2216 P S I or 3000 P S I on Ultralite units 4500 P S I on Custom 4500 Air Mask). Replace or recharge cylinder if pressure is less than that stamped on the cylinder (This procedure should be done at least weekly.)

b With main-line (yellow) closed open cylinder valve to pressurize regulator and hose

c Place hand over regulator outlet to block it leaktight

d Open the mainline valve

e Close cylinder valve Compare regulator gage to cylinder gage Plus or minus 100 P S I (200 total) allowable

f. Watch regulator gage for drop in reading which would indicate leakage (Check instruction card furnished with apparatus for allowable leakage.)

g Take hand from regulator outlet slightly and check regulator gage for indication of pressure at which Audi-Larm rings Alarm should ring at about ¼ full

h With cylinder valve closed, breathe out remaining pressure if necessary

Mine Safety Appliances Company
P O. Box 426
Pittsburgh, Pennsylvania 15230

IMPORTANT

Inspections must be made each month
Each use must be recorded

INSPECTION RECORD

Date	Findings and Action Taken	By

USE RECORD

Date	By	Date	By

Serial No. _____

Identification _____

APPENDIX Q

KAPPLER SUIT MANUAL

See attached.

Chempruf™ II

total-encapsulating suit
instruction manual

⚠ WARNING

This manual, including the warnings and cautions inside must be read and followed carefully by all persons who have or will have the responsibility for using or servicing the product. This suit will perform as designed only if it is used and serviced according to the instructions. Otherwise, it could fail to perform as designed, and persons who rely on this suit could sustain severe personal injury or death. Failure to follow this precaution may result in serious personal injury or death.

The warranties made by MSA with respect to the product are voided if the product is not used and serviced according to the instructions in this manual. Please protect yourself and your employees by following the instructions. Please read and observe the warnings and cautions inside. We encourage our customers to write or call for a demonstration of this equipment prior to use, or for any additional information relative to use or repairs. During regular working hours, call 1-800-MSA-2222. After working hours or during emergencies, call 1-800-MSA-5555.

Manufactured by
MSA MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

TAL395 (L) Rev 2
481127

Table of Contents/Description

TABLE OF CONTENTS

GENERAL DESCRIPTION 2
WARNING 3
Heat Resistance 3
CHEMICAL RESISTANCE GUIDE 3
Permeation Resistance 3
Triplicate Testing 4
Singular Testing 6
WARNING 6
Chemical Resistance Guide 7
Penetration Resistance 17
Degradation Resistance 18
WARNING 18
INSPECTING THE CHEMPRUF II SUIT BEFORE DONNING 18
Inspection Record 18
Suit Physical Inspection 18
WARNING 20
Breathing Apparatus Inspection 20
Shelf Life 20
DONNING THE SUIT 20
Preparing to Don the Chempruf II Suit 20
Donning the Self-Contained Breathing Apparatus 20
Donning the Hardhat 22
Donning the Standard Chempruf II Suit 23
WARNING 23
Donning the Dual-Purpose Chempruf II Suit 23
WARNING 23
USING THE CHEMPRUF II SUIT 24
WARNING 24
Emergency Operation, Standard SCBA from MSA 24
Emergency Operation, Dual-Purpose Breathing Apparatus from MSA 25
WARNING 25
Warnings and Cautions for Use 25
WARNING 25
Preliminary Decontamination (Before Removing the Suit) 26
WARNING 27
Removing the Suit 27
Decontamination 28
Decontamination Procedures 28
WARNING 28
Testing for Residual Contamination 28
Additional Decontamination Information 28
Cleaning and Sanitizing 29
Using the Suit Integrity Check Kit 30
Transportation and Storage 31
MAINTAINING THE SUIT 31
Replacing the Faceshield Lens and Gauge Window 32
To Remove the Faceshield Lens or Gauge Window 32
To Install the Faceshield Lens or Gauge Window 32
Removing a Boot 34
Installing a Boot 34
WARNING 35
Removing a Glove 35
Installing a Glove 35
WARNING 36
PRODUCT SPECIFICATIONS 36
REPLACEMENT PARTS 38
TECHNICAL INFORMATION CHART 42
MSA Protective Suit History 43
MSA Protective Suit Inspection Checklist 44

GENERAL DESCRIPTION

The Chempruf II total-encapsulating suit is designed to provide limited wearer protection from exposure to hazardous chemicals by completely covering the wearer and his breathing apparatus.

The suits were designed with respiratory protection in mind. The faceshield lens provides excellent peripheral vision when worn with the Ultravue facepiece from MSA. The "batwing" sleeve design provides extra room in the armpit areas. This permits the wearer to withdraw his arms from within the suit to perform such functions as:

- operate the by-pass and main-line valves
- disconnect the bulkhead air-line adapter assembly from the regulator
- check that the cylinder valve is fully open
- wipe the faceshield lens

A regulator gauge viewing window is located at the left waist area so that the user may check the regulator pressure gauge of his breathing apparatus from MSA.

There are two Chempruf II suit designs: Expanded Back and Dual-Purpose. The Expanded Back design is for use with any NIOSH/MSHA certified self-contained breathing apparatus. One may use the Ultralite or Custom 4500 Air Masks from MSA, or similarly approved units from other manufacturers, as long as the suit does not interfere with the form, fit or function of the breathing apparatus. To determine this, wear the suit and breathing apparatus in a clean environment and check all functions before entering any IDLH atmosphere.

The Dual-Purpose suit is equipped with a Bulkhead Air-line Adapter Assembly so that the suit may be used with the following combination breathing apparatus from MSA:

- Ultralite Dual-Purpose Air Mask
- Custom 4500 Dual-Purpose Air Mask
- Model 401 Dual-Purpose Air Mask

This permits the wearer to use air from either the cylinder or from an air-line up to 300 feet long during such operations as donning the suit, entering the work area, working in the hazardous atmosphere, exiting the work area and during suit removal.

The Pressure Demand Work Mask may be used with the dual purpose suit, but the user must enter the work environment while breathing from the air-line. Also, the user must leave the work atmosphere IMMEDIATELY if he disconnects the bulkhead air-line adapter assembly from the regulator, as the 5-minute cylinder is rated for escape purposes only, and the device has no audible alarm. If the Pressure Demand Work Mask (with chest-mounted regulator) *is used with the dual-purpose suit,* arrangements must be made with MSA to relocate the position of the regulator gauge viewing window.

Only dual-purpose breathing apparatus from MSA, and the Pressure Demand Work Mask from MSA may be used with Dual Purpose Chempruf II suits. Breathing apparatus from MSA are the only combination breathing apparatus with NIOSH/MSHA extension of approval for use with the bulkhead air-line adapter assembly of the Chempruf II Suit.

Chemical Resistance Guide

⚠ WARNING

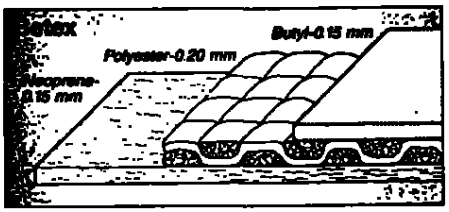
Do not use the bulkhead air-line adapter assembly from MSA with dual-purpose breathing apparatus of other manufacturers. Pressure drop through the assembly may *cause a malfunction of the breathing apparatus*, resulting in serious personal injury or death.

Chempruf II suit assemblies consist of the following components.

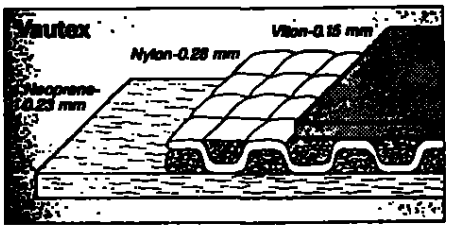
- suit material (Betex or Vautex)
- faceshield lens
- regulator gauge viewing window
- replaceable gloves and boots
- gas-tight zipper
- 3 exhalation valves to vent excess air from the suit
- V-Gard® cap with FasTrak™ suspension

The Chempruf II suit is available in Betex or Vautex fabric. Both are three-layered fabrics, but differ in color and outer layer material. The base layer for both fabrics is neoprene

Betex material begins with a supporting substrate fabric made from polyester. The inside is coated with black neoprene and the outside is coated with orange butyl. The fabric is approximately 19 mils (0.019") thick and weighs about 16 ounces per square yard.



Vautex material begins with a supporting substrate fabric made from nylon. The inside is coated with black neoprene and the outside is coated with green Viton*. The fabric is approximately 23 mils (0.023") thick and weighs about 20 ounces per square yard.

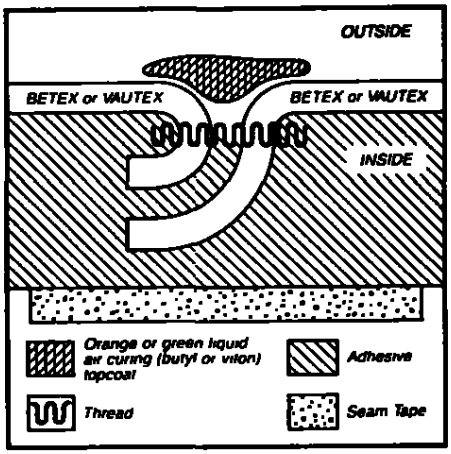


*Viton is a registered trademark of E.I. duPont deNemours & Co., Inc.

Heat Resistance

Vautex and Betex materials are tested at 320°F (160°C) in an air-circulating oven for 45 minutes to confirm that no delamination occurs. During this test, the coatings must remain unchanged.

Seams are made to be gas-tight, as measured by the Suit Integrity Check Kit from MSA This is done by sewing the suit material with polyester thread, applying adhesive to all inside surfaces of the seam, folding it to one side,then covering the inside of the seam with seam tape.



A physically durable closure results, because neoprene seam tape bonds tightly to the neoprene underside of the basic suit material with a neoprene-based adhesive.

Additionally, the top of each seam is covered with a topcoat material which is compatible with the outside surface of the seam threads Any thread contact with a chemical might be an indirect exposure---not a direct exposure. A secondary function of the topcoat is to improve the aesthetic appeal of the suit's exterior. The degree with which the topcoat shields the thread and underlying seam depends on the conditions of exposure such as, but not limited to, the type and purity of the chemical, temperature, and time of exposure. The topcoat material does not completely cover each and every thread of the suit and cannot be expected to do so because of the topcoat's consistency.

By remaining folded in storage, and with stretching and wear of the suit, the topcoat material may permit some threads to be seen from the outside of the suit. This does not compromise the gas-tightness of the suit, as that feature is maintained by the seam tape which completely covers the seam from the underside of the suit.The chemical permeation resistance of the seam is the same whether the topcoat is present or not.

The head area is designed so that the user must wear a hard hat. A V-Gard® cap from MSA is supplied with each suit. The suit is made with an expanded pouch in the back to accommodate the breathing apparatus cylinder. The zipper runs from the knee of the right leg, up the torso and over the head. The faceshield lens and the gauge window are made of polymethyl methacrylate. Glass lenses may be ordered as an option.

The gloves are made from neoprene. The boots are made from a compound of nitrile butadiene rubber (NBR), styrene butadiene rubber (SBR), natural rubber and fillers.

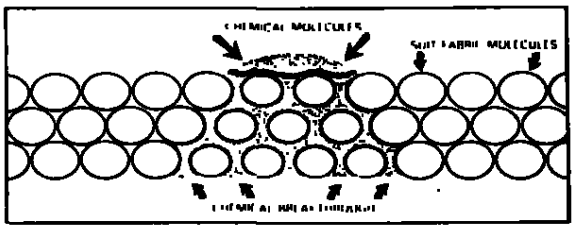
A disposable oversuit is available and may be used to minimize contamination of the Chempruf II suit exterior. The oversuit is made of Saranex-laminated Tyvek. Disposable overboots and overgloves also are available. Overboots are available in butyl rubber or polyvinyl chloride. Overgloves are available in *butyl rubber (for use with the Betex suit)* or Viton (for use with the Vautex suit).

CHEMICAL RESISTANCE GUIDE

A protective garment must resist hazardous chemical attack from three different routes of entry: Permeation, penetration and degradation.

Permeation Resistance

Permeation occurs when a chemical works its way into a suit fabric on a molecular basis, then comes through the underside. Betex and Vautex resist permeation, depending on the type of challenge chemical.



Chemical Resistance Guide

What This Guide Represents
Chemical permeation resistance information in this guide was derived by using a test procedure equivalent to that outlined in ASTM F739-85. The breakthrough times indicated are the shortest times observed from the start of the test to the lowest detectable level of the challenge chemical on the other side of the sample in the test cell (within the limits of the analytical instrumentation).

What This Guide Does Not Represent
The test procedure applied is not intended to represent the chemical resistance of such component parts as the faceshield lens, regulator gauge viewing window, boots, gloves, zipper, gaskets, and valves. Nor does it represent the chemical resistance of such critical junction areas as the fabric-to-gasket-to-lens joint, fabric-to-zipper-to-fabric joint, fabric-to-glove joint, and so forth.

Tests were performed under laboratory conditions-not actual workplace conditions They address breakthrough characteristics and do not account for other performance characteristics, such as tear resistance, abrasion resistance, and so forth. They are not, in and of themselves, recommendations

A few users have asked how to interpret breakthrough times For example, if a suit is exposed to a chemical for 40 minutes, but the listed breakthrough time is 240 minutes, does this mean that the suit has a remaining life of 200 minutes? The answer is NO. Length of exposure cannot be directly correlated to the remaining "life" of the suit. Permeation of a chemical through a material will continue after exposure has been discontinued. Permeation can be compared to dipping the corner of a dry cloth in water, then removing it. Moisture continues to travel through the cloth fibers after removal, but at a reduced rate. The only way to know how exposure affects the chemical permeation resistance of a protective material is to test the material again.

No warranties or other guarantees concerning protection by these materials are made, and no liability for the use of these materials with the chemicals tested is assumed. No single protective garment can provide protection against all hazardous environments. Before using these garments in a hazardous environment, be sure they have been selected to be used within their limitations. They are not resistant to all chemicals.

MSA cannot guarantee that a Chempruf II suit is applicable to your particular situation or assume responsibility for use thereof, because of such unknown variables as nature of work, type of exposure, concentration of exposure, and so forth. It is always best to test the material first.

Triplicate Testing
The following Chemical Resistance Guide refers to a group of chemicals of various classes tested by MSA. The chemical resistance breakthrough times listed for Chempruf II Vautex and Betex materials and boots reflect chemical resistance of representative swatches from which the suit is comprised. All breakthrough times are based on triplicate tests, in accordance with ASTM F739-85. Table 2-1 lists the results of triplicate testing done on the Vautex and Betex materials and boots.

Table 2. 1 Permeation Testing Performed by MSA

Chemical Resistance Chart

The permeation resistance data, shown in the chart at right, were derived by performing triplicate permeation tests, using a test cell developed by MSA Research Corporation. Although this test cell was constructed from stainless steel, rather than glass as outlined in ASTM F 739-85, MSA has determined it to be equivalent to the ASTM cell. All testing was performed at 23 ± 1°C under conditions of 50% relative humidity and a pressure of 1 atmosphere. The breakthrough times indicated are the shortest times observed from the start of the test to the lowest detectable level of the challenge chemical on the other side of the sample in the test cell (within the limits of the analytical instrumentation).

These breakthrough times listed for Vautex and Betex materials reflect the chemical resistance of representative swatches of the basic fabric from which the suit is constructed. (The user must understand that due to normal variation in the production and coating of such composites, no two Chempruf II Suits will demonstrate

Chemical Permeation Resistance Chart	VAUTEX 23 mils thick 19.1 oz/yd²						BETEX 19 mils thick 15.9 oz/yd²					
	Break-through time in minutes			Permeation Rate (micro-grams per cm² per minute			Break-through time in minutes			Permeation Rate in micro-grams per cm² per minute		
Chemical	Test # 1	2	3	1	2	3	1	2	3	1	2	3
Acetone†	15	15	15	33.4	24.8	36.7	135	135	135	12.9	10.8	7.5
Acetonitrile†	20	20	20	4.0	3.3	3.8	165	165	165	.04	.05	.05
Acrylonitrile	<5	<5	<5	24	21	23	125	125	125	0.18	0.22	0.10
Adiponitrile	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Allyl Alcohol	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Ammonia Gas	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Ammonia Liquid Splash	5	5	5	.121	.025	.096	5	5	5	.117	.076	.022
	60	60	60	.020	.010	.014	60	60	60	.004	.007	.002
	240	240	240	.014	.000	.005	240	240	240	.000	.001	.000
Aniline	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Benzene	65	65	165	.05	.08	.09	<5	<5	<5	144	147	147
Carbon Disulfide†	240+	240+	240+	NA	NA	NA	<5	<5	<5	5.8	6.0	5.5
Chlorine Gas	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA

NA -Not Applicable if breakthrough time exceeds 240 minutes.
† Listed in ASTM F1001
* Concentrations observed expressed in parts per million Permeation rates not available
Complete degradation occurred after reaching 40 ppm.

Continued on next page

Chemical Resistance Guide

the exact same chemical resistance characteristics.) The test procedure is not intended to represent the permeation resistance of such components as boots, gloves, gaskets, zipper materials, lenses, etc.

All challenge chemicals were applied in the following forms: Acids at highest percentage possible in water (concentrated), Organics as pure liquids, Ammonia and Chlorine as 100% gas, and Hydrogen Cyanide as saturated vapor.

The tests were performed under laboratory conditions—not actual workplace conditions.They address breakthrough characteristics and do not account for other performance characteristics such as tear resistance, abrasion resistance, etc.

Although the specific chemicals tested are generally representative of the chemical class of which they are a part, one cannot assume that they will behave exactly the same as any other single chemical in the same class. The only way to be sure that the suit material is resistant to a particular chemical is to test it against that chemical. MSA recommends that users perform their own tests to determine whether or not the Chempruf II Suit materials are suitable for their specific applications. Upon request, MSA will gladly furnish sample swatches of Betex or Vautex for this purpose.

Chemical Permeation Resistance Chart	VAUTEX 23 mils thick 19.1 oz/ yd²						BETEX 19 mils thick 15.9 oz/ yd²					
	Break-through time in minutes			Permeation Rate (micro-grams per CM² per minute			Break-through time in minutes			Permeation Rate in micro-grams per CM² per minute		
Chemical	Test # 1	2	3	1	2	3	Test # 1	2	3	1	2	3
Dichloromethane†	20	20	20	50.1	52.6	55.1	<5	<5	<5	193	310	259
Diethylamine	35	35	35	53.7	50.1	51.9	<5	<5	<5	78.8	102.1	55.5
Dimethyl Formamide†	30	30	30	6 8	7.7	8.4	240+	240+	240+	NA	NA	NA
Ethyl Acetate†	15	15	15	57.2	59.1	59.1	30	30	30	5.5	7.0	5.7
Ethyl Acrylate	<5	<5	<5	42.6	49.6	46.4	25	25	25	4.4	4 7	4.4
Ethylene Dibromide	240+	240+	240+	NA	NA	NA	15	15	15	24 4	23.3	21.8
Formaldehyde	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Gasoline	240+	240+	240+	NA	NA	NA	25	25	25	300	212	287
n-Hexane†	240+	240+	240+	NA	NA	NA	<5	<5	<5	36.6	36.6	36.6
Hexamethylene Diamine	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Hydrazine	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Hydrochloric Acid	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Hydrofluoric Acid	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Hydrogen Cyanide Gas	80	80	80	0.7	0.7	0.6	240+	240+	240+	NA	NA	NA
Isobutylamine	45	45	45	15.4	16.0	13.2	50	50	50	6.9	6 8	6 4
Methyl Alcohol† (Methanol)	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Methyl Ethyl Ketone	<5	<5	<5	62.4	68.6	64.6	30	30	30	12.4	12.2	12.6
Nitric Acid	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Nitrobenzene†	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Nitrogen Tetroxide†	15	15	15	2*	<1*	<1*	15	15	15	0*	<1*	<1*
	30	30	30	7*	<1*	<1*	30	30	30	>40*	<1*	>40*
	45	45	45	>40*	>40*	<7*	45	45	45	>40*	>40*	
Oleum (H_2SO_4+30%SO_3)	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Phenol	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Sodium Hydroxide†	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Sulfuric Acid†	240+	240+	240+	NA	NA	NA	240+	240+	240+	NA	NA	NA
Tetrachloroethylene†	240+	240+	240+	NA	NA	NA	20	20	20	142	147	155
Tetrahydrofuran†	<5	<5	<5	287	281	162	<5	<5	<5	193	175	200
Toluene†	240+	240+	240+	NA	NA	NA	<5	<5	<5	159	174	171

NA -Not Applicable if breakthrough time exceeds 240 minutes
† Listed in ASTM F1001
* Concentrations observed expressed in parts per million. Permeation rates not available. Complete degradation occurred after reaching 40 ppm.

CHEMICAL RESISTANCE OF CHEMPRUF II BOOTS

Permeation testing of the Chempruf II boots was performed at MSA Research Corporation. The Viton inner glove provides chemical permeation resistance similar to the Vautex suit material. The PVO-coated supported PVC-coated outer glove is used primarily for abrasion resistance and protection for the Viton glove.

The standard boots provided 3+ hours of protection against the following chemicals:

Hydrochloric acid	Nitric acid
Sulfuric acid	Hydroflouric acid
Oleum	Chlorine
Isobutyl amine	Formaldehyde
Allyl alcohol	Aniline
Acetonitrile	Methyl alcohol
Phenol	Gasoline
Ammonia	

By adding the butyl overboot on top of the standard boot, permeatin resistance for at least 3 hours was obtained for the following chemicals.

Benzene	Ethylene dibromide
Tetrahydrofuran	Ethyl acrylate
Methyl ethyl ketone	

Chemical Resistance Guide

PERFORMANCE OF CHEMPRUF II BOOTS AND BUTYL OVERBOOTS[1, 2]

Chemical	Break Time (minutes)			Permeation Rate[5] (ug/cm²-min)			Test Observations
	1	2	3	1	2	3	
Hydrochloric Acid[4]	240+	240+	240+	—	—	—	No visible damage
Nitric Acid[4]	240+	240+	240+	—	—	—	Fabric eroded
Sulfuric Acid[4]	240+	240+	240+	—	—	—	Fabric charred
Hydrofluoric Acid[4]	240+	240+	240+	—	—	—	No visible damage
Oleum[4]	240+	240+	240+	—	—	—	Fabric blistered
Chlorine Gas[4]	240+	240+	240+	—	—	—	No visible damage
Benzene	225	140	170	—	—	—	No visible damage
Benzene[3]	240+	240+	240+	NA	NA	NA	No visible damage
Ethylene Dibromide	240+	160	195	—	—	—	No visible damage
Ethylene Dibromide[3]	240+	240+	240+	NA	NA	NA	No visible damage
Isobutyl Amine	240+	240+	240+	NA	NA	NA	No visible damage
Tetrahydrofuran	150	—	—	—	—	—	No visible damage
Tetrahydrofuran[3]	240+	240+	240+	NA	NA	NA	No visible damage
Formaldehyde	240+	240+	240+	NA	NA	NA	No visible damage
Allyl Alcohol	240+	240+	240+	NA	NA	NA	No visible damage
Aniline	240+	240+	240+	NA	NA	NA	No visible damage
Acetonitrile	240+	240+	240+	NA	NA	NA	No visible damage
Ethyl Acrylate	230	145	—	—	—	—	No visible damage
Ethyl Acrylate[4]	240+	240+	240+	NA	NA	NA	No visible damage
Methyl Ethyl Ketone	165	—	—	—	—	—	No visible damage
Methyl Ethyl Ketone[3]	240+	240+	240+	NA	NA	NA	No visible damage
Methyl Alcohol	240+	240+	240+	NA	NA	NA	No visible damage
Phenol	240+	240+	240+	NA	NA	NA	No visible damage
Gasoline	240+	240+	240+	NA	NA	NA	No visible damage
Ammonia Gas[4]	240+	240+	240+	—	—	—	No visible damage

(1) Butyl overboots tested in conjunction with Chempruf II boots
(2) Chempruf II boot/butyl overboot combination tested only when Chempruf II boot alone failed to resist permeation for 3 hours
(3) Combination Chempruf II boot/butyl overboot
(4) Permeation rate not determined for acids, ammonia, and chlorine
(5) NA — Not applicable since the material resisted permeation for 3+ hours

Singular Testing
The following Chemical Resistance Guide refers to 598 different chemicals. All ratings are based on singular permeation tests, not triplicate tests. Not all symbols are based directly on permeation data. Actual permeation tests were performed on **only** 93 different chemicals, so as to represent most major chemical classes. When actual permeation tests were performed, it is noted as "tested." The symbols given for the chemicals not directly tested are extrapolations based on the results of similar chemicals directly tested in our laboratories. These are noted as "extrapolated." The following table lists these different chemicals.

Extrapolated ratings can never duplicate those obtained through actual testing. They serve only as a guide, based on the theory that different chemicals from the same chemical class will react to protective materials in similar ways. However, there are exceptions to this rule. Therefore, MSA recommends that you call us if you do not know how a Chempruf II suit will react to a particular chemical. MSA can provide sample swatches of Betex or Vautex materials for your own chemical resistance tests, or you may arrange for MSA to conduct permeation tests. If additional information is required, call MSA at 1-800-MSA-2222 during normal business hours, or at 1-800-MSA-5555 after hours or during emergencies.

⚠ WARNING

Do not use a Chempruf II suit if you do not know how it will react to a particular chemical. Call MSA if your chemical is not on this list. Failure to comply with this precaution may result in serious personal injury or death.

CHEMICAL RESISTANCE GUIDE

KEY TO RATING

Symbol	★★★	★★	★	0	-
Rating	Very Good	Good	Fair	Poor	Not Recommended
Breakthrough Time in Minutes	360 or more	120 to 359	60 to 119	30 to 59	29 or less

CHEMICAL	UN. NO.	PHYS.COND.	BETEX	VAUTEX	NOTES
Acetaldehyde, Saturated Vapor	1089	gaseous	★	-	tested
Acetamide	-	solid	★★★	★★	extrapolated
Acetic Acid, Anhydrous	2789	liquid	★★★	★★★	tested
Acetic Acid, Aqueous Solution	2789	liquid	★★★	★★★	tested
Acetic Acid, Glacial	2789	liquid	★★★	★★★	tested
Acetic Anhydride	1715	liquid	★★★	★	tested
Acetone	1090	liquid	★★	-	tested
Acetonitrile	1648	liquid	★★	-	tested
Acetophenone	-	liquid	★★★	-	extrapolated
Acetyl Chloride	1717	liquid	★★	-	tested
Acetylene	1001	gaseous	★★★	★★★	extrapolated
Acrylonitrile	1093	liquid	★★	-	tested
Adiponitrile	?	?	★★★	★★★	tested
Allyl Alcohol	1098	liquid	★★★	★★★	tested
Alum	-	solid	★★★	★★★	extrapolated
Aluminium Acetate	-	solid	★★★	★★★	extrapolated
Aluminium Chloride, Anhydrous	1726	solid	★★★	★★★	extrapolated
Aluminium Fluoride	-	solid	★★★	★★★	extrapolated
Aluminium Nitrate	1438	solid	★★★	★★★	extrapolated
Aluminium Phosphate	-	solid	★★★	★★★	extrapolated
Aluminium Sulfate	-	solid	★★★	★★★	extrapolated
Aluminiumtriethyl	1102	liquid	0	★★	extrapolated
Aminobutane, 1-	1125	liquid	★	★	extrapolated
Aminoethanol, 2-	2491	liquid	★	★	extrapolated
Ammonia	1005	gaseous	★★★	★★★	tested
Ammonia, Anhydrous, Liquefied	1005	liquid	★★★	★	extrapolated
Ammonia, Aquous Solution, 25%NH3	1005	liquid	★★★	★★★	tested
Ammonia, hot	1005	gaseous	★★	★	extrapolated
Ammonia, wet	1005	gaseous	★★★	★★★	tested
Ammonium Carbonate	-	solid	★★★	★★★	extrapolated
Ammonium Chloride	-	solid	★★★	★★★	extrapolated
Ammonium Nitrate	1477	solid	★★★	★★★	extrapolated
Ammonium Nitrite	2627	solid	★★★	★★★	extrapolated
Ammonium Peroxodisulfate	1444	solid	★★★	★★★	extrapolated
Ammonium Persulfate	1444	solid	★★★	★★★	extrapolated
Ammonium Phosphate	-	solid	★★★	★★★	extrapolated
Ammonium Sulfate	-	solid	★★★	★★★	extrapolated
Amyl Acetate, all Isomers	1104	liquid	-	★	extrapolated
Amyl Alcohol, n-	1265	liquid	★★★	★★★	extrapolated
Amyl Borate, n-	-	liquid	-	★★★	extrapolated
Amyl Chloronaphthalene,all Isomers	-		-	★★★	extrapolated
Amyl Naphthalene, all Isomers	-		-	★★★	extrapolated
Aniline	1547	liquid	★★★	★★★	tested
Aniline Hydrochloride	-	solid	★★★	★	extrapolated
Aqua Regia	-	liquid	★	★★★	extrapolated
Arochlor	2315	liquid	★	★★★	tested
Arsenic Acid	1554	solid	★★★	★★★	extrapolated
Arsenic Trichloride	1560	liquid	0	0	extrapolated
Arsenic Trioxide	1561	solid	★★★	★★★	extrapolated
Asphalt.	-		-	★★★	extrapolated
Barium Chloride	-	solid	★★★	★★★	extrapolated
Barium Hydroxide	-	solid	★★★	★★★	extrapolated
Barium Sulfate	-	solid	★★★	★★★	extrapolated
Barium Sulfide	-	solid	★★★	★★★	extrapolated
Benzaldehyde	1990	liquid	★★	-	extrapolated
Benzene	1114	liquid	-	★	tested
Benzene Sulfonic Acid	-	solid	0	★★★	extrapolated
Benzoic Acid	-	solid	★★★	★★★	extrapolated
Benzyl Alcohol	-	liquid	★★	★★★	extrapolated

CHEMICAL RESISTANCE GUIDE

KEY TO RATING

Symbol	★★★	★★	★	0	-
Rating	Very Good	Good	Fair	Poor	Not Recommended
Breakthrough Time in Minutes	360 or more	120 to 359	60 to 119	30 to 59	29 or less

CHEMICAL	UN. NO.	PHYS.COND.	BETEX	VAUTEX	NOTES
Benzyl Benzoate	-	liquid	★★	★★★	extrapolated
Benzyl Chloride	1738	liquid	-	★★	extrapolated
Biphenyl	-	solid	★	★★★	extrapolated
Bitumen	-		★	★★★	extrapolated
Blast furnace Gases	-	gaseous	0	★★★	extrapolated
Borax	-	solid	★★★	★★★	extrapolated
Boric Acid	-	solid	★★★	★★★	extrapolated
Bromine	1744	liquid	★	★★★	tested
Bromine Trifluoride	1746	liquid	-	-	extrapolated
Bromine Water	1744	liquid	★★★	★★★	tested
Bromine, wet	1744	liquid	★	★★★	tested
Bromobenzene, Mono-	2514	liquid	-	★★★	extrapolated
Bromochloromethane	1887	liquid	★★	★★	extrapolated
Bromomethane, Mono-	1062	gaseous	0	★★★	extrapolated
Bromotrifluoromethane	-	gaseous	★★★	★★★	extrapolated
Butadiene, 1.3-	1010	gaseous	★	★★	extrapolated
Butanal, 1-	1129	liquid	★★	-	extrapolated
Butane, n-	1011	gaseous	★	★★★	extrapolated
Butanethiol, 1-	2347	liquid	-	★	tested
Butanethiol, tert.-	-		-	★	extrapolated
Butanol, 1-	1120	liquid	★★★	★★★	tested
Butanol, tert.-	1122	liquid	★★	★★★	extrapolated
Butanone, 2-	1193	liquid	★	-	tested
Butene, 1-	1012	gaseous	★	★★★	extrapolated
Butoxy Ethanol, 2-	2369	liquid	-	★★★	extrapolated
Butyl Acetate, n-	1123	liquid	-	★	tested
Butyl Acetylricinoleate, n-	-		★★★	★★★	extrapolated
Butyl Acrylate, n-	2348	liquid	★	-	extrapolated
Butyl Alcohol, n-	1120	liquid	★★★	★★★	tested
Butyl Alcohol, tert.-	1122	liquid	★★	★★★	extrapolated
Butyl Amine, n-, Mono-	1125	liquid	★	★	extrapolated
Butyl Benzoate, n-	-		★★★	★★★	extrapolated
Butyl Carbitol, n-	-	liquid	★★	★★	extrapolated
Butyl Catechol, tert.	-		★★	★★★	extrapolated
Butyl Cellosolve, n-	2369	liquid	-	★★★	extrapolated
Butyl Mercaptan, n-	2347	liquid	-	★	tested
Butyl Mercaptan, tert.-	-		-	★	extrapolated
Butyl Oleate, n-	-	liquid	★★	★★★	extrapolated
Butyl Stearate, n-	-	liquid	★★	★★★	extrapolaed
Butylene, 1-	1012	gaseous	★	★★★	extrapolated
Butyraldehyde, n-	1129	liquid	★★	-	extrapolated
Calcium Acetate	-	solid	★★★	★★★	extrapolated
Calcium Bisulfite, Aqueous Solution-		liquid	★★★	★★★	extrapolated
Calcium Chloride -		solid	★★★	★★★	extrapolated
Calcium Hydrogen Sulfite, Aqu.Sol. -	-	liquid	★★★	★★★	extrapolated
Calcium Hydroxide	-	solid	★★★	★★★	extrapolated
Calcium Hypochlorite	1748	solid	★★★	★★★	extrapolated
Calcium Nitrate	1454	solid	★★★	★★★	extrapolated
Calcium Sulfide	-	solid	★★★	★★★	extrapolated
Carbitol	-	liquid	★★	★★	extrapolated
Carbolic Acid	1671	solid	★★★	★★	tested
Carbolic Acid/Water-Mixtures	-	liquid	★★★	★★★	tested
Carbon Dioside	1013	gaseous	★★	★★★	extrapolated
Carbon Disulfide	1131	liquid	-	★★★	tested
Carbon Monoxide	1016	gaseous	★★★	★★★	extrapolated
Carbon Tetrabromide	2516	liquid	-	★★★	extrapolated
Carbon Tetrachloride	1846	liquid	-	★★★	extrapolated
Castor Oil	-	liquid	★★★	★★★	extrapolated
Cellosolve	1171	liquid	-	★★★	extrapolated

CHEMICAL RESISTANCE GUIDE

KEY TO RATING

Symbol	***	**	*	0	-
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CHEMICAL	UN. NO.	PHYS.COND.	BETEX	VAUTEX	NOTES
Cellosive Acetate	1172	liquid	*	*	extrapolated
Chlorinated Biphenyls	2315	liquid	*	***	tested
Chlorinated Naphthalenes	-	liquid	*	***	extrapolated
Chlorine	1017	gaseous	***	***	tested
Chlorine Dioxide	-	gaseous	*	***	extrapolated
Chlorine Trifluoride	1749	gaseous	-	-	extrapolated
Chlorine Water	1017	liquid	***	***	tested
Chlorine, wet	1017	gaseous	***	***	tested
Chloro-I-Nitro-Ethane, 1-	-	liquid	-	*	extrapolated
Chloro-I.I-difluoroethane, 1-	-	gaseous	***	0	extrapolated
Chloro-1.1.2.2.2-Pentafluoroethane	-	gaseous	***	**	extrapolated
Chloro-1.3-Butadiene, 2-	1991	liquid	-	***	extrapolated
Chloro-2.3-epoxypropane, 1-	2023	liquid	*	-	tested
Chloroacetic Acid, Mono-	1751	solid	**	0	extrapolated
Chloroacetone, Mono-	1695	liquid	**	0	extrapolated
Chlorobenzene, Mono-	1134	liquid	-	***	extrapolated
Chlorodifluoromethane, Mono-	-	gaseous	***	0	extrapolated
Chlorododecanes, all Isomers	-		0	***	extrapolated
Chloroethane, Mono-	1037	gaseous	*	***	extrapolated
Chloroethanol, 2-	1135	liquid	0	***	extrapolated
Chloroform	1888	liquid	-	***	extrapolated
Chloromethane, Mono-	1063	gaseous	*	***	extrapolated
Chloroprene	1991	liquid	-	***	extrapolated
Chloropropane, 2-	2356	liquid	-	***	extrapolated
Chloropropene, Z-	-	liquid	-	***	extrapolated
Chlorosulfonic Acid	1754	liquid	-	*	extrapolated
Chlorotoluene, a-	1738	liquid	-	***	extrapolated
Chlorotrifluormethane	-	gaseous	***	***	extapolated
Chrome Plating Solutions	-	liquid	*	***	extrapolated
Chromic Acid	1463	solid	*	***	extrapolated
Chromic Acid, Aqueous Solution	1463	liquid	*	***	extrapolated
Chromium Trioxide	1463	solid	*	***	extrapolated
Citric Acid	-	solid	***	***	extrapolated
Cobalt-(2)-Chloride	-	solid	***	***	estrapolated
Coconut Oil	-	liquid	***	***	extrapolated
Cod Liver Oil	-	liquid	***	***	estrapolated
Coke Oven Gas	-	gaseous	0	***	extrapolated
Copper-(I)-Cyanide	-	solid	***	***	extrapolated
Copper-(2)-Acetate	-	solid	***	***	extrapolated
Copper-(2)-Chloride	-	solid	***	***	extrapolated
Copper-(2)-Sulfate	-	solid	***	***	extrapolated
Corn Oil	-	liquid	***	***	extrapolated
Cottonseed Oil	-	liquid	***	***	extrapolated
Creosote	-	liquid	*	***	extrapolated
Cresol, all Isomers	2076	liquid	*	***	extrapolated
Cumene	1918	liquid	0	***	extrapolated
Cyclohexane	1145	liquid	-	***	extrapolated
Cyclohesanol	-	liquid	***	***	extrapolated
Cyclohexanone	1915	liquid	*	-	extrapolated
Cymene, p-(1.4-)	-	liquid	0	***	extrapolated
Decahydronaphthalene	1147	liquid	0	***	extrapolated
Decalin	1147	liquid	0	***	extrapolated
Decanal, all Isomers	-	liquid	***	***	extrapolated
Decane, n-	2247	liquid	0	***	extrapolated
Decylaldehyd, all Isomers	-	liquid	***	***	extrapolated
Di-2-ethylhexyl Phthalate	-	liquid	**	**	extrapolated
Di-2-ethylhexyl Sebacate	-	liquid	**	**	extrapolated
Di-n-butyl Amine	2248	liquid	*	*	extrapolated
Di-n-butyl Ether	1149	liquid	*	*	extrapolated

CHEMICAL RESISTANCE GUIDE

KEY TO RATING

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CHEMICAL	UN. NO.	PHYS.COND.	BETEX	VAUTEX	NOTES
Di-n-butyl Phthalate	-	liquid	★★	★★	extrapolated
Di-n-butyl Sebacate	-	liquid	★	★★	extrapolated
Di-sec-octyl Phthalate	-	liquid	★★	★★	extrapolated
Di-sec-octyl sebacate	-	liquid	★★	★★	extrapolated
Diacetin	-	liquid	★★★	★★★	extrapolated
Diacetone Alcohol	1148	liquid	★★★	0	extrapolated
Diaminoethane, 1.2-	1604	liquid	-	★	extrapolated
Dibenzyl Ether	-	liquid	★★	0	extrapolated
Dibenzyl Sebacate	-		★★	★★	extrapolated
Dibromo-1.1.2.2-Tetrafluoroethane	-	liquid	0	★★	extrapolated
Dibromoethane, 1.2-	1605	liquid	★	★★	tested
Dichloro-1.1.2.2-Tetrafluoroethane	-	gaseous	★★★	★★	extrapolated
Dichlorobenzene, o- (1.2-)	1591	liquid	-	★★★	extrapolated
Dichlorodifluoromethane	-	gaseous	★★	★★★	extrapolated
Dichloroethane, 1.2-	1184	liquid	★	★★★	extrapolated
Dichloromethane	1593	liquid	-	-	tested
Dichloromonofluoromethane	-	gaseous	0	0	extrapolated
Dicyclohexyl Amine	2565	liquid	★	★	extrapolated
Diesel Oil	1202	liquid	-	★★★	extrapolated
Diethyl Amine	1154	liquid	-	★	tested
Diethyl Ether	1155	liquid	-	★	tested
Diethyl Oxalate	-	liquid	★★★	★★★	extrapolated
Diethyl Sebacate	-	liquid	★★	★★.	extrapolated
Diethylbenzene, all Isomers	2049	liquid	-	★★★	extrapolated
Diethylene Glycol	-	liquid	★★★	★★★	extrapolated
Diethylene Glycol Ether	-	liquid	★★	★★	extrapolated
Difluoroethane, I.I-	-	gaseous	★★★	0	extrapolated
Difluoromethane	-	gaseous	★★★	★	extrapolated
Dihydroxybenzene, p- (1.4-)	2662	solid	★★★	★★★	extrapolated
Diisobutylene	2050	liquid	0	★★★	extrapolated
Diisooctyl Phthalate	-	liquid	★★	★★★	extrapolated
Diisooctyl Sebacate	-	liquid	★★	★★	extrapolated
Diisopropyl Ether	1159	liquid	★	★	extrapolated
Diisopropyl Ketone	-	liquid	★	-	extrapolated
Diisopropylbenzene, all Isomsers	-	liquid	-	★★★	extrapolated
Dimethyl Aniline, N,N-	2253	liquid	★	-	extrapolated
Dimethyl Formamide, N,N-	2265	liquid	★★★	0	tested
Dimethyl Hydrazine, 1,1-	1163	liquid	0	★	extrapolated
Dimethyl Phthalate	-	liquid	★★	★★	extrapolated
Dinitrogen Tetroxide, liquefied	1067	liquid	-	-	extrapolated
Dinitrotoluene, all Isomers	2038	solid	★	★★	extrapolated
Dioctyl Phthalate	-	liquid	★★	★★	extrapolated
Dioctyl Sebacate	-	liquid	★★	★★	extrapolated
Dioxane, 1.4-	1165	liquid	★★	★	tested
Dioxolane, 1.3-	1166	liquid	★	0	extrapolated
Dipentene	2052	liquid	0	★★★	extrapolated
Diphenyl	-	solid	★	★★★	extrapolated
Diphenyl Ether	-	solid	0	★★★	extrapolated
Diphenyl Oxide	-	solid	0	★★★	extrapolated
Disulfur Dichloride	1828	liquid	-	★★★	extrapolated
Epichlorohydrine	2023	liquid	★	-	tested
Epoxypropane, 1.2-	1280	liquid	★	-	extrapolated
Ethane	1035	gaseous	-	★★★	extrapolated
Ethanethiol	2363	liquid	-	★	extrapolated
Ethanol	1170	liquid	★★	★★★	tested
Ethanol Amine, Mono-	2491	liquid	★	★	extrapolated
Ethene	1962	gaseous	0	★★★	extrapolated
Ether	1155	liquid	-	★	tested
Ethine	1001	gaseous	★★★	★★★	extrapolated

CHEMICAL RESISTANCE GUIDE

KEY TO RATING

Symbol	★★★	★★	★	0	-
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CHEMICAL	UN. NO.	PHYS.COND.	BETEX	VAUTEX	NOTES
Ethoxy Ethanol, 2-	1171	liquid	-	★★★	estrapolated
Ethoxyethyl Acetate, 2-	1172	liquid	★	★	extrapolated
Ethyl Acetate	1173	liquid	-	-	tested
Ethyl Acetoacetate	-	liquid	★★	-	extrapolated
Ethyl Acrylate	1917	liquid	-	-	tested
Ethyl Alcohol	1170	liquid	★★	★★★	tested
Ehyl Benzoate	-	liquid	★★	★★★	extrapolated
Ethyl Cellosolve	1171	liquid	-	★★	extrapolated
Ethyl Cellosolve Acetate	1172	liquid	★	★	extrapolated
Ethyl Cellulose	-	solid	★★★	★★★	extrapolated
Ethyl Chloride	1037	gaseous	★	★★★	extrapolated
Ethyl Chlorocarbonate	1182	liquid	-	★★★	extrapolated
Ethyl Chloroformate	1182	liquid	-	★★★	extrapolated
Ethyl Ether	1155	liquid	-	★	tested
Ethyl Formate	1190	liquid	-	★	extrapolated
Ethyl Mercaptan	2363	liquid	-	★	extrapolated
Ethyl Pentachlorobenzene	-		-	★★★	extrapolated
Ethyl Silicate	1292	liquid	★★★	★★★	extrapolated
Ethylbenzene	1175	liquid	-	★★★	extrapolated
Ethylene	1962	gaseous	0	★★★	extrapolated
Ethylene Chlorohydrine	1135	liquid	0	★★★	extrapolated
Ethylene Diamine	1604	liquid	-	★	extrapolated
Ethylene Dibromide	1605	liquid	-	★★★	tested
Ethylene Dichloride	1184	liquid	★	★★★	extrapolated
Ethylene Glycol, Mono-	-	liquid	★★★	★★★	extrapolated
Ethylene Oxide	1040	gaseous	★★	-	tested
Ethylene Oxide, liquefied	1040	liquid	-	-	tested
Fluorinated Cyclic Ethers	-		★★★	0	extrapolated
Fluorine, liquefied	1045	liquid	0	★	extrapolated
Fluorobenzene, Mono-	2387	liquid	-	★★★	extrapolated
Fluoroboric Acid, Aqueous Solution	1775	liquid	★★★	★★★	extrapolated
Fluorocarbon Oils	-	liquid	★★★	0	extrapolated
Fluoromethane, Mono-	-	gaseous	★★★	0	extrapolated
Fluorosilic Acid, Aqueous Solution	1778	liquid	★★★	★★★	extrapolated
Formaldehyd, Aqueous Solution	2209	liquid	★★★	★★★	tested
Formic Acid, Anhydrous	1779	liquid	★★★	★★★	tested
Freon 11	-	liquid	0	★★★	extrapolated
Freon 112	-	liquid	0	★★★	extrapolated
Freon 113	-	liquid	★★★	★	extrapolated
Freon 114	-	gaseous	★★★	★★	extrapolated
Freon 11482	-	liquid	0	★★	extrapolated
Freon 115	-	gaseous	★★★	★★	extrapolated
Freon 12	-	gaseous	★★	★★★	extrapolated
Freon 13	-	gaseous	★★★	★★★	extrapolated
Freon 1381	-	gaseous	★★★	★★★	extrapolated
Freon 142b	-	gaseous	★★★	0	extrapolated
Freon 152a	-	gaseous	★★★	0	extrapolated
Freon 21	-	gaseous	0	0	extrapolated
Freon 218	-	gaseous	★★★	★★★	extrapolated
Freon 22	-	gaseous	★★★	0	extrapolated
Freon 31	-	gaseous	★★★	0	extrapolated
Freon 32	-	gaseous	★★★	★	extrapolated
Freon SO2	-		0	★★	extrapolated
Freon BF	-		0	0	extrapolated
Freon C316	-		★★★	0	extrapolated
Freon C318	-	gaseous	★★★	★★★	extrapolated
Freon MF	-		0	0	extrapolated
Freon T-P 35	-		★★★	★★★	extrapolated
Freon T-WD 6O2	-		★★★	★★★	extrapolated

CHEMICAL RESISTANCE GUIDE

KEY TO RATING

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CHEMICAL	UN. NO.	PHYS.COND.	BETEX	VAUTEX	NOTES
Freon TA	-		***	*	extrapolated
Freon TC	-		***	***	extrapolated
Freon TF	-		0	***	extrapolated
Freon TMC	-		**	***	extrapolated
Fngen					see Freon
Fuel Oil	-	liquid	-	***	extrapolated
Fumaric Acid	-	solid	***	***	extrapolated
Furan	2389	liquid	*	0	extrapolated
Furfurol	1199	liquid	**	-	extrapolated
Furyl Methanal, 2-	1199	liquid	**	-	extrapolated
Gallic Acid	-	solid	***	***	extrapolated
Gasolin	1115	liquid	-	***	extrapolated
Gasoline (Fuel)	1203	liquid	-	***	tested
Gelatin	-	solid	***	***	extrapolated
Generator Gas	-	gaseous	-	***	extrapolated
Glucose	-	solid	***	***	extrapolated
Glycerin	-	liquid	***	***	extrapolated
Glycerin Triacetate	-	liquid	***	***	extrapolated
Glycerin Diacetate, 1.3-	-	liquid	***	***	extrapolated
Glycols	-	liquid	***	***	extrapolated
Hexafluorosilicic Acid,Aq.Solution	1778	liquid	***	***	extrapolated
Hexanal, 1-	-	liquid	**	**	extrapolated
Hexane, n-	1208	liquid	-	***	tested
Hexanol, 1-	2282	liquid	***	***	extrapolated
Hexanone, 2-	-	liquid	***	-	extrapolated
Hexene, 1-	2370	liquid	-	***	extrapolated
Hexyl Alcohol, n-	2282	liquid	***	***	extrapolated
Hexyl Aldehyde, n-	-	liquid	**	**	extrapolated
Hydraulic Oil	-	liquid	-	***	extrapolated
Hydrazine	2029	liquid	***	***	tested
Hydrazine Hydrate	2030	liquid	***	***	tested
Hydrobromic Acid, 47% HBr	1788	liquid	***	***	extrapolated
Hydrochloric Acid, 47% HCl	1789	liquid	***	***	tested
Hydrochloric Acid, 37% HCl, hot	1789	liquid	*	***	extrapolated
Hydrocyanic Acid, 20% HCN	1051	liquid	***	***	tested
Hydrofluoric Acid, 40% HF	1790	liquid	***	***	tested
Hydrofluoric Acid, 40%HF, hot	1790	liquid	-	**	extrapolated
Hydrogen	1049	gaseous	***	***	extrapolated
Hydrogen Cyanide, Saturated Vapor	1051	gaseous	***	*	tested
Hydrogen Fluoride,Anhydr., Liquef.	1052	liquid	**	***	extrapolated
Hydrogen Peroxide, 90% H2O2	2015	liquid	*	**	extrapolated
Hydrogen Peroxide,Aqueous Solution	2014	liquid	**	***	extrapolated
Hydrogen Sulfide	1053	gaseous	***	***	tested
Hydrogen Sulfide, Aqueous Solution	1053	liquid	***	***	tested
Hydrogen Sulfide, wet	1053	gaseous	***	***	tested
Hydrogen Sulfide, wet, hot	1053	gaseous	*	*	extrapolated
Hydroquinone	2662	solid	***	***	extrapolated
Hydroxy-4-methylpentan-2-one, 4	1148	liquid	***	0	extrapolated
Iodine Pentafluoride	2495	liquid	-	-	extrapolated
Iodoform	-	solid	***	0	extrapolated
Iron-(2)-Sulfate	-	solid	***	***	extrapolated
Iron-(3)-Chloride	-	solid	***	***	extrapolated
Iron-(3)-Nitrate	1466	solid	***	***	extrapolated
Isobutanol	1212	liquid	***	***	extrapolated
Isobutyl Alcohol	1212	liquid	***	***	extrapolated
Isobutyl Amine	-	liquid	0	0	tested
Isooctane	-	liquid	-	***	extrapolated

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Isophorone	-	liquid	***	-	extrapolated
Isopropanaol	1219	liquid	**	***	extrapolated
Isopropyl Acetate	1220	liquid	-	*	extrapolated
Isopropyl Alcohol	1219	liquid	***	***	extrapolated
Isopropyl Chloride	2356	liquid	-	***	etrapolated
Isopropyl Ether	1159	liquid	*	*	extrapolated
Isopropylbenzene	1918	liquid	0	***	extrapolated
Kerosene	1223	liquid	-	***	extrapolated
Lactic Acid	-	liquid	***	***	extrapolated
Lard	-		***	***	extrapolated
Lavender Oil	-	liquid	0	***	extrapolated
Lead-(2)-Acetate	2291	solid	***	***	extrapolated
Lead-(2)-Nitrate	1469	solid	***	***	etrapolated
Lead-(2)-Sulfate	-	solid	***	***	extrapolated
Lime Sulfur	-		***	***	extrapolated
Linoleic Acid	-	liquid	***	***	extrapolated
Linseed Oil	-	liquid	***	***	extrapolated
Lubricating Oils	-	liquid	-	***	extrapolated
Magnesium Chloride	-	solid	***	***	extrapolated
Magnesium Hydroxide	-	solid	***	***	extrapolated
Magnesium Sulfate	-	solid	***	***	extrapolated
Maleic Acid	-	solid	*	***	extrapolated
Maleic Anhydride	2215	solid	*	***	extrspolated
Malic Acid	-	solid	***	***	extrapolated
Menthadien-1.8(9), p-	2052	liquid	0	***	extrapolated
Mercury	2809	liquid	***	***	extrapolated
Mercury-(2)-Chloride	1624	solid	***	***	extrapolated
Mesityl Oxide	1229	liquid	**	-	extrapolated
Methane	1971	gaseous	-	***	extrapolated
Methanol	1230	liquid	*	***	tested
Methoxy Ethanol; 2-	1188	liquid	-	***	tested
Methoxy Ethyl Acetate, 2-	1189	liquid	*	*	tested
Methyl Acetate	1231	liquid	-	*	extrapolated
Methyl Acrylate	1919	liquid	*	-	extrapolated
Methyl Alcohol	1230	liquid	***	***	tested
Methyl Aniline, N-, Mono-	2294	liquid	*	-	extrapolated
Methyl Bromide	1062	gaseous	0	***	extrapolated
Methyl Cellosolve	1188	liquid	-	***	tested
Methyl Cellosolve Acetate	1189	liquid	*	*	tested
Methyl Chloride	1063	gaseous	*	***	extrapolated
Methyl Chloroform	2831	liquid	-	***	extrapolated
Methyl Cyclopentane	2298	liquid	-	***	extrapolated
Methyl Ethyl Ketone	1193	liquid	0	-	tested
Methyl Formate	1243	liquid	-	*	extrapolated
Methyl Isobutyl Ketone	1245	liquid	*	-	extrapolated
Methyl Methacrylate	1247	liquid	*	-	extrapolated
Methyl Oleate	-	liquid	**	***	extrapolated
Methyl Salicylate	-	liquid	**	0	extrapolated
Methyl n-Butyl Ketone	-	liquid	*	-	extrapolated
Methyl-4-isopropylbenzene, 1-	-	liquid	0	***	extrapolated
Methyl-n-propyl Amine, 2-, Mono-	-	liquid	*	*	extrapolated
Methylacrylic Acid	2531	liquid	**	-	extrapolated
Methylene Chloride	1593	liquid	-	***	extrapolated
Methylene Fluoride	-	gaseous	***	*	extrapolated
Methylpent-3-en-2-one, 4-	1229	liquid	**	-	extrapolated
Methylpentan-2-one, 4-	1245	liquid	*	-	extrapolated
Methylpropanol -2, 2-	1122	liquid	**	***	extrapolated

CHEMICAL RESISTANCE GUIDE

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CHEMICAL	UN. NO.	PHYS.COND.	BETEX	VAUTEX	NOTES
Mineral Oil	-	liquid	-	***	extrapolated
Naphtha	1255	liquid	-	***	extrapolated
Naphthalene	1334	solid	-	***	extrapolated
Naphthenic Acids	-		0	***	extrapolated
Naphtholsulfonic Acids	-	solid	**	***	extrapolated
Natural Gas	-	gaseous	-	***	extrapolated
Natural Gas, Liquefied	-	liquid	-	***	extrapolated
Neetsfoot Oil	-	liquid	***	***	extrapolated
Nevile's Acid	-	solid	**	***	extrapolated
Nickel-(2)-Acetate	-	solid	***	***	extrapolated
Nickel-(2)-Chloride	-	solid	***	***	extrapolated
Nickel-(2)-Sulfate	-	solid	***	***	extrapolated
Nitric Acid, 65% HN03	2031	liquid	***	***	tested
Nitric Acid, Aqueous Solution	2031	liquid	***	***	tested
Nitric Acid, red, fuming	2031	liquid	***	***	tested
Nitrobenzene	1662	liquid	***	**	tested
Nitroethane	2842	liquid	***	*	extrapolated
Nitrogen Dioxide, liquefied	1067	liquid	-	-	extrapolated
Nitromethane	1261	liquid	***	*	tested
Octachlorotoluene	-		-	***	extrapolated
Octadecane, all Isomers	-	liquid	-	***	extrapolated
Octafluorocyclobutane	-	gaseous	***	***	extrapolated
Octafluoropropane	-	gaseous	***	***	extrapolated
Octane, n-	1262	liquid	-	***	extrapolated
Octanol, 1-	-	liquid	***	***	extrapolated
Octyl Alcohol, n-	-	liquid	***	***	extrapolated
Oleic Acid	-	liquid	**	**	extrapolated
Oleum, 30% S03	1831	liquid	***	***	tested
Oleum 65% S03	1831	liquid	***	***	tested
Olive Oil	-	liquid	**	***	extrapolated
Oxalic Acid	-	solid	***	***	extrapolated
Oxirane	1040	gaseous	**	-	tested
Oxirane, liquefied	1040	liquid	-	-	tested
Oxygen	1072	gaseous	***	***	extrapolated
Oxygen, hot (100 to 200 C)	1072	gaseous	-	**	extrapolated
Ozone	-	gaseous	**	***	extrapolated
Palmitic Acid	-	solid	***	***	extrapolated
Peanut Oil	-	liquid	***	***	extrapolated
Pentanol, 1-	1265	liquid	***	***	extrapolated
Pentyl Acetate, all Isomers	1104	liquid	-	*	extrapolated
Pentyl Alcohol, n-	1265	liquid	***	***	extrapolated
Perchloric Acid, 70% HC104	1873	liquid	**	***	extrapolated
Perchloroethylene	1897	liquid	-	***	extrapolated
Petroleum, Bp above 250 C	-	liquid	-	***	extrapolated
Petroleum, Bp below 250 C	-	liquid	-	***	extrapolated
Phenetol	-	liquid	*	*	extrapolated
Phenol	1671	solid	***	***	tested
Phenol I Water - Mixtures	-	liquid	***	***	tested
Phenyl Ethyl Ether	-	liquid	*	*	extrapolated
Phenyl Hydrazine	2572	liquid	*	0	extrapolated
Phenylbenzene	-	solid	*	***	extrapolated
Phorone	-	solid	**	0	extrapolated
Phosphoric Acid, 85% H3P04	1805	liquid	***	***	tested
Phosphoric Acid, Aqueous Solution	1805	liquid	***	***	tested
Phosphorus Trichloride	1809	liquid	***	***	extrapolated
Picric Acid	1540	solid	**	***	extrapolated
Pine Oil	-	liquid	-	***	extrapolated
Pinene, all Isomers	-	liquid	-	***	extrapolated

CHEMICAL RESISTANCE GUIDE

KEY TO RATING

Symbol	***	**	*	0	-
Rating	Very Good	Good	Fair	Poor	Not Recommended
Breakthrough Time in Minutes	360 or more	120 to 359	60 to 119	30 to 59	29 or less

CHEMICAL	UN. NO.	PHYS.COND.	BETEX	VAUTEX	NOTES
Piperdine	2401	liquid	-	*	extrapolated
Polyvinyl Acetate Emulsion	-	liquid	***	***	extrapolated
Potassium	2257	solid	***	***	extrapolated
Potassium Acetate	-	solid	***	***	extrapolated
Potassium Aluminium Sulfate	-	solid	***	***	extrapolated
Potassium Chloride	-	solid	***	***	extrapolated
Potassium Copper-(1)-cyanideAq.s.	-	liquid	***	***	extrapolated
Potassium Cyanide	1588	solid	***	***	extrapolated
Potassium Dichromate	1464	solid	***	***	extrapolated
Potassium Hydroxide	1813	solid	***	***	extrapolated
Potassium Hydroxide,Aq.Sol.,50% KOH	1814	liquid	***	***	extrapolated
Potassium Nitrate	1486	solid	***	***	extrapolated
Potassium Sulfate	-	solid	***	***	extrapolated
Propane	1978	gaseous	-	***	extrapolated
Propanol, 1-	1274	liquid	**	***	extrapolated
Propanol, 2-	1219	liquid	**	***	extrapolated
Propen-1-ol, 2-	1098	liquid	**	***	extrapolated
Propene	1077	gaseous	-	***	extrapolaeed
Propyl Acetate, n-	1276	liquid	-	*	extrapolated
Propyl Alcohol, n-	1274	liquid	**	***	extrapolated
Propyl Nitrate, n-	1865	liquid	**	-	extrapolated
Propylene	1077	gaseous	-	***	extrapolated
Propylene Oxide	1280	liquid	*	-	extrapolated
Pyrane	-	liquid	*	*	extrapolated
Pyridine	1282	liquid	**	*	tested
Pyroligneous Acid	-	solid	**	0	extrapolated
Pyrrole	-	liquid	*	0	extrapolated
Rapeseed Oil	-	liquid	***	***	extrapolated
Red Oil	-	liquid	0	***	estrapolated
Salicylic Acid	-	solid	***	***	extrapolated
Silicate Esters	-	liquid	***	***	extrapolated
Silicon Greases	-		***	***	extrapolated
Silicone Oils	-	liquid	***	***	extrapolated
Silver Nitrate	1493	solid	***	***	estrapolated
Soda	-	solid	***	***	extrapolated
Sodium	1428	solid	***	***	estrapolated
Sodium Acetate	-	solid	***	***	extrApolated
Sodium Borate	-	solid	***	***	extrapolated
Sodium Carbonate	-	solid	***	***	extrapolated
Sodium Chloride	-	solid	***	***	extrapolated
Sodium Cyanide	1588	solid	***	***	extrapolated
Sodium Hydrogencarbonate	-	solid	***	***	extrapolated
Sodium Hydrogensulfite	-	solid	***	***	extrapolated
Sodium Hydroxide	1823	solid	***	***	tested
Sodium Hydroxide, AQ.Sol.,50ZNaOH	1824	liquid	***	***	tested
Sodium Hypochlorite	-	solid	***	***	extrapolated
Sodium Metaphosphate	-	solid	***	***	extrapolated
Sodium Nitrate	1498	solid	***	***	extrapolated
Sodium Perborate	-	solid	***	***	extrapolated
Sodium Peroxide	1504	solid	***	***	extrapolated
Sodium Phosphate	-	solid	***	***	extrapolated
Sodium Silicate, Aqueous Solution	-	liquid	***	***	extrapolated
Sodium Sulfate	-	solid	***	***	extrapolated
Sodium Sulfite	-	solid	***	***	extrapolated
Sodium Tetraborate	-	solid	***	***	extrapolated
Sodium Thiosulfate	-	solid	***	***	extrapolated
Soybean Oil	-	liquid	***	***	extrapolated
Stearic Acid	-	solid	***	***	extrapolated

CHEMICAL RESISTANCE GUIDE

KEY TO RATING

Symbol	***	**	*	0	-
Rating	Very Good	Good	Fair	Poor	Not Recommended
Breakthrough Time in Minutes	360 or more	120 to 359	60 to 119	30 to 59	29 or less

CHEMICAL	UN. NO.	PHYS.COND.	BETEX	VAUTEX	NOTES
Styrene, Mono-	2055	liquid	-	***	extrapolated
Sulfite Liquors	-	liquid	***	***	extrapolated
Sulfur	1350	solid	***	***	extrapolated
Sulfur Chloride	1828	liquid	-	***	extrapolated
Sulfur Dioxide	1075	gaseous	***	***	tested
Sulfur Dioxide, Aqueous Solution	-	liquid	***	***	tested
Sulfur Dioxide, wet	1079	gaseous	***	***	tested
Sulfur Hexafluoride	1080	gaseous	***	***	extrapolated
Sulfur Trioxide	1829		*	**	extrapolated
Sulfuric Acid, 98 H2S04	1830	liquid	***	***	tested
Sulfuric Acid, Aqueous Solution	1830	liquid	***	***	tested
Sulfuric Acid, fuming, 20 S03	1831	liquid	***	***	tested
Sulfuric Acid, fuming, 65 S03	1831	liquid	***	***	tested
Sulfurous Acid	-	liquid	***	***	tested
Tannic Acid	-	solid	***	***	extrapolated
Tartaric Acid	-	solid	***	***	extrapolated
Terpineol	-	liquid	*	***	extrapolated
Tertiary Butanethiol	-		-	*	extrapolated
Tertiary Butyl Alcohol	1122	liquid	**	***	extrapolated
Tertiary Butyl Catechol	-		**	***	extrapolated
Tertiary Butyl Mercaptan	-		-	*	extrapolated
Tetra-n-butyl Orthotitanate	-	liquid	**	***	extrapolated
Tetrabromomethane	2516	liquid	-	***	extrapolated
Tetrabutyl Titanate	-	liquid	**	***	extrapolated
Tetrachloro-1.2-difluoroethane	-	liquid	0	***	extrapolated
Tetrachloroethylene	1897	liquid	-	***	tested
Tetrachloromethane	1846	liquid	-	***	extrapolated
Tetraethyl Orthosilicate	1292	liquid	***	***	extrapolated
Tetraethyl Silicate	1292	liquid	***	***	extrapolated
Tetrafluoroboric Acid,Aq. Solution	1775	liquid	***	***	extrapolated
Tetrahydrofuran	2056	liquid	-	-	tested
Tetrahydronaphhalene, 1.2.3.4-	-	liquid	-	***	extrapolated
Tetralin	-	liquid	-	***	extrapolated
Thionyl Chloride	1836	liquid	-	***	extrapolated
Titan Tetrachloride	1838	liquid	-	***	extrapolated
Toluene	1294	liquid	-	***	tested
Train Oil	-	liquid	0	***	extrapolated
Transformer Oil	-	liquid	-	***	extrapolated
Tri-2-ethylhexyl Phosphate	-	liquid	***	**	extrapolated
Tri-n-butoxyethyl Phosphate	-	liquid	***	***	extrapolated
Tri-n-butyl Phosphate	-	liquid	***	***	extrapolated
Tri-sec-octyl Phosphate	-	liquid	***	**	estrapolated
Triacetin	-	liquid	***	***	extrapolated
Trichloro-1.2.2-trifluoroethane	-	liquid	***	***	extrapolated
Trichloroacetic Acid	1839	solid	**	**	extrapolated
Trichlorobenzene, 1.2.4-	2321	liquid	**	**	tested
Trichloroethane, 1.1.1-	2831	liquid	-	***	extrapolated
Trichloroethylene	1710	liquid	-	***	tested
Trichlorofluoromethane	-	liquid	0	***	extrapolated
Trichloromethane	1888	liquid	-	***	extrapolated
Tricresyl Phosphate, all Isomers	2574	liquid	***	**	extrapolated
Triethanol Amine	-	liquid	**	**	extrapolated
Triethyl Aluminium	1102	liquid	0	**	extrapolated
Triethyl Amine	1296	liquid	-	*	tested
Triethyl Borane	-	liquid	0	***	extrapolated
Triiodomethane	-	solid	***	0	extrapolated
Triisooctyl Phosphate	-	liquid	***	**	extrapolated
Trimethyl-i-pentene, 2.4.4-	2050	liquid	0	***	extrapolated
Trimethyl-2-cyclohexen-1-one,3.4.5-	-	liquid	***	-	extrapolated

CHEMICAL RESISTANCE GUIDE

KEY TO RATING

Symbol	★★★	★★	★	0	-
Rating	Very Good	Good	Fair	Poor	Not Recommended
Breakthrough Time in Minutes	360 or more	120 to 359	60 to 119	30 to 59	29 or less

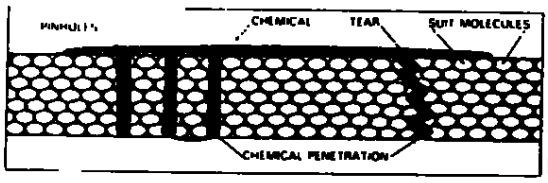
CHEMICAL	UN. NO.	PHYS.COND.	BETEX	VAUTEX	NOTES
Trimethyl-2-Cyclohexen-1-one, 3.4.5-	-	liquid	★★★	-	extrapolated
Trimethylpentane, 2.2.4-	-	liquid	-	★★★	extrapolated
Trinitrophenal, 2.4.6-	1540	solid	★★	★★★	extrapolated
Trinitrotoluene, 2.4.6-	2090	solid	-	★★	extrapolated
Trioctyl Phosphate	-	liquid	★★★	★★	estrapolated
Turbine Oil	-	liquid	-	★★★	extrapolated
Turpentine	1299	liquid	-	★★★	extrapolated
Unsym.Dimethyl Hydrazine	1163	liquid	0	★	extrapolated
Vinyl Acetylene	-	gaseous	★★★	★★★	extrapolated
White Oil	-	liquid	-	★★★	extrapolated
Wood Oil	-	liquid	★★	★★★	extrapolated
Xylene, all Isomers	1307	liquid	-	★★★	extrapolated
Zeolites	-	solid	★★★	★★★	extrapolated
Zinc Acetate	-	solid	★★★	★★★	extrapolated
Zinc Chloride	2331	solid	★★★	★★★	extrapolated
Zinc Sulfate	-	solid	★★★	★★★	extrapolated

The following sources may be consulted for chemical resistance information:

- Registry of Toxic Effects of Chemical Substances, (3 volumes) NIOSH publication number 83-107, from the Superintendent of Documents, Government Printing Office, Washington, DC 20402
- "Guidelines for the Selection of Chemical Protective Clothing," the American Conference of Governmental Industrial Hygienists, 6500 Glenway Ave., Bldg. D-5, Cincinnati, OH 45211
- MSA User's Guide for Chemical Protective Clothing

Penetration Resistance

Penetration occurs when a chemical enters the suit through a physical imperfection such as a damaged seam or zipper, a tear, a pinhole, or a loose glove, boot, or lens



Suits must be leak-tested in the field to ensure their penetration resistance. Simple bubble-indicating leak tests, without measuring pressure-drop over time, are not practical.

Such tests require that a suit be inflated, then covered with a soap and water solution. The user then checks for bubbles. The problem with this is that either too much or too little pressure is put into the suit most of the time. Too much pressure will always cause bubbles, resulting in failure every time. Too little pressure may never cause bubbles, and indicate a safe rating when it might not be deserved

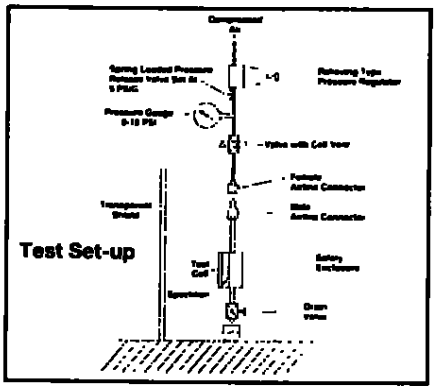
The MSA Suit Integrity Check Kit (P/N 476934) measures penetration resistance by indicating pressure drop over time (in accordance with ASTM F-1052)

It permits the user to inflate the suit with an MSA breathing apparatus, measure the pressure put into the suit, and the rate at which the pressure may drop.

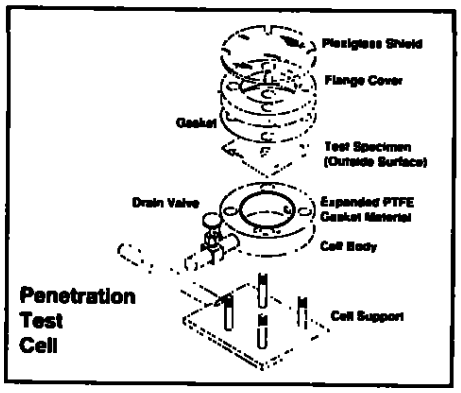
If the suit fails this pressure drop test, the source of the leak should be found with a bubble-indicating leak test, then repaired until the suit passes the suit integrity check.

The Chempruf II zipper, visor-to-gasket-to-material, and regulator gauge viewing window-to-gasket-to-material junction areas were tested for penetration resistance by a liquid in accordance with ASTM F903-84

The following illustration shows the test set-up used to determine the penetration of a liquid through these areas.



The specimen is clamped in the test cell as shown below, and mounted in a vertical position in the test set-up.



Inspection Before Use

Because each specimen tested has an irregular shape, a modified test cell was used to ensure a liquid-tight seal. The test cell is enclosed in a steel case with a transparent shield in front. This is to ensure safety for the observer performing the test The male air-line connector is removed from the pipe nipple on the test cell. The test cell is then filled with approximately 60 milliliters (ml) of the challenge liquid. The male air-line connector is then re-attached to the pipe nipple and connected to a source of compressed air. Test specimens were tested at 0 psig for 5 minutes, followed by a 10-minute test at 1 psig. The results are reported as pass (no penetration of liquid through a test specimen) or fail (liquid penetrates test specimen). Results are presented in the following table:

PENETRATION TESTING OF CHEMPRUF II JUNCTION AREAS

Chemical	*0 PSI	*1 PSI	Comments
ZIPPER PRESSURE			
Water	Pass	Pass	No Change
Methyl Alcohol	Pass	Pass	No Change
Sulfuric Acid	Pass	Pass	No Change
VISOR-TO-GASKET-TO-MATERIAL			
Water	Pass	Pass	No Change
Methyl Alcohol	Pass	Pass	No Change
Sulfuric Acid	Pass	Pass	Visor Fogged and Rubber Gasket Cracked
REGULATOR GAUGE VIEWING WINDOW-TO-GASKET-TO-MATERIAL			
Water	Pass	Pass	No Change
Methyl Alcohol	Pass	Pass	No Change
Sulfuric Acid	Pass	Pass	Fabric Discolored

*All tests were run in triplicate

Ammonia Vapor Test for Penetration Resistance

The American Society for Testing and Materials is developing a recommended testing practice to evaluate the penetration resistance of a total-encapsulating suit. This procedure is more realistic, because it evaluates the leakage of a test contaminant (ammonia vapor) from the outside of a suit to the inside of a suit, instead of other procedures which measure leakage of clean air from inside a suit to outside the suit.

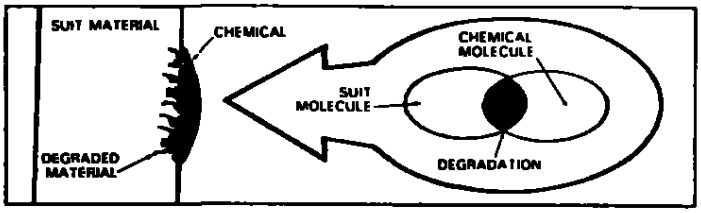
A suit is donned by a person wearing the appropriate respiratory protective equipment and worn inside the suit chamber containing ammonia vapor. An ammonia indicator is worn inside the suit. If leakage is detected, the suit fails the test.

A "pressure drop over time" test procedure (eg. MSA Suit Integrity Check Kit) is still valuable, as it represents the RELATIVE penetration resistance of a sample suit against a predetermined standard. Thus, with adequate recordkeeping, the user could chart a history of a given suit's penetration resistance, and use it as a predictor for preventive maintenance.

For further information on the Ammonia Vapor Test, contact the American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103. Refer to the F-23 Committee on Protective Clothing

Degradation Resistance

Degradation takes place when a chemical degrades one or more of a suit's physical properties, such as material thickness, color, tear resistance, or abrasion resistance. Such a physical change may not necessarily affect the material's permeation resistance. But just the opposite also is possible. A challenge chemical could **permeate** the garment material almost immediately without changing its physical appearance at all.



Neoprene tape is applied to the inside of the suit seams to increase their degradation resistance and penetration resistance.

⚠ WARNING

Gloves and boots are most susceptible to cuts, abrasions and other forms of degradation which may permit direct chemical contact on the skin. Additional work gloves and overboots designed for strong mechanical qualities (provided by the user) may be necessary to prevent damage to the underlying

⚠ WARNING (cont.)

gloves and boots. Failure to provide such overgarments may result in serious personal injury or death.

Betex and Vautex materials resist degradation from ultraviolet light. Samples were tested for UV stability by placing them under stress in an Atlas CXW Weatherometer containing a sunlight arc for 72 hours. Upon removal, no visible signs of attack were observed.

INSPECTING THE CHEMPRUF II SUIT BEFORE DONNING

Inspection Record

Before donning the suit, look at the inspection record. See the following page. Check:

- the date that the suit was last decontaminated
- the level of decontamination obtained
- the date when the suit was cleaned and sanitized
- the date that the suit was tested for penetration resistance with the MSA Suit Integrity Check Kit. The suit must be checked with the Suit Integrity Check Kit at least once every six months. The date that the person making the inspection signed-off, indicating that the suit is ready for reuse.

Suit Physical Inspection

Look at the suit closely, checking for missing or damaged parts:

1 Look for holes and tears in the suit fabric. Look for wear or abrasion that could let a chemical penetrate the suit. Inspect the seams to be sure they are not split completely through.

NOTE

Slight cracking of the seam topcoat material is not the same as a seam that is split completely through. The topcoat material does not affect seam resistance to chemical permeation. It is applied as an additional measure to prevent direct chemical exposure to seam threads, and to enhance the visual appearance of the suit.

2 Check the gloves and boots for tears or abrasions. Pull on the boots

Inspection Record Sample

MSA

PROTECTIVE SUIT INSPECTION CHECKLIST

STYLE _____ **DATE OF MANUFACTURE** _____

SIZE _____ **DATE OF PURCHASE** _____

PART NO. _____ **SERIAL NO.** _____

INSPECTION CHECKLIST

Inspector's Name										
Inspection Date										
SUIT										
Material	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Seams	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
COMPONENTS										
Exhalation valves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Zipper	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
V-GARD® Cap w/FASTRAC ™	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
DUO-FLO™ Adapter	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Lens	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gasket	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
AIR COOLING/DISTRIBUTION										
Suit Entrance	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Manifold	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tubing	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
GLOVES										
Gloves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Glove Ring (brass)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Glove Ring Sleeve (red)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Clamp (stainless steel)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
BOOTS										
Boots	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Boot Ring (aluminum)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Clamp (stainless steel)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Regulator Gauge Viewing Window	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gasket	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Bulkhead Airline Adapter Assembly	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

and gloves to make sure that they are firmly attached.
3. Make sure that the exhaust valve covers are in place.
4. Check the faceshield lens and gauge window for cracks or deep scratches Check the gaskets to make sure that the lenses are secure, and that there are no gaps.
5. Check that the faceshield lens and the gauge window were treated with Fogpruf™ (P/N 39474) for plastic lenses, or regular Fogpruf (P/N 13016) for glass lenses.
6. Check that the zipper has been lubricated.

⚠ CAUTION

If you find any signs of wear, or damaged or missing parts, do not use the suit.

Breathing Apparatus Inspection
Inspect the breathing apparatus according to the manufacturer's instructions. Check the pressure gauge to be sure that the air cylinder is fully charged.

Shelf Life
Actual shelf life of a Chempruf II Suit is dependent on so many variables of storage and exposure conditions that a general statement of a specific life is impossible.

Although a date-of-manufacture is stamped on the identification label attached to the interior of the suit when the entire suit has been inspected and tested. this date does not specify "age." Suit material actually is older, since it was manufactured by a supplier at some earlier date. Also, the date of manufacture does not reflect the time between manufacture and shipment.

There always will be variations in fabric age; however it is MSA's experience that shelf life is not a major cause of fabric deterioration. Other factors which have a greater effect on a suit's life expectancy include:
- knowledge of challenge chemicals and their effect on the suit material;
- thorough suit inspection, following the inspection procedures in this manual;
- detailed records of a suit's exposure and test results following cleaning and maintenance

Each Chempruf II Suit should be inspected individually. The inspection results should be the basis for deciding whether the suit is appropriate for use.

The best way to determine that a Chempruf II Suit is still appropriate for use is to follow the Suit Physical Inspection procedures and guidelines. In addition, the information recorded on the Protective Suit History form and the Protective Suit Inspection Checklist can be useful in helping to determine whether the suit is appropriate for use. By performing a Suit Integrity Test and a Soap Bubble Leak Test, you can determine the suit's overall penetration resistance.

DONNING THE SUIT
Wear cotton underwear, socks, and overalls to help absorb perspiration. Overalls made from flame-resistant synthetic materials, such as Nomex* also may be worn if exposure to flash-fire is a concern. Overalls should have sleeves that can be closed tightly and legs that can be tucked into the socks. If the Chempruf II suit will be worn in a cold environment, wear thermal underwear to help stay warm.

Under extreme conditions, the faceshield lens may fog up. Carry a clean cloth with you to wipe the lens from inside. You also may want to carry a small container of Fogpruf or Fogpruf P from MSA.

NOTE
The Standard Ultralite Air Mask was used in the following pictured sequence. Other models of dual-purpose breathing apparatus from MSA may be used also:
Custom 4500
Model 401
Pressure Demand Work Mask
Dual-purpose breathing apparatus must be from MSA.

Don the self-contained breathing apparatus according to the manufacturer's instructions.

To don the MSA breathing apparatus:
1. Check that the cylinder gauge points to FULL.

2. Lift the cylinder up and over your head

Or, slip your arms into the harness.

3. Bend forward slightly at the waist. Attach the chest strap, and pull it tight

*Nomex is a registered trademark of E.I. duPont deNemours & Co Inc

Donning the Suit

Then, pull down on the shoulder straps as you straighten up.

4. Finally, fasten the waist strap.

5. Check that the system has no air leaks, check that the main-line valve and by-pass valve are closed.
6. Cover the regulator outlet with the rubber regulator cover

7. Open the cylinder valve all the way

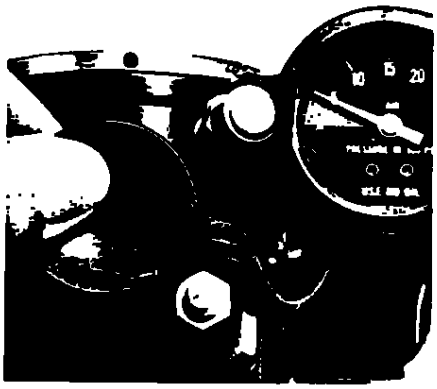
The Audi-Larm® should ring briefly.

NOTE
The Pressure Demand Work Mask has no audible alarm.

8. Open the main-line valve all the way.

The regulator pressure gauge (standard or dual-purpose) should read as follows.
- Ultralite Air Mask 2216 psig (±100 psig)
- Custom 4500 Air Mask: 4500 psig (±225 psig)
- Model 401 Pressure Demand Air Mask 2216 psig (±100 psig).
- Pressure Demand Work Mask: 1980 psig (±100 psig)

9. Close the cylinder valve. The regulator pressure gauge must not drop by more than 100 psig within 30 seconds. If it does, **do not** use the unit.
10. **Slowly**, uncover the regulator outlet.



When the needle reaches the red area on the gauge the Audi-Larm should ring. If it does not ring, **do not** use the unit
11. Close the main-line valve all the way

To don the facepiece:
1. Place your chin into the facepiece.

2. Pull the headharness over your head. Smooth the straps flat, and tighten the straps

Donning the Suit

Pull them back, not out, starting with the lower (neck) straps

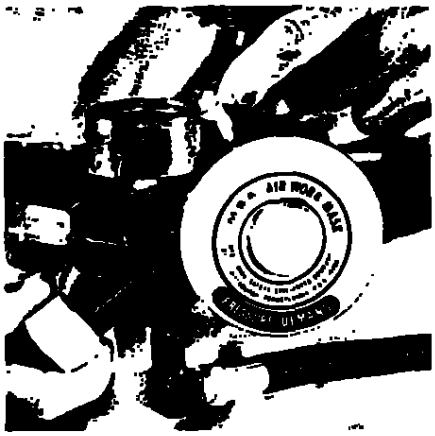
3. Be sure there is a gasket in the breathing tube coupling nut

4 To test the facepiece seal block off the breathing tube

5. Inhale and hold your breath counting to ten. If the seal is good, the facepiece will collapse against your face and stay that way until you unblock the breathing tube

6. If you do not get a good seal, readjust the facepiece. Re-test the seal again. **do not** use the unit if you can not get a good seal.
7 To complete the breathing apparatus hookup, open the cylinder valve all the way

8. Connect the breathing tube to the regulator while you open the main-line valve all the way



9. Check the by-pass valve by quickly opening and closing it to be sure air flows. This valve is your back-up and delivers air directly from the cylinder

NOTE
For additional instructions on the use of specific MSA breathing apparatus, refer to the instructions accompanying each unit

Donning the Hard Hat
Don the V-Gard cap and adjust the suspension for a comfortable fit.

Donning the Standard Chempruf II Suit

⚠ WARNING

Get someone to help you don the suit. Donning is easier and quicker, and you will avoid stumbling or tripping, which may result in serious personal injury or damage to the suit.

1. Step into the suit boots, left leg first. Then, pull the suit up to your crotch. Fasten the strap and-hook to your belt.

Donning the Suit

2. Slip your arms into the sleeves

3. Your helper now can zip up the suit. Straighten the suit material with one hand and pull the zipper up with the other.

Zip the suit slowly, a few inches at a time. Do not force it. Make sure that the zipper is closed all the way. If it is not, the suit will leak.

Donning the Dual-Purpose Chempruf II Suit

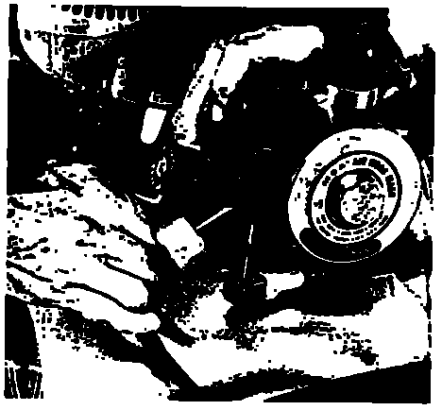
1. Turn on the primary air source for use with the air-line. Make sure this is a Grade D breathable air source at the proper inlet pressure range, and that it is used with the proper length of air-supply hose from MSA. Use the following table to select air-supply hose.

MSA BREATHING APPARATUS	INLET PRESSURE RANGE	AIR-SUPPLY HOSE LENGTH
Ultralite Dual-Purpose	85-90 psig	8-300 ft
Custom 4500 Dual-Purpose	85-90 psig	8-300 ft
Model 401 Air Mask Dual-Purpose	50-100 psig	8-300 ft
Pressure Demand	50-100 psig	8-300 ft

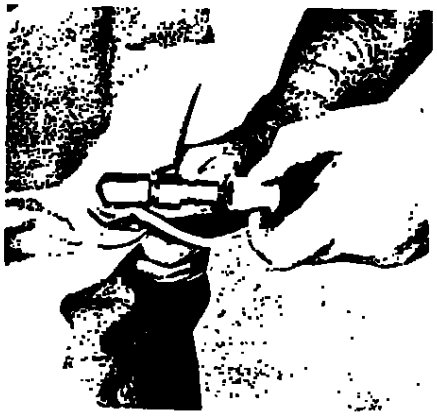
⚠ WARNING

Get someone to help you don the suit. Donning is easier and quicker, and you will avoid stumbling or tripping, which may result in serious personal injury or damage to the suit.

2. Step into the suit boots, left leg first. Then, pull the suit up to your crotch. Fasten the strapand-hook to your belt.



3. Remove the quick-disconnect cap and plug assembly (if provided) from the male quick-disconnect plug located on the front on the outside of the suit



4. Connect the air-line socket to the male quick-disconnect plug on the outside of the suit. Pull on the air-supply hose to be sure that the socket has snapped into place

5. Reach down inside the suit, remove the attached dust cap, and connect the bulkhead air-line adapter socket to the male quick-disconnect plug on the dual-purpose pressure regulator

Pull on the adapter to be sure that the socket has snapped into place

NOTE

The air-line will supply the regulator with air. The regulator will no longer demand air from the dual-purpose breathing apparatus cylinder when the air-line and bulkhead adapter are connected to the regulator.

⚠ CAUTION

Do not use more than 20 percent of cylinder air before connecting to the air-line. The remaining 80 percent is required for emergency escape. This precaution does not apply to the Pressure Demand Work Mask cylinder, which is for escape purposes only.

Donning the Suit

6. Slip your arms into the sleeves

7. Your helper now can zip the suit. Straighten the suit material with one hand and pull the zipper up with the other.

Zip the suit slowly, a few inches at a time. Do not force it. Make sure that the zipper is closed all the way. If it is not, the suit will leak.

USING THE CHEMPRUF II SUIT

Be sure to monitor your regulator pressure gauge. To check, look down into the suit regulator gauge viewing window, located at the left waist area in order to accommodate the design of MSA breathing apparatus. If the pressure gauge of your breathing apparatus is mounted elsewhere, be sure to adopt a workable procedure to monitor the pressure gauge. If using a breathing apparatus with a shoulder-mounted pressure gauge, the user might simply be able to look at the gauge through the breathing apparatus facepiece lens within the suit. If this does not work, contact MSA to inquire about mounting the regulator gauge viewing window in a different area of the suit, meeting your specific requirements. Allow enough time to leave the contaminated area, decontaminate, **and have enough air left to remove the suit and breathing apparatus.**

The Audi-Larm is a warning device that rings to let you know that your air supply is low. The Ultralite and Model 401 alarms are set to ring at about 540 psig, or when there are about five minutes of air left in the 2216 psig cylinder. The Custom 4500 alarm will ring at about 1100 psig, or when there are about 8 minutes of air left in a 30-minute cylinder, or about 12 minutes in a 60-minute cylinder. The Pressure Demand Work Mask has no alarm.

A special precautionary measure may need to be taken when using a dual-purpose suit with a dual-purpose breathing apparatus. If the air from the air-line stops flowing, IMMEDIATELY disconnect the bulkhead air-line adapter assembly from the pressure regulator inside the suit so that air will be supplied to the facepiece from the dual-purpose breathing apparatus cylinder. If using a Pressure Demand Work Mask, the wearer **must** exit immediately.

Immediately attach the Quick-Disconnect Plug to prevent contamination from entering the bulkhead air-line adapter assembly

⚠ WARNING

Below are Emergency Operation Procedures for standard SCBA and dual-purpose breathing apparatus. Practice the first four steps appropriate to your apparatus several times. Do not enter a hazardous atmosphere until you are sure that you can perform these steps in less than 4 seconds.

Emergency Operation, Standard SCBA (Ultralite, Custom 4500, or Model 401 Air Mask) from MSA:

1. Hold the **right** suit glove with your left hand. Pull your **right** arm out of the sleeve

2. Reach down and across, and open the regulator by-pass valve (6-sided knob).

3. Adjust the valve for a comfortable flow of air.
4. Close the main-line valve (round knob).

5 Leave the contaminated area immediately, wash down, and remove the suit and breathing apparatus

Emergency Operation, Dual-Purpose Breathing Apparatus (Ultralite Dual-Purpose, Custom 4500 Dual-Purpose, Model 401 Air Mask Dual-Purpose and Pressure Demand Work Mask) from MSA.

1. Hold the **left** suit glove with your right hand. Pull your **left** arm out of the sleeve.

2. Reach down and grasp the bulkhead air-line adapter hose.

3. Slide your **left** hand along the hose to the regulator and remove the quick-disconnect socket from the regulator.

Air will begin to flow from the cylinder

4. If air does not flow, open the regulator by-pass valve (6-sided knob).

5. Adjust the valve for a comfortable flow of air
6. Close the main-line valve (round knob).

7. If desired, remove the air-line quick-disconnect from the outside of the suit to increase mobility

8. Leave the contaminated area immediately, wash down, and remove the suit and breathing apparatus

NOTE

As an alternative, you may follow the steps outlined in Emergency Operation, Standard SBA, page 25. Then, if desired, remove the air-line quick-disconnect from the outside of the suit to increase mobility.

⚠ WARNING

Do not remove the air-line quick-disconnect until the bulkhead adapter is removed from the SCBA regulator, or air will not flow from the cylinder! Follow the Emergency Operations in this manual only. Failure to follow this precaution may result in severe personal injury or death.

Warnings and Cautions for Use

⚠ WARNING

Like any piece of complex equipment, the Chempruf II Total-Encapsulating Suit will perform as designed only if it is used and serviced according to MSA's instructions. All individuals who have or will have the responsibility for using or servicing the Chempruf II suit must read these precautions carefully and understand them. Failure to do so may result in serious personal injury or death.

Avoid Direct Flame Contact

Do not use the Chempruf II suit near a fire or open flame. Both Betex and Vautex materials will burn. Both fail Method 5903 of Federal Standard 191 Vertical Burn test. Do not use for fire-fighting, or in atmospheres which are combustible or explosive.

For atmospheres where a potential flash fire may occur, use the Flash Resistant Oversuit (P/N 486278). Follow the instructions and limitations supplied with the oversuit.

Do Not Wear a Suit Without Breathable Air

An air supply is **mandatory** to prevent suffocation. Self-contained breathing apparatus must be used in an atmosphere immediately dangerous to life or health (IDLH), or when the concentration of the contaminant is unknown. An air-line alone is prohibited by OSHA regulations in IDLH atmospheres, because the wearer would have no protection if the air supply should fail. In IDLH

atmospheres, an air-line can be used for wearer comfort (body cooling) only, unless it is part of an approved dual-purpose breathing apparatus.

Do Not Use Oxygen-Generating Breathing Apparatus
Never use an oxygen cylinder or oxygen-generating breathing apparatus while wearing a Chempruf II Suit. A severe fire hazard could result.

Never Work Alone in Hazardous Areas
Always work with another person and have at least one person on standby with equal protective equipment.

Do Not Pull on an Air-Supply Hose as a Retrieval Device
To do so may cause the air-supply hose to tear out of the suit and expose the wearer. Contact MSA to order special harness assemblies where retrieval may be necessary.

Avoid Continuous Exposures
Do not expose the suit to a constant liquid splash or deluge, or wade through liquid pools on purpose. Direct chemical exposure to the suit should be no more than a few seconds. If exposed to direct splash or deluge, leave the area immediately and decontaminate.

Prevent Heat Stress
Workers who wear total-encapsulating suits must be in good physical condition. Consult a medical doctor before donning a Chempruf II suit to be sure you are capable of wearing it under expected use conditions. The maximum time the suit can be worn depends on such things as the application, ambient atmosphere, climate inside the suit, physical and psychological condition of the wearer, work rate, and work load. Other factors which may influence the wearer's operating time must be evaluated by the medical doctor.

The wearer can take several steps which may prevent heat stress, such as wearing an ice-vest, feeding the suit with body-cooling air, and taking frequent rest periods during the work session. Contact MSA to order body cooling accessories when necessary.

Leave Immediately if You Experience These Symptoms

- Fever
- Dizziness
- Difficult Breathing
- Any unusual odor or taste
- Nausea
- Eye Irritation
- Excessive
- Tiredness

Then decontaminate the suit.

Avoid Cold Ambient Temperatures
Do not expose the suit to chemicals at very cold temperatures. The suit may become very brittle and crack, leaving an open path for chemicals to enter. Samples of Chempruf II Suit fabrics were tested to determine their cold temperature limitations. American Society for Testing and Materials procedure D-2136, Low Temperature Bend of Rubber-Coated Fabrics, and procedure D-2137, Brittleness Point of Rubber-Coated Fabrics, were performed on Betex and Vautex materials. Test results were as follows:

MATERIAL TESTED	ASTM D-2136 Low Temperature Bend of Rubber-Coated Fabrics [@ -50°F (-45KC)]	ASTM D-2137 Brittleness Point of Rubber-Coated Fabrics
Betex	Pass	-44°F (-42°C)
Vautex	Pass	-35°F (-37°C)

Avoid Chemicals Which May Quickly Freeze the Suit
Some chemicals (such as gases stored as liquids under high pressure) are very cold when the pressure is released. Examples include chlorine and ammonia. They may freeze the suit, causing it to crack. If you encounter these chemicals, wear an oversuit, overboots and overgloves to protect the Chempruf II suit.

Avoid Chemicals Which Generate High Heat
Some chemicals become very hot when mixed with water. The chemical reaction and the high temperature may melt or damage the suit materials, especially if the reaction occurs on the suit material. Leave the area immediately and decontaminate the suit if it gets wet while you are working with such chemicals, or if you observe such a reaction. Do not re-enter such an environment after the suit is wet.

Avoid Drawing Contaminant Inside the Suit
If the wearer stands up quickly from a squatting position, this may create a substantial vacuum within the suit, permitting inward leakage of a contaminated atmosphere. This condition may be prevented by avoiding sudden gross body movements.

Call MSA if Your Chemical is Not on Our List
The Chemical Resistance Chart in this manual refers to 598 different chemicals. Not all ratings are based directly on permeation data. Actual permeation tests were performed on only 93 different chemicals, so as to represent all major chemical classes. The ratings given to the chemicals not directly tested are extrapolations based on the results of the chemicals directly tested in our laboratories.

Extrapolated ratings can never duplicate those obtained through actual testing. They serve only as a guide, based on the theory that different chemicals from the same chemical class will react to protective materials in similar ways. However, there are exceptions to this rule. Therefore, it is recommended that you call MSA if you do not know how our suit will react to a particular chemical. MSA can provide sample swatches of Betex or Vautex materials for your own chemical resistance tests, or arrangements may be made for MSA to conduct permeation tests.

Wear Hearing Protection When Using a Cool-Flo Tube
High noise levels will occur when using a Cool-Flo (vortex) tube in suits equipped with a body-cooling air distribution system. Measure the noise level before use and wear hearing protection if required. For information on hearing conservation equipment, contact MSA.

Preliminary Decontamination (Before Removing the Suit)
Preliminary decontamination could be rather long, depending on exposure. Therefore, you have to know how long it takes to wash down. If you are breathing air from a standard SCBA cylinder, you must allow enough time for cleaning or you may run out of air before you are out of the suit. If you are using a dual-purpose suit with dual-purpose breathing apparatus, or a pressure demand work mask, you may need to continue to use an air-supply hose (connected to the primary air source) during the preliminary decontamination period.

Removing the Suit

⚠ WARNING

Be careful that you and your helper do not touch the outside of the suit directly. The suit may still be contaminated. Your helper must wear adequate protective clothing and a respirator. Protective gloves must be worn. If the contaminant can be absorbed through the skin, it may cause severe personal injury, illness or death. If inhaled the contaminant may cause serious respiratory injury or death.

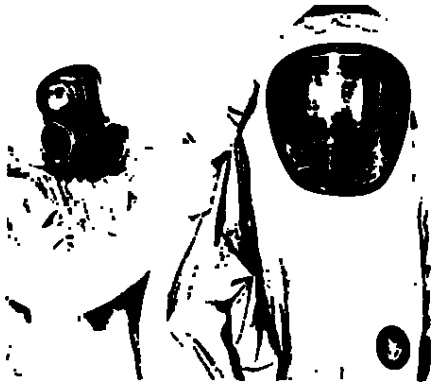
1. Leave the contaminated area, but stay within a boundary that has been set aside or decontamination.
2. Remove the contaminant gently by scrubbing the suit with warm water (120°F maximum) and a mild detergent
3. To remove surface dirt, use a light nylon brush or a utility broom. It may take more than one total scrub-down to completely clean the surface.
4. Catch the contaminated water in a container, such as a wading pool.

If the contaminant is corrosive, be sure that the container will not be damaged, which could let the contaminant escape

5. Follow applicable regulations in disposing of the contaminated water.

Removing the Suit

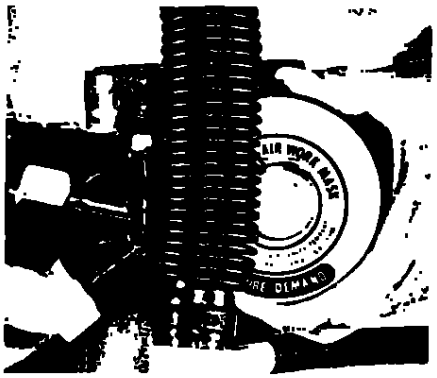
1. Do not remove the suit until after preliminary decontamination
2. Have your helper straighten the zipper with one hand and using the other hand slowly unzip the suit



Do a section at a time and do not force the zipper.

3. Pull your right arm from the sleeve, then reach down and unfasten the strap-and-hook.

4. Pull your right leg out of the suit
5. Now, have the your helper pull your left arm and leg from the suit. Be careful not to touch the outside of the suit.
6. Step clear of the suit to avoid contact with the contaminant, then remove the V-Gard cap
7. To remove the breathing apparatus, reach back and close the cylinder valve, all the way. Disconnect the breathing tube from the regulator
8. After the Audi-Larm stops ringing, close the main-line valve, all the way.



9. Put your fingers under the head-straps. Put your thumbs on the buckles. Pull the top of the buckles away from your face. Repeat as needed to loosen the headstraps

10. Grip the facepiece below the lens and under your chin
11. Pull the facepiece out, then up over your head.

12. Unhook the chest-strap and unbuckle the waststrap. Put your thumbs under the shoulder-strap buckles to loosen them. Then remove the apparatus.

Decontamination Procedures

Your helper must follow the procedures in your organization's decontamination plan to prepare the suit for decontamination before removing his protective clothing and respirator. This may include the following:

1. Fully zip up the suit to keep out any contaminant.
2. Place the suit in a container, such as a large plastic bag, and seal it.
3. Label the container to summarize the suit's use:
   - date
   - wearer identity
   - location used
   - nature of contaminant
   - other information as necessary or specified in your organization's decontamination plan.
4. Take the suit to the place reserved for decontamination and cleaning.

Decontamination

A decontamination plan should be created before personnel enter a hazardous environment. The Environmental Protection Agency considers decontamination to be a complex operation that requires a detailed plan of procedures. For a complete analysis of what such a plan should contain, see the EPA publication, Interim Standard Operating Safety Guides, [The Environmental Protection Agency (EPA), Hazardous Response Support Division, November 19, 1984, p 7-1], USEPA, Environmental Response Team, 26 West St Clair, Cincinnati, OH 45268.

Decontamination Procedures

⚠ WARNING

Do not handle a contaminated suit without adequate protective equipment. Don the proper protective clothing, including a respirator. A suit scrubbed in the preliminary decontamination steps may still be contaminated. If you handle the suit while you are unprotected, your skin may absorb the contaminant, resulting in severe personal injury, illness or death. Inhaling the contaminant may result in serious respiratory injury or death.

Actual procedures must be developed by those with full information on the type and level of the contaminant. Consult the Material Safety Data Sheet (MSDS) describing the particular hazardous substance to obtain detailed information regarding the nature of the substance, the protective equipment needed to handle it, and decontamination procedures recommended by the substance manufacturer. Contact MSA for assistance in selecting decontamination procedures that will not affect the integrity of the suit.

Decontamination can take many forms. Cleaning and sanitizing is one form. For some jobs, this may be enough. However, even short exposures to some hazardous materials can trap chemicals inside the suit fabric. When this happens, scrubbing with a detergent and water may not be enough. Further decontamination may be needed, following an established decontamination plan.

Some types of contamination may be removed by "air washing." In this method, warm air, not exceeding 120°F, is circulated around the suit for up to 48 hours. This speeds up the desorption of the contaminant from the protective material, and releases its vapor to the atmosphere. This method requires an enclosed, well ventilated area that is equipped with the necessary equipment to comply with air pollution regulations. See the illustration below The suit is then cleaned and sanitized to prepare it for re-use.

A suit may have to be sealed in a container and transported off-site for testing by specialists. In cases of extreme contamination, a suit may have to be discarded (according to procedures in the decontamination plan).

Testing for Residual Contamination

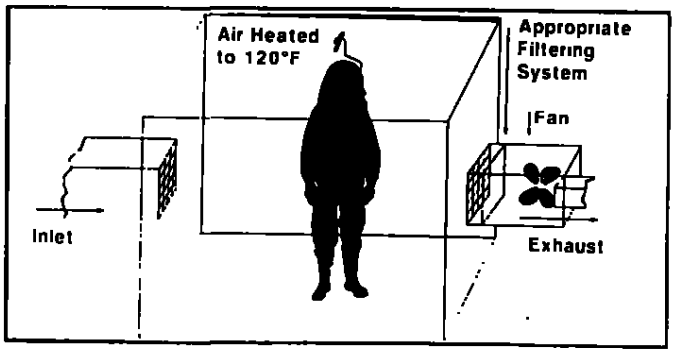
The American Society for Testing and Materials is developing a recommended testing practice to measure the level of residual contamination left in a chemical protective garment after it has been cleaned.

The test method assumes that the contaminant is known and has sufficient vapor pressure to be detected through a vapor-in-air sampling technique. The garment is placed in a closed container and heated for 24 hours. Then an air sample is drawn for analysis. If the sample contains an unacceptable level of contamination, additional decontamination is required until an acceptable level is obtained. The acceptable level of decontamination must be determined by a competent health professional.

For further information on these testing procedures, contact the American Society for Testing and Materials, 1916 Race St., Philadelphia, PA 19103. Refer to the F-23 Committee on Protective Clothing.

Additional Decontamination Information:

- Chemical, Biological and Radiological Decontamination, Technical Manual # TM-3-220, US Army Headquarters (1967). (Available as Publication #1984 0-444-870, from the Superintendent of Documents, Government Printing Office, Washington, DC 20402.)
- Mansdorf, A., "Ensemble Protective Clothing," first draft of ASTM-23.50 Standard, June 1985, American Society for Testing and Materials, 1916 Race St. Philadelphia, PA 19103.
- Hildebrand, Michael S., "Complete Decontamination Procedures" (Two Parts); Fire Command Magazine; Part One: January 1985, pp.18-21; Part Two: February 1985, pp. 38-41.
- Maslansky, Steven P., et al, "Decontaminate..A Perspective for First Responders," Fire Engineering Magazine, January 1985, pp. 16-20.



Cleaning and Sanitizing

Cleaning and Sanitizing
The suit may touch the wearer's skin and, therefore, must be cleaned and sanitized to avoid common skin diseases, such as dermatitis. Cleaning and sanitizing is done after thorough decontamination.

⚠ CAUTION

Do not dry clean the suit or use dry cleaning fluids. They may damage the suit fabric or lenses. Do not use abrasive cleaners. They will damage lenses and may damage the suit fabric. If you use a washing machine, be sure to remove the lens, regulator gauge viewing window, boots, and gloves before washing.

1. To clean and sanitize, add Cleaner-Sanitizer II (P/N 34337) to warm water (maximum temperature 120°F) one packet per gallon
2. Open the zipper far enough to install the Suit Hanger (P/N 695565).

3. Close the zipper to prevent any remaining contaminant from entering the suit.
4. Clean the outside of the suit thoroughly with Cleaner-Sanitizer II if this has not already been done during the decontamination procedure. If the suit is badly soiled, repeat the washing until it is clean.
5. Rinse the outside of the suit. Pay close attention to horizontal wrinkles or other places where chemicals may pool.
6. Dispose of cleaning solution according to federal, state, and local pollution regulations. This may mean using a catch basin, such as a wading pool.
7. Add Cleaner-Sanitizer II to warm water (maximum temperature 120°F) one packet per gallon.
8. Open the suit zipper all the way.
9. Pull the valve covers off and lift the discs out of the valves in the back of the suit.

A special accessory key (P/N 695548) should be used to remove the valve seat.

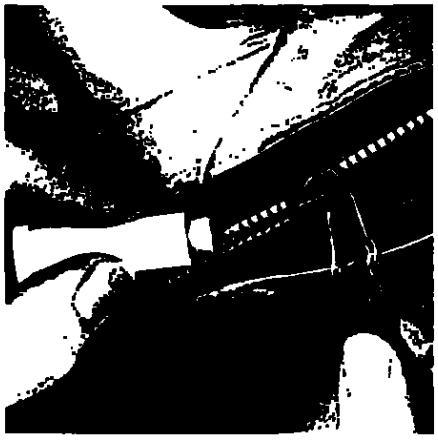
Inspect these parts thoroughly. If they show signs of wear or damage, or if the valve discs are hardened or deformed, replace them. Valve discs should be replaced every two years as a minimum. If these parts are in good condition wash them gently in Cleaner Sanitizer II, then rinse. Lay them aside to dry. Re-install the valve body with slide ring and threaded ring. Do not re-install the valve disc or valve cover at this time. They are re-installed after the Suit Integrity Check.

10. Clean the inside of the suit thoroughly. Use a soft cloth to wipe the faceshield lens and gauge window so that they are not scratched.
11. Rinse the inside of the suit.
12. Let the zipper open. Hang the opened suit up by the boots to air-dry.

⚠ CAUTION

Do not use heat to force-dry the suit. Do not dry the suit in direct sunlight, or use a sunlamp or hot-air blower. If a drying cabinet is used, the inside temperature must not be higher than 120°F. Higher temperatures may damage the suit fabric or distort the lenses.

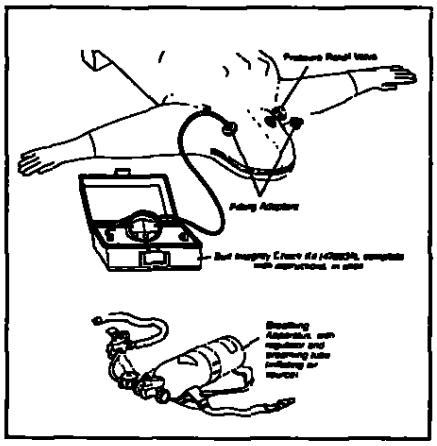
13. Rub the zipper lubricating pencil (P/N 695549) lightly over the links of the zipper.



Then run the zipper up and down to spread the lubricant evenly. Repeat this step after each six months of storage.

14. Clean the breathing apparatus also, using Cleaner Sanitizer II. Follow the instructions supplied with the apparatus.
15. Run the Suit Integrity Check to test the suit for penetration resistance (leak tightness).

Using the Suit Integrity Check Kit (P/N 476934)

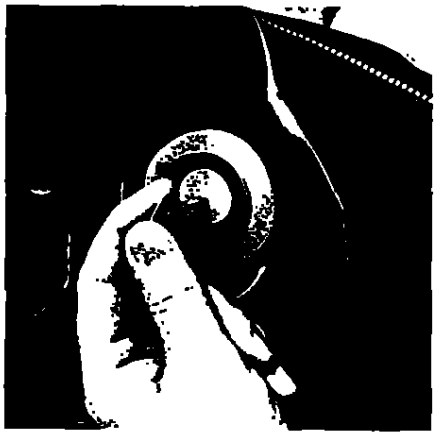


The Suit Integrity Check Kit tests the suit's penetration resistance to determine if there are breaks in the suit fabric (such as a pinhole), or between materials (such as a gap between the suit fabric and the zipper).

1. Lay the suit on a clean sheet or cloth to protect the faceshield lens and the suit fabric. Place the suit face down, with the zipper open.
2. Support the ankle areas with blocks to keep the legs as straight and full as possible.

3. Remove the three exhaust valve covers, then remove the valve discs if they have not already been removed during the cleaning and sanitizing procedure.

4A. To block off a valve body using a valve plugging key:
- Inspect the screw-in plug to be sure that the gasket is in place around the threaded stem.
- Reach inside the suit and thread the screw-in plug into the female threads in the underside of the valve body until hand tight. **Do not use a wrench.**



4B To block off a valve body using a rubber valve cover:
- Fold back the lips of the adapter.
- Place the cover against the valve body.
- Release the lips of the cover so that a tight seal is formed around the valve body

5. To attach the breathing tube adapter to a second valve body:
- Fold back the adapter lips.

- Place the adapter against the valve body.

- Release the adapter lips so that a tight seal is formed around the valve body.

6. To attach the gauge tube fitting to the third valve body:
- Fold back the fitting lips.
- Place the fitting against the valve body
- Release the lips to form a tight seal around the valve body

7 Close the suit zipper. Be sure it is fully closed to prevent leakage

8 Disconnect the breathing tube from the breathing apparatus facepiece. Attach this end to the breath-

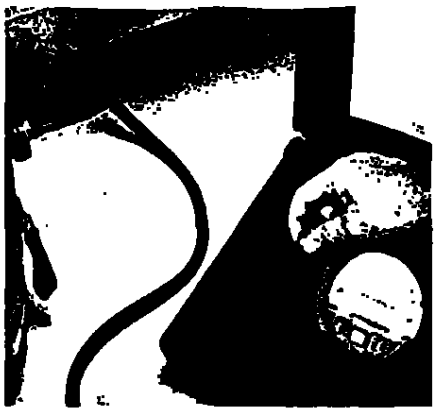
ing tube adapter. Connect the other end of the breathing tube to the regulator.

9. Close the regulator main-line and by-pass valves completely
10. Open the cylinder valve all the way.
11. **Slowly**, open the regulator by-pass valve (red knob). Let the suit inflate slowly at a constant rate to 8.0 inches water column (H_2O) pressure over one minute.

⚠ CAUTION

The suit should never be inflated to more than 10.0" H_2O. Otherwise the faceshield lens may pop out.

12. Close the by-pass valve.
13. Wait 60 seconds to let the suit fabric expand.
14. Slowly, open the bleeder valve on the left side of the test kit gauge until the gauge needle drops to 6.4" H_2O



Close the bleeder valve completely.

15. Start timing for 1 minute.
16. The test gauge needle must not drop more than 1.0" H_2O during this 1 minute period.

NOTE

If the test gauge needle drops to less than 5.4" H_2O pressure in less than 1 minute, the suit fails the penetration test.

17. If the suit fails, apply a soap solution to the breathing tube adapter, gauge tube fitting, the plugged valve body, and all other hardware connections of the test set-up. If bubbles occur, check that these items are clean and installed correctly. Repeat steps 4-16, above.

18. If the suit fails again, repeat steps 11 and 12, above, and apply a soap solution over the entire suit, starting with the areas around lenses, the zipper, seams and points where the gloves and boots are attached. Look for air bubbles until the leak has been found.
19. Repair the suit according to the instructions in the Maintenance section of this manual.
20. Repeat these procedures until the suit passes the test. To deflate the suit, open the zipper.
21. Close the cylinder valve on the breathing apparatus.
22. Slowly open the main-line valve to relieve pressure from the breathing apparatus regulator, high-pressure hose, and audible alarm. When the Audi-Larm stops ringing, close the main-line valve.
23. Remove the breathing tube adapter, gauge tube fitting, and the screw-in plug from the suit. Unscrew the breathing tube adapter from the breathing tube. Place the breathing tube adapter, gauge tube fitting, and the screw-in plug back in the Suit Integrity Check Kit.
24. Replace the exhaust valve discs and covers. Check all parts, especially the valve discs and covers, to be sure they are positioned correctly and are tight.
25. Install a fully-charged air cylinder in the breathing apparatus.

Transportation and Storage

1. The Chempruf II Suit should be shipped folded in a case or box. The suit should not be pressurized during shipment.
2. Store the suit in a clean, dry location, free from harmful substances, including ozone. Store the suit in an area protected from direct sunlight and at a temperature not to exceed 120°F.
3. Store the suit in a protective container, such as the shipping case or a cabinet. If the suit is hung in a cabinet, use the Suit Hanger (P/N 695565).
4. Do not force the material seams or zipper when folding the suit.
5. Do not pinch the suit fabric when closing the case.
6. Take the suit out of the case every six months to air it out, lubricate the zipper, and perform the Suit Integrity Check procedure.

MAINTAINING THE SUIT

NOTE

Minor repairs may be made with suit repair kits from MSA. However, the only parts which may be replaced by the user are the faceshield lens, regulator gauge viewing window, exhaust valves, gloves and boots. All other repairs must be done by MSA. Do not attempt to repair cuts, tears, abrasions, or punctures beyond the dimensions indicated in the repair kits. Do not replace the suit zipper.

For repairs other than those listed above, or for the addition of suit accessories such as body-cooling, air distribution systems and bulkhead air-line adapter assemblies return the suit (in a decontaminated and clean condition) to:

MSA
Returned Materials Dept
1901 William Flynn Highway,
Glenshaw, PA 15116

Do not send a contaminated suit to MSA! If the suit has been contaminated, attach the following to the **outside** of the return shipping container A copy of the decontamination document, listing the procedures used.

A statement indicating that the suit contains no detectable residual contamination.

Replacing the Faceshield Lens and Gauge Window

1 To remove the faceshield lens or gauge window, push the end of the gasket separator tool under one end of the splining.

2. Pry the splining out of the groove, then pull it out of the gasket by hand.

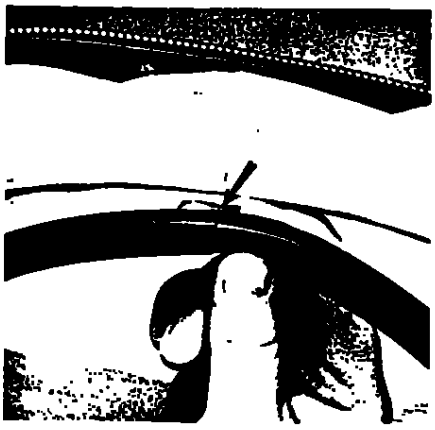
3. Push the faceshield lens or regulator gauge viewing window out of the gasket by pressing out from the inside of the suit

4. Pull the gasket out of the suit

Installing the Faceshield Lens or Gauge Window

NOTE

Always use a new gasket and splining when changing lenses. The old gasket or splining may stretch and not give a tight seal. The lens gasket has a mark to be lined up with the suit seam. The regulator gauge viewing window gasket has no mark.



1 Press the outer gasket groove on the suit frame The bottom of the groove must be tight against the frame Work the gasket until it fits tightly all around the frame

2 To open the lens groove in the gasket, wrap a clean cloth around the gasket separator tool Then, dip the cloth in soap solution, insert the tool into the groove, and work it all around the groove.

3 Insert the large tip of the splining inserter tool into the gasket, and "run" it all around the gasket to widen the groove and distribute the soap solution.

4. Apply soap solution to the lens or window edge.

5. Line up the small notch at the top of the faceshield lens with the gasket center-line.

6. Place the flexible lens guide into the lens groove.
7. Push the bottom of the lens down over the outside of the flexible lens guide and into the gasket groove.
8. Use the gasket separator tool (P/N 695665 metal for plastic lens, or P/N 695667 plastic for glass lens) to stretch the gasket out and up over the outside of the lens. Do this all around the gasket

9. Dip the gasket separator tool in soap solution and "run" the tool all the way around the splining groove on the inside of the lens gasket

10. Straighten any kinks or twists in the splining and pull one end through the handle and eyelet the splining-inserter tool.

11. Insert the eyelet (with the splining) into the splining groove and hold it in place.

12. Work the eyelet through the entire splining groove. To make the splining easier to insert, push down while pulling the splining-inserter tool from side to side
13. When you have installed splining through the entire splining groove, approximately one inch of splining should be left over.

14. Do not cut off this extra splining. Instead, use the pin on the back of the splining-inserter tool to push the loose end of the splining into the splining groove.

The splining material is more elastic than it appears, and can be pushed backward one inch until the ends butt together.

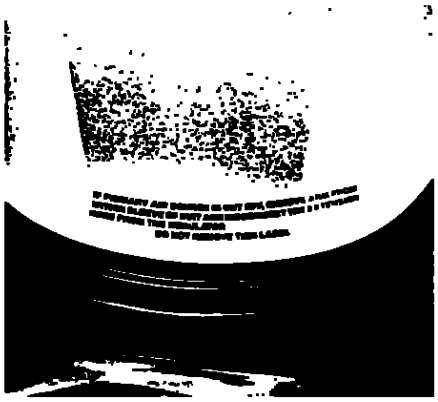
15. To check the fit, run your finger around the inside and outside of the gasket. It should feel smooth to the touch, and must touch the lens and suit fabric at all points, without buckling.

⚠ CAUTION

Inspect the inside and outside lips of the gasket. Make sure that they completely clamp the lens on both sides. Be sure to check the upper corners of the lens.

16. Clean the lens thoroughly to remove any residual soap solution
17. When a lens is replaced on a dual-purpose suit a new Warning Label (P/N 480278) must be installed inside the lens. To install the label,
    - Peel off the adhesive backing from the label

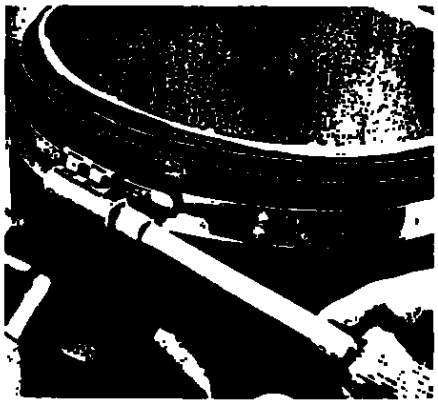
- Press the label against the bottom, inside surface of the faceshield lens.



18. Perform the Suit Integrity Check (see page 30).

Removing a Boot

1. To remove a boot, open the suit zipper all the way to the bottom.
2. Turn the suit leg inside-out so that you can see the boot clamp
3. Use a 7mm nut driver to loosen the screw drive, and remove the clamp and rubber protector. A 7/16 inch nut driver will also work. Save the rubber clamp protector for new boot installation



4. Reach into the boot and pull the boot ring out.

5. Pull the boot off the suit leg

Installing a Boot

NOTE

Make sure that the boot is for the correct leg

1. Turn the suit leg inside-out
2. Locate the notch in the leg fabric

3. Push the boot top into the suit leg

4. Line up the leg notch with the seam on the front of the boot

5. Push the boot ring into the boot. The ring should fit tightly. Make sure that the top of the ring is flush with the top of the boot.

6. Slide the boot clamp over the boot. Position the clamp at about the center of the ring
7. Turn the clamp so that the screw drive is located in the position it was in before disassembly.
8. Slide the rubber clamp protector under the clamp screw drive.

9. Use a 7mm nut driver to tighten the screw drive. A 7/16-inch nut driver

also may be used. A torque wrench may be used as an option-to tighten the screw drive. If so, tighten the screw drive to 44 ±3 in lb. (500 ±30 Newton-centimeters)

⚠ WARNING

The boot clamp must not be overtightened. If the clamp is distorted or large wrinkles appear in the leg material, the clamp is too tight. Wrinkles will provide a path for contaminants to enter the suit and may result in serious personal injury or death.

10 Turn the suit leg right-side out. Hold the suit up and check that the boot points forward properly.

If not, repeat steps 4 through 9, above.

11 Check that the boot is tight enough. Pull on it with enough force to be sure that it will not pull loose under working conditions.

12 Perform the Suit Integrity Check (see page 30.)

Removing a Glove

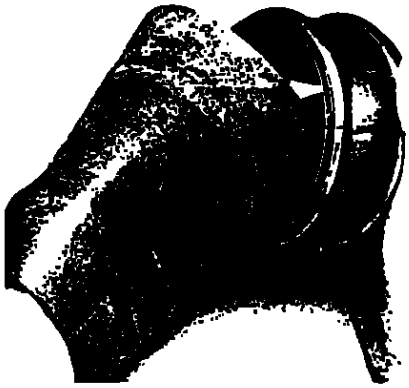
1 To remove a glove, open the suit zipper all the way to the bottom.

2 Turn the suit sleeve inside-out so that you can see the glove clamp.

3 Use a 5mm nut driver to loosen the clamp's screw drive, and remove the clamp and clamp protector. A -inch nut driver will also work. Save the clamp protector for new glove installation.

4. Pull the glove from the suit sleeve.

5. Remove the glove ring and glove-ring sleeve from the glove. If the ring or sleeve are damaged, remove the sleeve from the ring and replace it.



Installing a Glove

NOTE

Make sure that the glove is for the correct arm.

1. If the glove ring or the glove-ring sleeve were replaced, insert the sleeve in to the ring.
2. Wrap the sleeve completely over the ring until it fits snugly, with no wrinkles.

3 Push the glove ring assembly into the glove.

4 Apply talcum powder to the top of the glove to make it easier to insert.

5 Insert the glove into the suit sleeve, and pull it through.

6 Line up the palm of the glove with the arm sleeve seam that goes to the arm pit.

7. Slide the glove clamp over the glove. Position the clamp at about the center of the ring.
8. Turn the clamp so that the screw drive is located over the inside seam of the sleeve.
9. Slide the clamp protector under the clamp screw drive.

10. Use a 6mm nut driver to tighten the screw drive. A ¼-inch nut driver also will work. A torque wrench may be used as an option to tighten the screw drive If so, tighten the screw drive to 44 ±3 in /lb (500 ±30 Newton-centimeters)

⚠ WARNING

The glove clamp must not be over-tightened. If the clamp is distorted or large wrinkles appear in the sleeve material, the clamp is too tight. Wrinkles will provide a path for contaminants to enter the suit and may result in serious personal injury or death.

11 Carefully cut off any glove material that extends past the clamp.

12 Turn the sleeve right-side out Hold the suit up and check that the glove hangs properly.

13 If not, loosen the clamp and repeat steps 5 through 12.
14 Check that the glove is tight enough. Pull on it with enough force to be sure that it will not pull loose under working conditions.
15. Perform the Suit Integrity Check (see page 30).

PRODUCT SPECIFICATION

Total-Encapsulating suits in either Betex or Vautex materials for use with either SCBA or dual-purpose breathing apparatus

Purpose
To establish minimum standards for this equipment

Type, Size, and Design
The suit covered by this specification shall be a total-encapsulating suit which completely encloses the worker and the worker's respiratory protection device(s). The size and design of the suit shall be such that one standard size will fit virtually all prospective users. Length from top of head to bottom of boot shall be 79-½". Width from glove tip to glove tip shall be 87".

Critical Parts
The suit shall consist of the following critical parts: Suit fabric, faceshield lens, faceshield lens gasket, regulator gauge viewing window, regulator gauge viewing window gasket, zipper, gloves, boots, air exhaust valves, and headgear

Suit Fabric
The basic suit fabric shall be (check one):

- ☐ Green Vautex (Viton -on-nylon-on-neoprene), approximately 19.1 oz/yard and approximately 23 mils thick (0.023").
- ☐ Orange Betex (Butyl-on-polyester-on-neoprene), approximately 15.9 oz/yard and approximately 19 mils thick (0.019").

Representative samples of the suit fabric shall have been tested for chemical resistance with a test cell of similar concept and design to that outlined in ASTM F739, with test results published. Test results shall indicate breakthrough times of at least one (1) challenge substance from each of the following 17 chemical classifications:

- strong mineral acid
- chlorine
- halogenated hydrocarbon
- cyclic ester
- substituted allyl
- nitrile
- ketone
- phenol
- aliphatic hydrocarbon
- strong oxidizing acid
- aromatic hydrocarbon
- aliphatic amine
- aldehyde
- aromatic amine
- acrylate
- alcohol
- ammonia

Breakthrough times indicated shall be the shortest times observed from the start of the test to the lowest detectable level of the challenge chemical on the other side of the sample in the test cell (within the limits of the analytical instrumentation). All construction seams of the basic suit fabric shall be stitched from the underside and coated with a

compatible air-cured compound for a tight seal.

Faceshield Lens
The faceshield lens shall be constructed of a preformed 5/32" thick polymethyl methacrylate material. It shall be field replaceable with optional tools available from the manufacturer. The faceshield lens shall measure 11" wide, and 11" long, with a total perimeter of 37¾".

Faceshield Lens Gasket
The faceshield lens gasket shall be constructed of natural rubber material, and shall keep the lens affixed to its frame by way of a splining gasket wedged into the insert, thus creating a tight compression fit.

Regulator Gauge Viewing Window
The circular regulator gauge viewing window shall be constructed of flat polymethyl methacrylate material, 0.120" thick and 2¾" in diameter. It shall be field replaceable with optional tools available from the manufacturer.

Regulator Gauge Viewing Window Gasket
The gasket between the suit material and the clear window (which permits the user to view the breathing apparatus regulator gauge) shall keep the window affixed to its frame by way of a splining gasket wedged into the insert, thus creating a tight compression fit.

Zipper
A single zipper 72" long shall extend from the right leg up over the hood, permitting easy donning and doffing of the suit. No other zippers shall be permitted anywhere on the suit

Gloves
The gloves shall be Viton material, attached to the sleeves of the suit with a field replaceable clamp-and-ring assembly. PVC-coated over-gloves shall be provided.

Boots
The boots shall be constructed of neoprene rubber, approximately 3/32" thick at the sides. The boots shall be attached to the legs of the suit with a field replaceable clamp-and-ring assembly.

Air Exhaust Valves
The suit shall be equipped with three (3) demand-style, air-exhaust valve assemblies to relieve excess air build-up inside the suit. The exhaust valve assemblies shall be covered with a replaceable, open-bottomed rubber cover to prevent splash run-off from contaminating the valve.

Head Gear
The suit shall be designed to enclose and shall be equipped with a hard hat to provide head protection from impact hazards as specified in the performance requirements of ANSI A89.1-1981 (requirements for protective head gear for industrial workers).

Quality Control - Suit Integrity
The suit manufacturer shall certify that the suit meets or exceeds the manufacturer's published specifications

Test criteria for meeting specifications include the following leak-tests:

a. Pressurize the suit to 8" H_2O pressure for 30 seconds.
b. Drop suit pressure to 6.4" H_2O pressure and begin timing.
c. After 1 minute, the suit pressure shall be no less than 5.4" H_2O pressure.

A drop in suit pressure to less than 5.4" H_2O pressure represents suit failure within the scope of this test procedure.

Options
The manufacturer shall provide the following options (check one or more):

- ❑ Bulkhead air-line adapter assembly for use with dual-purpose breathing apparatus from MSA to be worn inside the suit. Manufacturer must have obtained an extension of approval from NIOSH/MSHA on the dual-purpose breathing apparatus as used with the bulkhead air-line adapter assembly.
- ❑ Glass lens, ⅛" thick, measuring 11" long and 11" wide, with a total perimeter of 37¾".
- ❑ Supplied-air body cooling system for worker comfort.
- ❑ Suit retrieval harness system
- ❑ Repair kit
- ❑ Flash-resistant oversuit

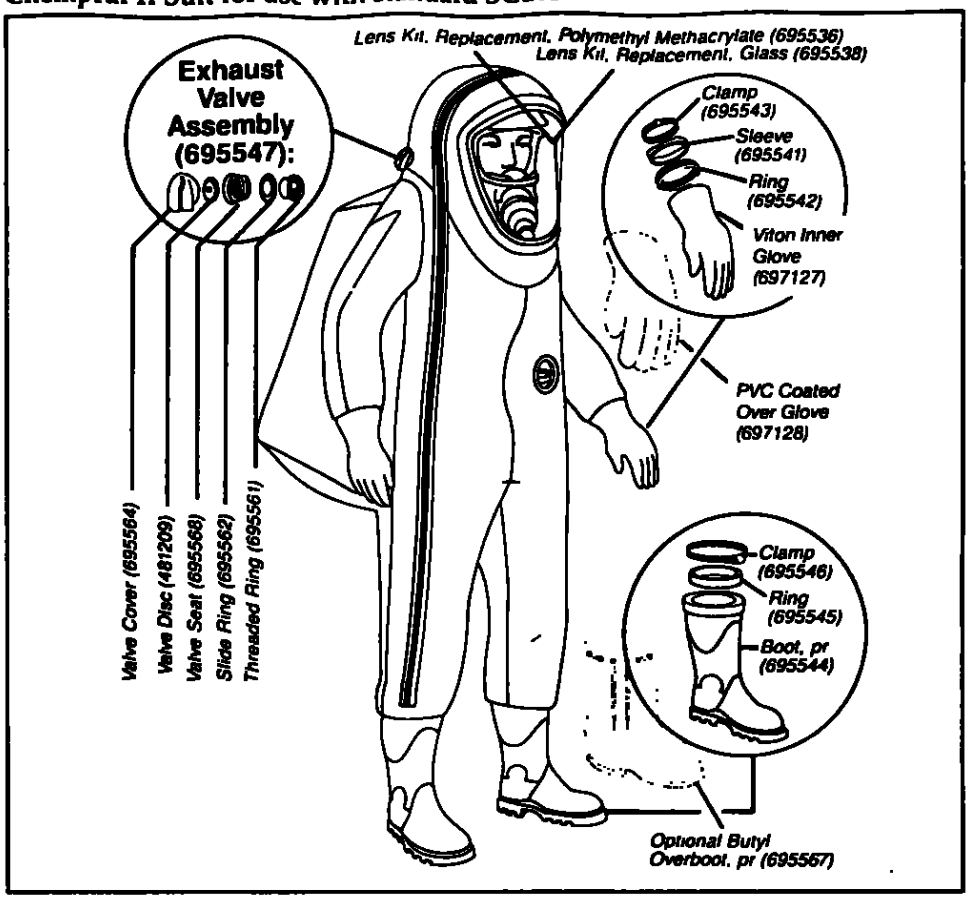
Chempruf II Total-Encapsulating Suits		
	For Use With MSA SCBA	For Use With MSA DPBA
Vautex	477096 in case	477098 in case
	476998 less case	477094 less case
Betex	477097 in case	477099 less case
	476999 less case	477095 less case

Replacement items

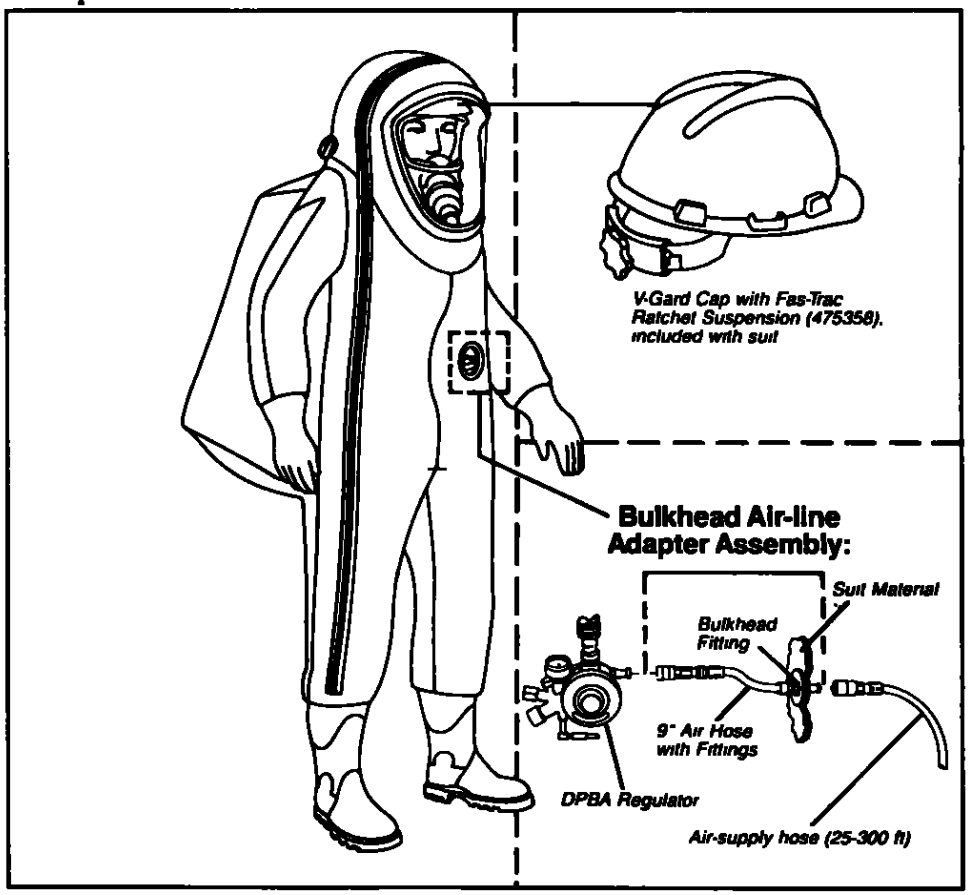
Part No.	
697127	Glove, replacement, viton, one pair
697128	Glove, replacement, PVC coated, one pair
695541	Sleeve, for glove installation
695542	Ring, for glove installation
695543	Clamp, for glove installation
695544	Boots, replacement, one pair; NBR, SBR and natural rubber compound
695545	Ring, for boot installation
695546	Clamp, for boot installation
632446	Gasket, for boot installation, neoprene
695660†	Nutrdriver, 6mm, for glove clamp
695661†	Nutdriver, 7mm, for boot clamp
695648†	Torque Wrench (inch-pound) with 9/32" and 1/4" sockets, used in place of nutdrivers
695547	Valve Assembly, exhaust, consisting of:
695561	Threaded Ring
695562	Side Ring
695568	Valve Body
481209	Valve Disc
695564	Valce Cover (shroud)
695549	Pencil, lubricating, for zipper (one is packaged with each suit)
632358	Regulator Gauge Viewing Window, shatter-resistant glass
695649	Regulator Gauge Viewing Window, polymethyl methacrylate
632359	Gasket for Regulator Gauge Viewing Window
481127	Instruction Manual

†Nonstocked

Chempruf II Suit for use with standard SCBA



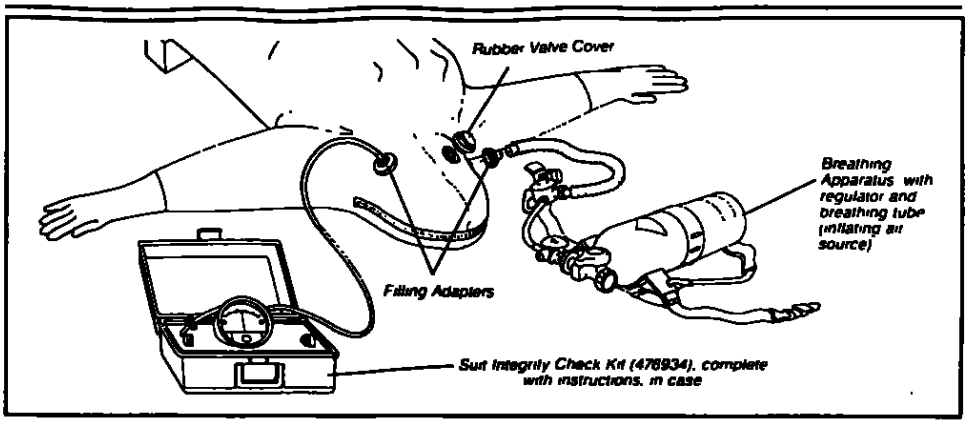
Chempruf II Suit for use with MSA DPBA



Customize your suit with MSA options and accessories:

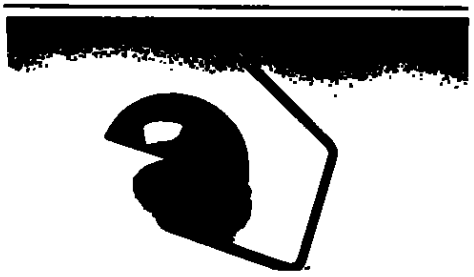
Flash-Resistant Oversuit
Provides limited wearer protection from exposure to a potential flash fire. Requires Retrofit Kit (Part No 485790)

486278	Flash-resistant oversuit, assembly consisting of items below:
486277	Flash-resistant Oversuit
486273	Flash-resistant Gloves, 1 pr
486275	Flash-resistant Boot, 1 pr
486272	Silver Polyester Cover Lens, 1 each
485790	Retrofit Kit, complete, includes items below:
485749	Template
485787	Sand Paper
20605	Bristle Brush
485798	Tabs with mounting snaps
485743	Adhesive, Part A
485744	Curing Agent, Part B
633851	Mixing Cup (2 enclosed)
633852	Graduated Dropper



Suit Integrity Check Kit
The MSA Suit Integrity Check Kit allows the user to inflate the suit with air directly from the MSA breathing apparatus being used. The suit should hold the stated pressure over a given period of time. The gauge of the check kit permits the operator to easily check for the allowable pressure drop over time. If the observed pressure drop is within the test criteria, the suit passes the test. If not, leak testing with a soap solution is called for until the leak has been identified and repaired and the suit passes the test.

476934 Suit Integrity Check Kit



Suit Hanger
695565 Suit Hanger

Carrying Case
631470 Carrying Case for Chempruf II Suits

Disposable outerwear
Optional overwear helps minimize contamination of the Chempruf II Suit in the field. A disposable oversuit made from Saranex*-laminatedTyvek** material fits right over the Chempruf II Suit and helps minimize contamination. Oversuit comes with presealed air-line extension sheaths which may be cut to feed in air hose at left side for Dual-Purpose Breathing Apparatus or at middle for an optional air-distribution system.

695613 Oversuit, to reduce contamination, Saranex-laminated Tyvek, white

Disposable overboots
695647 Overboots, PVC, one pair
695567 Overboots, Butyl, one pair

* Saranex is a registered trademark of Dow Chemical Company
** Tyvek is a registered trademark of E I du Pont de Nemours & Co., Inc.

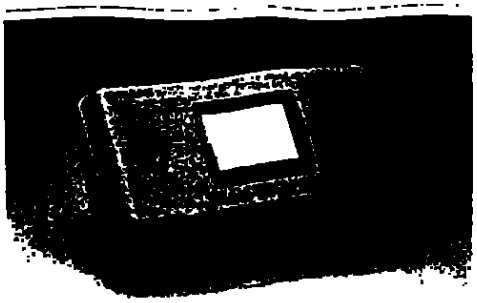
Suit Retrieval Harness Retrofit Kit
The Suit Retrieval Harness system is designed to lower, or suspend a user of the Chempruf II Suit into a contaminated area.

487693	Suit Retrieval Harness Retrofit Kit
485710	Chempruf II Suit, Vautex, SCBA model, with Suit Retrieval Harness installed, in Carrying case
485712	Chempruf II Suit, Betex SCBA model, with Suit Retrieval Harness installed, in Carrying case

Replacement Gloves

38552	Gloves, Butyl, size 10, 14" length, .017" thick, 1 pr
695637	Gloves, Viton, size 10, 14" length, .012" thick, 1 pr
695652	Linerst, glove, 14" length, small size, 1 pr
695653	Linerst, glove, 14" length, medium size, 1 pr
695636	Viton Overgloves, replacement, one pair: size 11, .012" thick
38556	Butyl Overgloves, replacement, one pair: size 11, .024" thick

Glove liners increase the ability to withdraw one's arms from within the suit during emergency procedures. Liners must be used when the standard cloth lined neoprene gloves are replaced with unlined Butyl or unlined Viton gloves.



Chempruf II Repair Kits

485634	Repair Kit for Vautex Suit, includes items listed below
485633	Repair Kit for Betex Suit, includes items listed below
633850	Seam Roller
633856	Sanding sponge
485627	Liquid Butyl topcoat, 1/4 pt. (Betex only)
485745	Liquid Viton topcoat 1/4 pt. (Vautex only)
485746	Viton accelerator (Vautex only)
485743	Adhesive, can
485744	Curing agent
485630	Seam tape, 20-ft roll

Oval Patches (pack of 6):

485604	2-1/2 x 8-1/2cm (Vautex)
485603	2-1/2 x 5cm (Vautex)
485602	2-1/2 x 8-1/2cm (Betex)
485601	2-1/2 x 5cm (Betex)

Round Patches (pack of 6)

485598	4cm Dia. (Vautex)
485597	3cm Dia. (Vautex)
485596	4cm Dia. (Betex)
485595	3cm Dia. (Betex)
485628	Toluene, 4 oz. can

Oval Neoprene Patches (pack of 6):

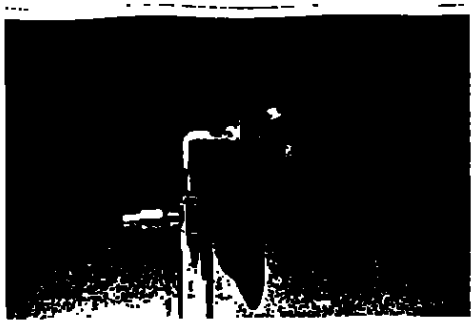
485606	2-1/2 x 8-1/2 cm
485605	2-1/2 x 5cm

Round Neoprene Patches (pack of 6):

485600	4 cm, Dia
485599	3cm Dia.
633852	Dropper
20605	Bristle brush
633851	Mixing cup, 50 ml

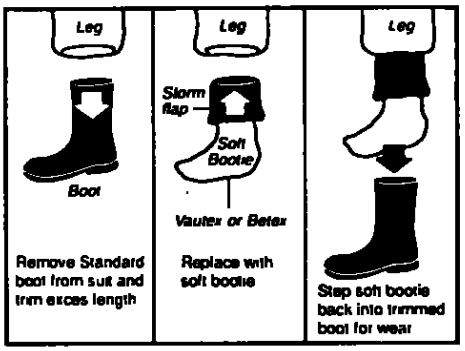
Fogpruf Solution

13016	Fogpruf, 4-oz bottle
39474	Fogpruf-P, 4-oz bottle



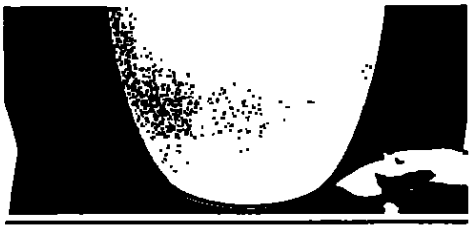
Retrofit Air Cooling System
This optional air cooling system can be installed by MSA at the factory, if desired. It brings air through an outside air-line to cool the wearer.

486680	Retrofit Cooling System Kit includes exhaust valve, manifold asembly, vortex tube and quick disconnects



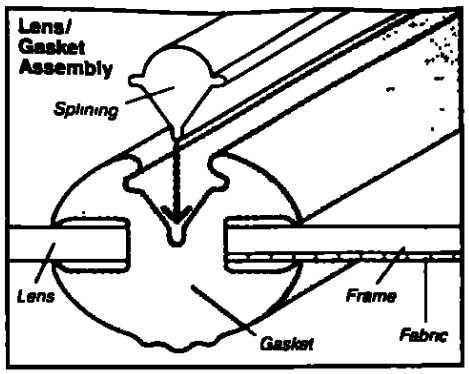
Soft -Bootie-foot replacement kit
Provides a pair of booties made of the same material as the rest of the basic suit. (Betex or Vautex).

479379	Soft-Bootie-Foot Replacement Kit, Betex, orange,one pair
479380	Soft-Bootie-Foot Replacement Kit, Vautex, green, one pair



Cover Lens

480289	Cover Lens, pkg. of 5 for faceshield lens, self-adhering



Lens Kit
A glass, wide-vision lens is available to replace the polymethyl methacrylate version in the field. Glass resists virtually all organic compounds and won't cloud up under such chemical attack. An accessory tool set is available to replace the lens or the regulator gauge viewing window in the field.

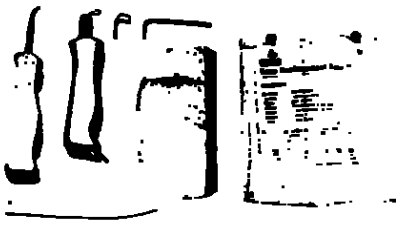
Improved Lens Kits with stout Gaskets and Splinings		
	New and Improved Style (stout design)[1]	Original Style (slender design)
Lens Kit PMMA	696146	695536
Lens Kit Glass	696145	695538
Splining	696147[2]	602801[3]

[1] New and improved style lens kit with stout gaskets and splinings are easier to install and offer better lens retention

[2] Part Number 696147 new style (stout) splining will fit only 696146 and 696145 new style lens kits with stout gaskets

[3] Part Number 602801 original style splining will fit only 695536 and 695538 original syle (slender) lens kit gaskets and 632358 and 695649 regulator gauge viewing windows with slender gaskets

Stick-On Fog-Preventive Lens
481682 Stick-On Fog-Preventive Lens, mounts inside Chempruf II wide vision lens, providing dead air space to reduce fogging.



Tool Set
481120 Tool Set, lens replacement, consisting of:
695665 Gasket Separator, metal tip, wood handle, for PMMA plastic lens insertion
695666 Inserter, splining, with Part No. 695668 small tip installed
695669 Tip, gasket spreading, large size
695670 Hex Wrench, for changing tips
481121 Lens Guide, flexible
695667 Gasket Separator, all plastic, for glass lens insertion

Quick-Disconnect Plug
486289 Quick-Disconnect plug, for capping exterior male fitting when dual-purpose feature is not in use.

Cleaner-Sanitizer II
34337 Cleaner-Sanitizer II, 12 two-oz pkg in carton

Ice Chest Cooling Vest
695803 Ice Chest Cooling Vest, polyester /cotton shell, one size fits all, (requires Part No. 695805)
695805 Ice Pack Set, 6 strips per set

Hi-Viz Numeral Kits
Hi-Viz Numerals provide high-visibility identification capability for night-time work. Eight-inch high numbers apply directly to the suit with pressure sensitive adhesive and will not compromise the suit's chemical resistance. Made from 3M's Scothlite† 38850 silver reflective film. Kit includes one numeral and instructions.

Part No.	High Viz Number
481672	0
481673	1
481674	2
481675	3
481676	4
481677	5
481678	6
481679	7
481680	8
481681	9

† Trademark of 3M Company

ClearCom™ V and ClearCom RI
474500 ClearComV with speaker/ amplifier
485727 ClearCom RI Radio Interface Kit

Breathing Apparatus and Air Supply Hose
See Data Sheet 01-00-11 for details.

Technical Information Chart

MSA CHEMPRUF II TOTAL-ENCAPSULATING SUITS

TECHNICAL INFORMATION CHART

* = optional
** = on Dual-Purpose Model Only
N/A = Not Applicable

	1 BASIC FABRIC		2 LENS	3 LENS GASKET	4 ZIPPER	5 GLOVES	6* OPTIONAL OVER GLOVES	7 BOOTS	8* OPTIONAL OVER BOOTS	9 EXHAUST VALVES	10 SLEEVES	11 LEGS	12* OPTIONAL AIR DISTRIBUTION SYSTEM
Name/Material Description	Butex Butyl/Polyester/ Neoprene	Vautex Viton® /Nylon/ Neoprene	Polymethyl Methacrylate (PMMA) Available in Glass. See Item #20	Natural Rubber	Dynaz Stainless Steel Teeth with Neoprene Backing & Brass Slider	Neoprene Coated with Knit Lining	Viton	NBR SBR and Natural Rubber with Fibers. Cloth Lining	Butyl Rubber	a Valve Cover b Valve Disc c Valve Seat d Slide Ring e Threaded Ring	Same as Basic Fabric (See Column #1)		Includes Aluminum Manifold and PVC Tubes
Thickness	.019 in (.483 mm)	.023 in (.584 mm)	.170 in (4.32 mm)	.125 in (3.17 mm)	.025 in (.635 mm)	.063 in (1.60 mm)	.023 in (.584 mm)	.093 in (2.36 mm)	.050 in (1.27 mm)	N/A			N/A
Weight	15.8 oz/ft² (535.8 grms/m²)	19.1 oz/ft² (647.7 grms/m²)	12.6 oz (358 grms)	4.48 oz (127 grms)	N/A	4.48 oz (127 grms)	3.37 oz (95.5 grms)	54.7 oz (1552 grms)	16.5 oz (467 grms)	Total Assembly 1.3 oz (38 grms)			
Color	Orange	Green	Clear	Black	Black Neoprene Backing	Black	Black	Black	Green	Black			Manifold - Silver Tubes - Clear
Dimensions	Length From Top of Head to Bottom of Boot is 79.5 in (201.9 cm)	Length From Top of Head to Bottom of Boot is 79.5 in (201.9 cm)	11 in (27.9 cm) Wide X 11 in (27.9 cm) High X 37.75 in (95.9 cm) Perimeter	OD = 13.25 in (33.6 cm) ID = 12.125 in (30.8 cm) Width = 0.54 in (1.37 cm)	Length 72 in (183 cm)	Length 13.25 in (33.6 cm)	Length 13.25 in (33.6 cm)	14.25 in (36.2 cm) High X 13 in Long (33 cm)	12.5 in (31.7 cm) High X 14.25 in (36.2 cm) Long	Total Assembly 1.50 in (3.8 cm) Wide X 2.25 in (5.7 cm) High X 1.50 in Diameter (3.8 cm)	Arm Inseam From Armpit To Glove-Tip is 33.5 in (85.1 cm)	Leg Inseam From Crotch To Bottom of Boot is 39 in (99 cm)	N/A
Other Pertinent Information	Width From Glove Tip To Glove Tip is 87 in (221 cm) Arm Inseam From Armpit to Glove-Tip is 33.5 in (85.1 cm) Leg Inseam From Crotch To Bottom of Boot is 39 in (99 cm)		Lt Trans 89% (ANSI Z-87.1) Haze 2% (ANSI Z-87.1) Impact Resistance OK (ANSI Z-87.1)			Size 10		Size 13 * Has Integral Metal Insoles and Steel Toes		a = Neoprene b = Neoprene and Natural Rubber c = Polyamide (Nylon) d = Stainless Steel e = Polyamide (Nylon)	Sufficient Room At Underarm Area Allows Quick Access To SCBA Regulator from within the Suit	A Strap-and Hook Assembly Located Inside the Crotch Area Works Like a Pair of Suspenders to Keep Extra Suit Material Away from the Legs	Requires Use Of Harness Assembly

Butex: MSA Part Numbers 477097, 476999, 477099 and 477099A
Vautex: MSA Part Numbers 477096, 476998, 477098 and 477098A

Viton® is a registered trademark of E.I. duPont de Nemours & Co. Inc.

* Metal insoles and steel toes conform to NFPA 1974 1987 edition Protective footwear for structural fire fighting, Sections 3-1.3 and 3-1.5

Rev. 1 09/95

TECHNICAL INFORMATION CHART (Cont.)

* = optional
** = on Dual-Purpose Model Only
N/A = Not Applicable

	13 REGULATOR GAUGE VIEWING WINDOW	14 REG. GAUGE VIEWING WINDOW GASKET	15 ADHESIVE	16 SEAM/ CLOSURE STITCHING	17 SEAM/ CLOSURE COATING	18 HEADGEAR	19** BULK-HEAD AIR-LINE ADAPTER ASSEMBLY	20* OPTIONAL GLASS LENS	21 BOOT CLAMP	22 GLOVE CLAMP	23 BOOT RING	24 GLOVE RING	25 GLOVE RING SLEEVE
Name/ Material Description	Polymethyl Methacrylate (PMMA)	Natural Rubber	Neoprene Based	Double Seam Stitch Type 301	Liquid Butyl on Butex Liquid Viton on Vautex	V-Gard Cap with Ratchet Type Fas Trac™ Suspension	Neoprene Hose, Aluminum and Vinyl Washers, Brass Fittings and Quick Disconnect	Glass With Plastic Laminated to Inside	Stainless Steel	Stainless Steel	Aluminum	Brass	Natural Rubber
Thickness	.120 in (3.05 mm)	.125 in (3.17 mm)	N/A	N/A	N/A	N/A	N/A	.125 in (3.17 mm)	.031 in (.79 mm)	.031 in (.79 mm)	.125 in (3.17 mm)	.062 in (1.57 mm)	.052 in (1.32 mm)
Weight	.49 oz (14 grms)	.85 oz (24 grms)	N/A	N/A	N/A	.13 oz (368 grms)	15.5 oz 438.5 grms)	19.6 oz (557 grms)	3.14 oz (89 grms)	.88 oz (25 grms)	7.62 oz (216 grms)	2.26 oz (64 grms)	2.29 oz (65 grms)
Color	Clear	Black	Black	Orange on Butex Green on Vautex	Orange on Butex Green on Vautex	White	Black	Clear	Silver	Silver	Silver	Brass	Red
Dimensions	2.75 in Diameter (6.98 cm)	OD = 3.38 in (8.57 cm) ID = 2.75 in (6.98 cm)	N/A	N/A	N/A	Standard Size Shell is 5.56 in High (14.1 cm) X 11 in long (27.9 cm)	Total Assembly 15 in Long (38.1 cm)	11 in wide (27.9 cm) X 11 in High (27.9 cm) X 37.75 in Perimeter (95.9 cm)	Min Dia = 5⅛ in (13.6 cm) Max Dia = 6⅝ in (16.8 cm) Width = ½ in (1.79 cm)	OD = 5⅜ in (14.1 cm) ID = 5⅜ in (13.8 cm) Width = 2⅜ in (5.87 cm)	OD = 4⅛ in (10.3 cm) ID = 3⅞ in (9.68 cm) Width = 1⅞ in (4.92 cm)	5.94 in Long (15.1 cm)	
Other Pertinent Information	Also Available in Glass With Plastic Laminated to inside 2.75 in Diameter (6.98 cm)			All Seams are Adhesive-Bonded Flat to the Neoprene Underside, then Overstrapped with Adhesive-Bonded Neoprene Tape				Light Trans 89% (ANSI Z-87.1) Haze 2% (ANSI Z-87.1) Impact Resistance OK (ANSI Z-87.1)					

Rev. 1 09/95

MSA

PROTECTIVE SUIT HISTORY

STYLE _____ DATE OF MANUFACTURE _____

SIZE _____ DATE OF PURCHASE _____

PART NO. _____ SERIAL NO. _____

EXPOSURE DATE	PLACE OF EXPOSURE	CHEMICAL EXPOSED	CLEANING DATE	DECON DATE	INSPECTED BY

ROUTINE INSPECTIONS

INSPECTION DATE	SUIT INTEGRITY TEST DATE	SOAP-BUBBLE LEAK TEST	INSPECTED BY

MSA

PROTECTIVE SUIT INSPECTION CHECKLIST

STYLE _____ **DATE OF MANUFACTURE** _____

SIZE _____ **DATE OF PURCHASE** _____

PART NO. _____ **SERIAL NO.** _____

INSPECTION CHECKLIST

Inspector's Name										
Inspection Date										
SUIT										
Material	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Seams	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
COMPONENTS										
Exhalation valves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Zipper	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
V-GARD® Cap w/FASTRAC™	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
DUO-FLO™ Adapter	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Lens	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gasket	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
AIR COOLING/DISTRIBUTION										
Suit Entrance	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Manifold	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tubing	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
GLOVES										
Gloves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Glove Ring (brass)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Glove Ring Sleeve (red)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Clamp (stainless steel)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
BOOTS										
Boots	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Boot Ring (aluminum)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Clamp (stainless steel)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Regulator Gauge Viewing Window	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gasket	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Bulkhead Airline Adapter Assembly	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

ADDENDUM A

Cytec Industries	Dept. : Safety	Number : S-8
	Date : 09/17/97	Issue No. : 4
Fortier Plant Waggaman, La.	Title : Fortier Plant Safety Standard - Fire Fighting Plan	Supersedes: 12/01/96 Sheet 1 of 59

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Prepared by:	Reviewed by:	Approved by:
Gene Tierney		P.L. Martinez
G. Tierney, Fortier Plant Safety Specialist	Rick Masson, Fortier Plant Process Owner	P. L. Martinez, Fortier Plant Safety Leader

Update Responsibility : Safety Leader
Implementation Responsibility: Safety Leader

Distribution List

Copy No.	Title / Location
1	Administrative Assistant/ SET Department
Copies can be accessed through the Cytec Fortier Plant Intranet	

Required Review Date is .09/17/2000
Reference Documents:

Blue Stamp Indicates a Controlled Document.

TABLE OF CONTENTS

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	PAGE
GENERAL INSTRUCTIONS	4
MAJOR FIRE FIGHTING EQUIPMENT	
AMD PLANT	8
AMMONIA INJECTION	9
ACID PLANT	10
KELLOGG AMMONIA	11
ACETONITRILE STORAGE TANKS WEST OF AMD PLANT	13
WAREHOUSE 210	14
MELAMINE PLANT	15
UREA PLANT	16
ACRYLONITRILE PLANT	17
AMINONITRILE PLANT	21
MMA PLANT	22
UTILITIES DEPARTMENT	24
END OF PIPE	25
RIVER DOCKS	26
OUTSIDE PLANT AREAS	28
METHANOL	31
OLD RESINS PLANT AREA	34

CONTROLLED COPY

TABLE OF CONTENTS

	PAGE
MAJOR FIRE FIGHTING EQUIPMENT	
ACRYLO TANK FARM	35
MMA TANK FARM	37
AFFF-ATC FOAM SUPPLY LOCATIONS AND APPROXIMATE AMOUNTS	39
ABBREVIATIONS	40
ATTACHMENT A Plant Fire Water System Maps Index	41

FORTIER GENERAL INSTRUCTIONS FOR FIRE FIGHTING

The following instructions are written to act as a guide for all personnel in the event of a fire. Personal judgement should be used in each instance because the circumstances surrounding each fire is different and instructions cannot be written to cover all the possibilities. **In each case, the Fire Department must be notified first**. The following procedure should be used.

1. Use fire alarm box in the area, the Fire Department can be alerted in this way.
2. Dial 6511
   a. When operator answers, report fire as follows:
      1. Give your name, extension number, location of fire and any known injuries.
      2. Stay on the line until operator indicates that all information has been received and understood.

If the fire is small, extinguish with a dry chemical extinguisher, CO_2 fire extinguisher, hose reel, or hose from the hose houses. Always stay up-wind from a fire or spill. Where fire is impinging on structural supports, tanks or pipe lines, keep water on adjacent areas for cooling purpose.

Where foam is being applied in tank or dyke area, don't apply water excessively because water will break up foam layer causing flash back to occur. However, cooling water on adjacent equipment must be maintained to prevent structural collapse or vessel failure.

PIPE ALLEY FIRES

1. Close valves to isolate affected lines.
2. Apply water to adjacent pipe lines.
3. Monitor water run off.

COMPRESSORS - OIL FIRES

Immediately shutdown the affected equipment. Use water to keep adjacent equipment cool. Use portable extinguisher or fog nozzles to combat the fire.

HYDROGEN FIRES

Hydrogen fires are a likely type of fire in many of the plants. Hydrogen has one of the widest ranges of flammability and an ignition energy requirement of about one-tenth of that of most hydrocarbons. Hydrogen flames are practically invisible during daylight hours and are difficult to put out.

Ignition of small leaks throughout the plant do not require an immediate plant shutdown. These fires can usually be snuffed out with a portable fire extinguisher or steam.

Hydrogen fires resulting from major leaks or ruptured piping should be combatted by keeping adjacent equipment and structures cool with water and letting the flame burn until the flammable gas has been displaced.

COOLING TOWER FIRES

1. **Electrical Fires**

   a. Open breaker supplying electrical power to motor that is burning.

      1. Follow standard operating procedures.

   b. Use CO_2 or dry chemical extinguisher.

2. **Structural Fire**

   a. Shut off all fans.

   b. Combat the fire with monitor nozzles and master streams.

      1. Do not access tower.

VENT FIRES

Vents may at times catch on fire. They are normally caused by lightning or static electricity. Snuff out the fire by introducing steam to the bottom of the vent stack.

NATURAL GAS

1. Allow fire to burn. **DO NOT ATTEMPT TO EXTINGUISH**.
2. Wet down adjacent equipment to keep area cool.
3. Close natural gas block valve.
4. As fire burns itself out, wet down natural gas piping and cool off immediate fire area.

AMMONIA

1. Allow fire to burn. **DO NOT ATTEMPT TO EXTINGUISH**.
2. Wet down adjacent equipment to keep area cool.
3. Close Ammonia isolation valves.
4. As fire burns itself out, wet down ammonia piping and cool off immediate fire area.

PUMPING STATIONS

Fire in Sump

a. Stop pumps to raise level and seal sewers preventing possible flash back.

b. Extinguish with dry chemical or foam extinguisher.

c. Extinguish with AFFF/ATC (firefighting foam).

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ACRYLONITRILE FIRE

1. Close Acrylonitrile isolation valve.
2. Extinguish fire with AFFF/ATC firefighting foam.
3. Wet down adjacent equipment to keep area cool.

HCN FIRE

1. Allow fire to burn. **DO NOT ATTEMPT TO EXTINGUISH**.
2. Wet down adjacent equipment to keep area cool.
3. Close HCN isolation block valves.
4. As fire burns itself out, wet down adjacent equipment to cool off immediate fire area.

ACH FIRE

1. Close ACH isolation valves.
2. Extinguish fire with AFFF/ATC fire fighting foam.
3. Wet down adjacent equipment to keep area cool.

AMD PLANT

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

6 Hydrant - Located East of Truck Loading Station
Controlled by PIV # 61

13 Hose House - Located West of Control Room
Controlled by Curb Box # 86
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

44 Hose House - Located North of HCN Control
Controlled by PIV # 18 or # 60

FIXED FIRE PROTECTION

20 Monitor - Located North of AMD Control Room
Controlled by PIV # 126

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AMMONIA INJECTION

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

32 Hydrant - Located South of NH3 Storage Control Room
Controlled by Curb Box # 145

11 Hose House - Located East of NH_3 Injection Station
Controlled by Curb Box # 141
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

FIXED FIRE PROTECTION

47 Monitor - Located Southeast of NH_3 Injection
Controlled by AN Foam House

41 Monitor - Located Southwest of NH_3 Injection
Controlled by AN Foam House

42 Monitor - Located West of NH_3 Injection
Controlled by AN Foam House

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ACID PLANT

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

69 Hydrant - Located Northeast of Cooling Tower
Controlled by PIV # 102

70 Hose House - Located West Truck Loading Ramp
Controlled by PIV # 104
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

35 Hydrant - Located Northeast of Maintenance Building
Controlled by Curb Box # 150

FIXED FIRE PROTECTION

32 Monitor - Located North of Sulphur Storage Tank
Controlled by PIV # 103

KELLOGG AMMONIA

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MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

55 Hydrant - Located South of Plant, on First Street and Bell Controlled by - PIV 25

54 Hydrant - Located South of Cooling Tower, North Side of 1st Street Controlled by PIV # 21

49 House House, Located - Northeast corner of Cooling Tower Controlled by PIV # 236
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

50 House Located West Kellogg Ammonia Maintenance shack
Controlled by PIV # 124

FIXED FIRE PROTECTION

A. **MONITORS**

2 Monitor - Located Southeast corner of Cooling Tower
Controlled by PIV # 23

1 Monitor - Located - Center - East of Cooling Tower
Controlled by PIV # 24

18 Monitor - Elevated platform located at 124C Area North of 103J.
Controlled by PIV # 53

64 Monitor - Located South of Sewage Treatment, west of PG-1
Controlled by PIV # 73

B. **PORTABLE MONITORS**

1. Hydrant # 55 south of plant on First Street
   Equipped with 200' - 2 1/2" Hose

KELLOGG AMMONIA (cont'd.)

2. Hydrant # 54 Southeast of Cooling Tower
   Equipped with 150' - 2 1/2" Hose

C. **SPRINKLER SYSTEM**

Located in Spare Parts Building
Controlled by PIV # 99

Located - Cooling Tower # 4
Controlled by PIV # 62

Located - Compressor sprinkler system. West of 102J
Controlled by PIV # 63

D. **HALON SYSTEM**

Located Kellogg Ammonia Computer Room
Located Kellogg Ammonia Computer UPS Room

E. **PULL DOWN FIRE ALARMS**

Outside Kellogg Ammonia Control Room
South of 124-CC
Overhead Pipe Rack at 1st Street
25-KII, West of E-1 Condenser

ACETONITRILE STORAGE TANKS WEST OF AMD PLANT

MAJOR FIRE FIGHTING EQUIPMENT

44 Hose House - Located Southeast of Storage Tanks
Controlled by P-18 and P-60

17 Hose House - Located North Side 3rd Street, South YPS Warehouse
Controlled by Curb Box # 134
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

13 Hose House - Located East of Storage tanks
Controlled by PIV # 126
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

FIXED FIRE PROTECTION

A. MONITORS

34 Monitor - Located Northeast Corner of Tank # 24A
Controlled by PIV # 111

35 Monitor - Located Northeast Corner Tank # 518
Controlled by PIV # 112

36 Monitor - Located Northwest Corner Tank # 519
Controlled by PIV # 114

28 Monitor - Located West Center of Storage Tanks
Controlled by PIV # 150

37 Monitor - Located Southwest Corner Tank # 24D
Controlled by PIV # 115

B. SPRINKLER SYSTEM

Located in YPS Warehouse
Controlled by PIV # 19

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WAREHOUSE 210

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

17 Hose House - Located North side 3rd Street, South YPS Whse.
Controlled by Curb Box # 134
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

60 Hose House - Located Southeast corner of Warehouse 210
Controlled by PIV 132
Equipped with 100' - 2 1/2" Hose and 150' 1 1/2" Hose

18 Hose House - Located Southwest corner of Warehouse 210, across tracks.
Controlled by Curb Box # 138
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

FIXED FIRE PROTECTION

SPRINKLER SYSTEM

Located - Northeast corner - Inside Building
Controlled by PIV # 6

Located - Southwest corner - Inside Building
Controlled by PIV # 5

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MELAMINE PLANT

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

62 Hydrant - Located Southeast of Plant
Controlled by PIV # 57

53 Hose House - Located West of Bagging Building
Controlled by PIV 41
Equipped with 100' - 2 1/2" Hose and 150' 1 1/2" Hose

FIXED FIRE PROTECTION

A. **SPRINKLER SYSTEM**

Located Center of Plant. East Side
Controlled by PIV # 68

Located South of Melamine Bagging Building
Controlled by PIV # 58

Located Northside Cooling Tower # 5-A
Controlled by PIV # 69

Located New Melamine Control Room
Controlled by PIV # 133

B. **HALON SYSTEM**

Located Melamine Computer Room
Located Melamine Computer UPS Room

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UREA PLANT

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

59 Hydrant - Located Gaugler Ave. at Urea Entrance
Controlled by PIV # 33

29 Hydrant - Located Northwest Compressor Building
Controlled by PIV # 32

52 Hydrant - Located Southeast of Urea Plant, across Gaugler Street
Controlled by PIV # 36

60 Hose House - Located Southeast Corner Warehouse 210
Controlled by PIV # 132
Equipped with 100' of 2 1/2" hose and 150' of 1 1/2" hose

FIXED FIRE PROTECTION

SPRINKLER SYSTEM

Located West of Compressor Building
Controlled by PIV # 132

ACRYLONITRILE PLANT

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSE AND HYDRANTS

48 Hydrant - Located Southwest of Plant
Controlled by Curb Box # 211

52 Hydrant - Located West side of Purification, East side of Gaugler Avenue
Controlled by PIV # 36

51 Hose House - Located North of Air Compressors
Controlled by PIV # 82
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

58 Monitor - Located Southeast of A/N Changehouse
Controlled by PIV # 159

57 Monitor - elevated - Located Southeast Propylene Vaporizer
Controlled by PIV # 159

61 Hydrant - Located East of Propylene Unloading Rack
Controlled by PIV # 42

53 Hose House - Located West of side of Melamine Warehouse; Northeast of Propylene Unloading
Controlled by PIV # 41
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

46 Hydrant - Located Northeast of Number 2 Deep Well
Controlled by PIV # 118

#59 Hydrant - Located northwest corner of Purification
Controlled by PIV #33

ACRYLONITRILE PLANT (cont'd.)

FIXED FIRE PROTECTION

A. MONITORS

M-3 Monitor - Located - North of Purification and South of electrical substation "V"
Controlled by PIV # 35
Contains 55 gallons of AFFF/ATC Foam

M-4 Monitor - Located - East of Waste Water Column
Controlled by PIV # 38
Contains 55 gallons of AFFF/ATC Foam

M-72 Monitor - Located north of Waste Water Filter controlled by PIV 27

M-5 Monitor - Elevated - Located - West of Quench Coolers
Controlled by PIV # 38

M-7 Monitor - Elevated -Located - East of Reactors near Catalyst Hoppers and North of A/N stairs to Waste Disposal
Controlled by PIV #239

M-8 Monitor - Located - Northwest Quadrant of Propylene Sphere
Controlled by PIV # 44 locally

M-9 Monitor - Located - Southwest Quadrant of Propylene Sphere
Controlled by PIV # 45 locally

M-10 Monitor -Located Northeast Quadrant of Propylene Sphere
Controlled by PIV # 46 locally

M-11 Monitor - Located Southeast of Propylene Sphere
Controlled by PIV # 47 locally

ACRYLONITRILE PLANT (cont'd.)

M-72 Monitor - Located north of Waste Water Filter
Controlled by PIV- 27

NOTE: Monitor Nos. 8, 9, 10 and 11 are set up with their local PIV's in the open position. They are controlled from a remote location by PIV 117 or PIV 43.

PIV 43 Located Southwest of the Acrylo Plant and across Gaugler Ave. for the Melamine Cooling Tower.

PIV 117 Located Northeast of Deepwell # 2.

M-17 Monitor - Located East of Propylene Tank Car Unloading Rack
Controlled by PIV # 56

M-19 Monitor - located West of Propylene Tank Truck Unloading Station
Controlled by PIV # 50.

M-43 Monitor - Located Northeast Corner of Plant, South of Demin Control Building
Controlled by PIV # 82
Contains 55 gallons of AFFF/ATC foam

M-48 Monitor - Located East of Oxazole Filters and North of Waste Disposal Operator Building
Controlled by PIV # 120
Contains 55 gallons of AFFF/ATC Foam

M-49 Monitor - Located Northwest of Oxazole filters and South of flare stack
Controlled by PIV # 121
Contains 55 gallons of AFFF/ATC Foam

B. **PORTABLE MONITORS**

Located Southwest Corner of Plant
Contains 35 gallons of AFFF/ATC Foam

ACRYLONITRILE PLANT (cont'd.)

C. SPRINKLER SYSTEM

Located - West side of Acrylo Purification Process Area

Provides protection for Purification, Heads Column, and Air Compressor Areas.

Controlled by PIV 81

Located - North side of Cooling tower # 3
Controlled by PIV # 67

D. HALON SYSTEM

Located - AN Computer Room
Located - AN Computer UPS Room

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AMINONITRILE PLANT

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSE AND HYDRANTS

57 Hydrant - Located Southeast corner of AN Plant
Controlled by PIV # 37

FIXED FIRE PROTECTION

A. **MONITORS**

M-69 Monitor - Located Northwest corner of Aminonitrile Plant
Controlled by PIV # 130

M-70 Monitor - Located Southwest corner of Aminonitrile Plant
Controlled by PIV # 132

B. **SPRINKLER SYSTEM**

Located - West of Aminonitrile Plant
Controlled by PIV # 131

MMA PLANT

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

27 Hydrant - Located Northeast Corner of 3rd Street and Bell Ave. Controlled by Curb Box # 99

39 Hydrant - Located South side of Control room
Controlled by Curb # 212

41 Hose House - Located North side of Rohm # 2
Controlled by Curb Box # 213
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

FIXED FIRE PROTECTION

A. **MONITORS**

M 16 Monitor - Located East side of Rohm # 3
Controlled by PIV # 54
Contains 55 Gallons AFFF/ATC Foam

M 51 Monitor - Located North side Rohm # 3
Controlled by PIV # 3
Contains 55 Gallons AFFF/ATC Foam

M 13 Monitor - Located Top of Control Room
Controlled by PIV # 29
Contains 55 gallon AFFF/ATC Foam

M 12 Monitor - Located Southeast Corner - ACH Section
Controlled by PIV # 28
Contains 55 Gallons AFFF/ATC Foam

MMA PLANT (cont'd.) CONTROLLED COPY

M 14 Monitor - Located West of MM6
Controlled by Curb Box 213
Contains 55 Gallons AFFF/ATC Foam

M 15 Monitor - Located Northwest of Rohm III
Controlled by PIV # 30
Contains 55 Gallons AFFF/ATC Foam

B. FOAM SYSTEM

West Foam House controlled by Curb Box # 237

Foam System protects the Rohm II, Rohm III, ACH, MM6 and MM7. It also supplies two each 1 3/4" fire hose lines located on the southeast corner of the West Foam House. These hose lines have 200 feet of hose each for use in Day Tank Area protection.

North Foam House controlled by Curb Box south of foam house. Foam system protects Rohm 4.

C. HALON SYSTEM

Located - MMA Computer Room
Located - MMA UPS Room

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MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

38 Hydrant - Located East of Bell Avenue at H_2O Treatment Area.
Controlled by Curb Box 160

37 Hydrant - Located North of Cooling Tower No. 2
Controlled by Curb Box # 115

3 Hose House - Located North of Compressor Building
Controlled by Curb Box # 116 or PIV 153
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

15 Hose House - Located Southeast of Warehoure 470 on Third Street
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose
Controlled by Curb Box #101

FIXED FIRE PROTECTION

A. **SPRINKLER SYSTEM**

Located East side of Cooling Tower # 2
Controlled by PIV # 64

B. **HOSE REEL**

Located East side of Compressor Building
Located West side of Compressor Building

C. **HALON SYSTEM**

Located Utilities Computer Room
Located Utilities Computer UPS Room

END OF PIPE

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

4 Hose House - Located North of Control Room
Controlled by Curb Box # 71
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

5 Hydrant - Located North of MET # 2 Tank
Controlled by PIV 152

37 Hydrant - Located North of Cooling Tower # 2
Controlled by Curb Box # 115

FIXED FIRE PROTECTION

A. **MONITORS**

53 Monitor - Located Southwest of M.E.T. # 1 Tank
Controlled by PIV # 105

52 Monitors - Located North of M.E.T. # 1 Tank
Controlled by PIV # 107

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RIVER DOCKS

MAJOR FIRE FIGHTING EQUIPMENT

FIXED FIRE PROTECTION

M 31 Located on West River Dock
Controlled by PIV # 1

M 22 Located on East River Dock
Controlled by PIV # 2

M 23 Located on East River Dock
Controlled by PIV # 2

M 50 Located Midway on East River Dock
Controlled by PIV # 2

M 71 Located West River Dock
Controlled by PIV #1

M 95 Located on east River Dock
Controlled by PIV #2

M 96 Located on east River Dock
Controlled by PIV #2

M 97 Located on east River Dock
Controlled by PIV #2

M 98 Located on east River Dock
Controlled by PIV #2

M 100 Located on west River Dock
Controlled by PIV #1

NOTE: All River Dock Monitors contain 55 gallons of AFFF/ATC Foam.

RIVER DOCKS (cont'd.)

Fireboat Connection - A 5" Storz connection is located between monitors 22 and 23, which enables the fire water system to be supplemented from the end of the East River Dock.

A 5" Stortz connection is located west of river pumps at ground level, which enables fire water to be used adjacent to River Road.

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OUTSIDE PLANT AREAS

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

20 Hydrant - Located East of Building 208
Controlled by Curb Box # 106
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

21 Hose House - Located East of Machine Shop
Controlled by Curb Box # 110
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

19 Hose House - Located West of Butler Building
Controlled by Curb Box # 216
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

40 Hose House - Located South of Corrosion Lab
Controlled by Curb Box 157
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

15 Hose House - Located on 3rd Street North of Warehouse 209
Controlled by Curb Box 101
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

24 Hydrant - Located Northwest Corner of Cafeteria
Controlled by Curb Box # 105

22 Hydrant - Located Northwest Corner Administration Building
Controlled by Curb Box # 108

23 Hydrant - Located Northeast Corner Administration Building
Controlled by Curb Box # 109

25 Hydrant - Located East Side Employee's Parking Lot
Controlled by Curb Box # 112

OUTSIDE PLANT AREAS (cont'd.)

HOSE HOUSES AND HYDRANTS

26 Hydrant - Located south of Bldg. 240
Controlled by Curb Box #97

28 Hydrant - Located on Bell Avenue north of 3rd west side of road
Controlled by Curb Box #92

33 Hydrant - Located on west side of Gaugler between 1st and 2nd
Controlled by Curb Box #149

#34 Hydrant - Located on east side of Gaugler at 2nd
Controlled by Curb Box #121

#36 Hydrant - Located on west side of Bell Avenue between 1st and 2nd

8 Hose House - Located on west side of Bell Avenue between 2nd and Third (old Resins Area
Controlled by Curb Box #118
Equipped with 100' - 2 1/2" hose and 150' - 1 1/2" hose

9 Hose House - Located on south side of 2nd Street between Bell Avenue and Gaugler
Controlled by PIV # 109
Equipped with 100' - 2 1/2" hose and 150' - 1 1/2" hose

FIXED FIRE PROTECTION

A. SPRINKLER SYSTEMS

Main Laboratory
Controlled by PIV # 8

Warehouse 209
Controlled by PIV # 9

Machine Shop
Controlled by PIV # 11

OUTSIDE PLANT AREAS (cont'd.)

A. **SPRINKLER SYSTEMS** (cont'd.)

Building 217
Controlled by PIV # 13

North Butler Building
Controlled by PIV # 48

Building 470
Controlled by PIV # 119

B. **HOSE CABINETS**

Administration Building - Located in Stairways
Controlled by PIV # 110

C. **SMOKE DETECTORS**

Cafeteria - None
Administration Building
Change House Records Room
Building 219
Change House no smoke detectors

D. **D.C. PRESSURIZED HOOD SYSTEM**

Cafeteria

METHANOL

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MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

68 Hose House - Located South of Control Room
Controlled by PIV # 98
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

67 Hose House - Located North of Maintenance Building
Controlled by PIV # 92
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

66 Hose House - Located Northwest corner of Cooling Tower
Controlled by PIV # 91
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

65 Hose House - Located Southeast of Plant
Controlled by PIV # 75
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

FIXED FIRE PROTECTION

A. MONITORS

30 Monitor - Located Top Platform De-Airation Tank
Controlled by PIV # 96

#81 Monitor - (elevated) Located Top Plaform De-Airation Tank
Controlled by PIV #96

26 Monitor - Located Top Platform De-Airation Tank
Controlled by PIV # 95

67 Monitor - Located northwest side of Plant
Controlled by PIV #92

METHANOL (cont'd.) CONTROLLED COPY

89 Located southwest side of 25K MeOH Storage
Controlled by PIV #171

90 Located southeast side of 25 MeOH Storage
Controlled by PIV # 170

#91 Located east side of 25K MeOH Storage
Controlled by PIV #172

#92 Located east side of 25K MeOH Storage
Controlled by PIV #173

#93 Located northeast side of 25K MeOH Storage
Controlled by PIV #174

#94 Located northwest side 25K MeOH Storage
Controlled by PIV #175

68 Monitor - Located southside of Control Room
Controlled by PIV #98

79 Monitor - Located west side of MeOH Day Tanks (elevated)
Controlled by PIV # 168

80 Monitor - Located west side of MeOH Day Tanks (elevated)
Controlled by PIV #168

83 Monitor - Located on northwest side of MeOH Day Tanks
Controlled by PIV #161

84 Monitor - Located on northeast side of MeOH Day Tanks
Controlled by PIV #162

85 Monitor - Located on east side of MeOH Day Tanks
Controlled by PIV #164

METHANOL (cont'd.) CONTROLLED COPY

86 Monitor - Located on south side of MeOH Day Tanks (elevated)
Controlled by PIV #165

#87 Monitor - Located on south side of MeOH Day Tanks (elevated)
Controlled by PIV #165

#82 Monitor - Located in northeast corner of plant
Controlled by PIV #159

#88 Monitor - Located on southwest corner of Compressor Building
Controlled by PIV #167

B. **SPRINKLER SYSTEMS**

Located - Compressor Building
Controlled by PIV # 76

CT Sprinkler controlled by PIV 90

C. **HALON SYSTEMS**

Located - C-3 Compressor Building
Automatic System

D. **FIXED FOAM SYSTEM**

Protects Day Tanks, ST-1 and Pump Alley
Located at northwest corner of plant

E. **PORTABLE EXTINGUISHERS**

3 - 150# D/C Extinguishers

1 - 2 cylinder CO_2 Wheel Units
Located on First Level Compressor Building

METHANOL (cont'd.) CONTROLLED COPY

1 - 2 cylinder CO_2 Wheel Unit
Located on 2nd Level Compressor Bulding at C-3

F. **PORTABLE FIRE FIGHTING FOAM**

1 - Tote Bin
Located southwest of Cooling Tower

1 - Foam Trailer
Located northwest corner of plant

ADDENDUM A

Cytec Industries	Dept. : Safety	Number : S-8
	Date : 09/17/97	Issue No. : 4
Fortier Plant Waggaman, La.	Title : Fortier Plant Safety Standard - Fire Fighting Plan	Supersedes: 12/01/96 Sheet 35 of 59

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OLD RESINS PLANT AREA

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

45 Hose House - Located Southwest of Plant on 3rd Street
Controlled by Curb Box # 217
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

2 Hose House - Located Northwest of Plant on Gaugler
Controlled by curb Box # 125
Equipped with 100' - 2 1/1" Hose and 150' - 1 1/2" Hose

14 Hose House - Located South of Resins Lab
Controlled by Curb Box # 131
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

10 Located Northwest of plant
Controlled by Curb Box 70

ACRYLO TANK FARM

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

16 Hose House - Located on 3rd Street West of Change Hose
Controlled by Curb Box # 221
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

47 Hydrant - Located midway of Storage Tanks on Access Road
Controlled by PIV # 20

12 Hose House - Located on R/R Ave. North of Operators Shack
Controlled by Curb Box # 159
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

11 Hose House - Located North of AN Tank Farm, East of NH_3 Injection
Controlled by Curb Box # 141
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

FIXED FIRE PROTECTION

A. **MONITORS**

M-27 Monitor - Located South of Operations Shack
Controlled by PIV # 66

M-38 Monitor - Located East of Tank 736
Controlled by AN Foam House

M-39 Monitor - Located East of Tank 724 and 725
Controlled by AN Foam House

M-40 Monitor - Located East of Tanks 727 and 728
Controlled by AN Foam House

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ACRYLO TANK FARM (cont'd.)

M-41 Monitor - Located Northwest of Tank 728
Controlled by AN Foam House

M-42 Monitor - Located Northwest of Ammonia Injection
Controlled by AN Foam House

M-47 Monitor - Located Northeast of Tank 728
Controlled by AN Foam House

B. **FOAM SYSTEM**

Foam House Controlled by valve inside building

Foam System protects Acrylo and MMA Tank Farm Storage Tanks.

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MMA TANK FARM

MAJOR FIRE FIGHTING EQUIPMENT

HOSE HOUSES AND HYDRANTS

18 Hose House - Located R/R Ave. North end of MMA Tank Farm
Controlled by Curb Box # 138
Equipped with 100' - 2 1/2" Hose and 150' - 1 1/2" Hose

30 Hydrant - Located Northwest of MMA # 1 Storage Tank
Controlled by Curb Box # 204

42 Hose House - Located on West side of R/R Ave.. Northwest of Propylene Unloading
Controlled by Curb Box # 209

43 Hydrant - Located on West side of R/R Ave., Northeast of MMA T/T Loading
Controlled by Curb Box # 205

FIXED FIRE PROTECTION

A. MONITORS

44 Monitor - Located Southeast of MMA # 1 Storage Tank and West of MMA T/T Loading
Controlled by MMA Foam House

45 Monitor - Located East of Methanol Storage Tank
Controlled by MMA Foam House

46 Monitor - Located Northeast of Acetone Storage Tank
Controlled by MMA Foam House

73 Monitor - Northeast of Methanol Storage Tank
Controlled by MMA Foam House

74 Monitor - Southeast of Methanol Storage Tank
Controlled by MMA Foam House

MMA TANK FARM (cont'd.)

75 Monitor - Southeast of MMA Tank Car Loading
Controlled by Curb Box #238

B. **FOAM SYSTEM**

MMA Storage Tanks and Raw Material Storage Tanks are protected by the MMA Foam System.

NOTE: The Acetone Storage Tank has a floating roof. If the storage tank is fully consumed by fire, the electrical power lines, (34.8KV Loop) located west of the storage tank, may become an exposure.

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AFFF-ATC FOAM SUPPLY LOCATIONS

AND

APPROXIMATE AMOUNTS

Building 270	16 - 55 Gal. Drums Total - 880 Gallons
Foam House	33 - 55 Gal. Drums 10 - 5 Gal. cans Total - 1,865 Gallons
Warehouse 210	49 - 55 Gal. Drums 168 - 5 Gal. cans Total - 3,535 Gallons
MMA Foam House	24 - 5 Gal. cans Total 120 Gallons
Approximate Foam Reserve Total	6,400 gallons

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ADDENDUM A

ABBREVIATIONS

H - Hydrant

HH - Hose House

P - Post Indicator Valve

M - Monitor

- Curb Box

ATTACHMENT A

PLANT FIRE WATER SYSTEM MAPS

INDEX

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	Page
Block 1 - Acid Plant	43
Block 2 - Kellogg Ammonia	44
Block 3 - Methanol	45
Block 4 - Area South of Acid	46
Block 5 - Area South of Kellogg	47
Block 6 - E.O.P.	48
Block 7 - AMD	49
Block 8 - Resins	50
Block 9 - Boiler Plant	51
Block 10 - Melamine/Urea/Warehouse 210	52
Block 11 - MMA/Acrylonitrile/Aminonitrile	53
Block 12 - Main Lab/Warehouse 209	54
Block 13 - South of AMEL	55
Block 14 - Propylene Storage	56
Acetone - MMA Tank Farm	57
Acrylo Tank Farm	58
River Dock	59

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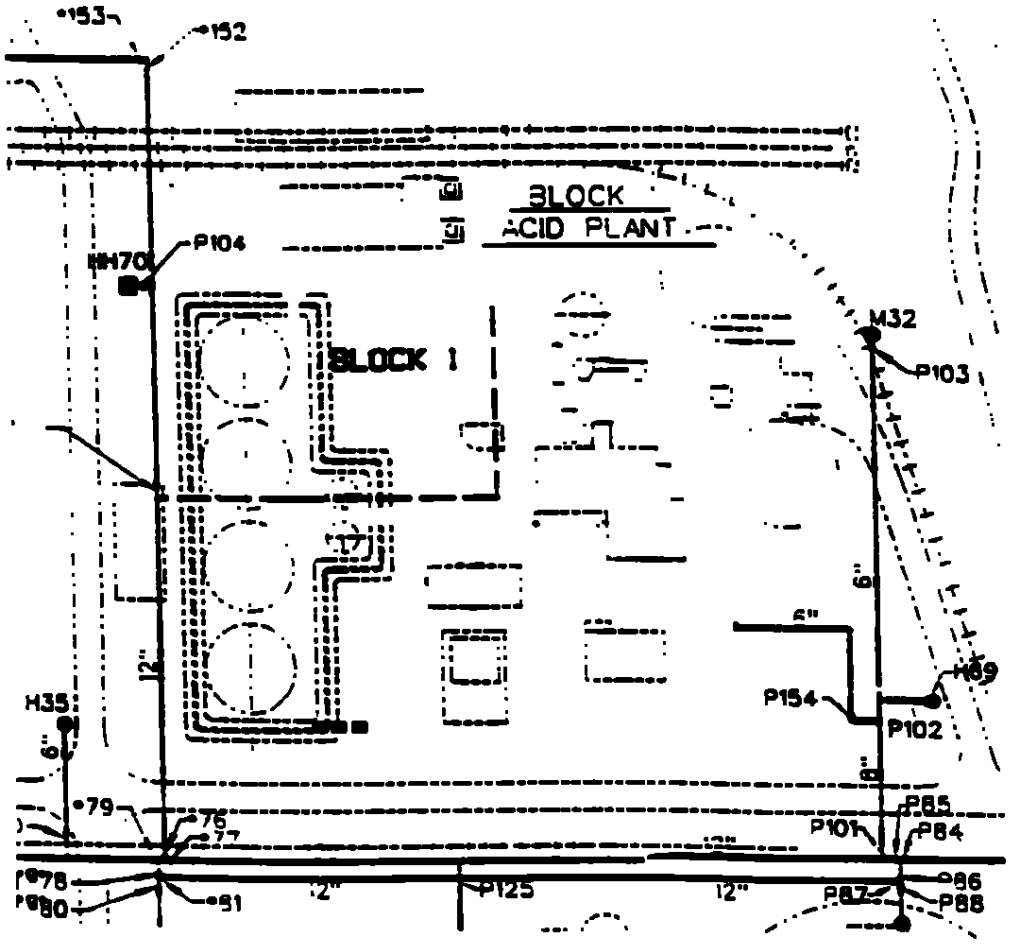

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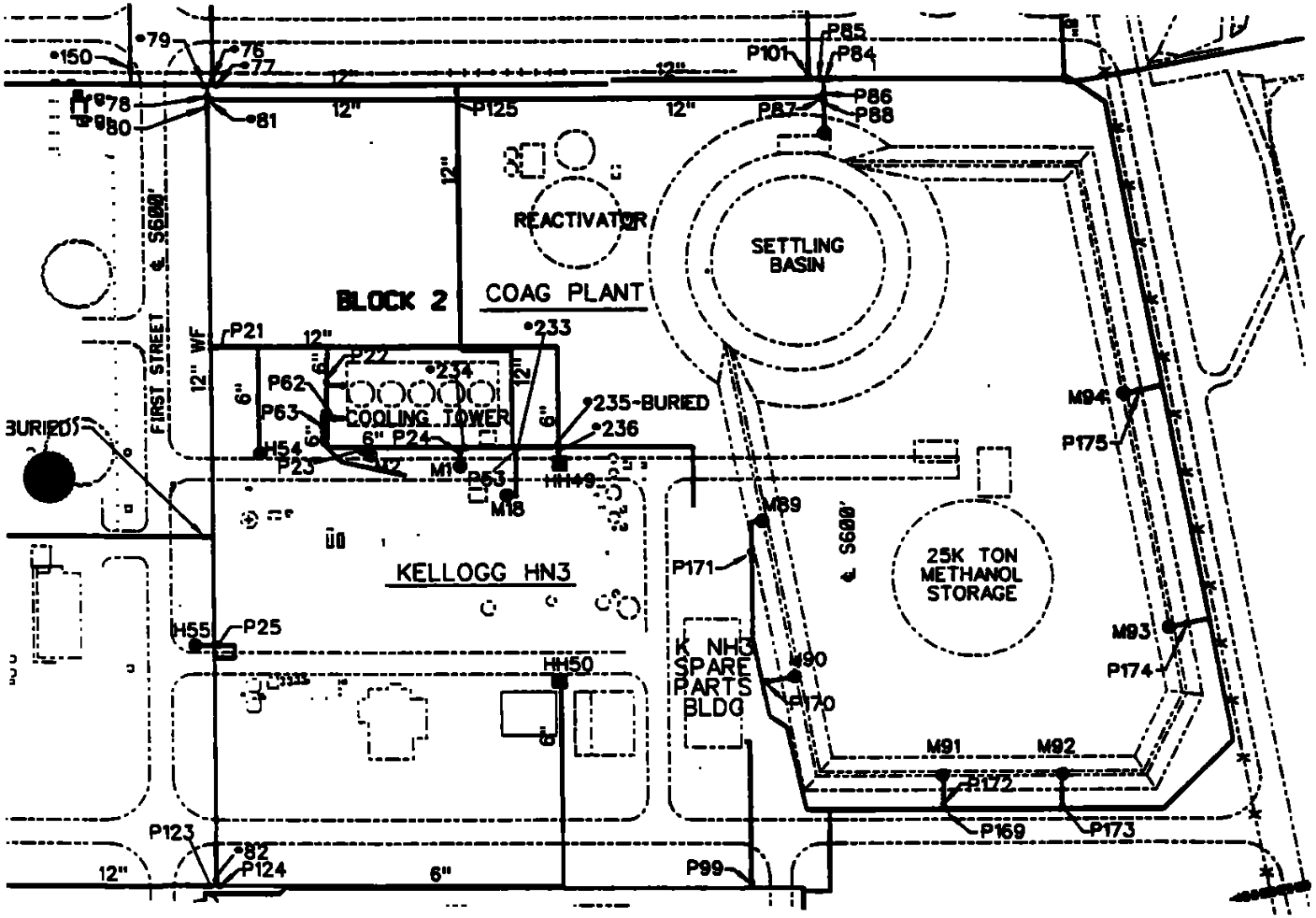

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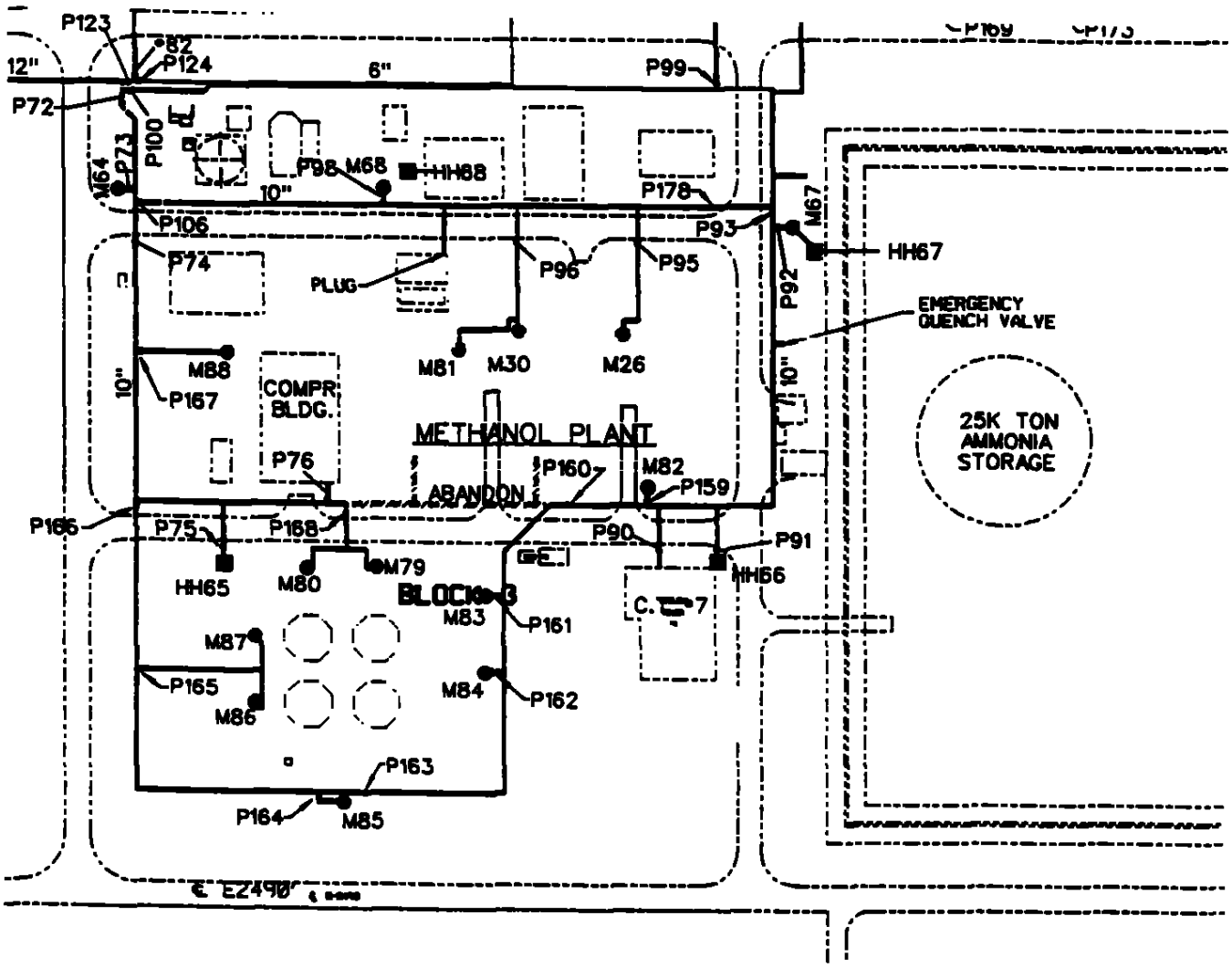

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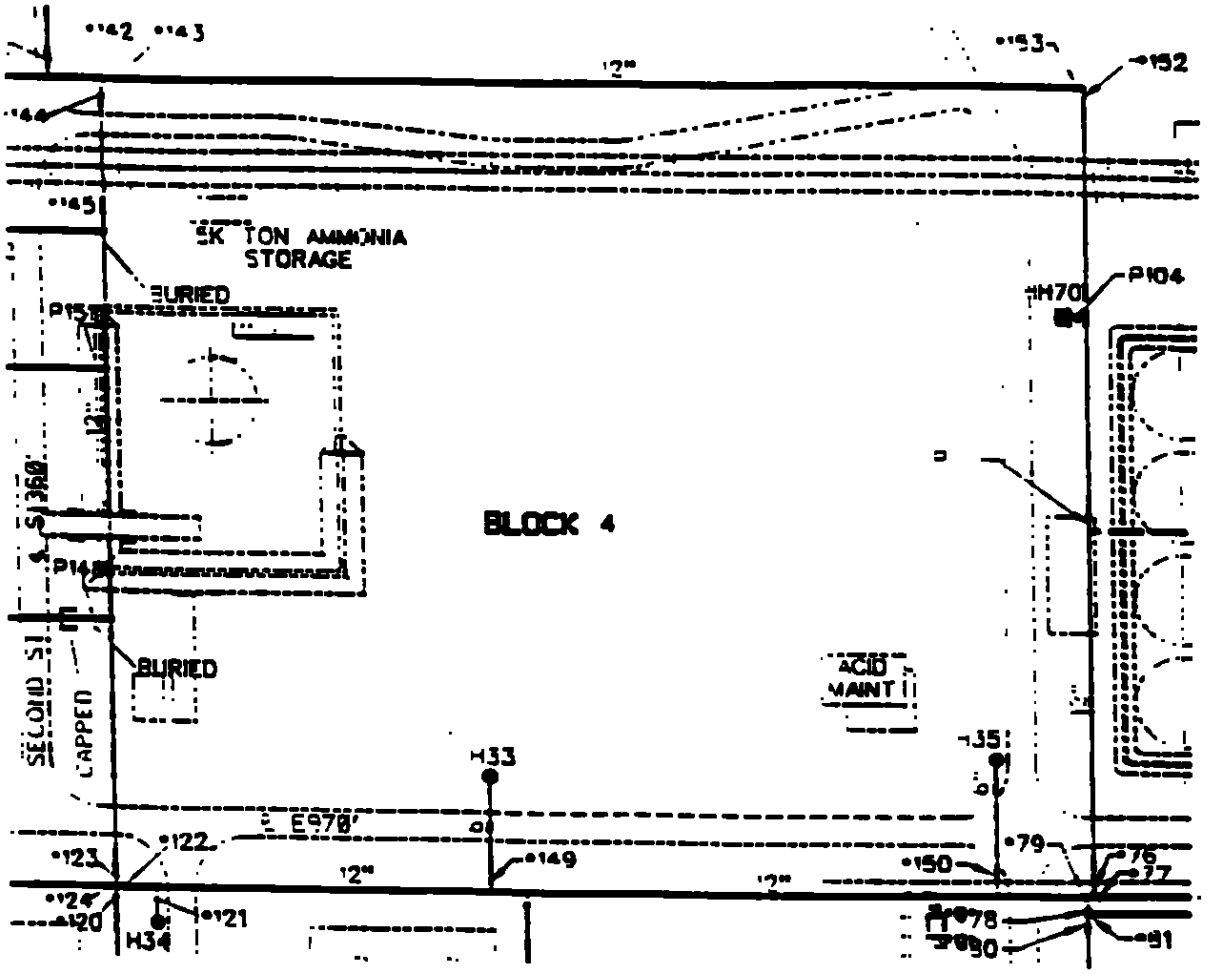

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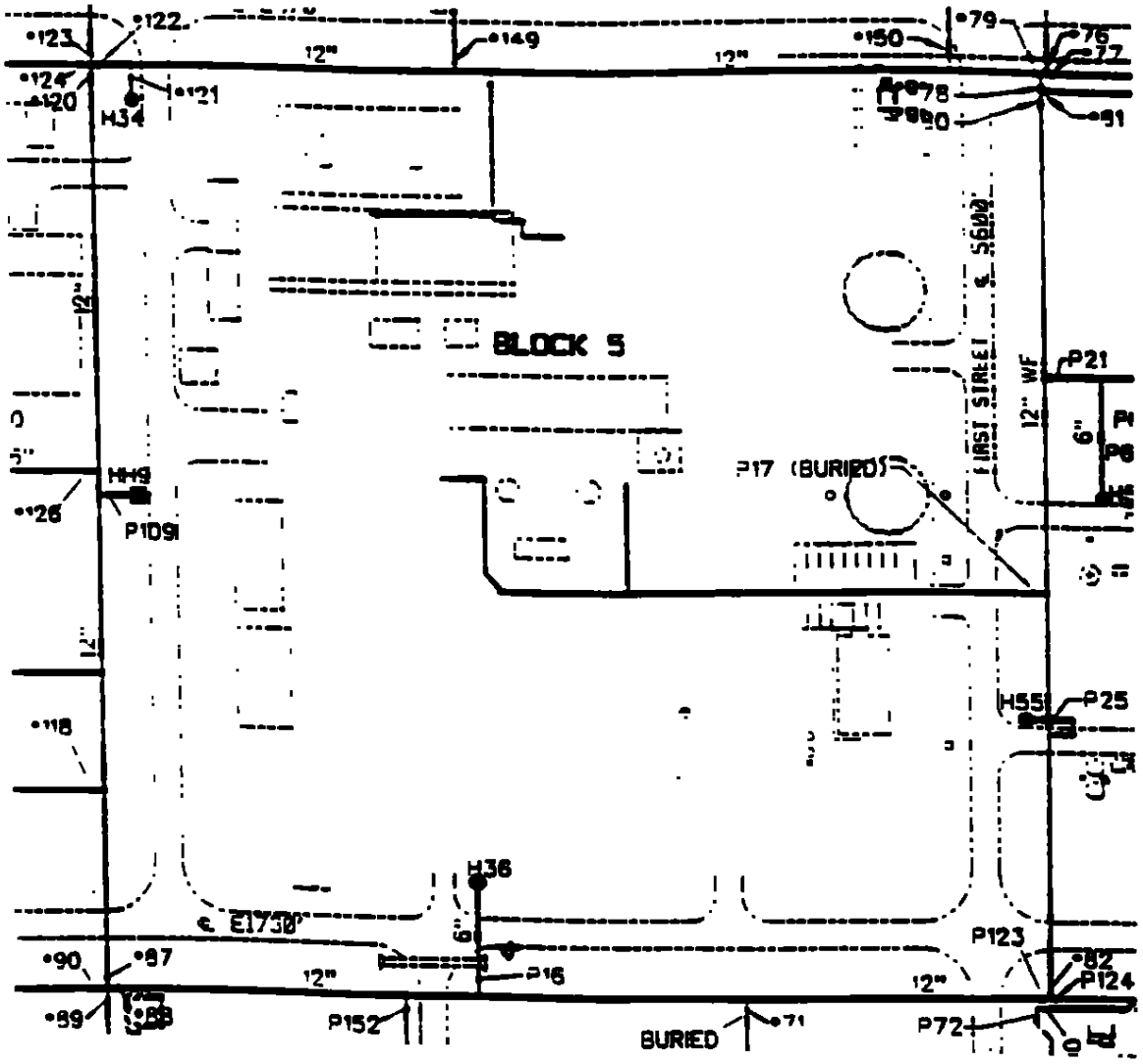

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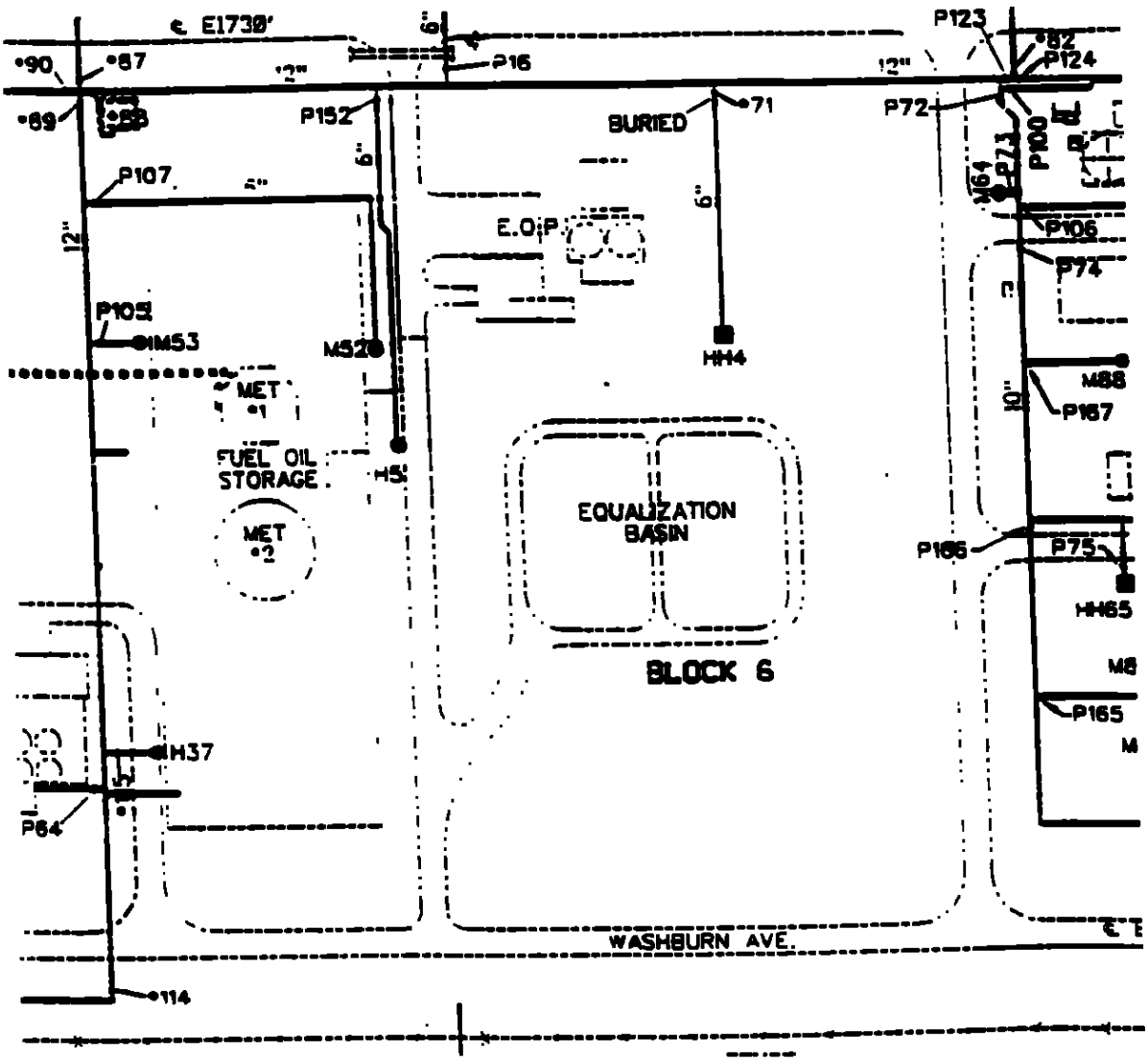

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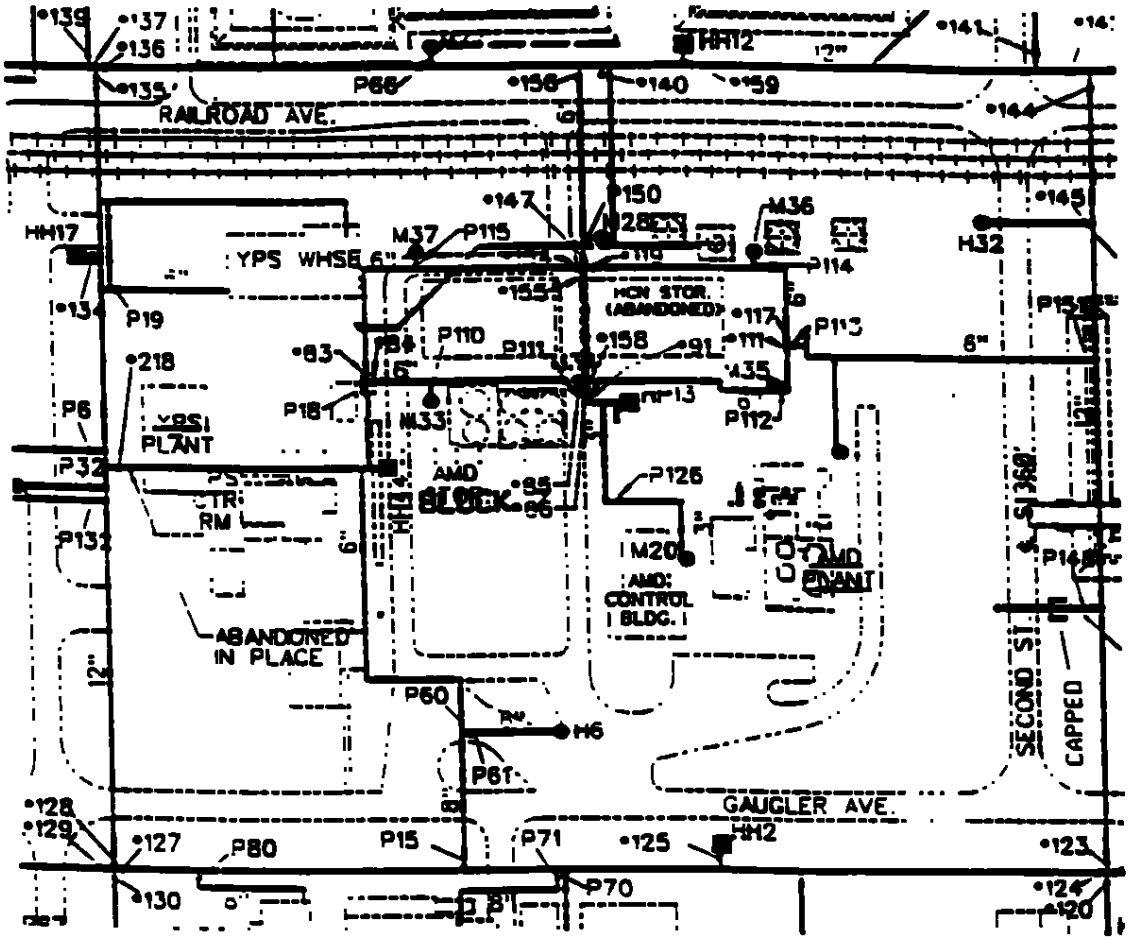

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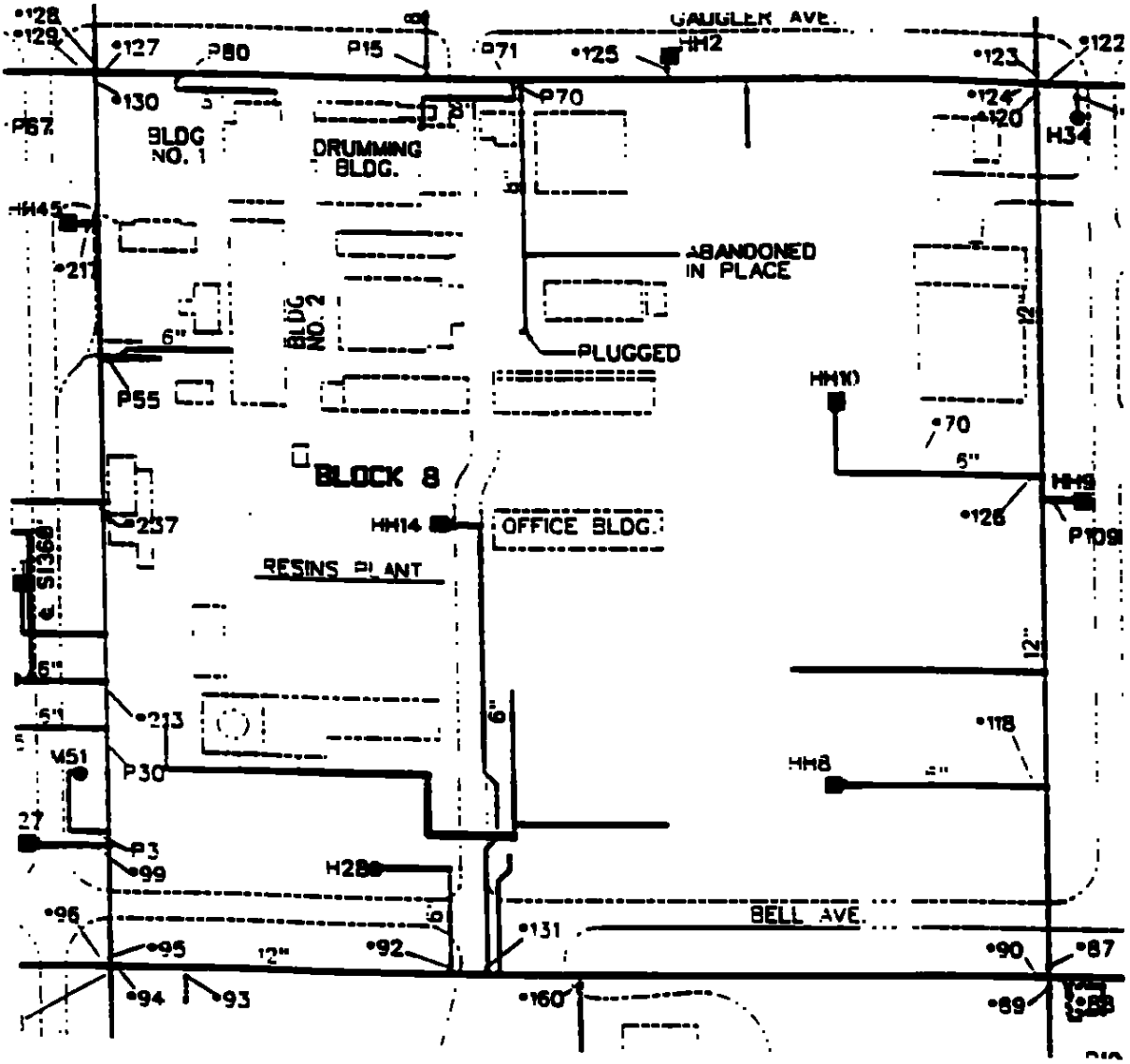

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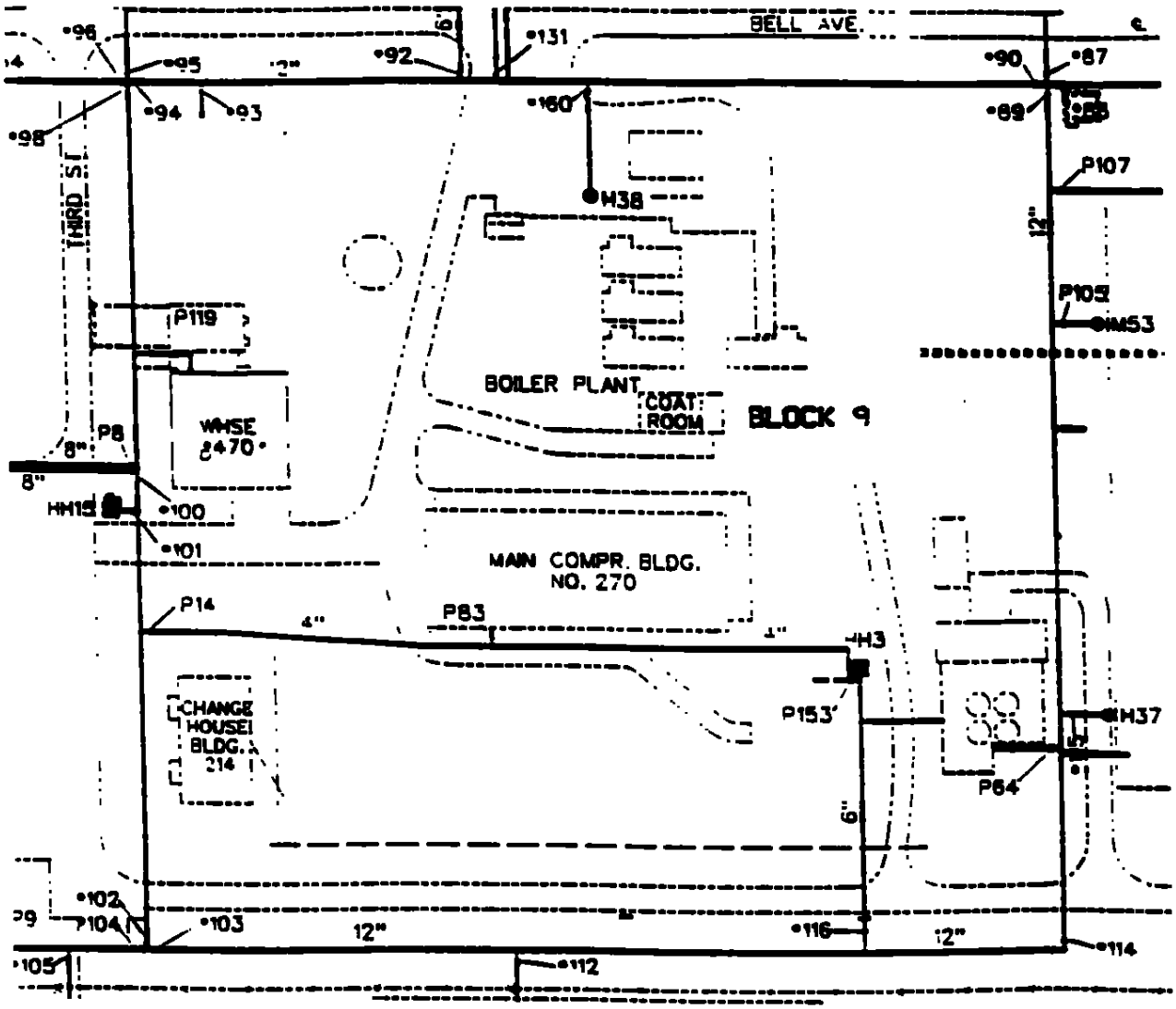

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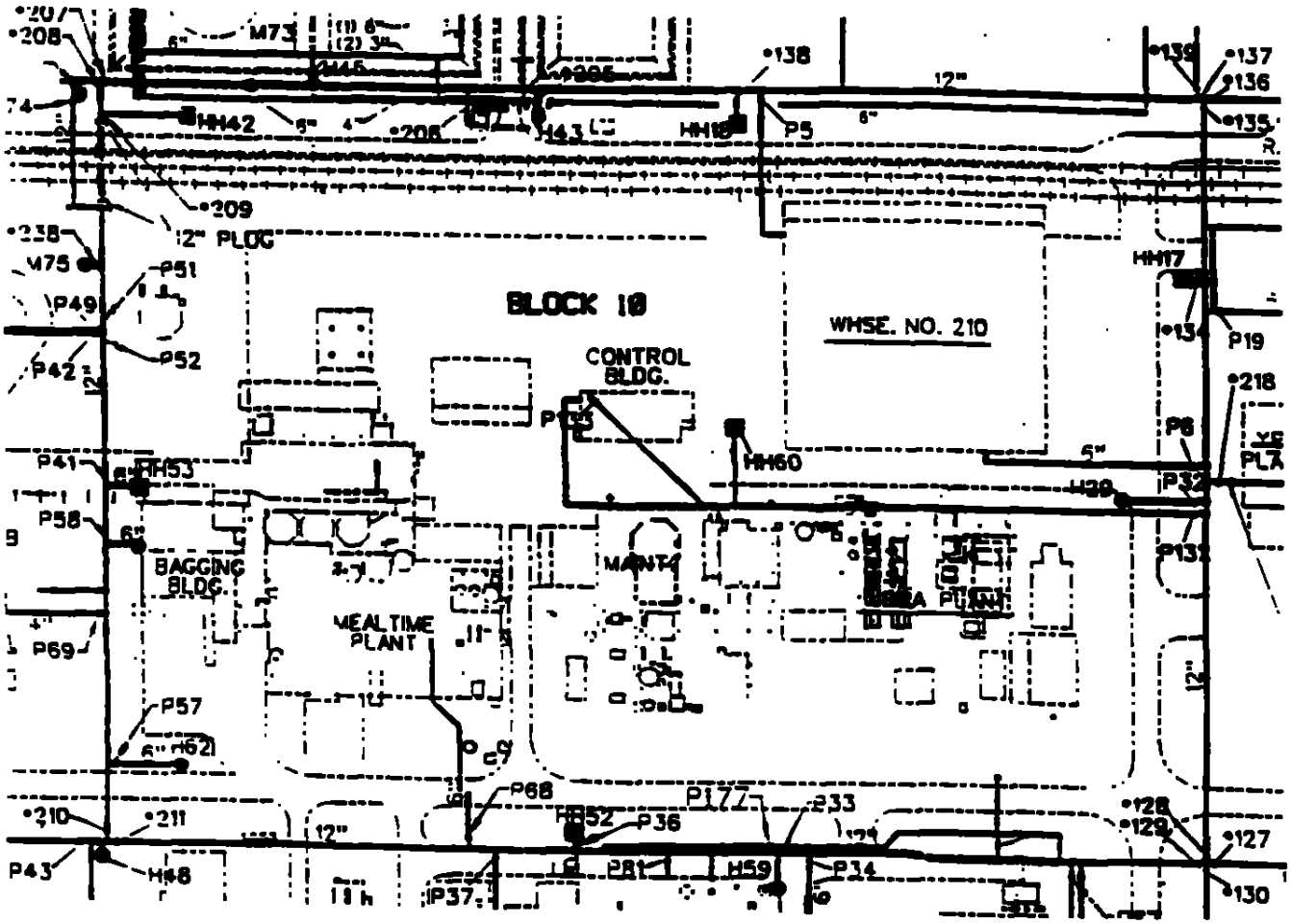

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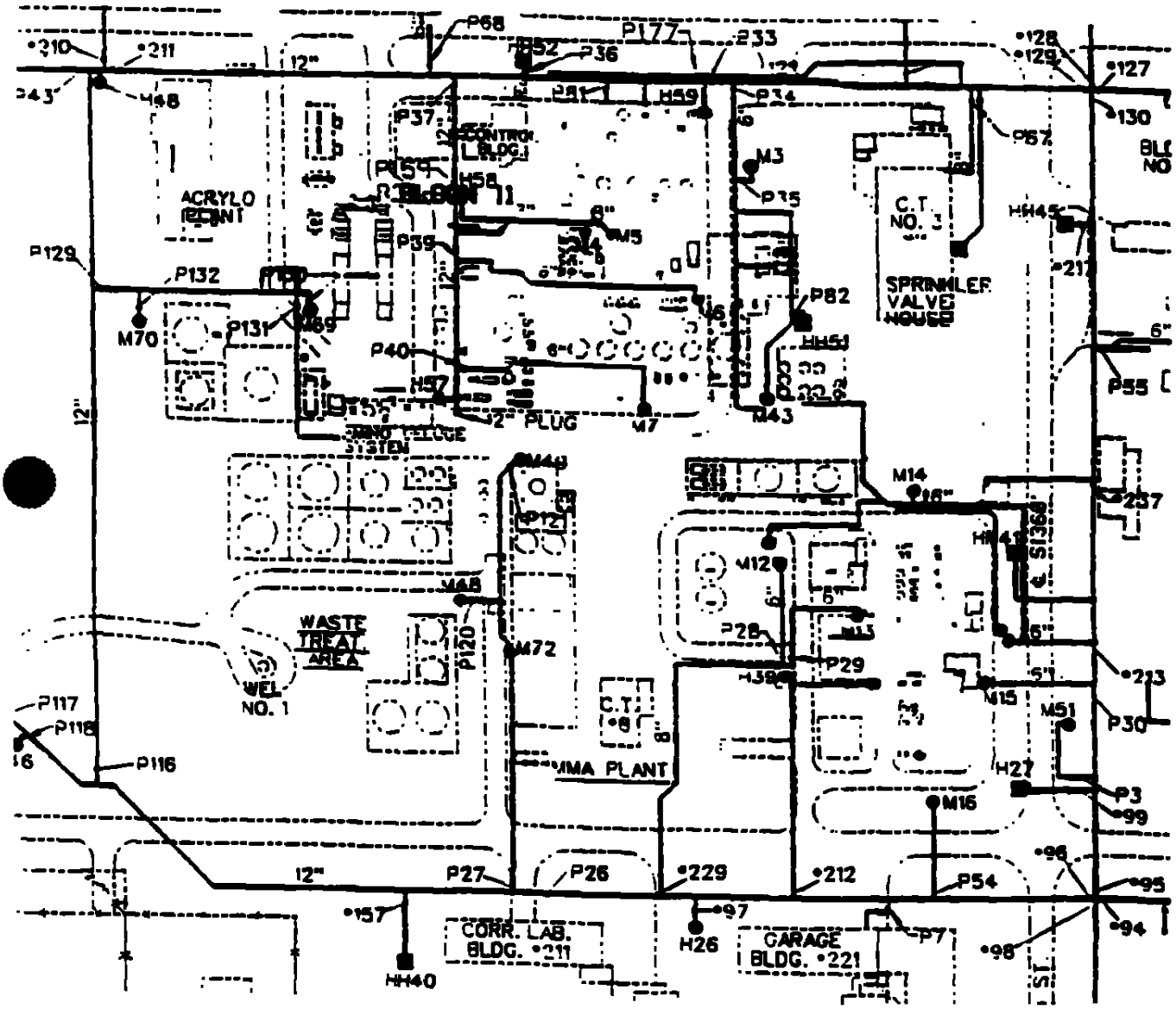

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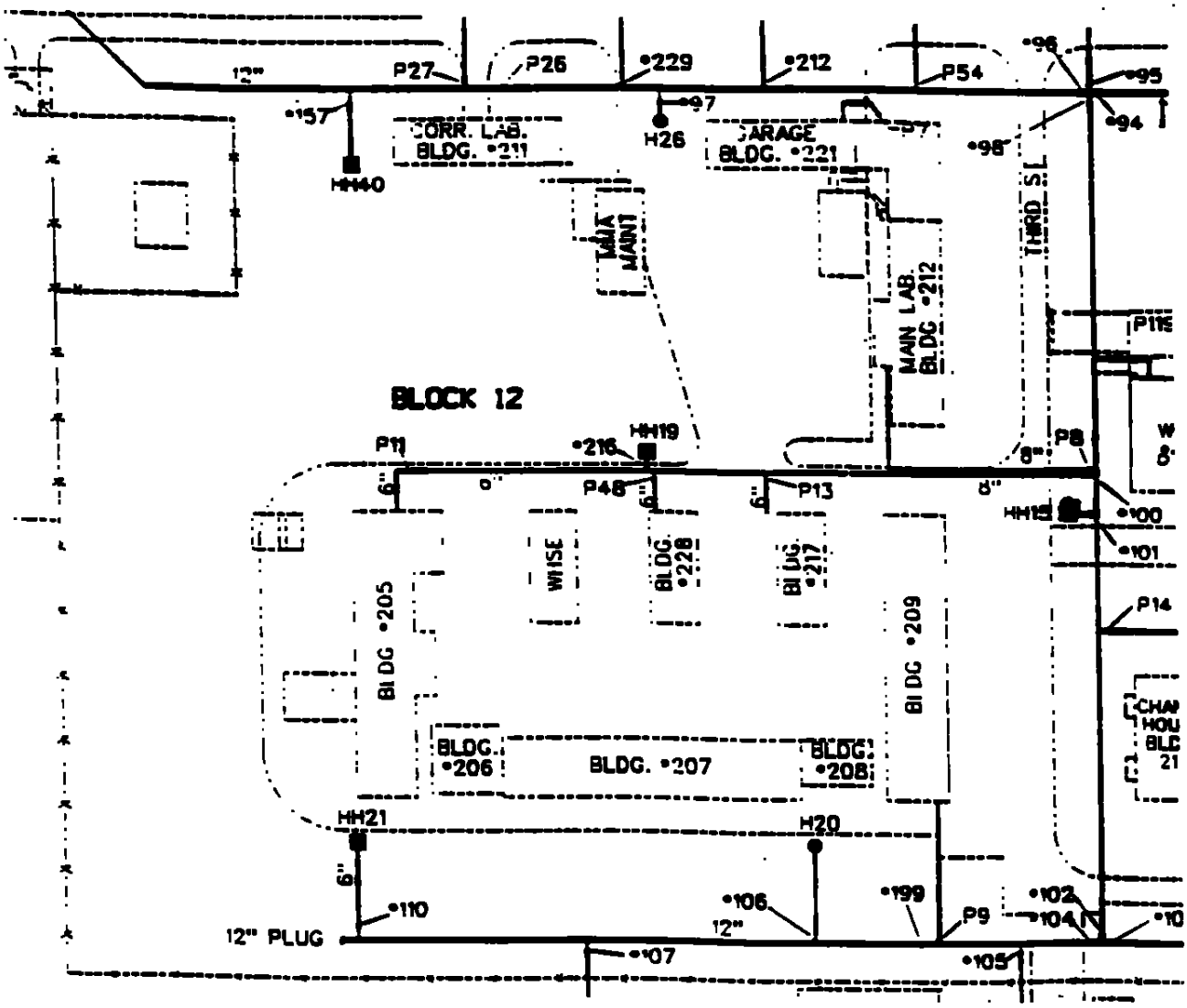

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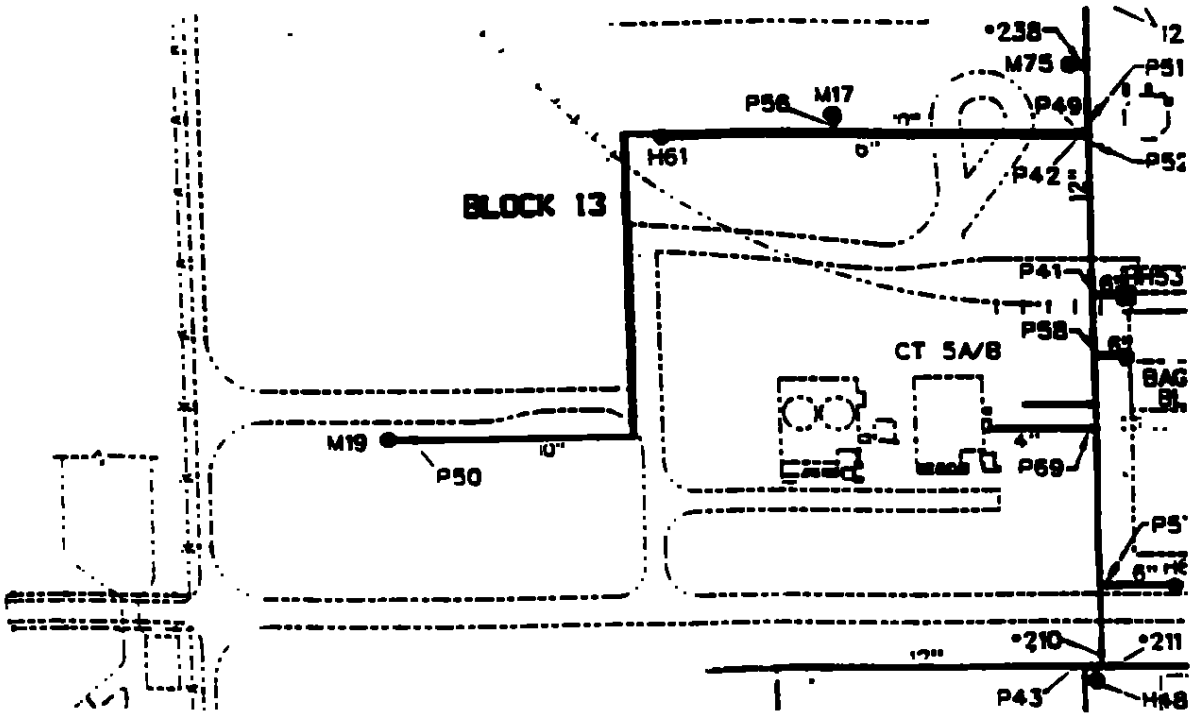

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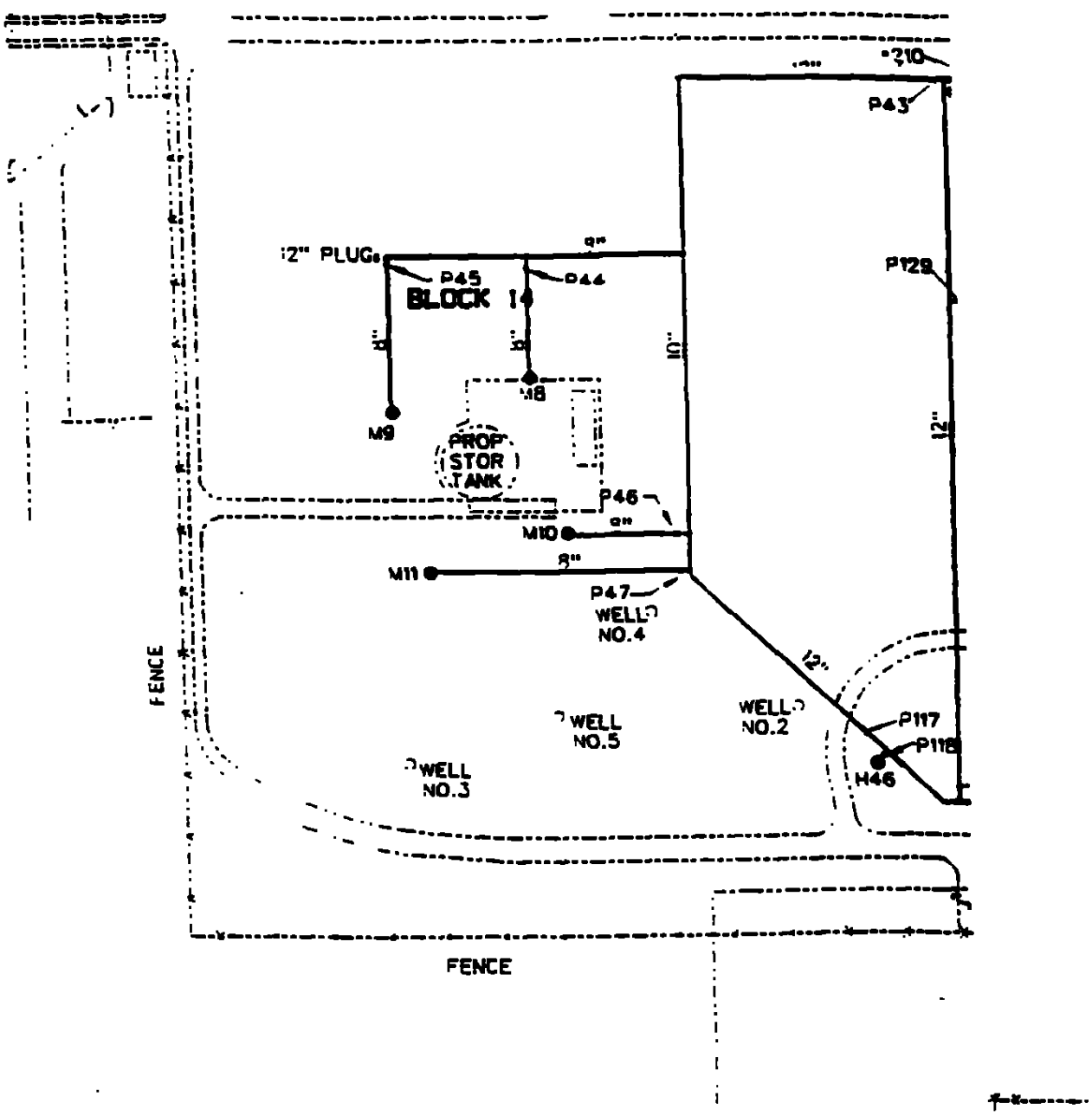

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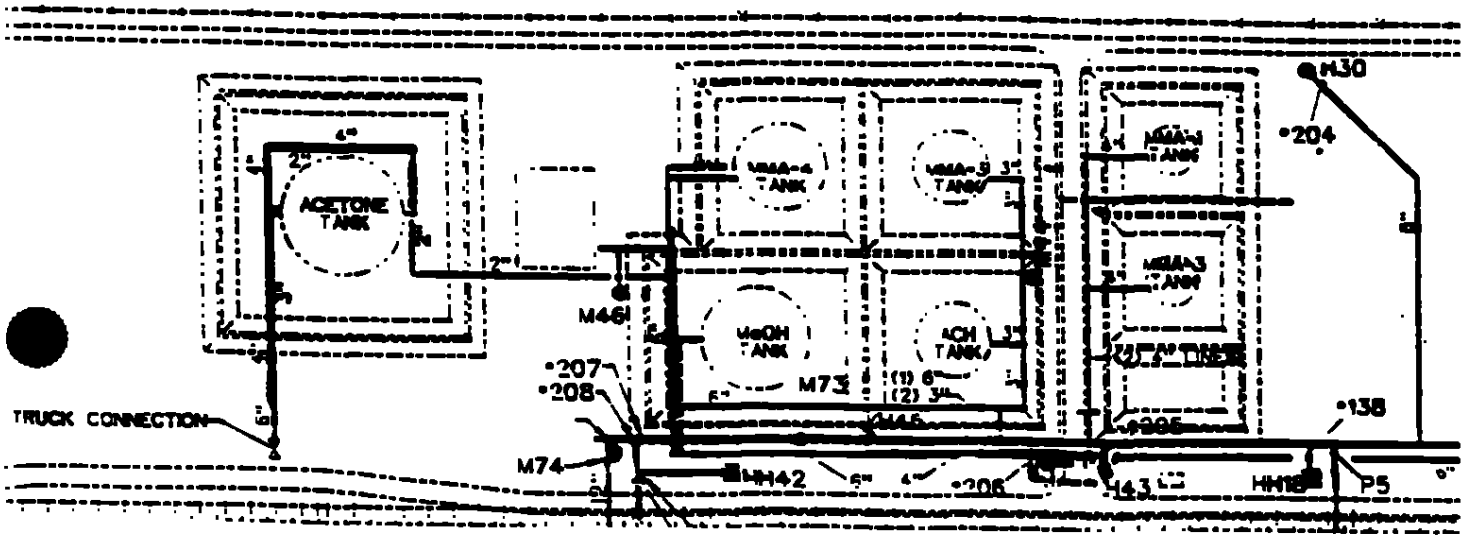

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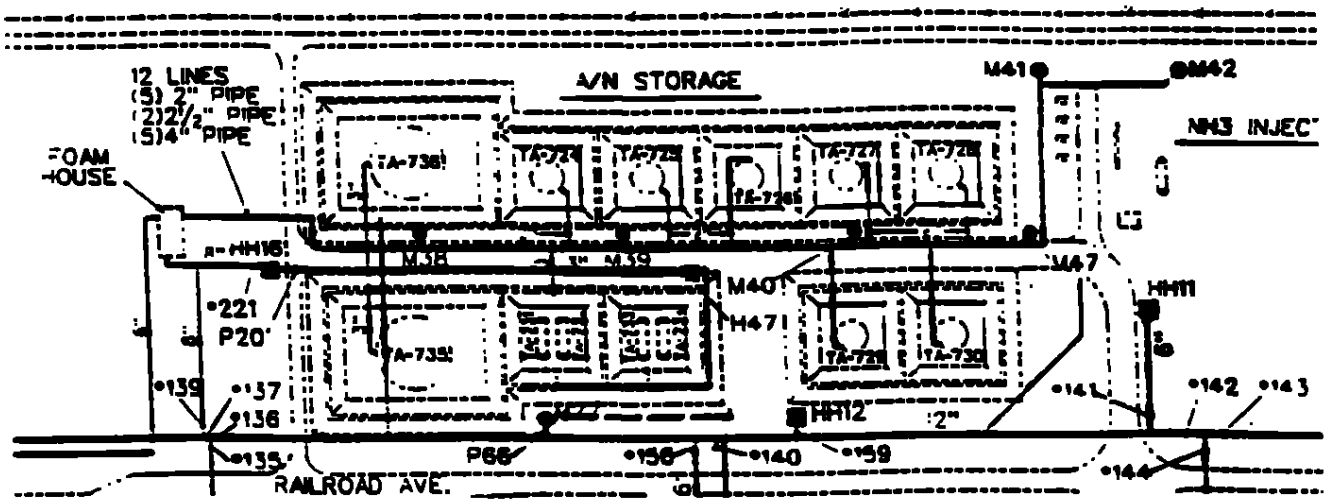

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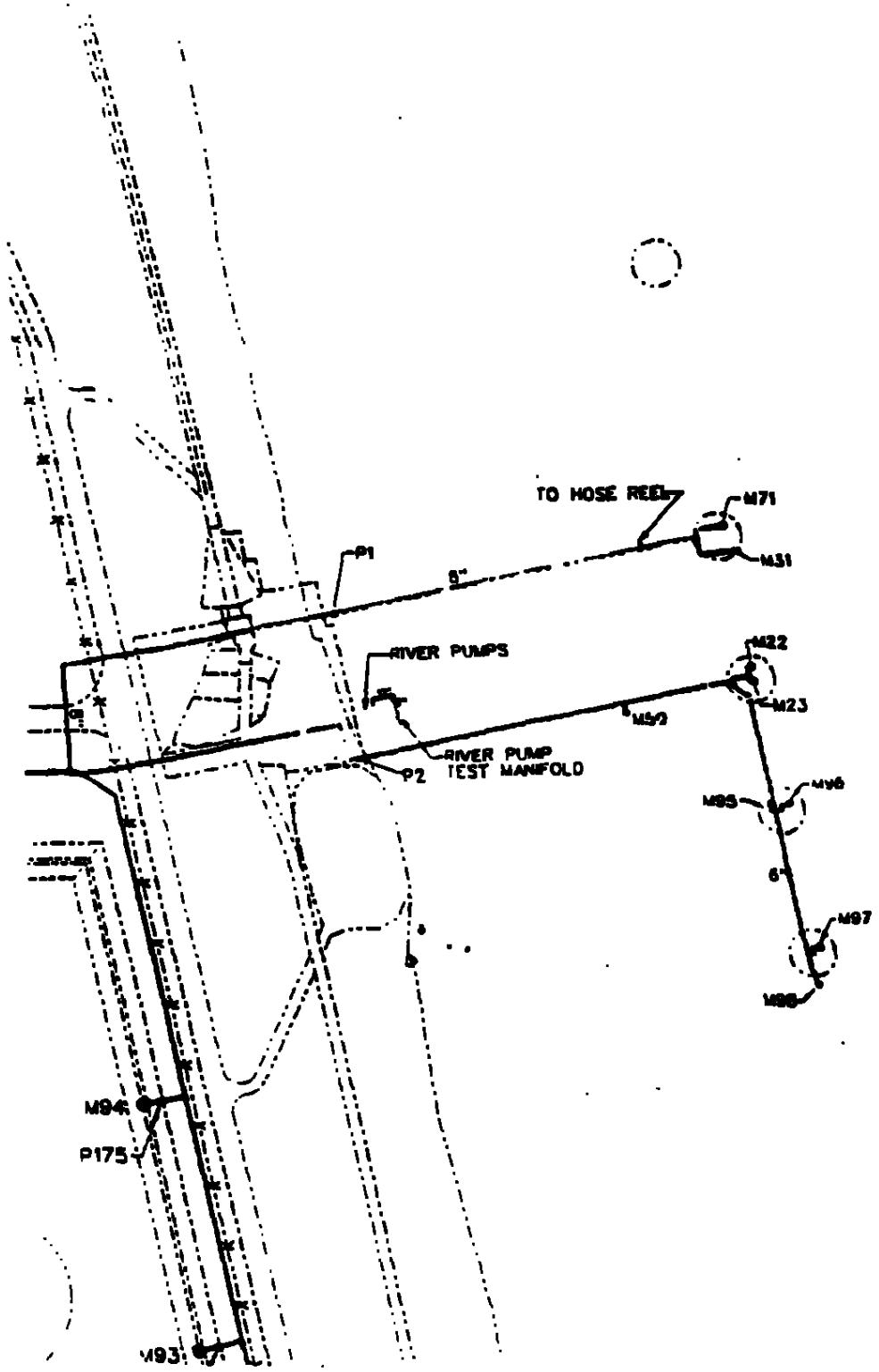

ADDENDEM B

Cytec Industries	Dept. : Safety	Number : S-8
	Date : 07/26/94	Issue No. : NEW
Fortier Plant Waggaman, La.	Title : Fortier Plant Safety Standard - Department Specific Emergency Plans	Supersedes : Sheet 1 of 2

CONTROLLED COPY

Prepared by:	Reviewed by:	Approved by:
A. J. Saccone, Safety Manager	P. L. Martinez, Fortier Plant Safety Director	D. J. Romanik Fortier Plant Manager

Update Responsibility : Safety Manager
Implementation Responsibility: Safety Manager

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	Date : 07/26/94	Issue No. : NEW
Fortier Plant Waggaman, La.	Title : Fortier Plant Safety Standard - Department Specific Emergency Plans	Supersedes : Sheet 2 of 2

APPENDUM B

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DEPARTMENT SPECIFIC EMERGENCY PLANS

The following is a list of Department Specific Emergency Plans for the Fortier Manufacturing Complex. These plans are available for review in the individual departments.

1. Administration Building
2. Personnel/Security/Medical Department/Credit Union
3. Main Lab
4. Building 219
5. Corrosion Lab
6. Whse. 209
7. Production Services/Whse. 210
8. Maintenance
9. AMEL
10. Methanol
11. Acrylonitrile
12. MMA
13. Sulfuric Acid
14. Ammonia/Utilities

ADDENDUM C CONTROLLED COPY

Cytec Industries	**Dept. : Safety**	**Number : S-8**
	Date : 05/20/96	**Issue No. : NEW**
Fortier Plant Waggaman, La.	**Title : Fortier Plant Safety Standard - Bomb Threat Procedures**	**Supersedes : Sheet 1 of 6**

Prepared by:	Reviewed by:	Approved by:
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Update Responsibility : Safety Manager
Implementation Responsibility: Safety Manager

Distribution List

Copy No.	Title / Location
1	Safety Secretary/ Safety Department
2	Plant Manager
7	Technical Services Manager
13	Industrial Relations Manager
15	Night Superintendent

Required Review Date is 05/20/97.
Minimum Length of Time for Archive of Outdated Document 3 Years.
Reference Documents:

Blue Stamp Indicates a Controlled Document.

<<<The text of the Fortier Plant Safety Standard No. S-8>>>
<<<has been intentionally omitted and retained by plant Security.>>>

Attachment II

HURRICANE PROCEDURE

1997 HURRICANE PROCEDURE

The objective of this procedure is to establish a general guide for the action of Fortier personnel and a detailed plan for procurement of emergency equipment in the event of a tropical disturbance or hurricane.

HURRICANE CATEGORIES

Category 1	Winds 74-95 mph
Category 2	Winds 96-110 mph
Category 3	Winds 111-130 mph
Category 4	Winds 131-155 mph
Category 5	Winds 156 or greater

A *hurricane* has tremendous forces with massive potential for death and destruction. In the Atlantic, the Caribbean and the Gulf of Mexico, an average of six hurricanes develop from the many tropical storms that are sighted each year. Most occur in August, September and October, but June 1st to November 30th is the official hurricane season.

For a *tropical storm* to be classified as a hurricane, steady winds must equal or exceed 75 miles per hour.

Hurricanes spiral counterclockwise around a relatively calm center known as the eye of the storm. This calm is deceptive, bordered as it is by hurricane-force winds and torrential rains. Many persons have been killed or injured when the calm eye lured them out of shelter, only to be caught in the hurricane winds at the far side of the eye.

At hurricane strength, winds can gust to more than 200 miles per hour as far out as 20 to 30 miles from the eye. The greatest threat from hurricane wind is flying debris. The forces of wind and flying debris can damage or totally destroy homes, buildings and other structures. Winds may also disrupt electric power, gas and tap water supplies and transportation.

Hurricane winds do much damage, but drowning is the greatest cause of hurricane deaths. As the storm approaches and moves across the coastline, it brings huge waves, raising tides (often 15 feet or more above normal). The rise may come rapidly and produce flooding and battering waves. Torrential rains may also cause flash floods.

Tornadoes frequently accompany or follow hurricanes and are another major hazard. A *tornado warning* means a tornado has been sighted and you should seek inside shelter immediately. If a tornado catches you outside, move away from its path at a right angle. If there is no time to escape, lie flat in the nearest ditch.

To minimize damage to property and loss of lives in the event of a hurricane, the National Weather Service will post first a hurricane watch, then, as the storm nears, a hurricane warning. A *hurricane watch* is an announcement that within 30 to 48 hours hurricane conditions may pose a threat to specific coastal and inland communities. Under a watch, you should take stock of your preparedness requirements, keep abreast of the latest advisories and bulletins and be ready for quick action in case a warning is issued for your area.

When a *hurricane warning* is issued, the following dangerous effects are expected in the specific coastal area in 24 hours or less; (a) Sustained winds of 74 miles per hour or more (b) Dangerously high water and high waves, even though expected winds may be less than hurricane force.

For your own well-being and that of others, please take hurricanes very seriously. Use the following outline as a guide when making preparations.

RESPONSIBILITY

Section I

1. The Hurricane Coordinator is the Plant Manager or his designee.
2. The hurricane information center is the office of the Plant Manager or the office of the Night Superintendent. The telephone numbers are 6201 and 6353 respectively.
3. The responsibility for weather tracking and information is vested in the Project Engineering Manager or his designee.
4. The responsibility for all precautionary measures is vested in the Production Managers of the operating areas and the Area Heads of the maintenance areas.
5. The responsibility for ample supplies of emergency equipment such as flash lights, batteries, rope, visqueen, etc., belongs to the Supervisor of Warehouse 209.
6. The responsibility for fuel requirements is assumed by the Plant Manager.
7. The responsibility for food and housing of hurricane standby personnel is vested in the Manager of Industrial Relations or his designee.

NOTE: *Each department or area will have a hurricane procedure for their own plant or area with a check list as to what is to be done and when, so in the rush of things, we don't fail to secure our plant properly.*

On plant shutdowns for hurricane threats, consideration should be given to isolate control valves that could fail open on loss of power or instrument air which could result in depleting utilities supplies, i.e. coag fire water, etc.

PROCEDURE PHASES

Section II

Phase I

This phase encompasses the hurricane season which is designated to begin June 1 and end November 30 of each year.

Phase II

This phase is the period of approximately three days before a tropical disturbance or hurricane has the potential of striking the Fortier area.

Phase III

This phase is defined as that period of 24-36 hours prior to the actual strike of the disturbance. However, this time period may be altered, when consideration is given to the intensity of the storm. At this time, the hurricane will probably be 250-350 miles from the Fortier Area.

Phase IV

This phase is defined as that period following shut down and during the hurricane. It is expected that in the event of a tropical disturbance striking the Fortier area, the plant will be shut down in an orderly fashion before damaging winds and their effects are felt.

NOTE: *In actual practice, the start of Phases II, III and IV will be declared by the Hurricane Coordinator as of a given hour. These phases will be tempered according to the type, size and/or severity of the disturbance.*

1997 HURRICANE MANNING TEAM

Section III

1. All personnel are expected to continue their normal activities during Phases I, II and III of the hurricane procedure except those having the previously assigned responsibilities.

2. Emergency manning requirements to insure the security of the plant are to be determined by the supervision of each department beforehand, see Section VI.

3. A hurricane task force consisting of one Production Manager, one Maintenance Supervisor, one Engineer, one member of the Purchasing Department and one member of the Safety Department is to be established by the Coordinator in advance of the potential disturbance. This task force will be functional at the beginning of Phase II and will report to the Hurricane Coordinator.

4. A hurricane command post in the Plant Manager's office will be established. It will be manned by the Plant Manager, two Operating Managers, Project Engineering Manager and the Acrylo Maintenance Head or their respective designees.

1997 TASK FORCE	Alternates
F. Goletz	E. Gurak
J. Claudet	J. Hemmer
G. Tippet	B. Brister
P. Martinez	A. Kuykendal
R. Kleefisch	M. Varisco

HURRICANE COMPENSATION POLICY

On an annual basis, and in advance of the Hurricane Season, the Fortier Plant will identify a voluntary emergency work force from which employees will be selected when and if a hurricane alert becomes necessary.

Plant management will determine any emergency alert. Affected departments will revert to the volunteers list on a low hours overtime basis when supplemental coverage is needed.

The utilization of the Hurricane Team would be separate from any regular plant coverage including overtime that becomes necessary due to the normal coverage of vacancies, i.e. holding over to cover for an absence.

The compensation program is intended to provide some incentive for those employees who might be asked to provide hurricane coverage The regular overtime provisions of the contract will prevail irrespective of this supplement.

Hurricane volunteers whom the Company anticipates utilizing in any given alert will be given one shift with pay in advance of the alert to attend to any personal needs. In some cases, the employees regular schedule might afford him that personal time prior to the alert and in those cases, he might elect to take his compensation day following the alert.

The policy is being implemented in an effort to reward those employees who contribute over and above normal plant overtime requirements and in no way is intended to impact the existing labor agreement in any way. However, the compensation day provided will be counted as time worked in the computation of any overtime, including the sixth (6th) and seventh (7th) consecutive day, in the week in which it occurs.

PHASE ACTIVITIES

Section IV

Phase I

The Hurricane Coordinator reminds Managers that Phase I activities (during the Hurricane season) are to be kept current through November 30 and that follow-up inspections should be made to insure our preparedness is maintained.

1. All production managers review their requirements for emergency equipment and verify that their hurricane procedures are current. Empty drum storage should be minimized.

2. All maintenance area heads inventory gasoline driven pumps, generators, compressor and welding machines and schedule necessary work required to get units in good working order.

3. Maintenance department arranges that its diesel fuel tanks are ready to receive k70 gallons of fuel.

4. All managers are to poll their personnel for the volunteer hurricane standby team. (See pay policy attached.)

5. Warehouse 209 personnel doubles the warehouse stock of rope, flash lights, flash light batteries and visqueen.

6. The Production Managers determine proper locations for emergency equipment, keeping in mind that safety of personnel and normal accessibility to operating equipment is maintained.

Phase II

The following activities begin when the Hurricane Coordinator declares that Fortier is in Hurricane Procedure Phase II: (See master list for food and water supplies.)

1. The Human Resources Department surveys the potential need for housing, feeding and bottled water for the hurricane manning group in Phase IV.

2. Each plant or department manager surveys his area of responsibility and prepares a check list covering the following:

   a. Material which should be removed from the area or secured to prevent it from becoming a hazard to personnel and equipment.

   b. Equipment in the process of construction or maintenance which requires special handling in the event of a hurricane.

   c. Other work required such as sand bagging, ditching, location and condition of railroad tank cars, empty storage tanks and mobile equipment, and disposal or securing of empty drums.

d. Arrange maintenance work by priority so that the greatest hazard is eliminated first.

3. The Project Engineering Manager arranges to monitor weather reports using the radio receiver in the Engineering Department (setting 162.5 MHz). If necessary, the following telephone contacts may be used:

465-9212 National Weather Service
366-1771 LP & L - Gretna

4. The Project Engineering Manager or his designee sets up the hurricane tracking chart, including the latest information such as location, wind velocity and projected track of hurricane. Copies will be distributed to the Managers.

5. The Warehouse 209 Supervisor checks inventory of equipment available at Fortier compared to requirements and prepares requisition, if necessary, for Purchasing to determine availability of remaining emergency equipment needs. Minimum requirements are given in Section V.

6. The Purchasing Department checks on the availability of and orders, if necessary, emergency equipment as per requisition from the Warehouse 209 Supervisor.

7. The Coordinator will review the status of preparedness with the Managers on a daily basis.

Phase III

The following activities begin when the Hurricane Coordinator declares that Fortier is in Hurricane Procedure Phase III:

1. All activities under phase II are expedited to completion except that item 4, the hurricane tracking, will continue.

2. The Hurricane Coordinator or his designee prepares a shutdown schedule.

3. Emergency equipment is delivered to Fortier and plans are made to place units in service. For a Category 3 Hurricane or above, equipment may need to be ordered 48 to 60 hours before landfall.

4. Maintenance gasoline and diesel storage tanks and trailer are filled to capacity.

5. Production Managers implement standby crews as outlined in Section IV, Phase I, #4 and provide a list of names and badge numbers to the Hurricane Coordinator. See Manning Chart, Page 12.

6. All personnel continue to report as scheduled for their normal duties until otherwise directed by the Coordinator. The emergency manning team is to be allowed time and assistance, if necessary, to secure their own property and make provisions for the safety of their families.

7. The Transportation Specialist will make arrangements to relocate acrylo barge fleet to the Intercoastal Waterway in Harvey, Evans Industries in Harvey, LA. Phone contact is Gary Hamilton at 368-6000. Secure river dock by removing all product from lines.

8. Office personnel store all papers, books, drawings, records, etc., in desks or cabinets to prevent loss or destruction in the event windows are blown in or roofs leak. If possible, move personal computers to rooms with no windows and cover with Visqueen.

9. The Plant Manager or his designee directs that plants be shut down after review with the Hurricane Coordinator. The Plant Manager has sole responsibility for ordering the shutting down of the units. See attached Section VII for required lead time by plants.

Phase IV

The following activities begin when the Hurricane Coordinator declares that Fortier is in Hurricane Procedure Phase IV:

1. Chlorine cars disconnected.

2. Disconnect all tank cars.

3. The shut down of the plant is completed according to schedule.
   a. Where possible, all piping to and from tanks should be closed at the tank.
   b. Consideration should be given to what needs to be secured since a major hurricane could result in periods when we do not have utilities, instrument air/nitrogen, or maybe even natural gas. Therefore, we should secure our equipment and not rely on check valves.

4. Fortier manning reduction begins. The predetermined emergency manning requirements are held as per Section VI.

5. All contractors are clear of the plant.

6. The remaining emergency manning complement will standby at location designated by the Hurricane Coordinator or his representative.

7. The coordination and communication activities will be directed by radio on the Night Superintendent's channel, by hurricane command post. Make sure all batteries are fresh.

8. Notify State agency that all scrubbers will be shut down as part of our hurricane procedure.

9. Connect emergency generators and air compressors.

10. Switch over to emergency generators, Section V, Item F. (With operation of generators, should plant loose power, this will allow phone system to continue operation.)

HURRICANE EMERGENCY EQUIPMENT

Section V

I. Generators (See Section VIII for connection instructions)

RENTAL COST				EXPECTED DEMAND
1st 3-day min. $1,675.00 4th day etc. $300.00/day	A.	800 KW or larger with 500 MCM cable or equal 50' long in length. Generator to be connected at Sub. M-42 EOP Plant.	Boiler Plant, EOP, Bldg. 219, Main Lab, Spec Room, Acrylo waste, Fire Head-Quarters and the Garage. Fuel consumption 91 gal.per hour. Kellogg office bldg. And Methanol Plant.	840 KVA
1st 3-day min. $2,140.00 4th day, etc. $380.00/day	B.	1000 KW or larger generator, 460 volt 3 phase, 60 cycles with parallel 500 MCM cables or equal, 100' in length. Generator to be connected at Sub MM-21 K-NH_3 plant.	K-NH_3 Storage (25,000 ton), Water Plant and the Sulfuric Acid Plant. Fuel consumption 91 gal. per hour. Kellogg office building and Methanol Plt.	910 KVA
1st 3-day min. $1,524.00 4th day, etc. $272.00/day NOTE: "Trailer Extra"	C.	600 KW or larger generator, 460 volt, 3 phase, 60 cycles with 500 MCM cable or equal 50' in length. Generator to be connected at Sub G-13 southeast of AMD.	MMA, AMD and Production Services. Fuel consumption 53 gal. per hour.	530 KVA
1st 3-day min. $720.00 4th day, etc. $125.00/day NOTE: "Trailer Extra"	D.	250 KW or larger generator, 460 volt, 3 phase, 60 cycles with 4/0 cable or equal 50' in length.	Acrylo Plant (AOG Section) Fuel consumption 20 gal. per hour.	200 KVA

NOTE: The three day minimum doesn't apply during the contract months of July through October. We would pay for transportation/delivery of the unit or units plus the per day charge listed.

RENTAL COST				EXPECTED DEMAND
Ist 3-day min. $1,385.00 4th day, etc. $237.00/day NOTE: "Trailer Extra"	E.	500 KW or larger with 500 MCM cable or equal, 100' in length. Generator to be connected at Sub X-38 AMEL Plant.	AMEL Plant. Fuel consumption 39 gal. per hour.	385 KVA
EST. COST PER SET-UP $7,514			SUB TOTAL	2,605 KVA
	F.	275 KW installed.	Main Gate/Medical, Ad Bldg./Cafeteria, Mtc. Bldgs. 205, 206, 207, 208, 209. Fuel consumption 27 gal. per hour.	240 KVA
		TOTAL DEMAND EXPECTED	2,845 KVA	
			POWER AVAILABLE	3,500 KW
			DEMAND FACTOR .85 .85(3,500) = 2,975	

2. Diesel Compressors: 1 Diesel operated 600 CFM unit for Boiler Plant to be located South end of Boiler Control Building.

   One 200-300 CFM unit for K-NH_3 to be located on East side of Demin Section of K-NH_3 adjacent to pipe rack. 50' of 1" hose required with boss fittings to go to instrument air receiver.

   One 200-300 CFM unit for Methanol to be located in Compressor Building. 125' of 1" hose with boss fittings to instrument air receiver.

   NOTE: Attempts should be made with the outside painting contractor to supply above plant needs.

   1 each 150 - 200 CFM unit for AMD

   Air Compressor Requirements: Air compressor requirements to fluidize the melamine reactor are listed below. These units will be a back-up to existing systems in case of their failure.

1. 2 each - 1500 SCFM "oil free" air compressors with 200 feet of 3" hose with fittings from: ATLAS COPCO RENTAL, INC.
   1703 SOUTH EDWARDS
   GONZALES, LA 70737
   PHONE 647-8760

2. 1 each - 500 gallon diesel tank with pump and hose from:
   MAYER HAMMANT
   471 MANHATTAN BOULEVARD
   HARVEY, LA 70059
   PHONE 368-4277

3. Miscellaneous:

   a. Fuel - Maximum capacity storage.
      70 k Hurricane Supple Tank located at corner of Bell and Third Streets
      10 k Fuel tanks located south of Machine Shop.

   c. Fuel Truck - A 6 k gallon fuel truck with its own pump to be able to withdraw fuel from our fuel tank and fill our temporary generators and compressors. IMC will supply a field truck and driver.

   d. Fuel Tank Capacity - when full

EOC Generator	48 hours
River Fire Pump	24 hours
Settle Water Fire Pump	30 hours

HURRICANE EMERGENCY MANNING

Section VI

The following guide represents minimum emergency manning under Phase IV after plants are shut down:

Ammonia - Kellogg	5 operators - 1 supervisor
Utilities	4 operators - 1 supervisor
Acrylonitrile	3 operators - 1 supervisor
Methyl Methacrylate	2 operators - 1 supervisor
Shipping and Receiving)	2 operators
Maintenance	4 mechanics - 1 supervisor 1 electrician 1 instrument
AMD	1 operator
Melamine/Urea	3 operators - 1 supervisor
Sulfuric Acid	1 operator
Methanol	2 operators
Safety & Security	1 security shift leader 1 EMT 1 fireman
	1 Night Superintendent
	1 Supervisor or Engineer knowledgeable in electrical system and switching.
	41 people total

HURRICANE SHUTDOWN TIMING

Section VII

The following guide represents the minimum safe lead time in hours for shut down of plants by section under Phase III. These may vary depending on available manning.

Kellogg	Synthesis and Refrigeration - 2 hours
	Shut down process gas and air to reformer - 6 hours
	Only steam in reformer at 1,000° F - 8 hours
	Shut down complete - 16 hours
Acrylonitrile	12 - 16 hours for shutdown and to decontaminate
Acrylamide	8 hours
Methyl Methacrylate	8 - 12 hours
Sulfuric Acid Plant	8 hours to shutdown and secure
Shipping & Receiving	4 - 8 hours
Ammonia Loading	4 - 8 hours
Melamine/Urea	8 - 12 hours
EOP	1 hour
Amino	4 hours
Methanol	Synthesis and Distillation - 2 hours
	Shutdown process gas and oxygen to reformer - 6 hours
	Only steam in reformer at 1,000° F - 8 hours
	Shutdown complete - 16 hours

POWER REQUIREMENTS

Listed below are the only equipment being provided with power from generators.

A.	**Water Plant**	
	Settled water rake	3 hp
	Coag I water rake	1 hp
	Jockey pump	100 hp
	Coag II water rake	2 hp
	Coag lights, reduced to 50%	100 amp
B.	**Boiler Plant**	
	Boiler plant lights reduced to 50%	100 amp
	Boiler No. 1 UPS; ID & FD Governors	8 amp, 120 VAC
	Boiler No. 2 UPS; (Water panel)	10 amp, 120 VAC
C.	**EOP**	
	Lamella rake, north	2 hp
	Lamella rake, south	2 hp
	MET Deep Well Pump	125 hp
D.	**Acrylo**	
	Acrylo sump pump	30 hp
	Air conditioning computer control room	65 amp
	Plant lighting, reduced to 50%	135 amp
	Acrylo (Waste Disposal)	
	Waste Water Sump	5 hp
	Waste Water B/W Tank Sump	3 hp
	SFFT Tank Sump	3 hp
	Waste Acid Tank sump	3 hp
	NSB Dike Sump	3 hp
	MET Injection Pump	200 hp
	Deep Well Transfer	45 kva
E.	**Sulfuric Acid**	
	Plant lighting, reduced to 50%	100 amp
	Sump Pumps	
F.	**Main Lab**	
	Computer air conditioning	3 hp
	Exhaust hood blowers	2.5 hp
	Mass spec	2 hp
	Appliance panel	30 kw
	Lighting panel	35 kw
	Building 219, one section only	30 kw

G. Personnel, Ad Building, Cafeteria and Medical (supplied by its own back up system)

Design of System	
Lighting in all of above buildings	
Air conditioning for Ad Building	
computer room	240 kva Total
Air conditioning for telephone control room	
Air conditioning for Security office	
Cafeteria freezer and refrigerator	
Maintenance Building 205, 206, 207, 208 and 209	

H. MMA

Storm sump pump	20 hp
ACH sump pump	10 hp
Effluent sump pump	7.5 hp
Plant lighting, reduced to 50%	100 amp
Computer room	23 hp
ACH Wastewater pump	25 hp

I. AMEL

Storm sump pump	20 hp (460V)
Effluent sump pump	25 hp (460V)
Plant lighting, reduced to 50%	100 amp
Sewer Pump	2 hp
Control Room/Office	123 amp
CO_2 System	31 amp
	2 hp
P-12 Sump Pump	7.5 hp

J. Production Service

Plant lighting, reduced to 50%	75 hp

K. Kellogg Ammonia Plant

25kll NH_3 Storage Tank Worthington	
Compressor	250 hp
25kll E-1 Condenser Circulating Pumps (2)	4 hp
25kll E-1 Condenser Fans (4)	30 hp
25kll Glycol Circulating Pump	2 hp
Plant lighting, reduced to 50%.	100 amp
Ammonia Technical Building	125 amp
Ammonia Flare UPS System	20 amp
Computer Room A/C	30 amp
PG-1 Flare	20 amp

L. AMD

AMD sump pump	20 hp
Plant lighting, reduced to 50%	55 amp

M.	Fire Headquarters Emergency lighting	10 kw
N.	Garage 1 compressor, emergency lighting, battery charger and fuel pumps	15 kw
O.	Urea Emergency lighting, CO_2 storage Refrigeration, Urea sump pump Sanitary pump	25 kw 2 hp (460V)
P.	Methanol Plant Control room lighting (MCCB-8J) Partial area lighting (MCCB-12LR, 12NL, 8EL) Computer room air conditioner (MCCB-8J) Aircraft warning lights (MCCB-8EL) Beacon lights (MCCB-8EL) Flare ignition systems (US-101 and US-4) 120 VDC Battery System (MCC-1) PLC & DCS UPS	126 kw

TEMPORARY POWER HOOKUP FOR KELLOGG AMMONIA STORAGE, WASTE WATER AND SULFURIC ACID, KELLOGG OFFICES AND METHANOL PLANT

Section VIII

1. Verify Kellogg ammonia storage is fed from Substation MM-2I via auto transfer switch (see sketch 1).

2. Water plant, fed from Substation P-57.

3. Sulfuric Acid Plant (temporary lighting source) fed from Substation S-58. NOTE: See pages 27 and 28.

4. Install one temporary 460 volt, 3 phase, 60 cycle, 1000 kw, generator at Substation MM-21. Connect two parallel 500 MCM cables or four parallel 4/0 cables from the generator to a spare D B - 50 breaker located at Substation MM-21. Verify phase rotation is correct prior to connecting the cables. See Sketch No. 2 for the connection information.

5. Methanol Plant - Powered from Kellogg 25K2 storage area.
   See Page 19.

   NOTE : All switching "opening and closing of breakers and switches" must be performed by, or coordinated with the Utility personnel.

   If the LP&L source should fail and it becomes necessary to use emergency power, the following procedure should be followed prior to putting additional load on the generator:

A. Open and lock out Switch MM-34 located at substation M-22. Switch position will be "on-on-off" front view.

B. Open the transformer Switch MM-34 located at substation MM-34 located at Substation MM-34. Switch position will be "off-on-on" front view.

C. Verify open, rack out and lock the ITE-1600 amp alternate source breaker located in the Kellogg MM-34 motor control center "lower unit."

D. Open and lock out Switch H-15 located at Substation J-60. (Do not ground the line.) Switch position front view will be "off-on-off."

   NOTE: Do not ground the switch.

E. Open the trans Switch J-16 located at sub J-16 switch position will be front view "off-on-on."

F. Open and lock out switch P-55 that feeds power to settled water pumps at Substation P-55. The switch position (front view) will be "off-on-on."

G. Place the P-56 switch (front view) in the "off-on-on" position.

H. Open and lock out switch (Feeder No. 7) located at Substation S-58. The switch position will be "on-on-off."

I. Verify the DB-25 breaker located at Sub S-58 is open. (Do not rack out the breaker.)

NOTE: The Acid Plant Personnel will perform switching after emergency power is available. See page 25 and Sketch 10.

J. Substation P-57 and associated MCC. Turn off all power to equipment not listed to be used in the Water Plant (See emergency list). Verify open, rack out and lock the main breaker for transformer T-9. Open and rack out the Coag No. 2 pump and the settled water pump starters.

NOTE: There is an automatic transfer scheme here that should operate when emergency power is restored.

K. Rack in the spare DB-50 (lower unit) breaker located at Substation MM-21. Verify Kellogg 25K-2 storage area compressor control switches are off.

NOTE: This step may have been performed by the Kellogg Plant Personnel. Verify the breaker is open and that the compressor will not start automatically.

L. Start the Emergency Generator. Verify the generator is operating properly. Voltage should be 480 volts/60 cycles. Verify the excitation switch is in the "on" position. Close the generator source breaker.

M. Open the DB-50 main breaker top unit located at Substation MM-2I. DO NOT RACK OUT.

N. Close the spare DB-50 breaker lower unit located at Substation MM-21. This will restore power to the 25K-2 Kellogg storage area. Start the storage area compressors. Only one compressor at 25k-2 should be used.

O. Close the DB-50 main breaker top unit at Substation MM-21. This will energize transformer MM-21 and provide emergency power to the Water Plant Substation P-57 and Substation S-58.

P. Notify the Acid Plant Personnel that power has been restored to Substation S-58 so they can perform the necessary switching to restore power as per the emergency list. See page 10, 16, 25 and 26.

SWITCHING INSTRUCTION FOR THE METHANOL PLANT

1. Verify power is available at the 25K2 storage area. Open the Line 1 (T1) main breaker located in Powerhouse 1. Open the Line 2 (T2) main breaker located Powerhouse 1. Rack out both main breakers T1 and T2.

2. Open and rack out the C-3 breaker located in Powerhouse 1 . Open and rack out the MCC-4B transformer breaker located in Powerhouse 1.

3. Open and rack out the MCC-2A transformer breaker located in Powerhouse 1.

4. Open the T3 (MCC-3) breaker located in Powerhouse 1. DO NOT RACK OUT THE BREAKER.

5. Open main breaker MCC-4A located in Powerhouse #2. Open main breaker MCC-4B located in Powerhouse #2. Open all 480 breakers in Powerhouse #2.

6. Close the 350 amp 25K2 emergency power breaker located by the storage area. See Sketch #1.

7. Close the emergency feeder breaker MCC-4A located in Powerhouse #2. See Sketch #1.

8. Close the MCC-4A tie breaker (Follow instructions for interlock scheme).

9. Close the main breaker MCC-4A located in Powerhouse #2.

10. Verify power has been restored to Powerhouse 1, the 13.8 kv substation.

11. Open the MCC-3 main breaker at Powerhouse #3. DO NOT RACK OUT.

12. Open and rack out the MCC-1 Breaker located in MCC-3. Open and rack out the 25K2 (S1) breaker. Open all 480 volt breakers except those needed for emergency power in MCC-3.

13. Open the MCC-4 (25K1) breaker located in MCC-3. DO NOT RACK OUT.

14. Close the T3 (MCC-3) 13.8 kv breaker located in Powerhouse 1.

15. Close the MCC-3 main breaker at Powerhouse #3.

16. Open all 480 volt breakers in MCC-4 (25K1) except those needed for emergency.

17. Close the MCC-4 (25K1) breaker located in MCC-3.

18. Close the 480 volt Powerhouse #2 MCC-4A and MCC-4B breakers needed to restore emergency power.

SWITCHING TO ENERGIZE COAG NO. 2

1. Open and rack out the following 480 volt breakers located in the COAG Substation.

   A. Main Breaker
   B. Pump breakers A, B and C

2. Open all breakers located in the COAG No. 2 Motor Control Center except those listed on the emergency list.

3. Close the spare emergency tie 480 volt breaker located in the COAG No. 2 Substation.

4. Close the emergency tie switch located in the COAG No. 2 Motor Control Center. This will restore power to the COAG No. 2 Motor Control Center.

NOTE 2: This generator is sized to allow starting of the 250 hp motors located at the Kellogg Storage Area and provide power to the Kellogg Office Building, Sulfuric Acid Plant, COAG and the Water Plant. Please see attached Emergency Power List for information on use of power.

TEMPORARY POWER HOOKUP FOR MMA, AMD AND PRODUCTION SERVICES

1. MMA Plant fed from Substation T-26 and T-35.

2. AMD Plant fed from Substation G-12.

3. Production Services fed from Substation G-13.

   Install one temporary 460 volt, 3 phase, 60 cycle 650 kw generator at Substation G-13 south of AMD drumming.

See Sketch No. 3 for connection instructions.

NOTE 1: All switching, opening and closing of breakers and switches must be performed by or coordinated with the Utilities Personnel.

If the LP&L source should fail and it becomes necessary to use emergency power, the following procedure should be followed prior to putting load on the generator.

A. Open switch HH-48/U-49 at Substation G-13. Switch position (front view) will be on-off-on.

B. Open switch T-44 and transformer T-26 located at Substation T-26. The switch position (front view) will be "off-on-off." NOTE: This is a temporary condition on the transformer to allow starting of the generator.

C. Open all ITE-K-600 amp breakers located in Substation T-26. (Do not rack out the breakers.) Plant personnel will close some of the breakers after the emergency power has become available.

D. Open all ITE-K-600 amp breakers located in Substation T-35. (Do not rack out the breaker.) Plant personnel will close some of the breakers after the emergency power becomes available.

E. Open transformer switch T-35 located in Substation T-35. (NOTE: This is a temporary condition to allow starting of the emergency generator.) The switch position (front view) will be "off-on-on."

F. Open all DB-25 breakers located in Substation G-12. (Do not rack out the breakers.) Plant personnel will close some of the breakers after the emergency power becomes available.

G. Open all AK-25 breakers located in Substation G-13. (Do not rack out the breakers.) Plant personnel will close some of the breakers after the emergency power becomes available.

H. Start the generator connected to Substation G-13.

I. Close the generator breaker. Verify the voltage is 480 volts. If the voltage is low, verify the exciter switch located in the generator control panel is on.

J. Close the emergency power "spare breaker" bottom unit located in Substation G-13. This will power up transformers G-12, G-13 and back feed the 13.8 kv system to transformer T-35 and T-26.

K. Close transformer switch T-26 located in substation T-26. The switch position (front view) will be "on-on-off."

L. Close transformer switch T-35 located in substation T-35. The switch position (front view) will be "on-on-on."

M. Notify the following production plants when emergency power becomes available to use as per attached list.

1) MMA Plant, the sections fed from Substation T-26 and T-35.
2) AMD Plant, the section fed from Substation G-12.
3) Production Services, the section fed from Substation G-13.

NOTE 2: This generator is sized to provide emergency power only. The attached list of power requirements should be used to avoid nuisance tripping or overloading the generator.

TEMPORARY POWER HOOKUP BOILER PLANT, EOP AND ACRYLO WASTE DISPOSAL AREA

1. Boiler Plant, fed from transformers T-6, T-8, Motor Control Centers E-62-1, E-62-2 or Alternate Source M-20.

2. EOP Plant, fed from Substation M-42.

3. Pumping Station No. 3, Fire House, Garage, Main Lab and Building 219, will be powered from Sub E-27.

Install one temporary 460 volt, 3 phase 60 cycle 800 KW generator at Substation M-42. Connect one 500 MCM cable, or two parallel 4/0 cables from the generator to a spare DS-800 amp breaker located at Substation M-42. Verify phase rotation is correct prior to connecting the cables. See sketch No. 5 for the connection information.

NOTE: All switching, opening and closing of breakers and switches, must be performed by or coordinated with Utilities personnel.

SWITCHING INSTRUCTIONS

If the LP&L source should fail and it becomes necessary to use emergency power, the following procedures should be followed prior to putting load in the generator.

A. Open and lock out switch M-22 located at Substation M-42. The switch position will be "on-on-off."

B. Open and lock out switch Q-18 located at Substation Q-43. The switch position will be "on-on-off."

C. Close switch Q-18 located at substation R-25. The switch position will be "on-on-on."

D. Open all 480 volt breakers in the Q-18 substation/motor control center except the main. Breakers needed to operate the waste disposal area will be closed by plant personnel after generator power is available. Refer to power reuirements list.

E. Verify the main breaker M-20 is open. Open feeder breaker M-47 going to Kellogg. (Do not rack out the breakers.) The main breaker will be closed later.

F. Start the generator and verify the exciter switch located on the generator panel is on and that the voltage is 480 volts AC.

G. Verify the generator 480 volt main switch is on. If not turn it on. Open the two EOP breakers MCC-1 and MCC-2. Close the spare DS-800 amp breaker located in Sub. M-42. This will power up transformer M-42 and M-20.

H. Open and lock out switch D-7 and E-45 transformer located at Sub station E-45. The switch position will be "off-off-on" front view.

I. Open all DB-25 breakers in Substation E-45 (the old E-8 and E-8A substation). Do not rack out the DB-25 breakers.

J. Open all 4.16 kv breakers except M-20 at Substation E-62. Turn off the auto tie scheme and verify both 4.16kv main breakers are open.

K. Close the main 4.16 breaker located at Substation M-20.

L. Verify the feeder No. 6 breaker, located at substation M-20 is closed. This will power up the 4.16 kv loop, and restore power to the M-20 tie in Substation E-62 (the new 4.16 kv substation located by the Boiler Plant.) Close the E-62-1 / E-62-2 tie breakers.

M. Open all 480 volt breakers in the E-8/E-27 Substation/Motor Control Center, except the main breaker. Do not rack out the breakers. Turn off the automatic tie scheme.

N. Close the 4.16 kv breakers E-27 and E-8 in Sub E-62. This will energize the transformers.

O. Verify the E-8/E-27 Motor Control Center has power. Close the necessary 480 volt breakers to restore emergency power to those units listed on the Power Requirement List.

P. Verify the E-45 main breaker is open and racked out.

Q. Close the E-27 alternate source breaker located at Substation E-45

R. Close the necessary DB-25 breaker located in substation E-45 to restore power to the Fire House, Pumping Station 3 and the Main Lab.

S. Turn off all breakers in the EOP Motor Control Center.

T. Close the MCC-1 and MCC-2 breakers located in M-42 Substation.

U. Turn on the necessary breakers to restore power to those units listed on the Power Requirement List.

TEMPORARY POWER HOOKUP FOR PART OF THE ACRYLO PLANT

(AOG MCC)

Install one temporary 460 volt, 3 phase, 60 cycle 250 kw generator at the Acrylo Plant (AOG Sub HH-41). See Sketch No. 6 and connection instructions attached.

Note 1: All switching, opening and closing of breakers and switches must be performed by or coordinated with the Utility Personnel.

SWITCHING INSTRUCTIONS

If the LP&L source should fail and it becomes necessary to use emergency power, the following procedure should be followed prior to starting the generator.

1. Open, rack out and lock the main 480 volt circuit breaker located in Substation HH-41.

Note 2: DO NOT trip the MCC-A, MCC-B, or MCC-C breakers.

2. Verify the 600 amp emergency power breaker located in Sub HH-41is open and that the temporary generator wiring is connected.

3. Verify the emergency generator breaker is closed.

4. Start the emergency generator.

5. Verify the voltage is 480 volts AC. (The excitation switch located on the control panel must be in the "on" position.) The frequency should be 60 cycles or above. This is a pre-set frequency.

6. Turn off all breakers except the main switch in MCC-A, MCC-B, and MCC-C.

7. Close the 600 amp emergency power breaker located in Sub HH-41. See Sketch 6.

8. Close the necessary breaker to provide power to the devices as per the Power Requirement List, for the AOG power center. Note: The computer room power must be switcher from the HH-31power center MCC-4) to the AOG alternate source.

9. Put the HH-31/HH-48 transfer scheme on manual. The switch is located in power control center HH-48.

10. Open the HH-31 main breaker snd all pump breakers and rack out the breaker. Do not open MCC-1, MCC-2, MCC-3 or MCC-4 breakers.

11. Open all breakers on MCC-1, MCC-2, MCC-4 and MCC-4.

12. Close the 250 amp Maintenance Shop breaker located on MCC-A, the AOG MCC.

13. Close the 225 amp breaker feeding the HH-31 east wall (Breaker is located in the Maintenance Shop panel).

14. Close the 225 amp main breaker (east wall) located in the HH-31 power center.

15 Close the 400 amp fuse switch located on MCC-3 powered from HH-31.

16. Close the necessary breaker to provide power as per power requirement list.

TEMPORARY POWER HOOKUP
FOR PART OF THE ACRYLO PLANT (AOG MCC) & HH-31 POWER CENTER

CONNECTION INSTRUCTIONS

1. Verify the 600 amp emergency power b reaker located in Sub HH-41 is open and locked out. (See Sketch 6.)

2. Install the temporary wiring as shown on Sketch No. 6 and connect the wiring to the load side of the breaker located in Substation HH-41.

3. Verify phase rotation is correct.

4. Verify the trailer wheels are blocked and the trailer is grounded.

SWITCHING INSTRUCTIONS: SUBSTATION D-7
EMERGENCY POWER SWITCHING PROCEDURE

(Powered from the Emergency Generator Located by Substation D-7)

1. Put the D-7 switch in the "on-on-off" position (front view).

2. Put the B-5 switch in the "on-off-on" position (front view).

3. Open all 480 volt DB-25 breakers located in substation B-5 and C-6.

4. Verify the emergency generator is running. If not follow the start-up procedure.

5. Change the generator control switch from automatic to manual. Located at substation D-7.

6. Close the D-7 main breaker.

7. Close the necessary breakers located at Sub B-5 and C-6 to restore power to those units listed on the Emergency Power List.

SWITCHING INSTRUCTIONS: SULFURIC ACID PLANT
EMERGENCY POWER SWITCHING PROCEDURE

1. Verify power is available from Sub S-58.

2. Open and rack out and lock the "Main" 480 volt breaker located in the Sulfuric Acid Plant 480 volt substation.

3. Open all 480 volt breakers located in the Acid Plant Motor Control Center except the main breakers.

4. Close the 400 amp emergency power breaker located on a column west of the Acid Plant Motor Control Center.

6. Close the emergency 350 amp breaker located in the west side Acid Plant Motor Control Center. This will provide emergency power for lighting and units listed on the Emergency Power Requirement List.

7. Transfer the 4.16 kv center battery charger and AC power load to the emergency source.

8. The transfer switch is located on the north wall in the 4.16 kv Acid Plant substation.

9. Close the necessary 480 volt breaker to restore power to those units listed in the Emergency Power Requirement List.

TEMPORARY POWER HOOKUP
AMEL PLANT, POWERED FROM SUBSTATION X-37
X-38, V-32, V-33, Y-36, Y-40, U-30 OR F-28

Install one temporary 460 volt, 3 phase, 500 KW generator south of Substation X-38. Connect one 500 MCM cable, or two parallel 4/0 cables from the generator to a spare 600 amp breaker located on a power rack east of the old melamine maintenance shop. Verify phase rotation is correct prior to connecting the cables. See Sketch 4 for connecting information.

SWITCHING INSTRUCTIONS FOR THE AMEL PLANT
EMERGENCY POWER SWITCHING PROCEDURE

If the LP&L source should fail and it becomes necessary to use emergency power, the following procedures should be followed prior to putting load on the generator.

1. Open and rack out main breaker X-37 (52-2).

   NOTE: Read instructions on breaker prior to racking out.

2. Open and rack out main breaker X-38 (52-1).

   NOTE: Read instructions on breaker prior to racking out.

3. Open all 480 volt breakers located in the AMEL plant substation, breakers A, B, C, D, E, F, G, H, J, melamine maintenance shop breaker and the ammonia recovery rack breaker.

4. Open all 480 volt breakers located in the AMEL motor control center that are not on the emergency list.

5. Verify the tie breaker position. If the tie breaker is closed, leave it closed. Turn the auto/manual control switch to manual. If the tie breaker is open, and the spring is charged, close the breaker manually. If the tie breaker is open and not charged, it must be manually closed. Call the electrical shop for help.

6. Notify utilities. They must perform this step. Open transformer switch V-33 located at substation V-33.

NOTE: Do not ground the transformer. This transformer will be back fed, energized from the low voltage side to provide power to the CO_2 section that is powered off of the 480 volt bus.

7. Verify all of the following 480 volt breakers are racked in and closed. Feeders A, B, C, AMEL control room and the main breaker.

8. Open all 480 volt breakers in the urea plant MCC section that are not on the emergency list.

9. Verify the emergency tie breaker located on the west wall in the urea plant MCC is open.

10. Install the 200 amp fuses as shown on Sketch 4 in the AMEL plant X-38 substation location.

11. Verify the 600 amp emergency tie breaker is open.

12. Verify the emergency generator source is connected to the 600 amp breaker.

13. Start the emergency generator. Verify the generator is operating properly.

14. Close the emergency generator breaker.

15. Close the 600 amp breaker mounted on the outside power rack.

16. Close the 200 amp switch mounted on the rack. This will power up the old maintenance shop and back feed power to substation X-37 and X-38.

17. Close the urea plant 400 amp emergency tie breaker mounted on the west wall in the urea plant MCC. This will power up all of the urea plant motor control centers, the AMEL control room and the CO_2 storage area power rack.

NOTE: Power is available to operate the various pump motors, lighting, etc. The necessary feeder breakers located in substations X-37 and X-38 may be closed when needed. This generator is sized to provide emergency power for the AMEL plant.

EMERGENCY GENERATOR AUTOMATIC CONTROL SYSTEM
START UP AND SHUT DOWN PROCEDURE

GENERAL

An automatic startup and shutdown system has been installed for supplying power to the Medical, Security, Personnel and EOC buildings. The automatic system consists of two new breakers and a control panel located in substation D-7 MCC.

A power failure at substation D-7, LP&L, or on the feeder #1 loop will automatically cause the emergency diesel generator to start up. The generator will then provide power to the medical, Guard, Personnel and EOC buildings. After the 13.8 kv power is restored to substation D-7 transformer, the new control system will shutdown the generator and transfer the load back to transformer D-7.

The second feature of the automatic control system is an electrical interlock that permits supplying generator power to the Administration and Maintenance buildings through the 13.8 kv system.

The generator capacity is 275 kw. The primary purpose is to support communication services in the Fortier Complex.

NORMAL OPERATION (MCC fed from Transformer D-7)

D-7 Oil Switch ON-ON-ON (being fed from the 13.8 kv loop)

The diesel generator selector switch in AUTOMATIC START STOP MODE position

The DIESEL GENERATOR BREAKER (located below the diesel generator control panel) in the ON position.

The "Automatic Transfer Panel" in AUTO position with the TRANSFORMER and AUTO lights burning.

The TRANSFORMER breaker should be CLOSED.

The GENERATOR breaker should be OPEN.

EMERGENCY OPERATION (MCC fed from diesel generator)

On loss of power to substation D-7 transformer, the Automatic Transfer system will automatically start up the diesel generator, open the TRANSFORMER breaker and close the GENERATOR breaker to supply electricity to the breakers in the D-7 distribution center. There is approximately 30 seconds between the loss at transformer D-7 and the transfer to generator power.

The following conditions should exist at D-7 after the transfer:

The Automatic Transfer Panel should be in AUTO with the AUTO light ON.
The GENERATOR LIGHT on the Automatic Transfer Panel should be ON.

The TRANSFORMER LIGHT on the Automatic Transfer Panel should be OFF.
The TRANSFORMER BREAKER should be OPEN.
The GENERATOR BREAKER should be CLOSED.

The diesel generator will supply power to the breakers in the distribution center as long as the transformer is de-energized. When power is restored to D-7 transformer, the Automatic Transformer system will sense that power has been restored and will automatically open the GENERATOR BREAKER and close the TRANSFORMER BREAKER and restore the system to NORMAL OPERATION. It will then allow the diesel engine on the generator to continue running for approximately 15 minutes (cool down period) and automatically shut the engine down.

NOTE: The A/C blower for Medical and Personnel Buildings must be restarted manually between each transfer.

SUPPLYING POWER TO ADMINISTRATION, CAFETERIA VIA SUB C-6 AND THE MAINTENANCE BUILDING VIA SUB B-5

NOTE: BEFORE ATTEMPTING TO SUPPLY GENERATOR POWER TO THE 13.8 KV LOOP, YOU MUST FIRST DETERMINE WHETHER THERE IS A FAULT IN D-7 TRANSFORMER OR THAT SECTION OF THE LOOP. **DO NOT** ATTEMPT TO USE THE EMERGENCY GENERATOR TO POWER A FAULTED TRANSFORMER OR FEEDER! **DO NOT** USE THE EMERGENCY GENERATOR TO LOCATE A FAULT!

1. Turn off circuit #10 for the CRISIS HORN in Boiler Control Room.
2. Place D-7 Oil Switch On-On-Off
3. Place N-24 Oil Switch at #2 cooling tower to ON-ON-ON.
4. Place B-5 oil switch to ON-OFF-ON.
5. Open all breakers at Substation B-5.
6. Open all breakers at Substation C-6.
7. Turn INTERLOCK KEYS (located behind the AUTOMATIC TRANSFER PANEL) clockwise.
8. Place selector switch on AUTOMATIC TRANSFER PANEL to MANUAL.
9. Close TRANSFORMER BREAKER in Substation D-7 distribution center.
10. Close breakers for Administration Building and Cafeteria in Substation C-6 distribution center and breaker in Substation B-5 to power up the Maintenance Building.
11. Close circuit #10 for CRISIS HORN in Boiler Control Room.

NOTE: When operating in this mode, the Automatic Transfer system will not restore the system to normal after power is restored. This will have to be done manually, as follows:

RETURNING TO NORMAL AFTER SUPPLYING POWER TO ADMINISTRATION BUILDING

1. Turn off circuit #10 for CRISIS HORN in Boiler Control Room.
2. Open TRANSFORMER BREAKER at Substation D-7.
3. Place D-7 Oil Switch OFF-ON-OFF.
4. Place B-5 Oil Switch ON-ON-ON.
5. Place D-7 Oil Switch OFF-ON-ON.
6. Place N-24 Oil Switch ON-ON-OFF.
7. Close Circuit #10 for Crisis Horn at Boiler Plant.
8. Close all breakers at Substation B-5.
9. Close all breakers at Substation C-6.
10. Open the GENERATOR BREAKER in Substation D-7 distribution center (This will cause a power loss to Medical, Personnel, Guard and EOC Buildings.).
11. Open the DIESEL GENERATOR BREAKER (located below the diesel generator control panel.).
12. Turn INTERLOCK KEYS located behind the AUTOMATIC TRANSFER PANEL counter-clockwise.
13. Turn the Selector Switch on the AUTOMATIC TRANSFER PANEL to the AUTO position.
14. Place D-7 Oil Switch ON-ON-ON.

15. Check to see if the following condition exist:

    The AUTOMATIC TRANSFER PANEL is in AUTO position with the TRANSFORMER and AUTO lights burning.

    The TRANSFORMER BREAKER should be CLOSED.

    The GENERATOR BREAKER should be OPEN.

    If so, PLACE THE DIESEL GENERATOR BREAKER (located below the diesel generator control panel) in the ON position.

16. Allow the DIESEL GENERATOR to automatically shutdown (takes approximately 15 minutes).

TO PERFORM MONTHLY TEST OF DIESEL ENGINE (without supplying power to the distribution center):

1. Place the DIESEL GENERATOR BREAKER (located below the diesel generator control panel) in the OFF position.
2. Start the Diesel engine by turning the selector switch in the diesel generator control panel to the ON, RUN position.
3. Allow Diesel engine to run for desired period of time.
4. Stop diesel engine by turning selector switch to the AUTOMATIC START STOP MODE position.
5. Verify the following:

   The Automatic Transfer Panel in AUTO position with the TRANSFORMER and AUTO lights burning.

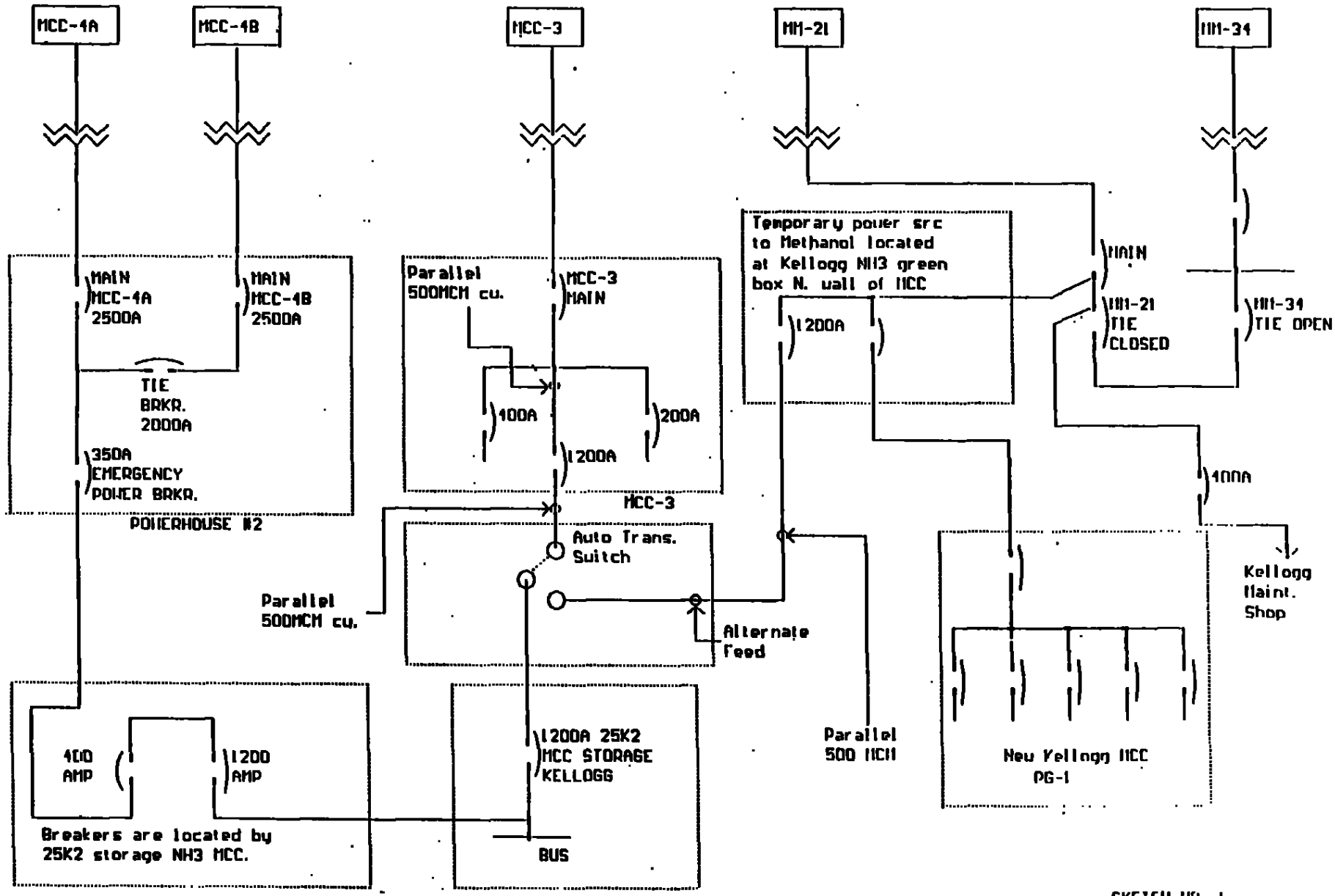
   The TRANSFORMER breaker should be CLOSED.

   The GENERATOR breaker should be OPEN.

6. Place the DIESEL GENERATOR BREAKER (located below the diesel generator control panel) in the ON position.

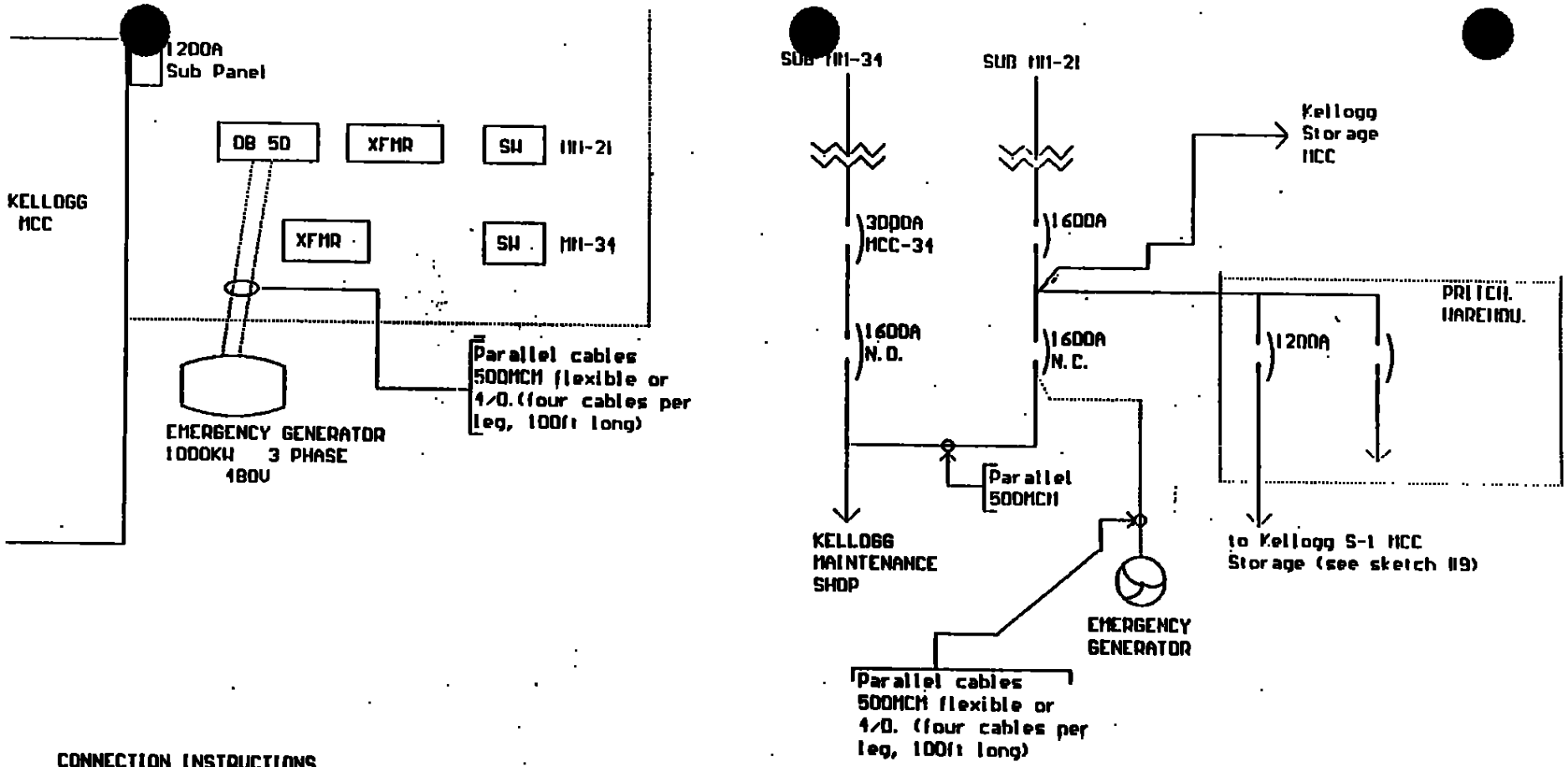
These emergency switching procedures and temporary hook-ups are reviewed annually. Changes in the distribution system, IE opening and closing of different switches on the 13.8 loop will necessitate changing the proposed procedures. Addition of proposed permanent generator will eliminate the need for portable generators in the future.

Paul Wischmeyer, Mark Varisco, Tom Shields and Dave Lucio (Electrical Engineers) or J . L. Hemmer (Electrical Supervisor) or Harold Williams (Utilities Maintenance Coordinator) must be notified before any additional power is used from the temporary generators.



SKETCH NO. 1

Plan by:

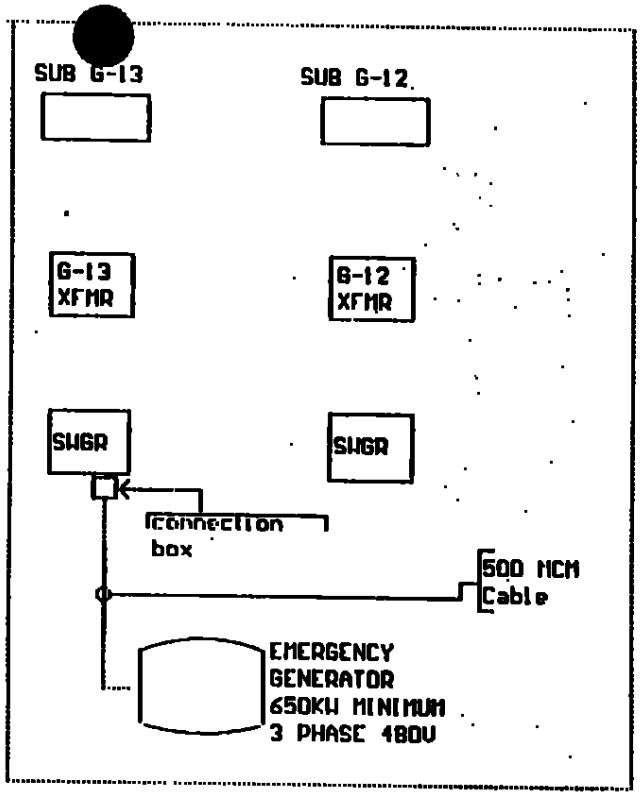


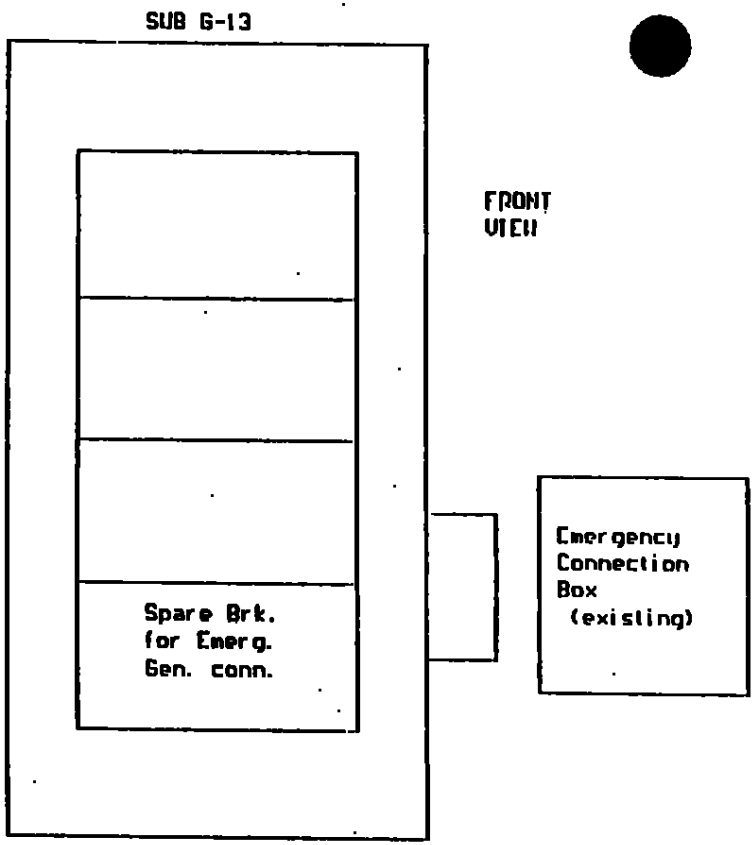
CONNECTION INSTRUCTIONS

1. Verify open and rack out the lower K-1600 AMP breaker powered from MM-34.
2. Open and rack out the lower DB-50 breaker located in SUB MM-21. Thi This step will kill power going to the Kellogg Maint. Shop, tempora this is a temporary condition.
3. Locate the 1000KW generator as shown above.
4. Install two 500MCM cables from the generator to the load side of th the lower Westinghouse DB-50 breaker located in MM-21 SWGR. Verify phase rotation is correct.
5. Verify the generator breaker is open.
6. Rack in and close the lower DB-50 breaker in SUB MM-21. This will restore power to the Kellogg Maintenance Shop.
7. If power from LP&L is lost, open the main brkr top unit DB-50 in SUB MM-21. Start generator and close generator brkr. Start motors in the storage area. Notify Utilities(refer to Emerg. Proc. Kellog Utility personnell will perform switching for COAG and ACID Plants.

Plan by: <Unregistered>

SKETCH NO. 2
CONNECTION OF EMERG.
GEN. FOR HURRICANE
PROTECTION AT KELLOGG





CONNECTION INSTRUCTIONS:

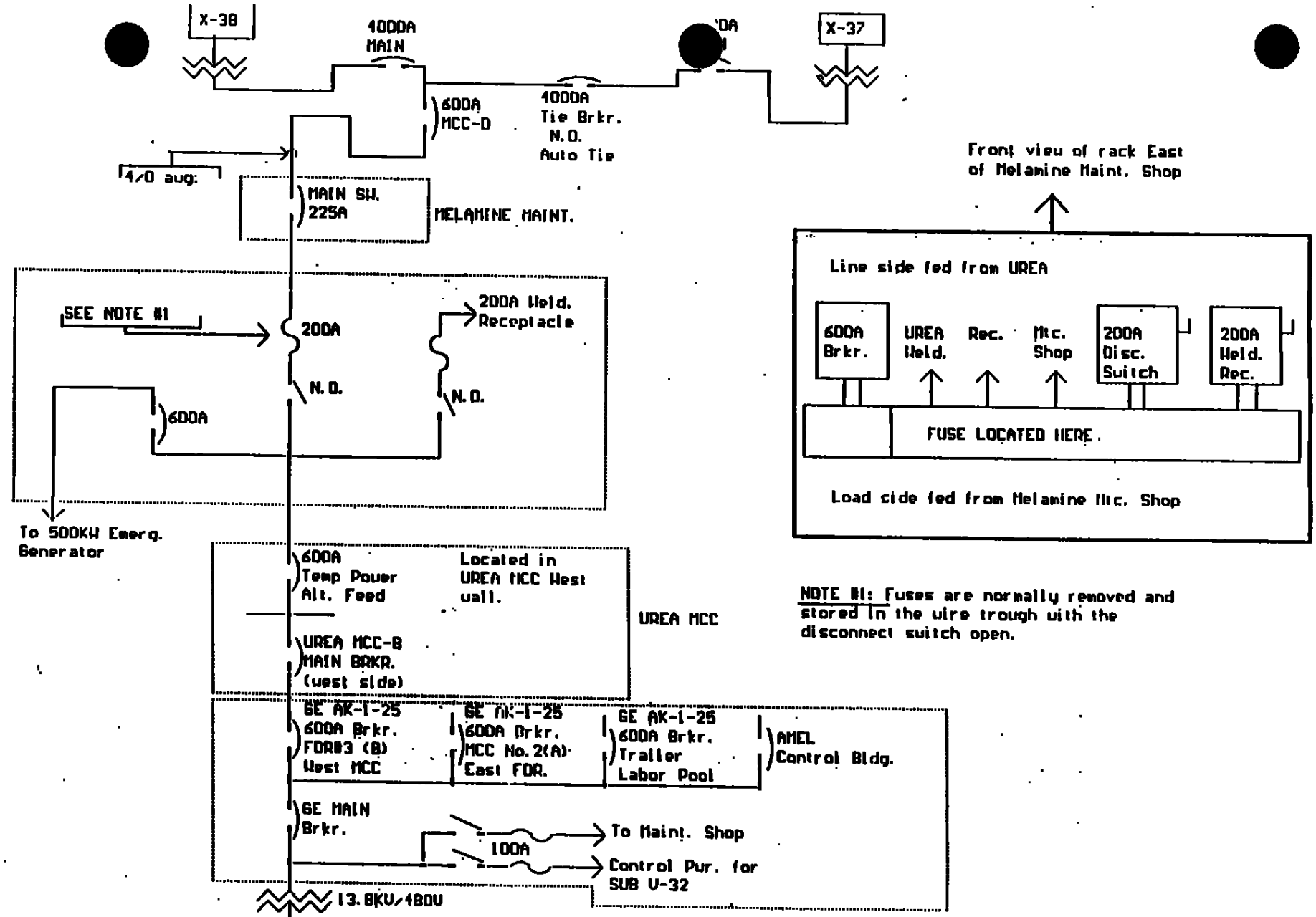
1. Verify the 600A GE-AK-1 breaker (bottom unit) is open and racked out.
2. Locate the generator as shown above.
3. Install a 500 MCM cable from the generator to the temporary connection box as shown above.
4. Verify phase rotation is correct.
5. Rack in the 600A breaker "lower unit" in SUB G-13. Leave the breaker open.

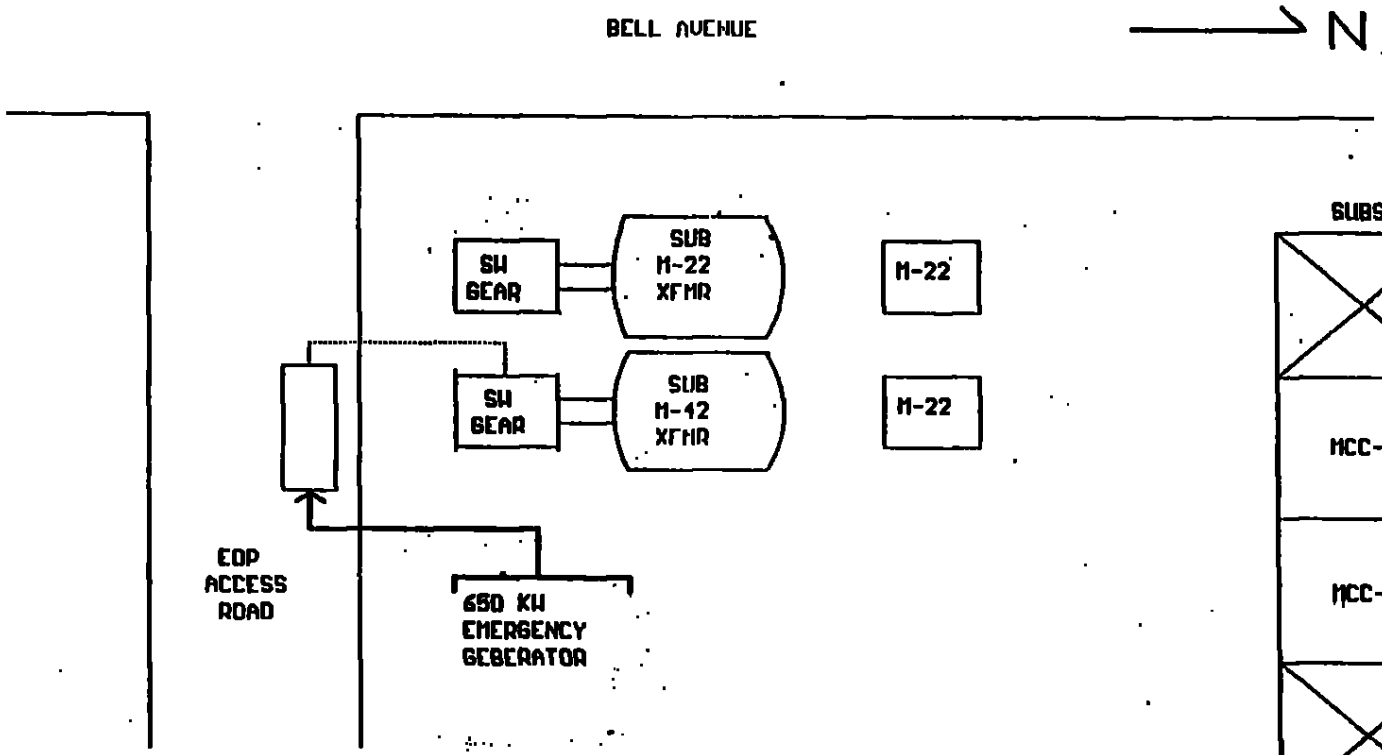
SWITCHING INSTRUCTIONS:

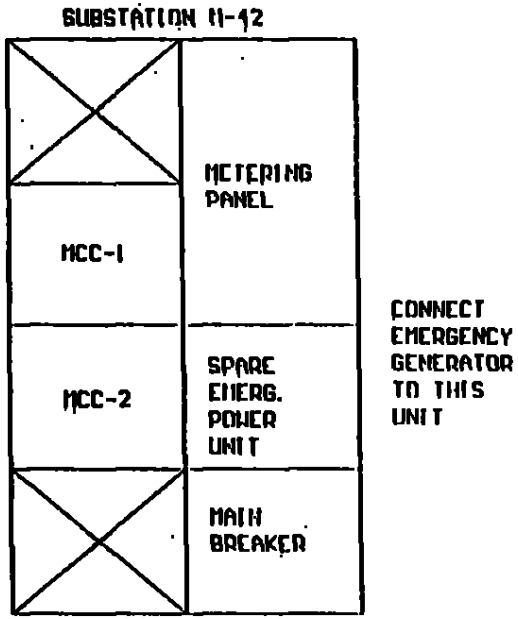
If power is lost from LP&L, NOTIFY UTILITIES. Utility personnel must perform switching prior to starting the generator. Refer to Emergency Procedures for the HCN, MMA, AMD and Production Services.

Plan by:

SKETCH NO. 3
CONNECTION OF EMERG. GEN
FOR HURRICANE PROTECTION
AT SUB G-13


X-38
4000A
MAIN
600A
MCC-D
4000A
Tie Brkr.
N.O.
Auto Tie
X-37
4/0 aug.
MAIN SW.
225A
MELAMINE MAINT.
SEE NOTE #1
200A
N.O.
200A Weld.
Receptacle
N.O.
600A
To 500KW Energ.
Generator
600A
Temp Power
Alt. Feed
Located in
UREA MCC West
wall.
UREA MCC
UREA MCC-B
MAIN BRKR.
(west side)
GE AK-1-25
600A Brkr.
FDR#3 (B)
West MCC
GE AK-1-25
600A Brkr.
MCC No.2(A)
East FDR.
GE AK-1-25
600A Brkr.
Trailer
Labor Pool
AMEL
Control Bldg.
GE MAIN
Brkr.
100A
To Maint. Shop
Control Pwr. for
SUB V-32
13.8KV/480V
SUB V-32
Front view of rack East
of Melamine Maint. Shop
Line side fed from UREA
600A
Brkr.
UREA
Weld.
Rec.
Mtc.
Shop
200A
Disc.
Switch
200A
Weld.
Rec.
FUSE LOCATED HERE.
Load side fed from Melamine Mtc. Shop
NOTE #1: Fuses are normally removed and
stored in the wire trough with the
disconnect switch open.
SKETCH NO. 1
SWITCHING INFO FOR MEL/UREA
PLANT PERSONNEL
(Energ. Pwr. Conn. for UREA)
Plan by:





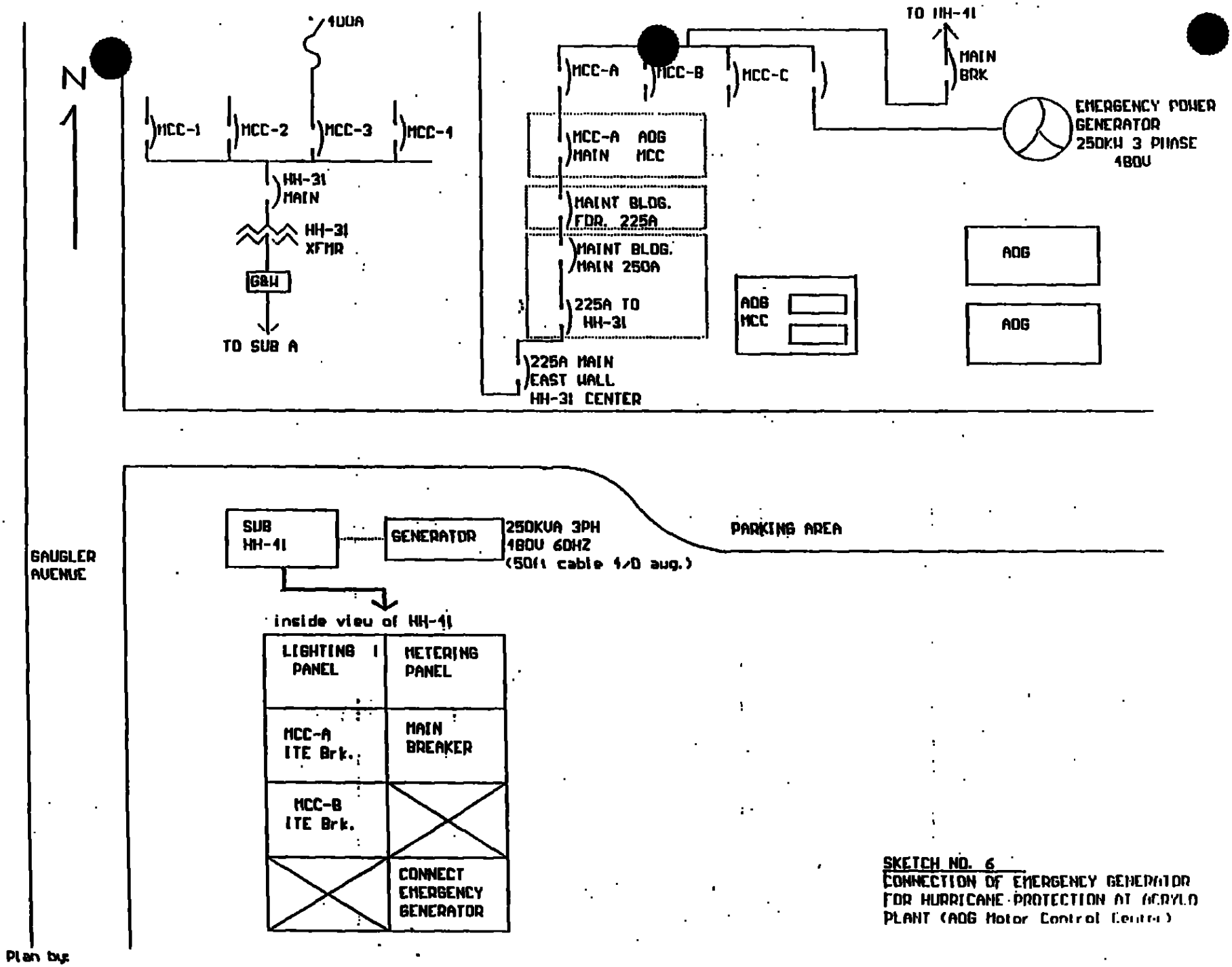
(FRONT VIEW)

CONNECTION INSTRUCTIONS

1. Locate the generator as shown above.
2. Open and rack out the spare DS-800 AMP breaker located in Substation M-42.
3. Install a 500 MCM cable or two parallel 4/0 cables from the generator to the spare 800AMP breaker as shown above.
4. Start the generator and verify phase rotation. After the test has been completed, shut off the generator.
5. Verify that the breaker settings are:
   - Long time pick up 800 amps.
   - Long time delay of 8 sec at 6 x LTPU
   - Instrument setting set for 8 x breaker setting or 6400 amps.
6. Rack in the spare breaker (Emergency Unit).

Plan by:

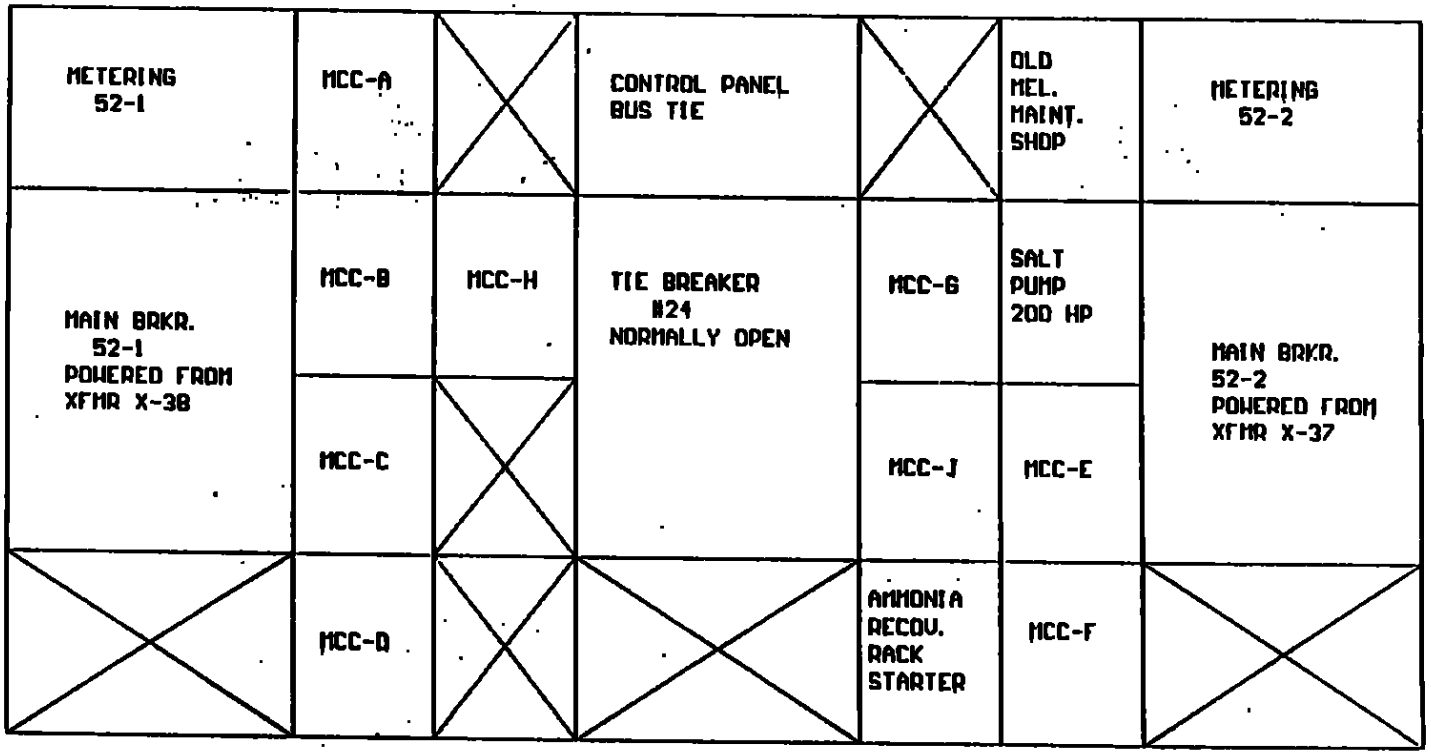
SKETCH NO. 5
CONNECTION OF EMERGENCY GENERATOR FOR HURRICANE PROTECTION AT SUB M-42 (EOP)



SKETCH NO. 6
CONNECTION OF EMERGENCY GENERATOR
FOR HURRICANE PROTECTION AT ACRYLO
PLANT (ADG Motor Control Center)

Plan by:

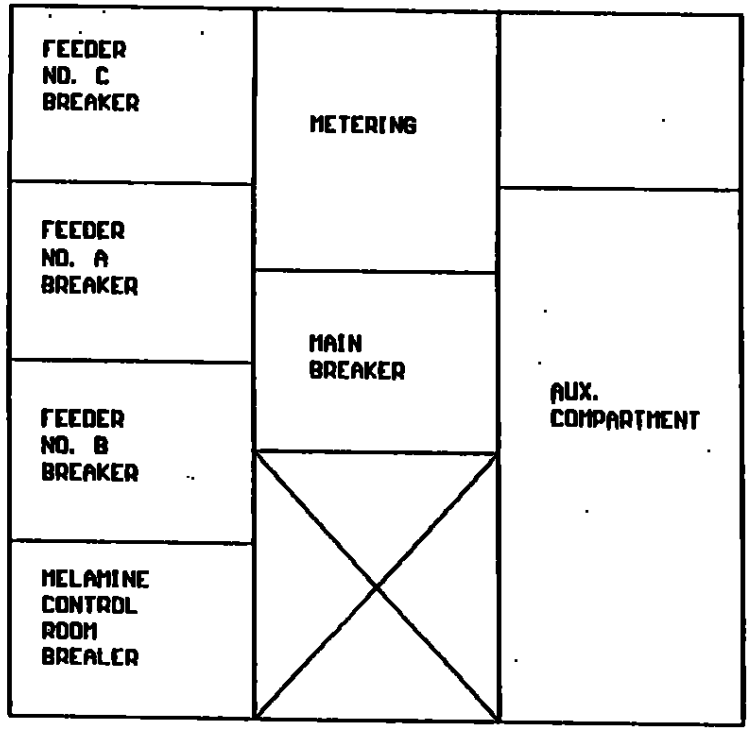
FRONT VIEW (INSIDE)



SKETCH NO. 7
MELEMINE PLANT 480V SUBSTATION
POWERED FROM SUBS X-37 AND X-38

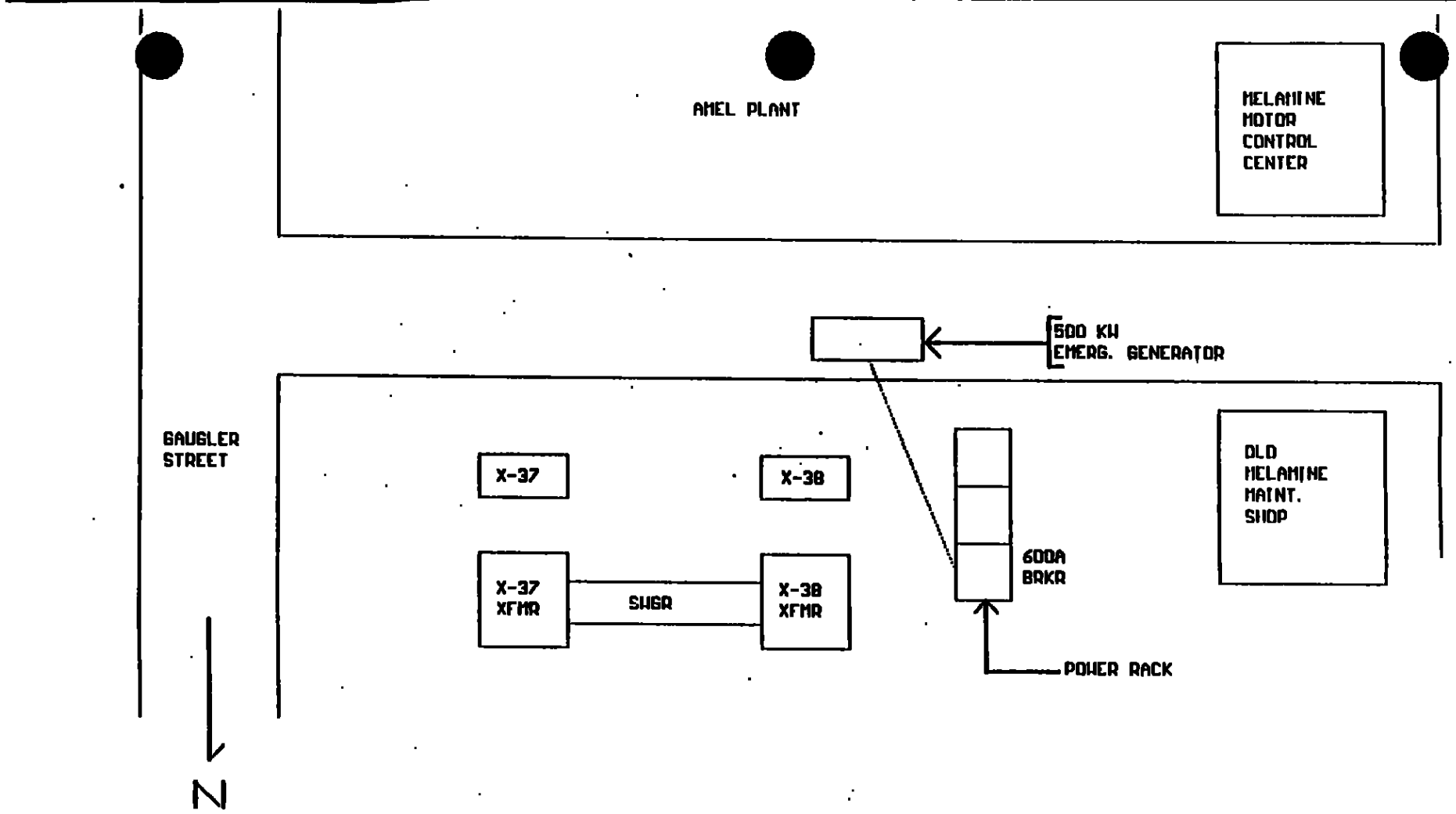
Plan by:

FRONT VIEW



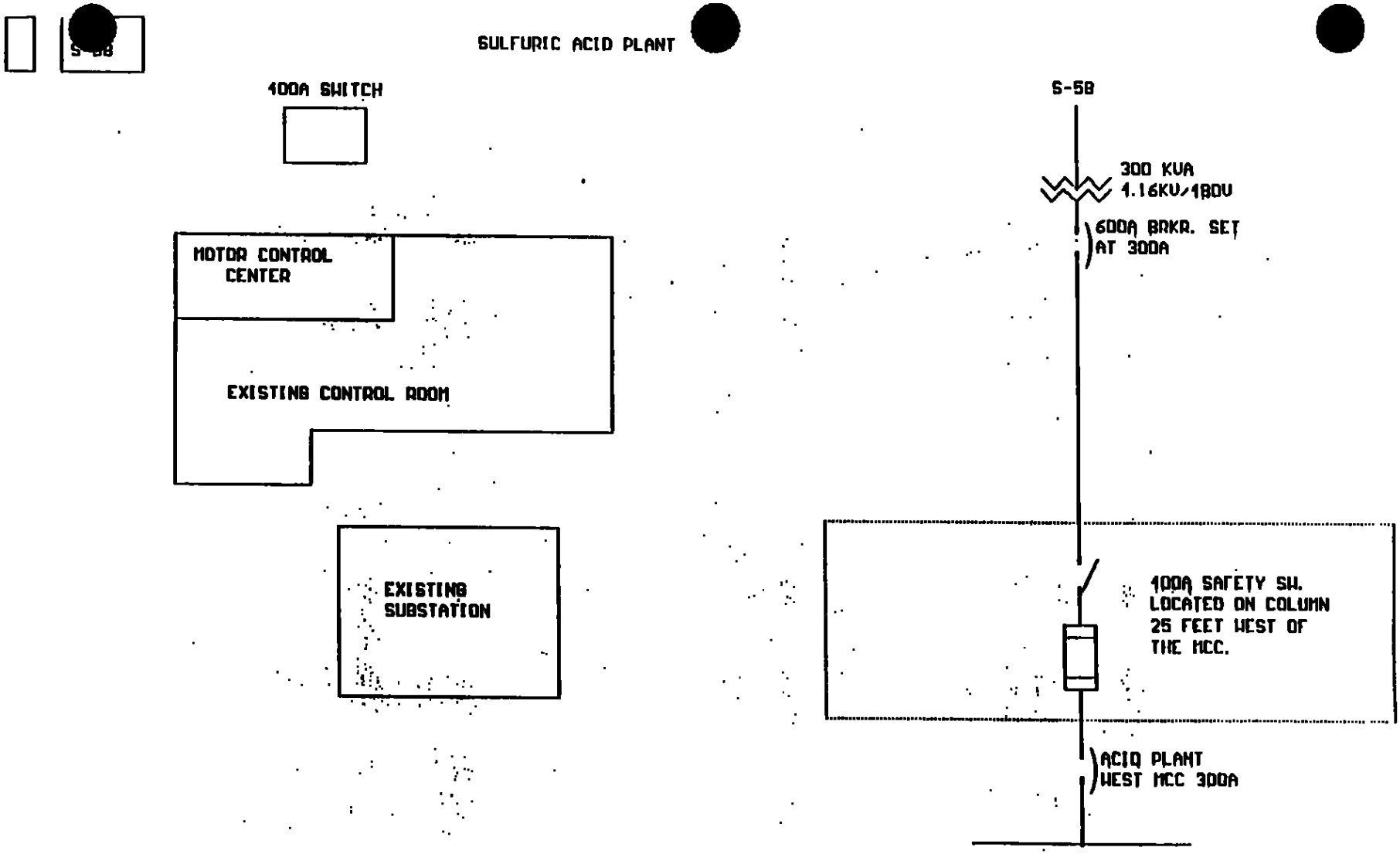
SKETCH NO. 8
UREA PLANT 480V SUBSTATION
POWERED FROM SUBSTATION U-33

Plan by:



SKETCH NO. 9
CONNECTION OF EMERGENCY GEN.
FOR HURRICANE PROTECTION AT
MELAMINE

Plan by:



SKETCH NO. 10
CONNECTION OF EMERGENCY POWER SOURCE FOR HURRICANE PROTECTION

Plan by: