

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A7001

INTRODUCTION

The following programs are included in your current Occupational Health Program. The programs are scheduled to be reviewed annually and updated on a two year basis.

- Industrial Hygiene Monitoring Program
- Hearing Conservation
- Asbestos
- Ventilation
- Ergonomics
- Heat Stress
- Medical Surveillance
- Hazard Communication
- Industrial Hygiene Education Program
- Respiratory Protection
- Protective Equipment
- Department Activities
- Roster and Job Descriptions (updated on a yearly basis)
- Chemical and Physical Agent Inventory (updated on a yearly basis)

These programs should be placed behind the appropriate tab in the Department Industrial Hygiene Manual.

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R&S153836

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A7001

OCCUPATIONAL HEALTH GOALS AND PLANS 1991-93

	<u>DATE LAST COMPLETED</u>	<u>DATE DUE</u>
Industrial Hygiene Monitoring:		
Comprehensive Chemical (8-hr TWA & Excursion)	1989	1992/93
Noise (Area & Personal)	1991	1994
Hearing Conservation Training (every 2 years):	1991	1993
Asbestos Awareness Training:	- - - -	1992
Ventilation:		
Ventilation Survey	1989	1992
Manometer Check	quarterly	
Ergonomics:		
Initial Training	- - - -	1992
Evaluation of Manual Lifting Activities	- - - -	1992
Heat Stress Training:	- - - -	1992
Hazard Communication:		
Review written Hazcom program	1991	1993
Review Industrial Hygiene Manual/Protocol	1991	1993
Update CPAI	1991	1992/93
Review MSDS's compared to CPAI	1991	1992/93
Health hazards training (annually)	1991	1992/93
New chemicals training	as needed	
Respiratory Protection:		
Fit Testing for SCBA, airline, half face air purifying	1991	1993
Inspections- Mouthbit, half face air purifying	before each use and annually	
SCBA, airline	before each use, monthly, and	
	annually by fire department	
Training- Mouthbit	1991	1993
SCBA, airline, half face air purifying,		
	1991	1992/93
Protective Equipment Training (every 2 years)	- - - - -	1992

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R&S 153837

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

MONITORING PROGRAM

1. RATIONALE

Personnel monitoring was conducted during 1988-1989 to evaluate employee exposures to ethylene dichloride (EDC), methylene chloride, 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, vinyl chloride, vinylidene chloride, 1,1-dichloroethane, and ethyl chloride. Both 8-hour time-weighted average (TWA) and short-term exposures were evaluated. Average exposures (8-hour TWA) for each monitored job classification were significantly less than the acceptable guidelines for each respective chemical with the exception of ethylene dichloride. Monitoring in 1988 and 1989 indicated that average 8 hour TWA exposures for Control C Operators exceeded the OSHA PEL for EDC of 1 ppm.

Closed loop process sampling was installed in 1991 at the EDC plant. Followup 8-hour TWA and short-term personnel monitoring will be conducted as part of the 1991-93 Occupational Health Program to evaluate the effectiveness of the controls in reducing exposures to EDC.

Additional 8-hour TWA and short-term monitoring will also be conducted during the 1992 plant shut-down. The monitoring will be conducted to evaluate exposures to EDC during line clearing activities.

Wipe testing was conducted in 1991 to evaluate hexachlorobenzene (HCB) levels in selected office and process areas (IHS File A70-3688). Areas identified with higher levels of HCB were cleaned and follow-up monitoring was conducted. HCB wipe testing will be conducted following the 1992 shut-down to insure the HCB remains at acceptable levels.

2. SAMPLING STRATEGY

A. 8-Hour TWA Chemical Monitoring

<u>Job Classification</u>	<u>Number of Employees</u>	<u>Chemical</u>	<u>Number of Samples</u>
Control C Operator	3	EDC	6
Sr. I&E Technician	2	EDC	4

B. Job Task Monitoring

<u>Job Task</u>	<u>Chemical</u>	<u>Number of Samples</u>
Process Sampling	EDC	3
Line clearing	EDC	3

Hexachlorobenzene wipe testing will be performed following the 1992 shut-down in areas to be selected at the time of the shut-down.

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R&S153838

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

MONITORING PROGRAM (CONT.)

3. SAMPLING METHODS

Sampling for ethylene dichloride will be conducted using 1 gram charcoal tubes and air sampling pumps. Pumps will be calibrated both before and after use at 50 cc/min for 8-hour TWA samples and 200 cc/min for excursion samples (as outlined in DLI-IHM-81-3). Analysis will be performed by the Industrial Hygiene Laboratory.

Wipe testing for HCB will be conducted with Whatman #2 filter paper, 5.5 cm diameter. Approximately 100 cm² of surface area will be wiped in a cross-hatched format with as much pressure as can be applied without tearing the paper. The filter will be placed in a clean labeled glass vial and sealed immediately after sampling. Gloves will be worn while sampling and changed frequently between samples to avoid cross contamination. Filters will be analyzed by the Industrial Hygiene Laboratory.

4. QUALITY CONTROL AND EQUIPMENT

Routine quality control procedures shall be an integral part of the sampling and analysis procedures and functions. These shall include:

- a. Routinely introduced sampling of blanks and spikes (known content) along with other samples for analysis
- b. Routine checking, calibrating, and maintaining in good working order all equipment and instruments. Air sampling pumps will be calibrated both before and after use.
- c. Routine checking of procedures and results.
- d. Participation in Dow's Analytical Proficiency Testing (APT) Program.

5. EVALUATION CRITERIA

Material	Exposure Guideline	Excursion Guide	Source*
Ethylene Dichloride (EDC)	1 ppm	2 ppm	OSHA-PEL

* OSHA-PEL = Occupational Safety and Health Administration Permissible Exposure Level

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R&S153839

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

REVIEW OF PAST MONITORING DATA

A. CHEMICAL REPORTS:

TABLE I
SUMMARY OF 8-HOUR TIME WEIGHTED AVERAGE EXPOSURES, 1988-90

JOB CLASS	# OF SAMPLES	CONCENTRATION (PPM) ^{4,5}						
		EDC	MECL2	1112	1122	112	V1	V2
1988: ¹ Control C Operator	5	3.6	0.03	0.01	<0.01	0.01	----	----
1989: ² Control A Operator	6	0.18	----	----	0.01	----	0.03	0.05
Control C Operator	6	1.3	----	----	0.01	----	0.03	0.11
1990 Shutdown: ³ Control C Operator	3	4.2	----	< 0.02	< 0.02	< 0.03	----	----
Control A Operator/SRO	1	3.8	----	< 0.02	< 0.02	< 0.03	----	----
Foreman	2	3.9	----	< 0.02	< 0.02	< 0.03	----	----
Prod. Mtc. Foreman	1	1.3	----	< 0.02	< 0.02	< 0.03	----	----
Process Engineer	1	0.24	----	< 0.02	< 0.02	< 0.03	----	----
EXPOSURE GUIDELINE (8 HOUR TWA)		1	50	NE	0.1, S	10, S	1	1

1. Reference: Sorrells, M.J., 1988 Evaluation of Chemical Exposures to Ethylene Dichloride; Methylene Chloride; 1,1,2-Trichloroethane; 1,1,1,2-Tetrachloroethane; and 1,1,2,2-Tetrachloroethane at EDC/NPA, A-7001, IHS File A70-3212C
2. Reference: Sorrells, M.J., 1989 Evaluation of Potential Personal Exposures to Ethyl Chloride; Ethylene Dichloride; 1,1-Dichloroethane; 1,1,2,2-Tetrachloroethane; Vinyl Chloride; and Vinylidene Chloride at Ethylene Dichloride/North Process Area, A-7001, IHS File A70-3390C-89.
3. Reference: Blue, M.A., Evaluation of Employee Exposures to Chemicals During Plant Shut-down at EDC/NPA, A-7000, 1990, IHS File A70-3581-89C.
4. EDC = ethylene dichloride; MECL2 = methylene dichloride; 1112 = 1,1,1,2-tetrachloroethane; 1122 = 1,1,2,2-tetrachloroethane; 1,1,2 = 1,1,2-trichloroethane; V1 = vinyl chloride; V2 = vinylidene chloride.
5. Ethyl chloride and 1,1-dichloroethane were also evaluated however all results were less than 10% of their respective IHGs.

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

REVIEW OF PAST MONITORING (CONT.)

Short-term personal monitoring was conducted in February, 1990 to evaluate employee exposures to ethylene dichloride during process sampling. The monitoring was conducted after one of the sampling points was modified to determine if additional controls were warranted. Three samples were collected ranging from 58 ppm to 237 ppm. Exposures were potential as respiratory protection was used during the survey.

Hexachlorobenzene (HCB) wipe testing was conducted in October, 1990 in select process and non-process areas of the EDC plant to determine the need for personal protective equipment or controls (IHS File A70-3688). Areas of the plant identified with higher levels of HCB included pump P-200A, P-200B and the lab hood. These areas were cleaned and follow-up monitoring was conducted in May, 1991. HCB levels were determined to be within acceptable levels for process areas.

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R&S153841

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

REVIEW OF PAST MONITORING (CONT.)

B. NOISE REPORTS:

TABLE 3
SUMMARY OF 8-HOUR TWA NOISE EXPOSURES, 1991¹

JOB CLASS/ JOB CODE	# OF SAMPES	% OF OSHA ALLOWABLE	
		RANGE	AVE.
Control C Operator/ 16026790	4	16 - 25	20
Sr. I & E Technician/ 12704034	4	16 - 48	26
Utility Man/Contractor 18113140C	6	16 - 37	29
OSHA PEL			100
OSHA Action Level			50

1. Reference: Blue, M.A., Personal and Area Noise Levels at EDC/NPA, A-7001, 1991-92, IHS File A70-3581-89N.

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1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**HEARING CONSERVATION PROGRAM****1. JOB CLASSIFICATIONS IN A HEARING CONSERVATION PROGRAM**

The date of the last noise survey was May, 1991 - January, 1992. The survey included both area noise levels and personal job exposure evaluations. Personal noise dosimetry data for the monitored job classifications indicated that all average noise exposures were below 50% of the OSHA-PEL. Therefore, participation of employees at EDC/NPA in the Hearing Conservation Program is not required.

2. TRAINING

Training is recommended every 2 years.

3. HEARING PROTECTION AREAS

The entire process area is designated as a hearing protection area.

Temporary jobs that have equipment with noise levels at or above 90 dBA require temporary signs and mandatory use of hearing protection any time the equipment is in operation. This includes such areas as sandblasting, hydroblasting, use of portable air compressors and hand tools.

4. HEARING PROTECTION TYPES

Hearing protection devices utilized at this department need to have a NRR rating over 19 dBA. Some of the devices available in the plant are:

<u>DEVICE</u>	<u>NOISE REDUCTION RATING (NRR)</u>
E-A-R. foam plugs	29 dB
Bilsom Universal Ear Muffs UF-1	23-25 dB
Bilsom Viking Ear Muffs #2318	28
Willson Sound Ban # 20	19-22 dB
E-A-R Ultrafit with cord	27 dB

Other devices are available through plant supervision or the Occupational Health Department.

5. NOISE ABATEMENT PLAN

There are no noise control plans at this time.

Any new equipment or changes to the process, will be evaluated for noise and when feasible, engineered to keep noise levels below 85 dBA. Contact your Industrial Hygienist.

6. NEXT REVIEW DATE: December, 1993

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R&S 153843

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**ASBESTOS PROGRAM****1. INVENTORY**

Asbestos is contained in this block in the following forms :

Gaskets

Transite

Fireproofing

An inventory of all asbestos containing materials and their respective locations is attached. The inventory must be maintained until the materials have been removed. Labeling of asbestos is by block signs located at entrances to the block.

2. INSPECTION SCHEDULE

Asbestos containing materials will be inspected every 6 months by for signs of deterioration. If deterioration is found the material will be repaired or removed. In the event removal is required insulation services will be contacted for assistance. Removal and disposal will be according to appropriate procedures as outlined in the Texas Operations Asbestos Handbook (TOAH).

Questions may arise at the time of removal of insulation or at the time of the 6 month inspection as to whether a particular piece of equipment contains asbestos or not. If this situation arises, the material will be sampled and sent to analytical services to be analyzed.

3. TRAINING

The following job classifications are identified as having potential to handle asbestos containing materials and should be trained according to Section III of the TOAH.

Utility Man/Contractor

All individuals in the above job classification will be trained before initial assignment and annually thereafter. Training will be documented and forwarded to Industrial Hygiene Services for inclusion in the plant's Industrial Hygiene files.

4. RESPIRATOR CERTIFICATION

For those jobs that require a respirator, an approved respirator will be chosen and mandatory medical certification and fit tests completed before initiation of the job. If exposure exceeds the Action Level (0.1 f/cc), the employee must be fit tested semi-annually and have annual medical examinations. Currently there are no employees at EDC/NPA that require medical surveillance.

5. PROCEDURES

Written procedures have been developed for the handling of asbestos materials during the performance of maintenance, demolition, and renovation activities to be conducted at the facility. The procedures are located in the Industrial Hygiene Manual.

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R&S153844

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

ASBESTOS PROGRAM (CONT.)

6. ASBESTOS ABATEMENT PLANS

Asbestos on column skirts will be removed in 1992.

7. NEXT REVIEW DATE: December, 1993

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R&S 153845

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1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

VENTILATION PROGRAM

1. PROGRAM DESCRIPTION

The EDC/NPA ventilation system includes as follows:

ID Number	Location	Last Survey	Next Survey	Average Velocity
A700101	A-1001	04/08/91	04/08/94	150

2. OPERATING CRITERIA

A. Periodic Performance Evaluation and Maintenance Programs

-Administered by Industrial Hygiene Services and lab personnel at EDC/NPA.

B. Laboratory Fume Hood Performance Criteria

-Utilize marked static pressure manometers to provide direct readouts and fall under the quarterly inspection guidelines.

3. DOCUMENTATION

The Industrial Hygiene Contact for EDC/NPA is responsible for maintaining documentation on hood surveys and inspections.

5. NEXT REVIEW DATE: December, 1993

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R&S153846

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**ERGONOMICS PROGRAM****1. INTRODUCTION**

The plant ergonomics program is dependent on the work situation and other specific factors which contribute to musculoskeletal injuries. Physical stressors and other activities which can contribute to musculoskeletal injuries include manual lifting, repetitive motion/forceful exertions, or excessive vibration. Identification of these factors is the basic responsibility of the assigned plant ergonomics contact with assistance from the plant Industrial Hygienist.

2. MANUAL LIFTING ACTIVITIES

<u>Job Activity</u>	<u>Frequency</u>	<u>Weight</u>
Moving Drums/Bottles using a dolly	2-3/week	100 - 500 lb

3. REPETITIVE MOTION/FORCEFUL EXERTIONS

Computer personnel (keyboard entry)

4. POWER TOOL USE

<u>Type of Tool</u>	<u>Frequency of use</u>	<u>Duration</u>
Disc grinder	daily	30 min
Impact	weekly	30 min

5. TRAINING

Basic training on the identification of ergonomics factors is recommended for all block employees on a periodic basis.

6. NEXT REVIEW DATE: December, 1993

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R&S153847

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**HEAT STRESS PROGRAM****1. HEAT STRESS INVENTORY**

The plant heat stress program is dependent upon the work situation and other specific factors which would generate excessive heat for the employee. The two factors to be considered are environmental temperatures and heat build-up due to the activity level of the employee. Based on previous heat stress studies, work/task evaluations, hot process operations and/or use of personal protective equipment such as impermeable suits, the following are identified as potential heat stress problems:

Outside manual labor with or without chemical protective clothing (PPE for HCL spill)

2. TRAINING

The following job classifications are identified as having potential for heat stress and should be trained in the recognition, prevention and treatment of heat stress:

Control C Operator

Heat stress training is conducted every 2 years.

3. HEAT STRESS ABATEMENT

The following drinking fluids are available for fluid replacement:

Water

Gatorade

The following checked personal protective equipment for the prevention of heat stress is available at this plant:

none

Recommended work practices for reduction of heat stress include:

1. Fluid replacement 2. Self-paced work 3. Scheduling 4. Acclimation

4. WORK REST SCHEDULE

The heat stress prevention work/rest schedule for jobs requiring impermeable clothing is as follows:

<u>Temperature (°F)</u>	<u>Maximum Stay Time (min.)</u>	<u>Minimum Rest Time (min.)</u>
72 - 79	40	20
80 - 87	30	30
88 - ?	20	40

5. NEXT REVIEW DATE: December, 1993

CONFIDENTIAL

R&S 153848

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

HEALTH SURVEILLANCE PLAN

1. HEALTH SURVEILLANCE

All employees are offered core examinations every two years.

2. MEDICAL SURVEILLANCE REQUIREMENTS

The following job classifications are included in the MSR programs as identified below:

<u>Job Classification</u>	<u>MSR</u>	<u>Tests</u>	<u>Test Frequency</u>
Control C Operator	EDC	Same as periodic core exam	Every 2 years

3. DOCUMENTATION

Results are reported individually and in group format to area supervision.

CONFIDENTIAL

R&S 153849

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**INDUSTRIAL HYGIENE EDUCATION PROGRAM****1. INTRODUCTION**

Training will be documented using the forms located in the "Hazard Communication" section of the facility's Industrial Hygiene Manual. Copies of the training records will be stored in the Industrial Hygiene Manual until the time of the next regularly scheduled Occupational Health Plant Program review. The original documentation will be sent to Industrial Hygiene Services at B-101 for filing in the plant compliance files.

2. TRAINING PLANS - CHEMICALS

The Industrial Hygiene Education Program will focus on the following key agents for 1992/1993:

1992

Chlorine
Ethylene Dichloride
Vinyl Chloride
Polychlorinated Biphenyl
Methylene Chloride

1992

1,1,2,2-tetrachloroethane
1,1,1,2-tetrachloroethane
Phosgene
Caloria HT-43
Noise

3. RESPIRATORY PROTECTION TRAINING

EDC/NPA will follow the guidelines defined in the Plant's written respirator program (located in the Industrial Hygiene Manual). Annual training is required.

4. CHEMICAL SURVEY RESULTS

A report of the results of sampling conducted in accordance with this protocol will be written and communicated individually and in a group session.

5. HAZARD COMMUNICATION TRAINING

All new employees shall review and document with signatures:

- a. hazard communication videos (2)
- b. the facility's hazard communication program
- c. health hazard information for all materials with Priority Rating of 1, 2, or 3 (see CPAI)
- d. health hazard information for OSHA regulated chemicals with Priority Rating of 1, 2, 3, or 4
- e. health hazard information for the key agents listed above

See the Plant's written Hazard Communication program in the Hazard Communication section of the facility's Industrial Hygiene Manual for other training requirements.

Any temporary employees shall review and document: b,c,d,e.

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R&S153850

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**INDUSTRIAL HYGIENE EDUCATION PROGRAM (CONT.)****6. ASBESTOS TRAINING**

All personnel who work in EDC/NPA must receive initial training. Personnel who handle asbestos must receive annual training. Consult the Texas Operations Asbestos Handbook for training requirements.

7. NOISE TRAINING

Employees at EDC/NPA are not required to participate in the Texas Operation Hearing Conservation Program as all average personnel exposures were less than the OSHA Action Level of 50%. As there are noise levels greater than 90 dBA in the plant, training should be performed on a periodic basis (ie. every 2 years). Refer to Safety Standard O-46 and the Hearing Conservation Manual for training requirements.

8. NEW CHEMICAL TRAINING

Per HAZCOM all employees to be potentially exposed to a new chemical must be trained on the hazards of that chemical and the approved protective equipment. Signed documentation is required at the time of this training, to include MSDS, TIME sheet, or hazard data used.

9. HEAT STRESS TRAINING

Personnel performing jobs (eg. chemical suit in the summer) that may lead to heat stress are to be trained on heat stress avoidance procedures. This training is recommended for new employees and on a periodic basis for experienced employees. Training should be documented.

10. PROTECTIVE EQUIPMENT TRAINING

Per 29 CFR 1910.132 protective equipment shall be provided, used and maintained for employees with potential of exposure to environmental or process hazards. Personnel are to be trained on the proper use of applicable protective equipment upon initial assignment, after major job changes, and periodically. Consult the Texas Operations Personal Protective Equipment Program Manual for training guidelines.

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R&S153851

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**INDUSTRIAL HYGIENE EDUCATION PROGRAM (CONT.)****12. VENTILATION SYSTEM TRAINING**

Personnel that use ventilation systems (incl. hoods, dust and chemical ventilators) are to be trained in the use, maintenance and documentation requirements. Hood requirements are covered in Safety Ref. 7.

13. HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE

Per HAZWOPER personnel involved in operations in RCRA Treatment, Storage, and Disposal facilities must be trained. Training must enable the employees to perform their job in a safe and healthful manner so as not to endanger themselves or others. Training topics include respiratory protection, hazard communication, health hazards training, protective equipment, safety standards/references, job procedures, RCRA, hearing conservation, eye protection, emergency procedures and unit specific rules.

All new employees must receive at least 24 hours of initial training. Current employees do not need the 24 hours of initial training if equivalency can be proved. Certificates of training must be issued to all employees. Eight hours of refresher training is required on an annual basis.

Personnel in facilities where RCRA wastes are stored less than 90 days are only affected by the emergency response portion of the HAZWOPER RCRA section. Training for those employees who must respond must occur prior to ER assignment and annually thereafter and must include:

1. elements of the ER plan
2. ER procedures
3. personal protective equipment
4. job procedures

Non-responding employees should be trained to recognize an incident and activate the ER system. The method used to demonstrate competency must be documented.

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R&S153852

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

RESPIRATORY PROTECTION PROGRAM

1. INTRODUCTION

Information regarding Dow respiratory protection programs is located in Safety Standard O-45 and the Texas Operations Respiratory Protection Manual (RPM). The RPM addresses selection, use, fit testing, medical approval, training, maintenance, records, administration and recommended respirators. Responsibilities for employees, supervisors, industrial hygiene, fire departments and Occupational Health are detailed in the RPM.

2. TYPES OF RESPIRATORS USED

<u>Respirator Type</u>	<u>Cartridges Filter. Canisters</u>	<u>Sources of Breathing Air</u>
AOR9722 Mouthbit	OVAG (R722)	NA
AO 5 Star	OVAG	NA
Scott Air Pack 2.2 SCBA		
with Scottoramic full face mask	NA	20 min. air tank
Scottovista full face airline	NA	Cylinder
Scottoramic full face airline	NA	Cylinder
3M 8710 Dust Mask	NA	NA

OVAG - NIOSH approved for Organic Vapors and Acid Gases

Industrial Hygiene is contacted whenever a new respirator is selected.

3. RESPIRATORY USE CATEGORIES

<u>Job Classification</u>	<u>User Category</u>	<u>Resp. Types Used</u>	<u>Individually Issued</u>
Office personnel	Escape	MP	MP
Operators	Routine/Escape	MP; Half-face	MP; AO 5 star
	Emergency	SCBA	
Maintenance	Routine/Escape	MP; Half-face; airline	MP; AO 5 star
	Emergency	SCBA	

MP = AOR9722 Mouthbit

Routine/Emergency users are fit tested and medically approved biennially.

Respirator training is conducted by:

<u>Respirator Type</u>	<u>Trainer</u>	<u>Frequency</u>
Escape	Plant Representative	Every 2 years
Routine/emergency	Plant Representative	Annually

Visitors, contractors and employees are required to carry an escape respirator on their person while in block process areas.

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R8S153853

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

RESPIRATORY PROTECTION PROGRAM (CONT.)

4. USE SITUATIONS

<u>Respirator Type/Filter</u>	<u>Chemical of Concern</u>	<u>Use Situation</u>
Mouthbit	Cl ₂ , Acid Gases	Escape
Half face/OVAG	RCL's, Cl ₂	Process sampling; equipment opening
Full face airline	RCL's, CL ₂	Equipment opening
SCBA	All chemicals	Emergency response
3M 8710	Dust/silica	Cleaning and/or charging silica drums

Filter cartridges for the mouthpiece respirator or half face respirators carried for escape purposes only should be replaced after each use or at least every six months. Filter cartridges for half face respirators used for routine work should be replaced when breathing becomes difficult, breakthrough is detected, or at least every 2 weeks.

5. RESPIRATOR CLEANING STATIONS

The cleaning station is a sink located in the change room. Half face masks are cleaned with alcohol towlettes. Airline equipment and SCBA are sent to the fire department for cleaning after each use. Contaminated respirators and cartridges which cannot be decontaminated must be disposed of as chemical waste in accordance with applicable environmental standards.

6. RESPIRATOR STORAGE

<u>Respirator</u>	<u>Storage Location</u>
MP	A-7001 lockers
Half face air purifying	A-7001 lockers
SCBA (30 min.)	A-7001 Control room and day Foreman's office
Airline masks	A-7001 cabinet behind control panel
Dust masks	A-7001 cabinet behind control panel

Except for the mouthpiece respirator, all respirators must be stored in secondary containers such as respirator pouches, plastic bags or storage boxes.

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R&S 153854

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**RESPIRATORY PROTECTION PROGRAM (CONT.)****7. INSPECTION SCHEDULE**

<u>Respirator</u>	<u>Frequency</u>	<u>By</u>	<u>Documentation Retained By</u>
Half Face	Monthly	User	Plant Rep.
Airline	Before each use	User	none
SCBA	Before each use	EDC/NPA SRO	none
	Monthly	EDC/NPA SRO	Plant Rep
	Annually	Fire Dept.	Fire Dept.
	5 year hydro	Fire Dept.	Fire Dept.
MP	Quarterly	User	User
Dust Mask	Before each use	User	none

8. BREATHING AIR

The breathing air source is from bottles which have been pre-checked for oxygen content and markings.

9. DOCUMENTATION

Documentation of inspections, fit testing, and training are maintained by the plant safety contact. Original signatures on training are sent to the plant industrial hygienist at B-101 for placement in the plant's 75 year compliance file. The plant superintendent and the Occupational Health Department maintain the medical approval list on file.

10. NEXT REVIEW DATE: December, 1993

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R&S153855

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1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**PERSONAL PROTECTIVE EQUIPMENT PROGRAM****1. INTRODUCTION:**

Information regarding the Texas Operations personal protective equipment (PPE) program is located in the Texas Operations PPE Program Manual. The manual addresses program administration, approval procedures, testing requirements, selection, use and maintenance, decontamination, laundering, training, records, and program evaluation. Responsibilities for employees, supervisors, industrial hygiene, safety, purchasing, the Texas Operations Protective Equipment Team, and the Texas Operations Protective Equipment Supplier Partnership Team are detailed in the manual.

2. SELECTION:

See Table 1 for a listing of approved PPE for the EDC/NPA plant. PPE selection was based upon the health and safety hazards associated with the site or job tasks. All PPE has been reviewed by the EDC/NPA Industrial Hygienist and Safety Director and has been approved for use by the Texas Operations Protective Equipment Team.

3. TRAINING:

Training on user responsibilities, PPE inspection, use, donning, doffing, decontamination, limitations and the location of the EDC/NPA PPE program is conducted for Dow employees and long-term contractors upon initial assignment and biennially thereafter. This training is documented. Visitors are informed of and provided the minimum PPE required in the EDC/NPA plant.

4. INSPECTION:

All PPE items must be inspected visually before, during and after use for signs of deterioration, defects, damage, etc. However, the PPE items listed below shall be inspected according to the following minimum frequency and specific test protocol:

<u>PPE Item</u>	<u>Test Method</u>	<u>Frequency</u>	<u>By</u>
Chemical Protective suits	Visual Inspection	Biannually	Dept Rep
Chemical protective gloves	Visual Inspection	Each use	User
Electrical rubber gloves	High voltage test Air test method	Biannually Each use	Elec Shop User
Electrical rubber blankets	High voltage test	Biannually	Elec Shop

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R&S153856

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**PERSONAL PROTECTIVE EQUIPMENT PROGRAM (CONT.)****5. DECONTAMINATION AND DISPOSAL:**

The EDC/NPA decontamination stations are located in the following locations:

safety showers throughout the process area.

After each use where PPE has been contaminated by hazardous substances, users of the contaminated PPE shall use one of the above listed decontamination stations and clean their PPE by rinsing with copious quantities of potable water. Before storage, the PPE is air dried. Contaminated PPE which cannot be decontaminated must be disposed of as chemical waste in accordance with applicable environmental standards.

6. MAINTENANCE:

No clothing or chemical protective suits are repaired in this department. Defective or damaged equipment is discarded.

7. LAUNDERING:

General purpose clothing is laundered in a standard type washer and dryer located in A-7001. No personal clothing may be washed in block washers. Half face and mouthbit respirators are cleaned by the individual owner. Full face respirators are sent to the fire department for cleaning.

8. STORAGE:

The following lists where PPE is stored when not in use:

- a. Cotton gloves in glove bin in men's change room, glove bin
- b. North Silver Shield gloves are in laboratory drawer in A-7001
- c. Low voltage gloves and flash suits in switchroom locker
- d. Individually issued equipment is stored in personal lockers
- e. Respiratory equipment is stored as follows:
 - Full face airline in the respirator cabinet in A-7001
 - Half face respirators in personal lockers and the day foreman's office in A-7001
 - Mouthbit in personal lockers and the safety cabinet in A-7001
- f. SCBA's are located in the following locations:
 - A-7001 control room
 - A-7001 day foreman's office
- g. New PPE is stored in the Safety cabinet in A-7001
- h. Full body harness in production/maintenance foreman's office

9. PROGRAM EVALUATION:

This program shall be evaluated biennially or whenever there are major job or process changes that require a re-evaluation of the PPE currently in use.

NEXT REVIEW DATE: December, 1993

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R&S153857

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**TABLE 1**
EDC/NPA PPE INVENTORY, 1991

The following lists the approved PPE for the EDC/NPA plant. EDC/NPA written job procedures indicate when and which PPE items must be worn for specific job tasks.

A. HAND PROTECTION

1. Edmont Solvex (Vallen # 37-155) gloves
2. Edmont PVA (Vallen # 15-552)
3. North Silver Shield (Vallen # SS504S)
4. Scooba #JPS 10B Cotton Gloves
5. Low Voltage Gloves (the electric shop)

B. FOOT AND LEG PROTECTION

1. Steel Toe Servus 21714, 22114,
2. Boot, steel toe dielectric & chemical neoprene, DCS-1010ST
3. Servus Rainfair 9043
4. Boot, steel toe pak rubber 15 in. top Servus 21629
5. Lehigh #1149 dielectric natural rubber boots

C. EYE, FACE AND HEAD PROTECTION

1. Face Shields
 - Wilson # V-10-86
 - Encon # SD-115A
2. Hard Hats
 - Vallen 302
 - Fibremetal E2W851
3. Sideshields
 - Variety (anything that is on approved list)
4. Chemical goggles
 - Allsafe #G211-10R
 - American Optical #484B
 - Encon 500 series
 - Encon 160 series

D. BODY PROTECTION

1. Neese 45

E. RESPIRATORY PROTECTION

1. Self-Contained Breathing Apparatus
 - Scott Air Pack
2. Airline Respirators
 - Scottoramic Full Face #801548-00 (MSMS #4871)
3. Half-Mask Respirator
 - AO 5-Star
4. Dust Mask
 - 3M 8710 (MSMS #4869)
5. Escape Respirator
 - AO Mouthpiece R9722 with organic vapor/acid gas cartridge (MSMS #106840)

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R&S153858

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

TABLE 1 (CONT.)

F. HEARING PROTECTION

1. Willson Sound Ban #20 (NRR=19-22)
2. E-A-R Foam Ear Plugs (NRR=29)
3. Bilsom Universal I Ear Muffs (NRR=23-25)
4. Bilsom Viking Ear Muffs #2318 (NRR=28)
5. E-A-R Ultra Fit Plugs with cord (NRR=27)

G. FALL/RESCUE PROTECTION

1. RTC 7435-PT1 Body Harness
2. RTC 8250-P6HH Lanyard

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R&S153859

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EDC/NPA, A-7001

DEPARTMENT ACTIVITIES

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IHS File #A70-3926-91

EDC/NPA
Process Flow, A-7000



Figure 1

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1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001**JOB DESCRIPTIONS****Plant Superintendent:**

The job is primarily administrative with the individual spending 80% to 90% of the time in offices or control rooms. Remaining time is spent in production areas as an observer or supervisor. Non-routine situations require close inspection of damaged or leaking equipment and operation of process equipment.

Maintenance/Production Foreman and Foreman:

Approximately 40% of work time is spent office areas. Maintenance job supervision in production areas and dealing with open process systems requires 40% of work time. The remaining 20% of the time involves direct supervision of outside operations including spill cleanup, clearing of process equipment and operation of process equipment.

Control A Operator:

Almost 100% of time is spent in the control room.

Control C Operator:

About 85% of the time is spent in the process area. Work includes sampling, draining equipment, piping line-up, starting/stopping process pumps and plant clean-up. The remaining time is spent in the laboratory area performing analysis on process samples. Lab area includes approved fume hoods.

Senior Instrument Technician:

Repairs and troubleshoots process analytical equipment and other instruments. Approximately 60-70% of the time is spent in the plant process areas and the remaining time is spent in the instrument shop.

Utility Man/Contractor:

These personnel are called upon to perform and support maintenance activities in the A-7000 block. Activities may include pipe fitting, welding, and grinding. 90% of the time is spent in the plant process areas with the remainder of the time in the maintenance shop.

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R&S153862

1991-93 OCCUPATIONAL HEALTH PROGRAM
EDC/NPA, A-7001

OSHA SPECIAL REGULATIONS

The EDC/NPA plant is directly affected by OSHA special regulations 29 CFR 1910.1001: Asbestos, 29 CFR 1910.1028: Vinyl Chloride, and 20 CFR 1910.95: Occupational Noise Exposure. A copy of each of these standards is located in the plant's Industrial Hygiene Manual. Key elements of the standards includes:

A. Asbestos and Vinyl Chloride

1. exposure monitoring requirements
2. respiratory protection and personal protective equipment
3. medical surveillance
4. information and training

A review of the past monitoring data, the plant's respiratory protection and protective equipment policies, and Hazard Communication and training program, has confirmed the EDC/NPA plant to be in compliance with the requirements outlined in the Asbestos and Vinyl Chloride standards.

B. Noise

1. exposure monitoring requirements
2. audiometric testing requirements
3. hearing protection requirements
4. training requirements

A review of the hearing conservation program at the EDC/NPA plant has confirmed the plant to be in compliance with the requirements outlined in the Noise standard.

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R&S153863

1993-95 OCCUPATIONAL HEALTH PROGRAM
UNIT 5/VINYL CHLORIDE, OC-501

OSHA SPECIAL REGULATIONS

Unit 5 is directly affected by OSHA special regulations 29 CFR 1910.1017: Vinyl Chloride, 29 CFR 1910.1028: Benzene, and 29 CFR 1910.95: Occupation Noise Exposure. A copy of each of these standards is located in the plant's Industrial Hygiene Manual. Key elements of the standards include:

A. Vinyl Chloride and Benzene

1. exposure monitoring requirements
2. respiratory protection and personal protective equipment
3. medical surveillance
4. information and training

Initial monitoring as required by both standards will be completed upon start-up of the plant. Respiratory protection, protective equipment and medical surveillance policies will be developed and all Unit 5 employees will be trained on the requirements of both the vinyl chloride and benzene standard before plant startup.

B. Noise

1. exposure monitoring requirements
2. audiometric testing requirements
3. hearing protection requirements
4. training requirements

Area noise level monitoring will be conducted as new equipment is installed to determine areas where hearing protection will be required. Additional area monitoring and personnel monitoring will be conducted after plant startup. All employees of Unit 5 will be trained on the requirements of the noise standard before plant startup.

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R&S153864

1993-95 OCCUPATIONAL HEALTH PROGRAM
UNIT 5/VINYL CHLORIDE, OC-501**INDUSTRIAL HYGIENE EDUCATION PROGRAM****1. INTRODUCTION**

Training will be documented using the forms located in the "Training Guidelines" section of the facility's Industrial Hygiene Manual. The original documentation will be sent to Industrial Hygiene Services at B-101 for filing in the plant compliance files.

2. TRAINING PLANS - CHEMICALS

The Industrial Hygiene Education Program for Unit 5 will focus on the following key agents for 1993/94:

1993

Vinyl Chloride
Benzene
Ethylene Dichloride
Methylene Chloride
Carbon Tetrachloride
Chlorine
Refractory Ceramic Fiber

1994

Vinyl Chloride
1,1,2,2-Tetrachloroethane
Benzene
HCL
Welding fumes

3. RESPIRATORY PROTECTION TRAINING

Unit 5 will follow the guidelines defined in the Plant's written respirator program (located in the Industrial Hygiene Manual). Annual training is required.

4. CHEMICAL SURVEY RESULTS

A report of the results of sampling conducted in accordance with this protocol will be written and communicated individually and in a group session.

5. HAZARD COMMUNICATION TRAINING

All new employees shall review and document with signatures:

- hazard communication videos (2)
- the facility's hazard communication program
- health hazard information for all materials with Priority Rating of 1, 2, or 3 (see CPAI)
- health hazard information for OSHA regulated chemicals with a Priority Rating of 1, 2, 3, or 4
- health hazard information for the key agents listed above

See the plant's written Hazard Communication program in the Hazard Communication section (Section 10) of the facility's Industrial Hygiene manual for other training requirements.

Any temporary employees shall review and document: b, c, d, e.

6. ASBESTOS TRAINING

There is no asbestos in this plant. However employees will be given asbestos awareness training on initial assignment.

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1993-95 OCCUPATIONAL HEALTH PROGRAM
UNIT 5/VINYL CHLORIDE, OC-501

HEALTH SURVEILLANCE PLAN

1. HEALTH SURVEILLANCE

All employees are offered core examinations every two years.

2. MEDICAL SURVEILLANCE REQUIREMENTS

Initial exams are conducted as is required by the OSHA vinyl chloride, benzene, and noise standards. Inclusion in a medical surveillance program will be determined based on monitoring data collected as soon as possible after plant startup.

3. DOCUMENTATION

Results are reported individually and in group format to area supervision.

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1993-95 OCCUPATIONAL HEALTH PROGRAM
UNIT 5/VINYL CHLORIDE, OC-501**MONITORING PROGRAM****1. RATIONALE**

To fulfill OSHA requirements of the vinyl chloride and benzene standards, establish a monitoring base and to evaluate the need for any additional engineering controls, Initial monitoring will be conducted immediately after plant startup. Chemicals evaluated will include vinyl chloride, benzene, ethylene dichloride, and methylene chloride. Respiratory protection will be used for any job tasks with a significant potential for exposure to concentrations above the acceptable guidelines. Respiratory protection will be continued until monitoring data has proven levels to be below acceptable exposure standards.

Area noise level monitoring will be conducted as new equipment is installed to determine the need for hearing protection, additional engineering controls and identify any job classifications that may need to be included in the hearing conservation program. Personnel monitoring will be conducted for job classifications where 8-hour TWA exposures may exceed 85 dBA. After plant startup, a comprehensive area and personnel noise survey will be conducted to identify all areas with noise levels greater than 85 dBA and determine if any job classifications need to be included in the hearing conservation program.

2. SAMPLING STRATEGY

When Unit 5 reaches the final stages of construction, job classifications will be evaluated periodically to determine the need for chemical and/or noise monitoring. Monitoring will be conducted on an as needed basis until startup. As soon as possible after startup a comprehensive noise and chemical survey will be conducted. The sampling strategy (number of samples and job classifications) will be determined at that time.

3. SAMPLING METHODS

Sampling for vinyl chloride, ethylene dichloride, methylene chloride, and benzene will be conducted using 1 gram charcoal tubes and air sampling pumps. Pumps will be calibrated both before and after use at 50 cc/min for 8-hour TWA samples and 200 cc/min for excursion samples (as outlined in DLI-IHM-83-25A). Analysis will be performed by the Industrial Hygiene Laboratory.

Personal noise levels will be measured using Quest noise dosimeters (Model M-7B) and area noise levels will be measured using a Quest noise level meter (Model 215). All dosimeters and meters will be calibrated both before and after use.

4. QUALITY CONTROL AND EQUIPMENT

Routine quality control procedures shall be an integral part of the sampling and analysis procedures and functions. These shall include:

- a. Routinely introduced sampling of blanks and spikes (known content) along with other samples for analysis
- b. Routine checking, calibrating, and maintaining in good working order all equipment and instruments. Air sampling pumps will be calibrated both before and after use.
- c. Routine checking of procedures and results.
- d. Participation in Dow's Analytical Proficiency Testing (APT) Program.

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R&S 153867

1993-95 OCCUPATIONAL HEALTH PROGRAM
UNIT 5/VINYL CHLORIDE, OC-501

MONITORING PROGRAM (CONT.)

5. EVALUATION CRITERIA

Agent	Exposure Guideline	Excursion Guide	Source*
Vinyl Chloride	1 ppm	5 ppm-STEL	OSHA-PEL
Ethylene Dichloride	10 ppm	-----	ACGIH-TLV
	1 ppm	2 ppm	Proposed OSHA PEL
Benzene	1 ppm	5 ppm-STEL	OSHA-PEL
Methylene Chloride	50 ppm	-----	ACGIH-TLV
Noise	-----	90 dBA-Ceiling	Dow IHG
	90 dBA (8-hr TWA)	-----	OSHA-PEL
	85 dBA (8-hr TWA)	-----	OSHA-Action Level

- * OSHA-PEL = Occupational Safety and Health Administration - Permissible Exposure Limit
ACGIH-TLV = American Conference of Governmental Hygienists-Threshold Limit Value
Dow-IHG = Dow Industrial Hygiene Guideline

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R&S 153868

1993-95 OCCUPATIONAL HEALTH PROGRAM
UNIT 5/VINYL CHLORIDE, OC-501

REVIEW OF PAST MONITORING DATA

Since this is a new plant there is no historical monitoring data. Previous routine monitoring conducted for the Unit 1/Vinyl Chloride plant has shown vinyl chloride, ethylene dichloride, and benzene personal exposures to be within acceptable levels.

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R&S 153869