OCCUPATIONAL HEALTH PROGRAM FOR TRICHLOROETHYLENE/HCL
B-1500, TEXAS OPERATIONS
1991-93

FILE NUMBER: B15-3839-91

PLANT CODE:

Trichlor Services	66930
HCL	66926
Trichlor	66915
Trichlor Lab	66940
Trichlor Maintenance	66950
Trichloroethylene	66900

PLANNED START DATE: June, 1991

PLANNED REVIEW DATE: June, 1993

INDUSTRIAL HYGIENE: _____
Melissa A. Blue

MEDICAL: _____
Carole K. Browdy, M.D.

PLANT SUPERINTENDENT: _____
Jim Burgner

APPROVED: _____
Sam Norwood
Industrial Hygiene Group Leader

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R&S153921

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.

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

OCCUPATIONAL HEALTH GOALS AND PLANS
1991-93

	DATE LAST COMPLETED	DATE DUE
Industrial Hygiene Monitoring:		
Comprehensive Chemical (8-hr TWA & Excursion)	1989	1992
Noise (Area & Personal)	1989	1992
Hexachlorobenzene Wipe Testing	every 6 months	
Hearing Conservation Training (every 2 years):	1990	1992
Asbestos Training (annually):	- - - -	1991/92
Ventilation:		
Ventilation Survey	1989	1992
Manometer Check	quarterly	
Ergonomics:		
Initial Training	1989	- - - -
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	1990	1992
Inspections- Mouthbit, half face air purifying	before each use and annually	
SCBA, airline, Scott 5 min., Elsa	before each use, monthly, and annually by fire department	
Training- Mouthbit	1990	1992
SCBA, airline, half face air purifying, Scott 5 min, Elsa	1990	1991/92
Protective Equipment Training (every 2 years)	- - - - -	1992

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1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

MONITORING PROGRAM

1. RATIONALE

Personnel monitoring was conducted during 1985-1989 to evaluate employee exposures to trichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, ethylene dichloride, 1,1,1-trichloroethane, carbon tetrachloride, perchloroethylene, 1,1,2,2-tetrachloroethane, and pentachloroethane. 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.

Personnel exposures to vinyl chloride and vinylidene chloride have not previously been evaluated at the Trichloroethylene plant and will be included as part of a comprehensive chemical survey to be conducted as part of the 1991-93 Occupational Health program. Additional chemicals that will be evaluated will include trichloroethylene, ethylene dichloride, 1,1,1-trichloroethane, 1,1,2,2-tetrachloroethane, 1,1,1,2-tetrachloroethane, and carbon tetrachloride. Both 8-hour TWA and short-term monitoring will be conducted.

Short-term monitoring will be conducted to evaluate employee exposure levels to hydrogen chloride during specific job activities. With the exception of during shut-downs, HCL has never been monitored at this facility.

Texas Operations Safety Standard 0-46 (Hearing Conservation) requires that a noise survey be conducted every three years. The previous noise survey at Trichlotoethylene/HCL was conducted in 1989; therefore, a comprehensive area and personal noise survey will be conducted in 1992.

The Trichloroethylene plant is currently on a Hexachlorobenzene (HCB) quarterly wipe test program to insure HCB surface cleanliness levels are being maintained. Recent results from HCB wipe testing has indicated levels in the process areas have decreased significantly and cleanliness levels have been maintained therefore, HCB wipe testing will be decreased to every 6 months instead of quarterly.

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

MONITORING PROGRAM (CONT.)

2. SAMPLING STRATEGY

A. 8-Hour TWA Chemical Monitoring

Job Classification	Number of Employees	Chemical*	Number of Samples
Trichlor (66915)			
Control A Operator	5	8 Chlorinated Organics	4
Control C Operator	2	8 Chlorinated Organics	6
Ass. Chem. CL A	1	8 Chlorinated Organics	3
Chemical Aide	1	8 Chlorinated Organics	2
Sr. I&E Technician	1	8 Chlorinated Organics	3
Trichlor Services (66930)			
Control C Operator	1	8 Chlorinated Organics	3
Class 2 Operator	1	8 Chlorinated Organics	3
Trichlor Maintenance (66950)			
Pipefitter	5	8 Chlorinated Organics	6
Machinist	3	8 Chlorinated Organics	6
Utility Man/Contractor	6	8 Chlorinated Organics	8

* 8 Chlorinated Organics includes vinyl chloride, vinylidene chloride, trichloroethylene, ethylene dichloride, 1,1,1-trichloroethane, carbon tetrachloride, 1,1,2,2-tetrachloroethane, and 1,1,1,2-tetrachloroethane.

B. Job Task Monitoring

Job Task	Chemical*	Number of Samples
Process Sampling	7 Chlorinated Organics	3
Recharging filters	Trichloroethylene	3
Tank car loading	Trichloroethylene	3
Drumming	Trichloroethylene	3
Cleaning HCL compressors	1,1,1-trichloroethane;	3
Line clearing	1,1,2,2-tetrachloroethane	3

* 8 Chlorinated Organics includes vinyl chloride, vinylidene chloride, trichloroethylene, ethylene dichloride, 1,1,1-trichloroethane, carbon tetrachloride, 1,1,2,2-tetrachloroethane, and 1,1,2-tetrachloroethane.

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1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

MONITORING PROGRAM (CONT.)

D. Noise Monitoring

Job Classification	Number of Employees	Number of Samples
Trichlor (66915):		
Control A Operator	5	4
Control C Operator	2	4
Sr. I&E Technician	1	3
Asst. Chem. CL A/Chemical Aid	2	3
Trichloroethylene (66900):		
Rotating Shift Foreman	3	3
Trichlor Services (66930):		
Control Operator C	1	3
Class 2 Operator	1	3
Trichlor Maintenance (66950):		
Instr. Technician	2	3
Sr. Electrician	1	3
Pipefitter/Welder-Pipe	6	8
Machinist	3	6
Utility Man/Contractor	6	8
HCL (66926):		
Control A Operator	5	4
Control C Operator	4	6

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

MONITORING PROGRAM (CONT.)

3. SAMPLING METHODS

Sampling for vinyl chloride, vinylidene chloride, trichloroethylene, ethylene dichloride, 1,1,1-trichloroethane, 1,1,2,2-tetrachloroethane, and carbon tetrachloride 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.

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.

Wipe testing for HCB will be conducted with Whatman #2 filter paper, 5.5 cm diameter. Approximately 100 cm^2 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.

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

MONITORING PROGRAM (CONT.)

5. EVALUATION CRITERIA

Material	Exposure Guideline	Excursion Guide	Source[1]
Vinyl Chloride	1 ppm	5 ppm	OSHA-PEL
Vinylidene Chloride	1 ppm	- - - -	OSHA-PEL
Ethylene Dichloride	1 ppm	2 ppm	OSHA-PEL
1,1,1-Trichloroethane	350 ppm	450 ppm	OSHA-PEL
Carbon Tetrachloride	2 ppm	- - - -	OSHA-PEL
Trichloroethylene	50 ppm	200 ppm	OSHA-PEL
1,1,2,2-tetrachloroethane	0.1 ppm	- - - -	Dow-IHG
Noise	90 dBA-Ceiling		Dow-IHG
	90 dBA (8 hr. TWA)	115 dBA	OSHA-PEL
	85 dBA (8 hr. TWA)		OSHA Action Level

1. Dow IHG = Dow Industrial Hygiene Guide
OSHA-PEL = Occupational Safety and Health Administration Permissible Exposure Level

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

REVIEW OF PAST MONITORING DATA

A. CHEMICAL REPORTS:

TABLE I
SUMMARY OF 8-HOUR TIME WEIGHTED AVERAGE EXPOSURES, 1989[1]

JOB CLASS	# OF SAMPLES	CONCENTRATION (PPM)[2,3]						
		1,1,1	CCL4	EDC	TCE	PCE	1,1,2,2	PENTA
Control A Operator	5	0.01	0.02	0.01	0.39	0.03	0.01	0.01
Control C Operator	5	0.01	0.02	0.01	0.11	0.04	0.02	0.01
Class 2 Operator/WHSE	5	ND	ND	0.03	12	0.04	ND	ND
Pipefitter	5	0.79	ND	ND	0.14	0.03	0.03	0.02
Machinist	5	0.64	0.01	ND	0.31	0.03	0.02	ND
EXPOSURE GUIDELINE (8 HOUR TWA)		350	2	1	50	25	0.1, S	----

1. Reference: Sorrells, M.J., 1989 Evaluation of Area and Personal Chemical Exposures During Trichloroethyene Cycle at Trichloroethylene Plant, B-1500. IHS File B15-3173C.
2. 1,1,1 = 1,1,1-trichloroethane; CCL4 = carbon tetrachloride; EDC = ethylene dichloride; TCE = trichloroethylene; PCE = perchloroethylene; 1,1,2,2 = 1,1,2,2-tetrachloroethane; PENTA = pentachloroethane
3 ND = non-detectable; detection limit = 0.01 ppm

Personnel monitoring was conducted in 1989-90 to evaluate employee exposures to chemicals during plant shut-down activities. Chemicals evaluated included cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, carbon tetrachloride, ethylene dichloride, trichloroethylene, perchloroethylene, 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, and hydrogen chloride. All 8-hour TWA exposures were well within acceptable guidelines with the exception of 1,1,2,2-tetrachloroethane for Control C Operators during the Trichloroethylene plant shut-down at 0.24 ppm. On the days in which these exposures occured, the Operators were clearing lines.

Short-term personal and area monitoring was conducted in 1989-90 to evaluate employee exposures to welding fumes. Analysis was conducted for 14 metals or metal oxides and total fumes. The personal and area monitoring indicated all routine welding fume exposures of the Welder/Pipefitter and Utility Man/Contractor were below acceptable guidlines.

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

REVIEW OF PAST MONITORING (CONT.)

B. NOISE REPORTS:

TABLE 3
SUMMARY OF 8-HOUR TWA NOISE EXPOSURES, 1989[1]

JOB CLASS/ JOB CODE	# OF SAMPES	% OF OSHA ALLOWABLE RANGE	AVE.
Production Foreman	4	4.8 - 27	17.4
Control A Operator	4	1.0 - 2.6	1.7
Control C Operator/HCL	6	17 - 44	28
Control C Operator/TCE	4	1.3 - 21	14
Class 2 Operator	4	2.2 - 58	25
Sr. Instr. Technician	6	2.1 - 9.9	4.8
Machinist	6	3.4 - 18	9.8
Pipefitter	6	3.2 - 34	24
Utility Man/Contractor	20	13 - 63	29
OSHA PEL			100
OSHA Action Level			50

1. Reference: Sorrells, M.J. , 1989 Evaluation of Personal Noise Exposures at Trichloroethylene/HCL Plants, B-1500. , IHS File B15-3173N.

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

HEARING CONSERVATION PROGRAM

1. JOB CLASSIFICATIONS IN A HEARING CONSERVATION PROGRAM

The date of the last noise survey was July, 1989. 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 Trichloroethylene/HCL in the Hearing Conservation Program is not required.

2. TRAINING

Training is recommended every 2 years.

3. HEARING PROTECTION AREAS

The following areas are designated as required hearing protection areas since they are at or above 90 dBA. These areas are posted with signs requiring hearing protection.

1. The following equipment in the maintenance areas:
   - Disc, cone, plug, and wheel grinders
   - Pipe threading machines
   - Impact wrenches
   - Percussion tools (noise levels >105 dBA)
   - Metal hole puncher
   - Metal disc saw
   - Disc buffer
2. Mycom compressor and fin fan deck in HCL process area
3. Underneath the furnace in the B-column area
4. Air bleed on drum valves in warehouse

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.

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

HEARING CONSERVATION PROGRAM (CONT.)

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:

DEVICE	NOISE REDUCTION RATING (NRR)
E-A-R. 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. They will be developed as part of the 1992 noise survey.

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: June, 1993

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

ASBESTOS PROGRAM

1. INVENTORY

Asbestos is contained in this block in the following forms :

gaskets transite insulation

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 Bonnie Martinez 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.

Pipefitters

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 Trichloroethylene/HCL 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.

ASBESTOS PROGRAM (CONT.)

6. ASBESTOS ABATEMENT PLANS

There are no asbestos abatement plans at his time.

7. NEXT REVIEW DATE: June, 1993

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

VENTILATION PROGRAM

1. PROGRAM DESCRIPTION

The Trichloroethylene/HCL ventilation system includes as follows:

ID Number	Location	Last Survey	Next Survey	Average Velocity
150101	B-1501	10-02-90	10-01-93	136
150601	B-1506	03-15-89	03-14-92	116
151002	B-1510	03-15-89	03-14-92	93

The hoods are are separately ducted to the outside.

2. OPERATING CRITERIA

A. Periodic Performance Evaluation and Maintenance Programs
-Administered by Industrial Hygiene Services and lab personnel at Trichloroethylene/HCL.

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 Trichlorethylene/HCL is responsible for maintaining documentation on hood surveys and inspections.

5. NEXT REVIEW DATE: June, 1993

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

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

Job Activity	Frequency	Weight
Moving waste drums (tilt & roll)	Once/mo (<5 drums)	200 lbs
Placing empty 55 gal drums on conveyor belt	varies daily to weekly (50-100 drums)	25-30 lb

3. REPETITIVE MOTION/FORCEFUL EXERTIONS

Computer personnel (keyboard entry)

Pipefitters (wrenching action)

4. POWER TOOL USE

Type of Tool	Frequency of use	Duration
Disc grinder	daily	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: June, 1993

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

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:

1. Maintenance Personnel 2. 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:

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

5. NEXT REVIEW DATE: June, 1993

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

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:

Job Classification	MSR	Tests	Test Frequency
HCL (66926):			
Control C Operator	HCB*	Blood Chemistries (Hepatic) HCB Level	Annual If ≥ 50, annual If < 50;>25 biennial
Trichloroethylene (66900):			
Production Foreman	HCB	Same as above	Same as above
Trichlor (66915)			
Control C Operator	HCB	Same as above	Same as above
Control C Operator/PRG	HCB	Same as above	Same as above
Trichlor Services (66930):			
Control C Operator	HCB	Same as above	Same as above
Class 2 Operator	HCB	Same as above	Same as above
Trichlor Maintenance (66950):			
Pipefitter	HCB	Same as above	Same as above
Machinist	HCB	Same as above	Same as above

* HCB = Hexachlorobenzene

3. DOCUMENTATION

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

1991-93 OCCUPATIONAL HEALTH PROGRAM
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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 1991/1992:

1991	1992
Chlorine	o-Dichlorobenzene
Ethylene Dichloride	Diisobutylene
Diisopropyl Amine	Ethyl acetate
Vinyl Chloride	Methyl Pyrrole
Butylene Oxide	1,1,2,2-tetrachloroethane
Methylene Chloride	

3. RESPIRATORY PROTECTION TRAINING

Trichloroethylene/HCL 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.

1991-93 OCCUPATIONAL HEALTH PROGRAM
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INDUSTRIAL HYGIENE EDUCATION PROGRAM (CONT.)

6. ASBESTOS TRAINING

All personnel who work in Trichloroethylene/HCL 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 Trichloroethylene/HCL 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. Signatured 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 or applicable protective equipment upon initial assignment, after major job changes, and periodically. Consult the Texas Operations Personal Protective Equipment Program Manual for training guidelines.

1991-93 OCCUPATIONAL HEALTH PROGRAM
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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 invloved 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.

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

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

Respirator Type	Cartridges Filter, Canisters	Sources of Breathing Air
AOR9722 Mouthbit	OVAG (R722)	NA
Scott Air Pack 2.2 SCBA with Scottoramic full face mask	NA	20 min. air tank
Scott, 5 min Escape (Scottovista mask)	NA	5 min. air tank
Elsa 5 minute escape	NA	5 min. air tank
Scottovista full face airline	NA	Cylinder
Scottoramic full face airline	NA	Cylinder
3M Easi Care 5000 Disposable 1/2 face	AG	NA
3M Easi Care 5000 Disposable 1/2 face	Ammonia/Methylamine	NA
AO 5 Star	OVAG; Ammonia/Methylamine	NA
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

Job Classification	User Category	Resp. Types Used	Individually Issued
Office Personnel	Escape Only	MP; Elsa	MP
Lab Personnel	Routine/Escape	MP; Half Face	MP; AO 5 Star
Operators	Routine/Emergency	SCBA; Airline; Half Face	Half Face
	Escape	MP; Half Face	MP; Half Face
Maintenance	Routine/Emergency	Airline; Half Face	Half Face
	Escape	MP; Half Face	MP; Half Face

MP = AOR9722 Mouthbit

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

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RESPIRATORY PROTECTION PROGRAM (CONT.)

Respirator training is conducted by:

Respirator Type	Trainer	Frequency
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.

4. USE SITUATIONS

Respirator Type/Filter	Chemical of Concern	Use Situation
Mouthbit	Cl2, Acid Gases	Escape
Half face/OVAG	RCL's, HCL, Cl2	Escape, equipment clearing, minor leak repair
Half Face/Ammonia	Ammonia	Breaking/entering equipment associated with ammonia refrigeration unit
Full face airline	RCL's, HCL, CL2	Breaking/entering equipment
SCBA	All chemicals	Emergency response
Scott 5 min.	All Chemicals	Escape only
Elsa	All chemicals	Escape only

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.

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RESPIRATORY PROTECTION PROGRAM (CONT.)

5. RESPIRATOR CLEANING STATIONS

The cleaning stations are sinks located in the change rooms. Half face masks are cleaned with soap and water. 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

Respirator	Storage Location
MP	B-1513 Storage Bins
Half face air purifying	B-1513 Storage Bins; B-1501; B-1506 Safety Cabinets
SCBA (30 min.)	B-1501; B-1506; B-1505 Control Rooms
Scott 5 min. escape	B-1501; B-1506
Elsa	B-1510 Office Supply Storage Room
Airline masks	B-1501; B-1506; B-1513; B-1516
Dust masks	B-1501; B-1506 Safety Cabinets

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

7. INSPECTION SCHEDULE

Respirator	Frequency	By	Documentation Retained By
Half Face	Before each use	User	none
Airline	Before each use	User	Fire Dept.
SCBA; Scott 5 Min; Elsa	Before each use	User	none
	Monthly	Plant Rep	Plant Rep
	Annually	Fire Dept.	Fire Dept.
	5 year hydro	Fire Dept.	Fire Dept.
MP	Monthly	User	Plant Rep
Dust Mask	Before each use	User	Plant Rep

RESPIRATORY PROTECTION PROGRAM (CONT.)

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: January, 1993

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

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 Trichlor/HCL 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 Trichlor/HCL 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 theTrichlor/HCL PPE program is conducted for Dow employees and long-term contractors upon initial assignment and biennally thereafter. This training is documented. Visitors are informed of and provided the minimum PPE required in the Trichlor/HCL 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:

PPE Item	Test Method	Frequency	By
Totally encapsulated suits (Maintenance activities)	Visual Inspection	Biannually	Dept Rep
Chemical protective gloves (high hazard operations)	Air test method	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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PERSONAL PROTECTIVE EQUIPMENT PROGRAM (CONT.)

5. DECONTAMINATION AND DISPOSAL:

The Trichlor/HCL 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 B-1501 and B-1506. No personal clothing may be washed in block washers. Cotton gloves are sent to the Learning Center. 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
b. North Silver Shield gloves are in laboratory drawer in B-1500
c. Low voltage gloves and flash suits in switchroom locker
d. Individually issued equipment is stored in personal lockers
e. New respiratory equipment is stored as follows:
   Full face airline in the respirator cabinet in B-1501
   New half face respirators in the day foreman's office
   Mouthbit in the safety cabinet in B-1500
f. SCBA's are located in the following locations:
   B-1501 in the control room
   B-1506 in the control room
g. New PPE is stored in the Safety cabinet in B-1500

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

PERSONAL PROTECTIVE EQUIPMENT PROGRAM (CONT.)

9. PROGRAM EVALUATION:

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

NEXT REVIEW DATE: June, 1993

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

TABLE 1
TRICHLOR/HCL PPE INVENTORY, 1991

The following lists the approved PPE for the Trichlor/HCL plant. Trichlor 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 & 37-175) gloves
2. North #E214B dielectric natural rubber gloves
3. Scooba #JPS 10B Cotton Gloves
4. Fisher Scientific Vinyl Disposable (#11-384-36C)

B. FOOT AND LEG PROTECTION
1. Servus 21714, 22114, and 21629 boots
2. Servus Rainfair 9043
3. Lehigh #1149 dielectric natural rubber boots
4. Iron Age 990 Steel Toe Natural Rubber

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 #211-10R
   - American Optical #484B

D. BODY PROTECTION
1. Kappler Saranex coated Tyvek
2. Life-Guard Responder Hazard Suit (Protection Level A) 41450

E. RESPIRATORY PROTECTION
1. Self-Contained Breathing Apparatus
   - Survivair 30 min.
   - Scott Air Pack
   - Scott 5 min. SCBA Pack 9881-22 (MSMS# 74694)
2. Airline Respirators
   - Scottoramic Full Face #801548-00 (MSMS #4871)
3. Half-Mask Respirator
   - 3M Easi Air 5000 disposable
   - AO 5-Star
4. Dust Mask
   - 3M 8710 (MSMS #4869)
5. Escape Respirator
   - AO Mouthpiece R9722 with organic vapor/acid gas cartridge (MSMS #106840)
   - ELSA 5 min. escape SCBA

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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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DEPARTMENT ACTIVITIES

TRICHLOROETHYLENE PRODUCTION

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DEPARTMENT ACTIVITIES (CONTINUED)

ANHYDROUS HCL LIQUIFACTION PLANT

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DEPARTMENT ACTIVITIES (CONTINUED)

ANHYDROUS HCL LIQUIFACTION PLANT (CONT.)

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DEPARTMENT ACTIVITIES (CONTINUED)

ANHYDROUS HCL LIQUIFACTION PLANT (CONT.)

IH File B15-3839-91

Trichloroethylene Production

MB/7-91

FIGURE 1

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

JOB DESCRIPTIONS

Production Superintendent, Assistant Superintendent, Project, Office Specialist:
The probability of personnel in these job classifications experiencing a significant exposure to chemical and physical stresses in the plant is low as the majority of their time is spent in office areas.

TRICHLOROETHYLENE (66900)

Production Foreman:
Coordinates the Trichloroethylene plant production activities (rates, personnel, safety, and maintenance) with the Production Engineer, Assistant Superintendent and Maintenance Foreman. Spends approximately 50% of the time in the plant area. The balance of the time is spent in office areas.

Sr. Production Chemist:
Supervises the production lab and performs development work to improve analytical capabilities. Acts as the Customer Quality Service Coordinator. Exposure to chemicals is minimal due to the short period of time they are handled and the use of lab exhaust hoods.

TRICHLOR PLANT (66915)

Assistant Chemist CL A:
Responsible for running routine and non-routine samples of the Trichloroethylene plant process sample points, storage tanks, HCl tank car shipments, etc. 75% of the time is spent in the lab. The balance of the time is spent in plant areas catching samples.

Production Engineer:
Directly responsible for safety, production, and maintenance in the Trichloroethylene plant. 20% of time is spent in the process area with the remainder of time spent in office areas.

Sr. I& E Technician:
Repairs and troubleshoots process analytical equipment including Dp cells, pressure transmitters and other instruments. Approximately 30% of time is spent in the plant process areas with the remainder in instrument shop areas.

Chemical Aide:
Responsible for all routine and non-routine sample analyses including environmental. industrial hygiene. and process. Works production to solve plant problems by doing necessary analytical work, Responsible for daily water analysis. Industrial Hygiene Monitoring are also part of the responsibilities. About 15% of the time is spent in the process areas and the balance is in the lab or office area.

1991-93 OCCUPATIONAL HEALTH PROGRAM
TRICHLOROETHYLENE/HCL, B-1500

JOB DESCRIPTIONS (CONTINUED)

TRICHLOR PLANT (66915) (CONTINUED)

Control A Operator:
Resonsible for the operation of the thermal chlorinator. tetras cracker, and the acid absorption columns. Duties include start-up, shut-down, analysis, and adjustments of operating parameters for safe and profitable operation of the units. Outside activities include sampling which takes up to 5 to 10% of each shift. Under normal operating conditions, the Control A Operator spends 95% of the time in the control room.

Control B Operator:
Responsible for ensuring plant hazardous waste shipments are made in correct fashion. Spends 70% of time in the process area working with vacuum trucks, etc. with the remainder spent in office areas.

Control C Operator, PRG Control C Operator:
Responsible for implementing job tasks identified by the Control A Operator as necessary for the safe, proper, and profitable operation of the unit. The Control C Operator also handles activities such as clearing equipment for maintnenance, switching pumps, opening and closing valves, and touring reas watching for problems. About 80% of time is spent in process areas.

TRICHLOR SERVICES (66930)

Foreman:
Coordinates shipping and warehousing activities of the department. Supervises two operators and assures the movement and the quality of the departments products.

Sr. Parts Technician:
Orders all the necessary equipment for the Trichloroethylene and HCl plants. Acts as the backup material handler for the warehouse. Ten percent of the time is spent in the plants with the remainder of the time spent in office and storage areas.

Sr. Vibration Asst.:
Routinely checks all pumps and motors in the B-1500 block and assists the operators in the warehouse. 35% of the time is spent in the plants with the remainder of the time in the warehouse and office areas.

Control C Operator:
Assists warehouse personnel with loading and sampling activities. Approximately 80% of time is spent in the warehouse and loading facilities. The balance is spent in office or other plant areas.

Class 2 Operator:
Loads all tank cars, tank trucks and drums that leave the B-1500 block. Catches samples of all trucks, cars and drums for analysis. 90% of time is spent in the warehouse and loading facilities.

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JOB DESCRIPTIONS

HCL PLANT (66926)

Process Supervisor:
Responsible for safety, production, and maintenance in the HCl plant, warehouse and shipping area. 30% of time is spent on the plant process areas. The remainder of the time is spent in office areas.

Project Engineer (TCE & HCl):
Responsible for new construction, demolition, and capital projects. 90% of time is spent in office areas with the balance of the time spent in the plant.

Control A Operator:
Operates compressors. refrigeration units, and distillation columns in the production of HCl. Operates the air compressors and distribution system for plant air. These duties are performed primarily from the control room. Outside activities are mainly short-term for investigation of problems or performance of manual adjustments. Approximately 90% of time is spent in the control room and 10% is spent in the process area.

TRICHLOR MAINTENANCE (66950)

Maintenance Foreman:
Responsible for coordinating and completing all routine maintenance of the plants. 80% of time is spent in the plant areas.

SR. I&E Technician:
Repairs and troubleshoots process analytical equipment including Dp cells, pressure transmitters and other instruments. Approximately 30% of time is spent in the plant process areas with the remainder in instrument shop areas.

Sr. Electrician:
Responsible for all electrical equipment in the B-1500 block. 85% of time is spent in the plant with the remaining time is office and shop areas.

Pipefitter:
Responsible for all pipe fitting jobs and pipeline maintenance. Routine jobs include working on reboilers in the Trichloroethylene plant, working on 32% HCl distribution lines, and breaking into lines to make repairs or changes. Maintenance work is done on pipelines owned by the Trichloroethylene plant but located outside the block. 90% of time is spent in the process areas with the remaining time in the shops.

Pipefitter/Welder:
In addition to pipe fitting responsiblities, the Pipefitter/Welder is responsible for welding in the shop and in the plant. 75% of the time is spent in the shop and 25% of the time is spent in the plant process area.

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TRICHLOROETHYLENE/HCL, B-1500

JOB DESCRIPTIONS

TRICHLOR MAINTENANCE (66950) (CONTINUED)

Machinist:
Responsible for maintenance of all pumps, compressors, fans, and motors in the B-1500 block. Alignment of fin-fans and motors are also part of the job. 75% of the time is spent in the shop and 25% of the time is spent in the plant process area.

Utility Man/Contractor:
These personnel are called upon to perform and support maintenance activities in the B-1500 block. They perform pipe fitting, welding, grinding, and pipe insulating activities. 90% of the time is spent in the plant process areas with the remainder of the time in the contractor maintenance shop.

Control C Operator, PRG Control C Operator:
Assists the Control A Operator. Checks and operates process compressors, transfers products and raw materials, catches and analyzes process samples, operates division wide anhydrous HCl distribution system. Approximately 80% of the time is spent in the process area and 20% is in the control room.

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OSHA SPECIAL REGULATIONS

The Trichloroethylene/HCl 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 Trichloroethylene/HCl to be in compliance with the requirements outlined in the Asbestos standard. To complete the requirements for Vinyl Chloride, initial training and personnel monitoring will be conducted as part of the 1991-93 Occupational Health program at Trichloroethylene/HCl

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 Trichloroethylene/HCl has confirmed the plant to be in compliance with the requirements outlined in the Noise standard.