

LOUISIANA DIVISION INDUSTRIAL HYGIENE REPORT
AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY

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DEPARTMENT	FILE NUMBER	DATE
LIGHT HYDROCARBONS II	LAD-LHC II-87.01	7-13-88
TITLE		
LHC II INDUSTRIAL HYGIENE ACTIVITY REPORT FOR 1987		
AUTHOR(S) - SIGNATURE(S)		
ROCK GUSTIN	<i>Rock Gustin</i>	
REVIEWERS SIGNATURE		
<i>William E. Ledford 7/28/88</i>		

SUMMARY/RECOMMENDATIONS

THE EMPLOYEES THAT HAD A LIKELIHOOD FOR EXPOSURE IN THEIR JOBS TO BENZENE, TOLUENE, XYLENE, AND/OR 1, 3-BUTADIENE WERE MONITORED USING APPROVED SAMPLING AND ANALYTICAL METHODS. RESULTS OF THE MONITORING SHOWED NO EXPOSURE PROBLEMS. THIS FINDING SUPPORTS HISTORICAL DATA.

A NOISE SURVEY WAS CONDUCTED AND THE RESULTS WERE PRESENTED TO PLANT PERSONNEL. THIS SURVEY SUPPORTS THE HISTORICAL DATA OF HIGH NOISE LEVELS THROUGH OUT THE PLANT. INFORMATION ON THE EFFECTIVENESS OF THE VARIOUS TYPES OF HEARING PROTECTION WAS PRESENTED TO ALL PERSONNEL.

IN 1988, NOISE, BENZENE, TOLUENE, XYLENE AND (1, 3-BUTADIENE) SURVEYS WILL BE CONDUCTED FOLLOWING MAJOR CHANGES THAT THE PLANT IS SCHEDULED TO UNDER GO.

LOUISIANA DIVISION

*L. ADCOCK - 2306
*H.M. BELL - 4701
DR. M. CURRIER - 2303
M.E. NEVILL - 3502-E
N.L. GRISSOM - 4801
K.D. DIAMOND - 4801
W.E. LEDFORD - 3502-E
PAUL ROZAS - 2306
BOB NORMAN - 3801

MIDLAND

*L.W. RAMPY - 1803
M.G. SWANK - 1803
*J.E. LeBEAU - 1803
*G.W. ENGDAHL - 1803
*R.D. OLSON - 1803
*S.M. GORGACZ - 474
*A.W. SCHAFFER - 1803
*R.R. COOK - 1803

OTHER

*F.D. AXE-PITTSBURG
*G.L. MEIER-STRONGSVILLE
*J.A. VOPICA - SARNIA
*D.E. CRAGER - FREEPORT

* COVER SHEET ONLY

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BENZENE EXPOSURE EVALUATION

Explanation of Guidelines and Sampling Method

The ACGIH Threshold Limit Value (TLV-TWA) for benzene is 10 (ten) ppm. Dow's Industrial Hygiene Guide calls for a 10 (ten) ppm ceiling and does not allow short term excursions above this ceiling.

In December 1987, the Osha Standard for Benzene went into effect. This reduced the permissible exposure limit of benzene to 1 ppm (TLV-TWA) for 8 hours, and the short term exposure limit (stet) not to exceed 5 ppm average for 15 minutes.

The 3M organic vapor monitor badge (#3500) was used to obtain breathing zone samples of operators working in areas most likely to contain benzene. The badges, which use an active charcoal wafer as a collection medium, were desorbed with carbon disulfide and analyzed by gas chromatography.

1. PERSONNEL MONITORING

As shown on Table 1 (Attachment 1) the personnel samples were well below the 10 ppm TLV-TWA. This agrees with historical data. See also Attachment 2.

TOLUENE EXPOSURE EVALUATION

Explanation of Guidelines and Sampling Method

The ACGIH Threshold Limit Value (TLV-TWA) for toluene is 100 ppm with a TLV-STEL of 150 ppm. The TLV-STEL is a 15 minute exposure guideline.

The 3M organic vapor monitor badge (#3500) was used to obtain breathing zone samples of operators working in areas most likely to contain toluene. The badges, which use an active charcoal wafer as a collection medium, were desorbed with carbon disulfide and analyzed by gas chromatography.

1. PERSONNEL MONITORING

As shown on Table 2 (Attachment 3) the personnel samples were well below the 100 ppm TLV-TWA. This agrees with historical data. See also Attachment 4.

XYLENE EXPOSURE EVALUATION

Explanation of Guidelines and Sampling Method

The ACGIH Threshold Limit Value (TLV-TWA) for xylene is 100 ppm with a TLV-STEL of 150 ppm. The TLV-STEL is a 15 minute exposure guideline.

The 3M organic vapor monitor badge (#3500) was used to obtain breathing zone samples of operators working in areas most likely to contain xylene. The badges, which use an active charcoal wafer as a collection medium, were desorbed with carbon disulfide and analyzed by gas chromatography.

1. PERSONNEL MONITORING

AS SHOWN ON TABLE 3 (ATTACHMENT 5) THE PERSONNEL SAMPLES WERE WELL BELOW THE 100 PPM TLV-TWA. This agrees with historical data. See also Attachment 6.

1, 3-BUTADIENE EXPOSURE EVALUATION Explanation of Guidelines and Sampling Method

The ACGIH Threshold Limit Value (TLV-TWA) for 1, 3-Butadiene is 10 ppm. No TLV-STEL value was available. The TLV-STEL is a 15 minute exposure guideline.

The 3M organic vapor monitor badge (#3500) was used to obtain breathing zone samples of operators working in areas most likely to contain 1, 3-Butadiene. The badges, which use an active charcoal wafer as a collection medium, were desorbed with carbon disulfide and analyzed by gas chromatography.

1. PERSONNEL MONITORING

As shown on Table 4 (Attachment 7) the personnel samples were well below the 10 ppm TLV-TWA. This agrees with historical data. See also Attachment 8.

NOISE EXPOSURE EVALUATION Method and Explanation of Guidelines

A DuPont MK-2 Audio Dosimeter was used as a sound level meter to measure area noise levels. The dosimeter meets or exceeds all current requirements established by government agencies in the United States for personal audio dosimeters. All noise measurements were made using an 80 and 90 db(A) threshold level and a 90 db(A) criterion level. The threshold is the level that noise must exceed to be included in the dose calculation and the criterion is the decibel level that will yield a 100 percent dose in eight hours. The 90 db(A) criterion level is an OSHA regulation, to obtain the dose percent using the Louisiana Division criterion level of 85 db(A) the results were multiplied by 2 (two). This is true due to the 5 db(A) doubling rate that is included in both the OSHA regulations and Louisiana Division Standard. All of the audio dosimeters were calibrated before use with an Audio Dosimeter Calibrator at sound level of 94 decibels.

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1. Area Survey

As shown in Attachments 9 & 10, most of the plant is a high noise area (>90 dbA), especially around the turbomachinery. The entire plant is considered an ear protection area. High noise areas are posted with warning signs and these areas are communicated to employees in the annual Industrial Hygiene Safety Meetings.

SAMPLING STRATEGY PLAN FOR 1988

1. Noise

Conduct area surveys following major modifications to the plant and while the plant is being shut-down and started-up.

2. Benzene, toluene, xylene, and 1, 3-butadiene

Conduct personnel and area monitoring in our new waste water area.

No other monitoring is considered necessary as indicated by historical data.

ACCOMPLISHMENTS FOR 1987 AND GOALS FOR 1988

Hearing:

Accomplishments in 1987:

Investigated efficiencies of various types of hearing protection used in block and communicated this information to all employees.

Redirected 60 pound steam muffler discharge to lessen noise exposure to personnel on road way north of plant.

Goals for 1988:

Investigate all new hearing protection available and communicate this information to employees.

Asbestos:

Accomplishments in 1987:

Trained plant personnel on the dangers of asbestos at our Industrial Hygiene Training classes.

Positively identified all asbestos in the plant and labeled all lines with asbestos warning label.

Removed or encapsulated all damaged asbestos.

Goals for 1988:

Remove as much asbestos as possible and reinsulate with a non-asbestos material.

Waste Water Area:

Accomplishments
in 1987:

Discontinued use of API separators and associated waste water equipment in block 38. New waste water equipment in block 48 is in service.

Goals
for 1988:

Continue to update waste water equipment.

Benzene Emissions

Accomplishments
for 1987:

Monitored all Benzene valves (460) in plant with a yearly leaker rate of 0.002%.

Goal
for 1988:

No leaks

V.O.C. Emissions

Accomplishments
for 1987:

Reduced leaker rate from 3.6% to 2.9% monitored 3200 valves quaterly.

Goal
for 1988:

continue to reduce leaker rate to 2% or lower

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SUMMARY

FUTURE INDUSTRIAL HYGIENE ACTIVITIES

CONTINUE TO EVALUATE NOISE LEVELS OF THE PLANT, INFORM PLANT PERSONNEL OF THE RESULTS AND INFORM THEM ON THE VARIOUS TYPES OF HEARING PROTECTION AVAILABLE.

CONTINUE TO MONITOR PERSONNEL FOR CHEMICAL EXPOSURE, INFORM PERSONNEL ON ANY CHANGES THAT MAY OCCUR IN THE CHEMICAL EXPOSURE LIMITS.

CONTINUE TO REMOVE ASBESTOS INSULATION AS MAINTENANCE JOBS PERMIT AND CLEAN OUR ASBESTOS GASKET AREA ON A REGULAR BASIS.

CONTINUE TO MONITOR AND CONTROL FUGITIVE EMISSIONS TO DECREASE PERSONNEL EXPOSURE AND TO MEET THE REGULATED GUIDELINES.

DEVELOPE A RESPIRATORY TEST FIT PROGRAM WITH DOCUMENTATION ON AN ANNUAL BASIS FOR ALL PERSONNEL.

ROCK GUSTIN
LHC 2
INDUSTRIAL HYGIENE CONTACT

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LOUISIANA DIVISION
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INDUSTRIAL HYGIENE TRAINING

IN OCTOBER 1987 ALL OPERATING, MAINTENANCE, TECHNICAL STAFF, AND CONTRACT MAINTENANCE PERSONNEL WERE TRAINED ON THE CONSEQUENCES OF OVER EXPOSURE TO THE BLOCK'S HAZARDOUS CHEMICALS. THE CHEMICAL EXPOSURE MONITORING PROGRAM WAS REVIEWED. RESPIRATORY PROTECTION WHICH INCLUDED, MOUTHBIT, FULLFACE, HALFFACE AND SUPPLIED AIR WAS DISCUSSED. THE HALFFACE DUAL CARTRIDGE RESPIRATOR IS THE TYPE USED FOR ALL CHEMICAL EXPOSURE IN THE BLOCK, WITHIN THE LIMITS OF THE CARTRIDGES. A YEARLY RESPIRATOR TEST FIT PROGRAM WILL BE STARTED IN 1988. HEARING PROTECTION REQUIREMENTS AND THE DIFFERENT TYPES OF PROTECTION AVAILABLE WAS REVIEWED.

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LOUISIANA DIVISION LHC 2
JOB CLASSIFICATION DESCRIPTIONS

OPERATIONS TECHNICIAN

THE PURPOSE OF THIS JOB IS TO STARTUP AND SHUTDOWN PROCESS EQUIPMENT IN THE SPENT CELL EFFLUENT CLEAN UP SYSTEM, OILY AND WASTE WATER SYSTEMS, SWAPPING CAUSTIC STREAM STRIPPERS AND PUMPS, OILY WATER STRIPPERS, PUMPS

AND DRUMS. THIS PERSON ALSO RUNS ALL LAB SAMPLES, TO INCLUDE BUT IS NOT LIMITED TO : CAUSTIC, ETHYLENE, PROPYLENE AND OIL AND WATER SAMPLES. HE/SHE ALSO MAKES ROUNDS IN THE ABOVE ASSIGNED AREAS INSPECTING AND GATHERING INFORMATION FROM SPECIFIED FIELD SENSING DEVICES AND ANALYZING THIS DATA FOR CHANGE AND/OR PROXIMITY TO OPERATING LIMITS. PERFORM CHECKS ON ALL CARRIER GASES IN THE BLOCK MONITORING FOR LEAKS AND PRESSURE. THIS IS A 12 HOUR ROTATING SHIFT JOB AND THE POTENTIAL EXPOSURE TO CHEMICALS ARE MODERATE AND THE POTENTIAL EXPOSURE TO NOISE IS HIGH.

SENIOR OPERATIONS TECHNICIAN (PROCESS)

THE PURPOSE OF THIS JOB IS TO PROVIDE SAFE AND EFFICIENT OPERATIONS OF THE PROCESS END OF LHC 2. THE OPERATOR MUST BE ABLE TO PREFORM ALL MANUAL OPERATIONS REQUIRED FOR THE SAFE CONTROL AND OPERATION OF THE PLANT. THESE INCLUDE THE START-UP AND SHUTDOWN OF PROCESSING EQUIPMENT, GATHERING AND ANALYZING FIELD DATA, CHECKING THE STATUS OF EQUIPMENT IN THE FIELD FOR PROPER OPERATION, PREPARING EQUIPMENT FOR MAINTENANCE WORK, AND PERFORMING MAINTENANCE WORK. THIS JOB PROVIDES FOR THE COMPLETE MANUAL PORTION OF THE PLANT PROCESS OTHER THAN THE LARGE ROTATING EQUIPMENT. THIS IS A 12 HOUR SHIFT ROTATING JOB. THE POTENTIAL EXPOSURE TO CHEMICALS ARE MODERATE, AND THE POTENTIAL EXPOSURE TO NOISE IS HIGH.

SENIOR OPERATIONS TECHNICIANS (FURNACE)

THE PURPOSE OF THIS JOB IS TO PROVIDE SAFE AND EFFICIENT OPERATIONS OF THE FURNACE SIDE OF LHC 2. THE OPERATOR MUST BE ABLE TO PERFORM ALL MANUAL OPERATIONS REQUIRED FOR THE SAFE CONTROL AND OPERATION OF THE PLANT. THESE INCLUDE THE STARTUP AND SHUTDOWN OF PROCESSING EQUIPMENT, GATHERING AND ANALYZING FIELD DATA, CHECKING THE STATUS OF EQUIPMENT IN THE FIELD FOR PROPER OPERATION, PREPARING EQUIPMENT FOR MAINTENANCE WORK, AND PREFORMING MANITENANCE WORK. THIS JOB PROVIDES FOR THE COMPLETE MANUAL OPERATION OF THE PLANT PROCESS, OTHER THAN THE LARGE ROTATING EQUIPMENT. THIS IS A 12 HOUR SHIFT ROTATING JOB. THE POTENTIAL EXPOSURE TO CHEMICALS ARE MODERATE AND THE POTENTIAL EXPOSURE TO NOISE IS HIGH.

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SENIOR OPERATIONS TECHNICIANS (MECHANICAL)

THE PURPOSE OF THIS JOB IS TO PROVIDE SAFE AND EFFICIENT OPERATION OF THE LARGE MECNICAL EQUIPMENT AT LHC 2. THE OPERATOR MUST BE ABLE TO PERFORM ALL MANUAL OPERATIONS REQUIRED FOR THE SAFE CONTROL AND OPERATION OF THE PLANT. THESE INCLUDE THE STARTUP AND SHUTDOWN OF MECHANICAL EQUIPMENT, GATHERING AND ANALYZING FIELD DATA, CHECKING THE STATUS OF EQUIPMENT FOR MAINTENANCE WORK, AND PERFORMING MAINTENANCE WORK. THIS JOB PROVIDES FOR THE COMPLETE MANUAL PORTION OF THE PLANT'S LARGE ROTATING EQUIPMENT. THIS IS A 12 HOUR SHIFT ROTATING JOB. THE POTENTIAL EXPOSURE TO CHEMICALS ARE LOW. AND THE POTENTIAL EXPOSURE TO NOISE IS HIGH

LOUISIANA DIVISION
LHC 2

OPERATIONS SPECIALIST

THE PURPOSE OF THIS JOB IS TO PROVIDE A SAFE AND EFFECTIVE OPERATION OF THE PLANT. THE INCUMBENT MUST BE KNOWLEDGEABLE IN PROCESS EQUIPMENT, ANALYSIS, FLOWS, PROCESS AND TEMPERATURES IN ORDER TO MAXIMIZE PRODUCTION AND MINIMIZE LOSSES. THIS PERSON MUST BE ABLE TO MONITOR AND EVALUATE DATA FROM ROUND SHEETS WHICH HE COLLECTS THROUGH OUT THE WORK PERIOD. THIS IS A 12 HOUR ROTATING SHIFT AND THE POTENTIAL FOR CHEMICAL EXPOSURE IS LOW AND THE POTENTIAL FOR NOISE EXPOSURE IS MODERATE.

SHIFT SUPERVISOR

THE PURPOSE OF THIS JOB IS TO SUPERVISE PERSONNEL SO AS TO OPTIMIZE USE OF MANPOWER AND EQUIPMENT AT LHC 2. THE SUPERVISOR MUST BE KNOWLEDGABLE OF THE PROCESS AND EQUIPMENT, MUST BE ABLE TO PERFORM ALL MANUAL FUNCTIONS OF PLANT CONTROL, MONITOR AND EVALUATE ANALYSIS OF LOG SHEETS AND IS INNOVATIVE IN ATTEMPTS TO OPTIMIZE PRODUCTION. THIS IS A 12 HOUR ROTATING SHIFT JOB, AND THE POTENTIAL EXPOSURE TO CHEMICALS IS LOW. THE POTENTIAL EXPOSURE TO NOISE IS HIGH.

PRODUCTION OFFICE ASSISTANCE

THE PURPOSE OF THIS JOB IS TO KEEP ACCURATE DAILY PRODUCTION RECORDS WHILE EFFICIENTLY ORGANIZING AND MAINTAINING OFFICE FUNCTIONS. THIS INVOLVES RESPONSIBILITIES FOR COLLECTING DATA FROM VARIOUS SOURCES, CHECKING ITS ACCURACY, RECORDING IT, MAKING CALUCLATIONS AND ENTERING DATA INTO COMPUTER FILES. ALSO, INCULDED ARE SECRETARIAL DUTIES FOR THE PLANT SUPERINTENDENT, TECHNICAL STAFF, AND OPERATING PERSONNEL. THIS IS NORMALLY AN 8 HOUR JOB AND THE POTENTIAL EXPOSURE TO CHEMICALS AND NOISE ARE NEGLIGIBLE.

TECHNICAL MANUFACTURERS

THIS GROUP OF ENGINEERS PARTICIPATE IN DIRECTING THE OPERATIONS AND IMPROVEMENTS IN PARTICULAR PLANT PROCESSES. THEY INCORPORATE GOOD DESIGN PRACTICES INTO THE DESIGN OF EACH PLANT PROJECT, AND PARTICIPATE IN SETTING REALISTIC GOALS AND SCHEDULES. THIS IS NORMALLY AN 8 HOUR JOB WITH A LOW POTENTIAL EXPOSURE TO CHEMICALS, AND A MODERATE POTENTIAL EXPOSURE TO NOISE.

MANUFACTURING MANAGERS AND SUPERINTENDENT

THIS GROUP CONSISTS OF THE PRODUCTION SUPERVISOR AND THE PLANT SUPERINTENDENT. A LARGE PART OF THEIR TIME IS SPENT DEALING WITH THE ECONOMICS OF SUPPLY AND DEMAND FOR THE PLANT'S PRODUCTS AND FEED STOCKS. THEY TAKE AN ADMINISTRATIVE ROLE. THEIR POTENTIAL EXPOSURE TO CHEMICALS IS LOW AND THEIR POTENTIAL EXPOSURE TO NOISE IS MODERATE. THIS IS NORMALLY AN 8 HOUR JOB.

LOUISIANA DIVISION
LHC 2

MATERIAL CONTROLLERS

THE MATERIAL CONTROLLER SPENDS MOST OF HIS TIME IN HIS OFFICE AND WAREHOUSE STOCKING SPARE PARTS AND SUPPLIES. HE SECURES ITEMS NEEDED BY THE ENGINEERS, SUPERVISORS, OPERATORS, AND CONTRACT PERSONNEL TO KEEP THE PLANT IN OPERATION AND IMPROVEMENT. THIS IS NORMALLY AN 8 HOUR JOB, AND THE POTENTIAL EXPOSURE TO CHEMICALS AND NOISE IS NEGLIGIBLE.

MAINTENANCE CONTRACTORS

THIS GROUP CONSISTS OF WELDERS, PIPEFITTERS, BOILERMAKERS, LABORERS, PAINTERS, INSULATORS, AND INSTRUMENT PERSONNEL WHO DO THE MAJORITY OF THE MANUAL AND PHYSICAL LABOR PERFORMED IN THE PLANT. THEIR POTENTIAL EXPOSURE TO CHEMICALS ARE LOW AND THEIR POTENTIAL EXPOSURE TO NOISE IS HIGH. THEY NORMALLY WORK AN 8 HOUR SHIFT.

SAFETY/TRAINING SPECIALISTS

THIS JOB EXISTS BECAUSE OF THE CONTINUOUS NEED FOR A FOCAL POINT FOR SAFETY AND TRAINING ACTIVITIES TO HELP PREVENT INJURY TO PERSONNEL AND DAMAGE TO PROPERTY, AND MAINTAIN A TRAINING PROGRAM TO ENSURE PLANT PERSONNEL ARE ADEQUATELY TRAINED TO PERFORM THEIR JOBS. THE POTENTIAL EXPOSURE TO CHEMICALS ARE LOW AND THE POTENTIAL EXPOSURE TO NOISE IS HIGH.

INSTRUMENT GROUP

THIS GROUP PREFORMS THE INSTALLATION, MAINTENANCE AND MODIFICATION OF ALL INSTRUMENTATION IN THE PLANT. THEIR POTENTIAL EXPOSURE TO CHEMICALS ARE LOW AND THEIR POTENTIAL EXPOSURE TO NOISE IS HIGH.

SENIOR INSTRUMENT SPECIALISTS

THIS JOB EXISTS BECAUSE OF THE NEED FOR APPLICATION AND MAINTENANCE OF THE MOST COMPLEX PNEUMATIC, ELECTRONIC, AND DIGITAL INSTRUMENTS AND CONTROL SYSTEMS IN THE DIVISION. INCUMBENT PERFORMS THE DUTIES NECESSARY TO PROVIDE THE DIVISION WITH WELL DESIGNED, WELL MAINTAINED, ACCURATE, AND RELIABLE INSTRUMENTATION AND SYSTEMS. THE POTENTIAL EXPOSURE TO CHEMICALS ARE MODERATE AND THE POTENTIAL EXPOSURE TO NOISE IS HIGH.

INSTRUMENT BLOCK SUPERVISOR

INCUMBENT REPRESENTS THE INSTRUMENT DEPARTMENT TO PLANT SUPERINTENDENT AND PRODUCTION PEOPLE. COORDINATES ALL THE INSTRUMENT FUNCTIONS, PROCESS MEASUREMENTS AND CONTROL, COMPUTER, ANALYTICAL, COMMUNICATIONS, AND ELECTRONICS IN A PRODUCTION PLANT. THIS INCLUDES BOTH ADMINISTRATIVE AND TECHNICAL RESPONSIBILITIES FOR THE DOW AND CONTRACT INSTRUMENT PEOPLE IN THE BLOCK. THE POTENTIAL FOR CHEMICAL EXPOSURE IS LOW AND THE POTENTIAL FOR NOISE EXPOSURE IS MODERATE.

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LHC 2

INDUSTRIAL HYGIENE CONTACT AT LHC 2

THE INDUSTRIAL HYGIENE CONTACT IS REQUIRED TO ACT AS A FOCAL POINT FOR LHC 2. THIS JOB REQUIRES THE DEVELOPEMENT OF AN EFFECTIVE INDUSTRIAL HYGIENE PROGRAM WHICH WOULD INCLUDE BUT NOT BE LIMITED TO THE PERSONNEL MONITORING FOR CHEMICAL EXPOSURE AND PHYSICAL STRESSES. THE I.H. CONTACT TRAINS ALL PLANT PERSONNEL IN PLANT HAZARDS AND THE BEST MEANS OF PERSONNEL PROTECTION. THIS PERSON HAS TO REVIEW AND REVISE CURRENT REGULATIONS AND STANDARDS OF THE CHEMICAL AND PHYSICAL AGENTS INVENTORY, JOB DESCRIPTIONS, MONITOR AND REVIEW DATA, CONDUCT NOISE SURVEYS, INFORM PERSONNEL OF THE PROPER HEARING PROTECTION, CONDUCT RESPIRATORY TRAINING AND TEST FITTING CLASSES. THIS PERSON IS RESPONSIBLE FOR ENVIRONMENTAL AND INDUSTRIAL HYGIENE INDOCTRINATION OF CONTRACT PERSONNEL AT LHC 2. THIS PERSON HAS TO MAINTAIN A GOOD WORKING RELATION WITH THE DIVISION'S INDUSTRIAL HYGIENE DEPARTMENT AND OTHER I. H. CONTACTS

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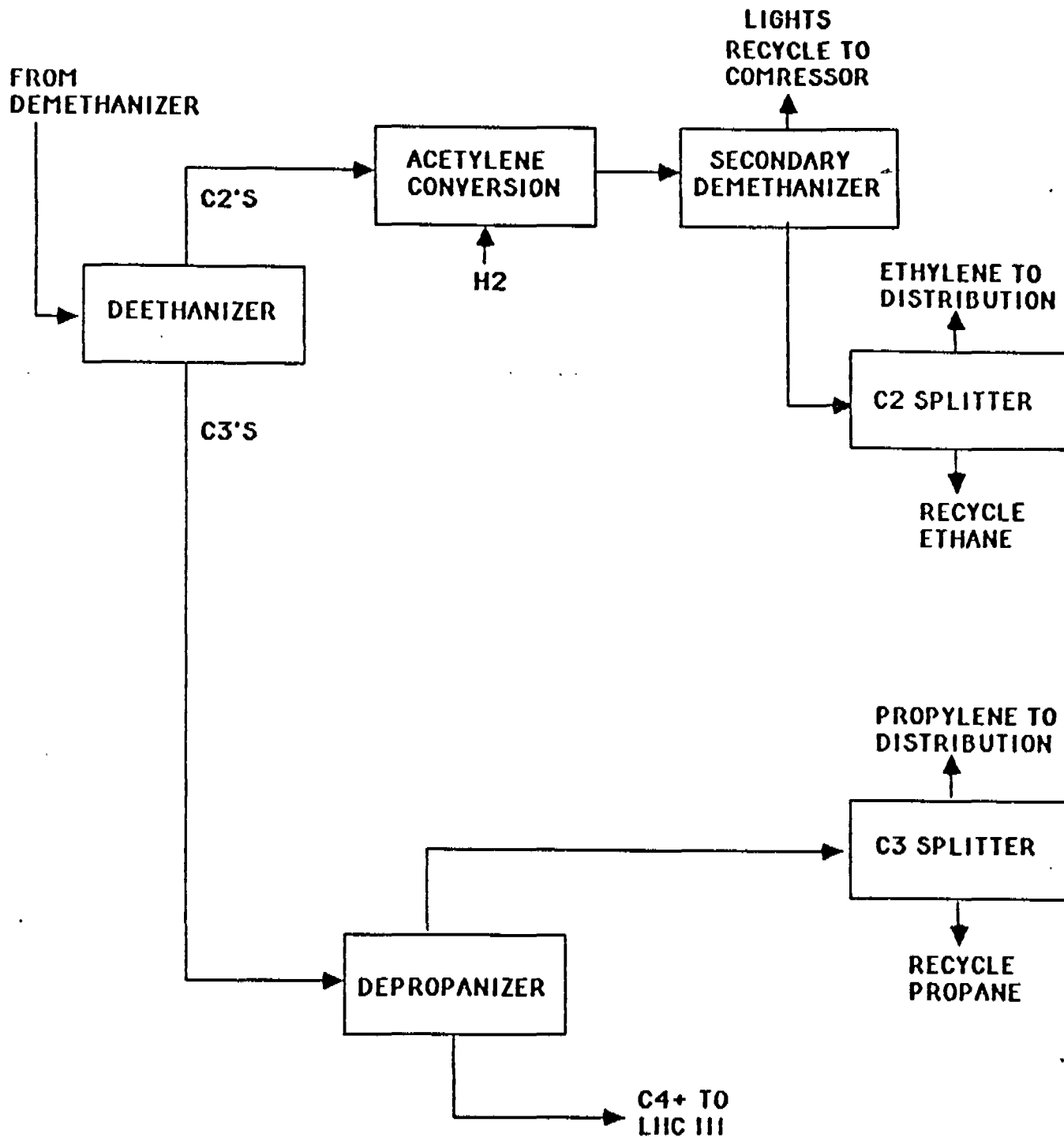
NOISE SURVEY LHC 2
LOUISIANA DIVISION

	1986	1987
NORTH OF FURNACES		
2F-1	85	88
2F-6	92	91
2F-12	93	96
2F-13	95	95
2F-18	92	90
2F-24	88	88
BETWEEN FURNACES		
2F-1 2F-2	100	100
2F-5 2F-6	102	99
2F-6 2F-7	99	99
2F-7 2F-8	100	97
2F-11 2F-12	98	97
2F-13 2F-14	98	98
2F-17 2F-18	99	99
2F-18 2F-19	94	96
2F-19 2F-20	100	97
2F-23 2F-24	101	102
BOILER 1 DECK	91	88
BOILER 2 DECK	89	92
BOILER FEED WATER TURBINE	92	91
NORTH OF 2SH 1	85	86
NORTH OF 2SH 2	84	86
WEST OF BLOCK 48 WAREHOUSE	82	81
INSIDE OF BLOCK 48 WAREHOUSE	76	77
INSIDE BLOCK 48 CONTROL ROOM	82	90
SOUTH EAST OF 2E-250 B	90	90
BOTTOM OF 2K-71 DECK	108	108
BOTTOM OF 2K-120 DECK	104	104
UNDER 2D-220 & 2D-30	85	82
NORTH OF 2C-30 A/B	80	80
NORTH OF 2C-152	86	86
NORTH OF 2C-151	96	96
NORTH OF 2C-100	89	97
UNDER 2D-100	96	98
NORTH EAST OF 2C-100 ON ROADWAY	96	90
NORTH OF 2C-102	88	87
NORTH OF 2D-52	98	98
WEST OF 150 # STEAM STATION	112	101
NORTH OF 2TK-41	101	100
2TK-41 DECK	104	103
BOTTOM DECK OF 2K-20 & 2K30	98	97
NORTH END OF 2D-51	95	92
NORTH OF 2C-51	94	89
EAST OF 2C-35 A/B	90	81
TOP DECK SOUTH END OF 2TK-71	102	100
TOP DECK MIDDLE OF 2K-71 & 2K-120	106	103
WEST OF 2K-71 DISCHARGE	109	109
TOP DECK NORTH END 2K-120 DECK	99	102
SOUTH OF 2E-152 A/B	90	102
CAT WALK SOUTH OF 150# SREAM STATION	110	92
TOP DECK SOUTH END 2K-20	100	106
TOP DECK MIDDLE OF 2K-20 & 2K-30	109	106
TOP DECK NORTH END 2K-30	106	98
TOP DECK BETWEEN 2TE-50 A/B & 2TE-51	104	106

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LHC II.

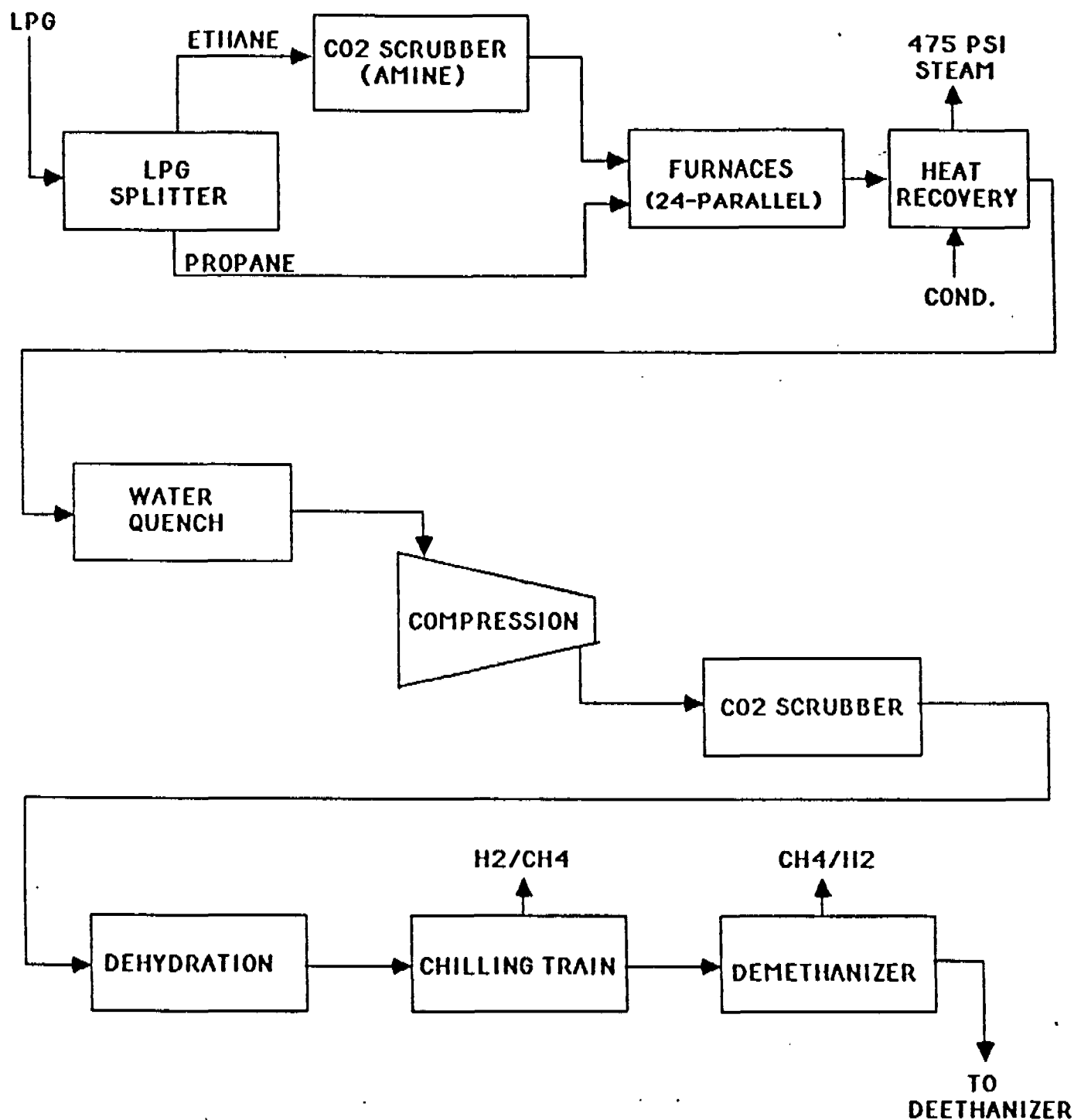
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LOUISIANA DIVISION
FLOW SCHEMATIC



Attachment 1
 Employees time weighted average potential exposure
 Chemical Benzene (TLV-TWA: 10ppm)
 LHC-2 LOUISIANA DIVISION

Results (ppm)	Duration (min)	Volume (L)	Employer Number	Date	Job or Location
< 0.11	480	23.66	area	5-29-87	East of oil P.T. (Blk 38)
3.28	480	23.66	area	5-29-87	Top of load rack (Blk 38)
< 0.11	480	23.66	area	5-29-87	East side API
3.52	480	23.66	area	5-29-87	West side API
< 0.11	480	23.66	area	5-29-87	Inside blk 38 shop
< 0.11	480	23.66	area	5-29-87	South side API
0.71	480	23.66	area	5-29-87	North end blk 38 shop
0.61	480	23.66	area	5-29-87	North end API
< 0.11	480	23.66	434241	8-25-87	Process SOT
< 0.11	480	23.66	433401	8-25-87	Mechanical SOT
< 0.11	480	23.66	433844	8-25-87	Furnace SOT
< 0.11	480	23.66	430642	8-25-87	Shift Supervisor
4.15	480	23.66	434319	8-25-87	API OT *
< 0.11	455	23.66	432211	8-25-87	Safety OB Tri Sept bed

NOTE * COMFO II RESPIRATOR WAS WORN

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FILLED IN BY Rock Gustin ATTACHMENT 2 DATE 0002-5085 TAG 10 ppm
 PLANT LHC-2 BLOCK 48 CHEMICAL Benzene MINIMAL DETECTABLE LIMIT AND UNIT 0.004 mg/ml
 LOUISIANA DIVISION PERSONAL EXCURSION * AREA

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Attachment 3
Employees time weighted average potential exposure
CHEMICAL TOLUENE (TLV-TWA 100ppm)
LHC-2 LOUISIANA DIVISION

Results (ppm)	Duration (min)	Volume (L)	Employer Number	Date	Job or Location
< 10.14	480	23.66	area	5-29-87	East of oil P.T. (Blk 38)
< 10.14	480	23.66	area	5-29-87	Top of load rack (Blk 38)
< 10.14	480	23.66	area	5-29-87	East side API
< 10.14	480	23.66	area	5-29-87	West side API
< 10.14	480	23.66	area	5-29-87	Inside blk 38 shop
< 10.14	480	23.66	area	5-29-87	South side API
< 10.14	480	23.66	area	5-29-87	North end blk 38 shop
< 10.14	480	23.66	area	5-29-87	North end API
< 0.09	480	23.66	434241	8-25-87	Process SOT
< 0.09	480	23.66	433401	8-25-87	Mechanical SOT
< 0.09	480	23.66	433844	8-25-87	Furnace SOT
< 0.09	480	23.66	430642	8-25-87	Shift Supervisor
0.80	480	23.66	434319	8-25-87	API OT *
< 0.09	455	22.43	432211	8-25-87	Safety OB Tri Sept bed

NOTE * COMFO II RESPIRATOR WAS WORN

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Attachment 5
 Employees time weighted average potential exposure
 Chemical Xylene (TLV-TWA 100ppm)
 LHC-2 LOUISIANA DIVISION

Results (ppm)	Duration (min)	Volume (L)	Employer Number	Date	Job or Location
< 11.37	480	23.66	area	5-29-87	East of oil P.T. (Blk 38)
< 11.37	480	23.66	area	5-29-87	Top of load rack (Blk 38)
< 11.37	480	23.66	area	5-29-87	East side API
< 11.37	480	23.66	area	5-29-87	West side API
< 11.37	480	23.66	area	5-29-87	Inside blk 38 shop
< 11.37	480	23.66	area	5-29-87	South side API
< 11.37	480	23.66	area	5-29-87	North end blk 38 shop
< 11.37	480	23.66	area	5-29-87	North end API
< 0.04	480	23.66	434241	8-25-87	Process SOT
< 0.04	480	23.66	433401	8-25-87	Mechanical SOT
< 0.04	480	23.66	433844	8-25-87	Furnace SOT
< 0.04	480	23.66	430642	8-25-87	Shift Supervisor
0.10	480	23.66	434319	8-25-87	API OT *
< 0.04	455	23.66	432211	8-25-87	Safety OB Tri Sept bed

NOTE * COMFO II RESPIRATOR WAS WORN

DO 099656
 CONFIDENTIAL

PLANT	LHC-2	BLOCK	48	CHEMICAL	Xylene	MINIMAL DETECTABLE LIMIT AND UNIT	0004 mg/ml
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LOUISIANA DIVISION

PERSONAL

EXCURSION

AREA

[illegible]

*PROTECTIVE EQUIPMENT. (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

Attachment 7
 Employees time weighted average potential exposure
 Chemical 1,3-Butadiene (TLV-TWA 10ppm)
 LHC-2 LOUISIANA DIVISION

Results (ppm)	Duration (min)	Volume (L)	Employer Number	Date	Job or Location
< 0.12	480	23.66	area	5-29-87	East of oil P.T. (Blk 38)
0.27	480	23.66	area	5-29-87	Top of load rack (Blk 38)
< 0.12	480	23.66	area	5-29-87	East side API
1.00	480	23.66	area	5-29-87	West side API
< 0.12	480	23.66	area	5-29-87	Inside blk 38 shop
< 0.12	480	23.66	area	5-29-87	South side API
< 0.15	480	23.66	area	5-29-87	North end blk 38 shop
< 0.12	480	23.66	area	5-29-87	North end API
< 0.76	480	23.66	434241	8-25-87	Process SOT
< 0.76	480	23.66	433401	8-25-87	Mechanical SOT
< 0.76	480	23.66	433844	8-25-87	Furnace SOT
< 0.76	480	23.66	430642	8-25-87	Shift Supervisor
0.50	480	23.66	434319	8-25-87	API OT *
< 0.80	455	22.43	432211	8-25-87	Safety OB Tri Sept bed

NOTE * COMFO II RESPIRATOR WAS WORN

DO 099658
 CONFIDENTIAL

PLANT LHC-2 BLOCK 48 CHEMICAL 1, 3-Butadiene MINIMAL DETECTABLE LIMIT AND UNIT 0.002 mg/ml

LOUISIANA DIVISION

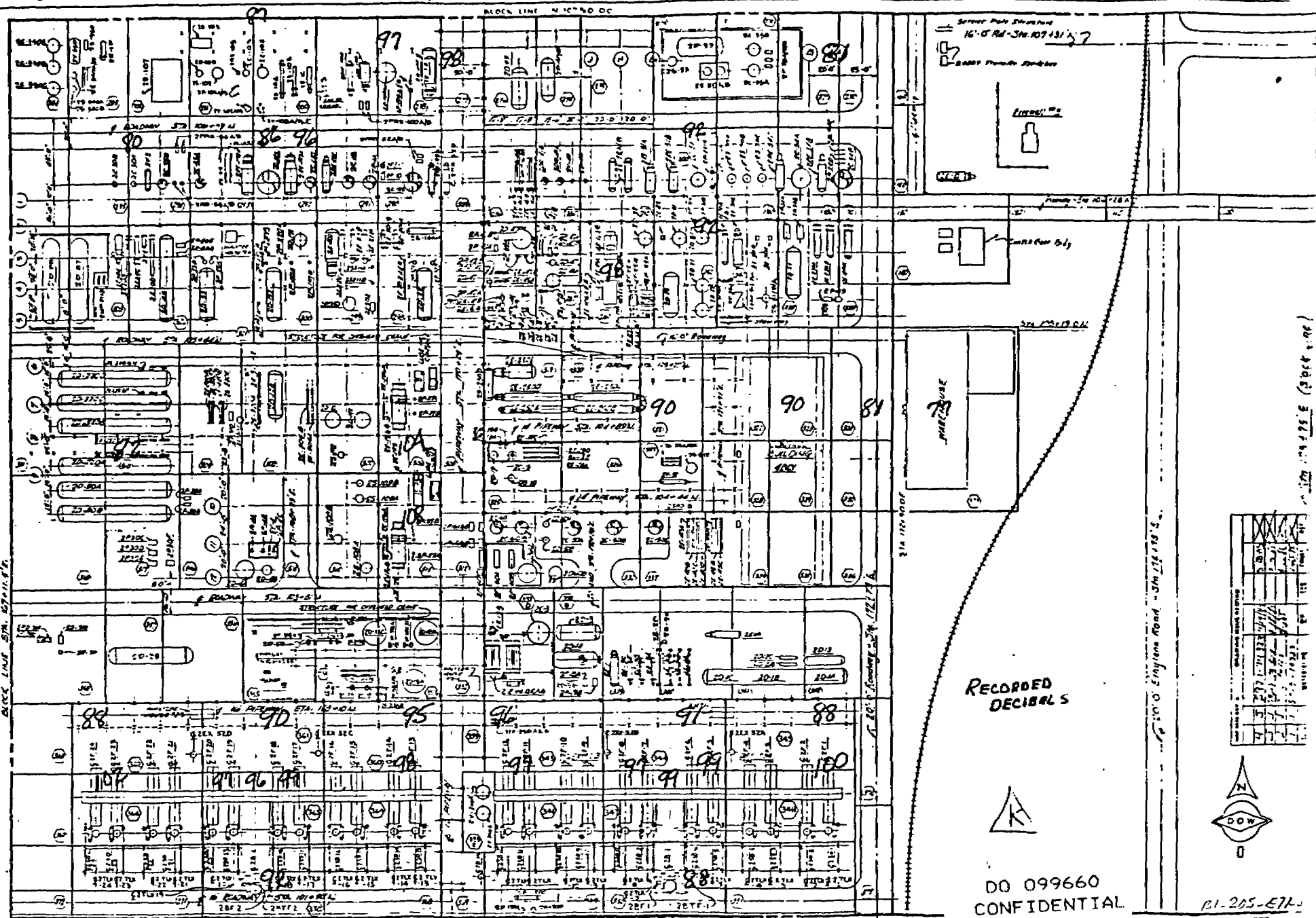
PERSONAL

EXCURSION

AREA

[illegible]

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

RECORDED
DECIBLSDO 099660
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B1-205-574

DATE PRINTED

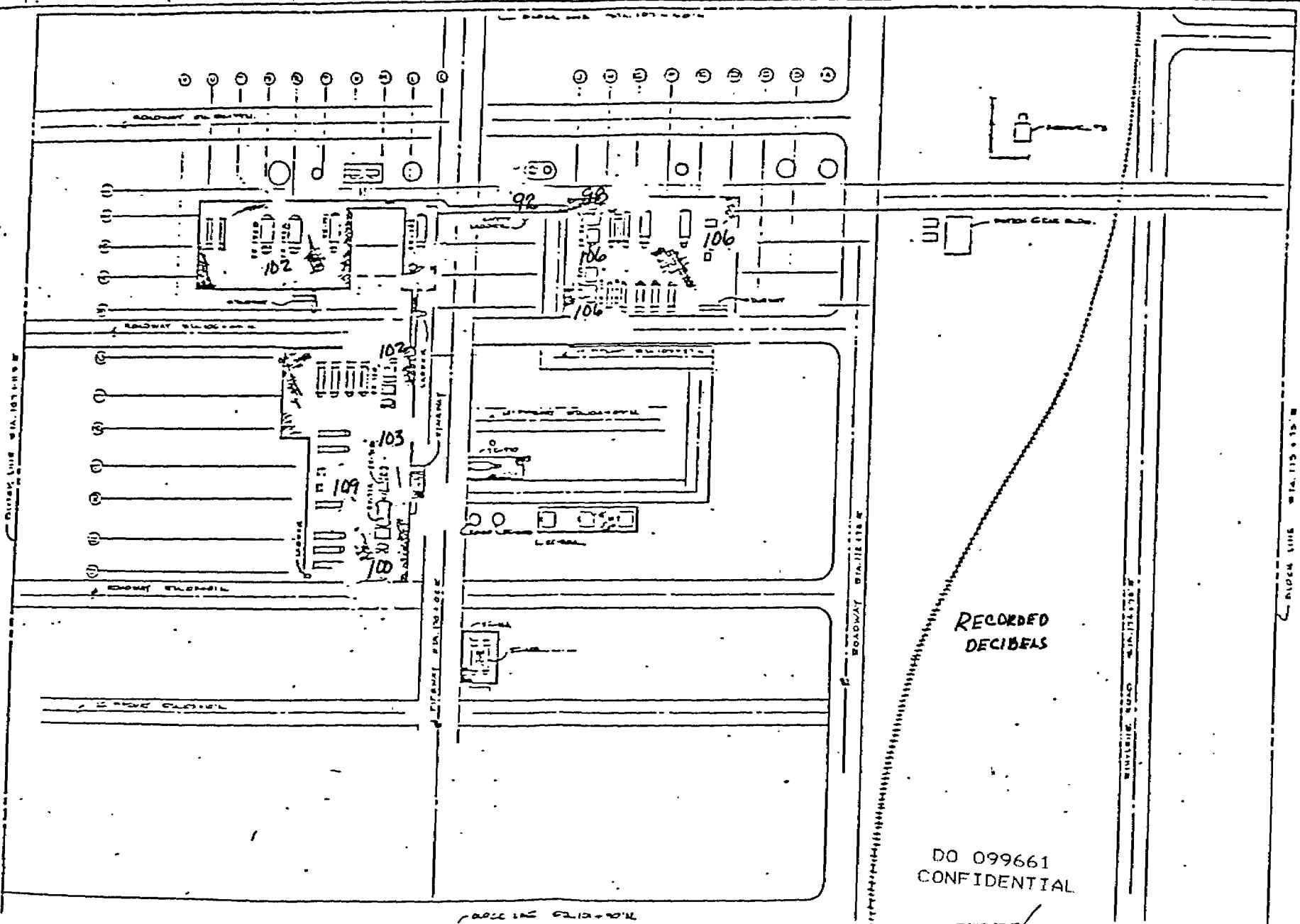
☐ NO ONLY
☐ CONSTRUCTION
☐ REFERENCE

JOB NO. (1102)

SEAL

 USED FOR
 JOB NO.
THE DOW CHEMICAL COMPANY
LOUISIANA DIVISION
 BY DATE APP. NAME CO. NO. REVISION
 ORIGINAL BY NO. 5711-7055
 BY DATE APP. NAME CO. NO. REVISION
 DESIGNED DATE

LOUISIANA DIVISION
LHC2
NOISE SURVEY



DO 099662
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