

SHELL OIL COMPANY

PLAINTIFF'S EXHIBIT

SH-2102

PRIVATE AND CONFIDENTIAL

DATE JULY 24, 1973

FROM D. P. ATWOOD

DATE REC'D:

8/10 TO

MR. H. L. KUSNETZ

✓ GGP
✓ RWB
WAB
BSB
GPB
JRC
HLI
DHKA
IRM
EMR
AGS

SUBJECT NIOSH - NATIONAL OCCUPATIONAL
HAZARD SURVEY - HOUSTON
REFINERY

Is. Handle

File map

This memorandum will summarize the National Occupational Hazards Survey which was conducted at the Houston Refinery during July 16-23 by Jerry D. Ransdell of the National Institute for Occupational Safety and Health - Office of Health Surveillance and Biometrics. Mr. Ransdell was accompanied by myself and Bob Bryan of the Houston Refinery Safety Department throughout the survey. In an opening interview with Mr. John Pratt, Houston Refinery Manager, Ransdell stated that the hazard survey was a research effort by NIOSH to identify materials to which workers are exposed. Information on the refinery's medical-health-safety program was also requested as shown on the attached questionnaire. During the walk-around survey of the refinery, Ransdell talked primarily to department managers. He did not walk through any refinery facilities except the wax plant, maintenance shop, refinery laboratory, garage, and MTM-R&D laboratories. He did not make any effort to talk to operating personnel. Also, he did not make any extensive effort to evaluate exposures, but did note ventilation facilities in the shop and laboratories.

Ransdell requested from the department managers information on the materials and physical agents to which the workers in their departments were "exposed" on either a once-a-week or cumulative 24-hour per year basis. His definition of being "exposed" was being subjected to gases, aerosols, and dusts; open containers of liquids; skin contact with materials; noise; heat; and radiation. Workers were not considered "exposed" to materials in enclosed pipes and vessels unless these materials were sampled or transferred in some way that they would become open to the atmosphere. Exposure to leaks of liquids, gases, and dusts were not recorded unless the leaks were "continuous" in nature.

For simplicity sake, Ransdell often classified materials as to whether they were aromatic, aliphatic, paraffinic, olefinic, etc., in nature rather than getting an exact breakdown of the streams. He tried to obtain information on all materials used in the refinery which fell under the once-a-week or 24-hour yearly cumulative exposure criteria whether they were considered toxic or not. This included process streams, chemical process additives, laboratory reagents, water treatment chemicals, garage materials, drafting materials, photographic chemicals, printing chemicals, and janitorial supplies. He collected detailed noise information from the refinery noise contour diagrams.

ARS-013124

LAM 030514

Exposure of all refinery personnel including managerial and professional staff were taken into account. The one weakness of the survey as I saw it was that Ransdell did not take time to walk through the process units and unit laboratories. A detailed list of materials recorded by Ransdell is attached.

Dys

Attachments

*Copies - G. Holzman
J. Pratt*

LAM 030515

ABS-013125

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
ROCKVILLE, MARYLAND 20852NATIONAL SURVEILLANCE NETWORK
NATIONAL OCCUPATIONAL HAZARD SURVEY
PREFACE

1. FACILITY NAME

SHELL OIL COMPANY

2. ADDRESS

DEER PARK REFINERY

3. CITY

DEER PARK

STATE

TEXAS

ZIP CODE

4. LEGAL OWNER (S)

CORP.

5. PERSON(S) INTERVIEWED

John Smith, Leonard Kowalski

NAME

TITLE

PART

6. AREA CODE

713

TELEPHONE NUMBER

477-2211

7. DATE SURVEY STARTED OR VISIT MADE

7-16-73

8. FACILITY IDENTIFIER

026 032

If mailing address or person to contact concerning information about the survey is different from that indicated above,
list the correct mailing address and contact below.

9. FACILITY NAME

10. ADDRESS

P.O. Box 1070

11. CITY

Deer Park

STATE

Texas

ZIP CODE

77536

12. ATTENTION

TITLE

AREA CODE

TELEPHONE NUMBER

LAM 030516

ABS-013126

NATIONAL OCCUPATIONAL HAZARD SURVEY

PART I--FACILITY HEALTH AND SAFETY SERVICES

1. Revision Code 1

2. Date Survey Started (Mo., da., yr.) 2 0 0 9 4

3. State Code 11 48 12

4. Facility Identifier Code 13 0119 18

5. a. What is your major activity?
mtg.

b. What are your chief products, services, lines of trade, etc.
petroleum fuels, lubricants, industrial solvents, water, asphalt

SIC Code if known 19 22

6. Approximately how many years has this facility been involved in this activity? 44 23 24

7. How many people are on your facility payroll for all shifts at the present time? 25 29

8. Of this number, how many are normally in the work areas as opposed to the administrative or other areas? 30 34

9. How many shifts do you have? 3 35

10. Has this facility received industrial hygiene services during the past year? 36

1 ☒ YES, FROM AN INDUSTRIAL HYGIENIST

2 ☐ YES, FROM A SAFETY ENGINEER (Skip to Question 13)

3 ☐ YES, FROM OTHER (Specify:)

(Skip to Question 23)

4 ☐ NO (Skip to Question 13)

11. Is the industrial hygienist based in this facility? 1 man week 37

1 ☐ YES

2 ☒ NO, BASED ELSEWHERE

3 ☐ NO, CONSULTING BASIS

4 ☐ NO, OTHER (Specify:)

5 ☐ NOT APPLICABLE

12. Estimate the average number of industrial hygienist hours that are devoted to your facility per month 38

13. Has your facility received safety engineer services during the past year? 1

1 ☐ YES, FROM A SAFETY ENGINEER BASED IN THIS FACILITY

2 ☐ YES, FROM A SAFETY ENGINEER BASED ELSEWHERE

3 ☐ YES, ON A CONSULTING BASIS

4 ☐ YES, OTHER (Specify:)

5 ☐ NO (Skip to Question 15)

14. Estimate the average number of safety engineer hours that are devoted to your facility per month 42

15. Is there a formally established health unit at this facility? 43

1 ☐ YES, PHYSICIAN IN CHARGE

2 ☐ YES, REGISTERED NURSE IN CHARGE

3 ☐ YES, LICENSED PRACTICAL NURSE IN CHARGE

4 ☐ YES, OTHER IN CHARGE (Specify:)

5 ☐ NO

16. Do you employ or have an arrangement with a physician or clinic to give your employees medical care? 44

1 ☐ YES, EMPLOYED FULL TIME

2 ☐ YES, EMPLOYED PART TIME

3 ☐ YES, ON CALL (Skip to Question 18)

4 ☐ YES, AT CLINIC (Skip to Question 18)

5 ☐ OTHER (Specify:)

(Skip to Question 18)

6 ☐ NO ARRANGEMENTS MADE (Skip to Question 18)

17. Estimate the average number of physician hours that are devoted to your facility per week 47

18. Do you have one or more nurses at this facility to provide care for employees? 48

1 ☐ YES

2 ☐ NO (Skip to Question 21)

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ABS-013127

PART I--(Continued)

19. How many registered nurses and licensed practical nurses are employed at this facility?

RN 52 53
LPN 54 55

20. Estimate the average number of nursing hours that are devoted to your facility per week

56 59

21. Do you have an employee at this facility with formal first-aid training, other than doctors or nurses, who has been designated to provide emergency treatment?

60

- 1 ☐ YES
2 ☐ NO

22. Do you record health information about a new employee on some regular form?

61

- 1 ☐ YES, ALL EMPLOYEES
2 ☐ YES, EXECUTIVE AND/OR MANAGERIAL ONLY
3 ☐ YES, OTHER EMPLOYEES
4 ☐ NO

23. Before new employees are hired or placed, are they required to take a medical examination?

62

- 1 ☒ YES, ALL EMPLOYEES
2 ☐ YES, EXECUTIVE AND/OR MANAGERIAL ONLY
3 ☐ YES, OTHER EMPLOYEES
4 ☐ NO

24. Do you require medical examinations of your employees who return to work after a sickness, or whose employment is terminated?

63

- 1 ☒ RETURN TO WORK ONLY
2 ☐ EXIT EXAMINATION AT TIME OF TERMINATION ONLY
3 ☐ BOTH
4 ☐ NEITHER

25. Do you provide periodic medical examinations or tests of any type for employees?

64

- 1 ☐ YES, ALL EMPLOYEES
2 ☐ YES, EXECUTIVE AND/OR MANAGERIAL ONLY
3 ☐ YES, OTHER EMPLOYEES
4 ☐ NO (Skip to Question 32)

26. Do you provide periodic ophthalmologic examinations for employees?

65

- 1 ☐ YES, ALL EMPLOYEES
2 ☐ YES, EXECUTIVE AND/OR MANAGERIAL ONLY
3 ☐ YES, OTHER EMPLOYEES
4 ☐ NO

27. Do you provide periodic audiometric examinations for employees?

- 1 ☐ YES, ALL EMPLOYEES
2 ☐ YES, EXECUTIVE AND/OR MANAGERIAL ONLY
3 ☐ YES, OTHER EMPLOYEES
4 ☐ NO

28. Do you provide periodic blood tests for employees?

- 1 ☐ YES, ALL EMPLOYEES
2 ☐ YES, EXECUTIVE AND/OR MANAGERIAL ONLY
3 ☐ YES, OTHER EMPLOYEES
4 ☐ NO

29. Do you provide periodic urine tests for employees?

- 1 ☐ YES, ALL EMPLOYEES
2 ☐ YES, EXECUTIVE AND/OR MANAGERIAL ONLY
3 ☐ YES, OTHER EMPLOYEES
4 ☒ NO

30. Do you provide periodic pulmonary function tests for employees?

- 1 ☐ YES, ALL EMPLOYEES
2 ☐ YES, EXECUTIVE AND/OR MANAGERIAL ONLY
3 ☐ YES, OTHER EMPLOYEES
4 ☐ NO

31. Do you provide periodic chest x-rays for employees?

- 1 ☐ YES, ALL EMPLOYEES
2 ☐ YES, EXECUTIVE AND/OR MANAGERIAL ONLY
3 ☒ YES, OTHER EMPLOYEES
4 ☐ NO

32. Do you have a regularly scheduled program to give employees flue or other immunizations?

- 1 ☐ YES
2 ☐ NO

33. Do you keep employee absenteeism records?

- 1 ☐ YES, SHOWING SPECIFIC NATURE OF SICKNESS WHEN PRESENT
2 ☐ YES, SHOWING ONLY THE TYPE OF ABSENCE
3 ☐ YES, WITHOUT SHOWING TYPE OF ABSENCE
4 ☐ NO

ABS-013128

PART I—(Continued)

34. What is your rate of unscheduled absenteeism (days per year per employee)?

19 20

35. Is there a formally established safety committee at your facility?

21 ☒

- 1 ☐ YES, INVESTIGATIVE
2 ☐ YES, POLICY SETTING
3 ☐ BOTH
4 ☐ YES, OTHER (Specify: e.g. advisory only)

5 ☐ NO

36. Do you have areas where personal protective devices are required or recommended?

22

- 1 ☐ YES, REQUIRED
2 ☐ YES, RECOMMENDED
3 ☐ YES, BOTH
4 ☐ NO (Skip to Question 39)

37. Who provides personal protective devices?

23

- 1 ☐ EMPLOYEE
2 ☐ EMPLOYER
3 ☐ BOTH
4 ☐ OTHER (Specify:)

5 ☐ NOT APPLICABLE

38. Who has been designated to see to it that personal protective devices are serviced and maintained?

24

- 1 ☐ INDIVIDUAL EMPLOYEES
2 ☒ EMPLOYER REPRESENTATIVE
3 ☐ BOTH
4 ☐ OTHER (Specify:)

5 ☐ NO ONE

6 ☐ NOT APPLICABLE

39. How do you carry your workmen's compensation insurance?

- 1 ☐ PRIVATE INSURANCE COMPANY
2 ☐ SELF-INSURED
3 ☐ STATE INSURANCE FUND
4 ☐ OTHER (Specify:)

5 ☐ NONE

40. Are any unions operating in this facility?

- 1 ☐ YES
2 ☐ NO

41. Is this facility a member of a national association or institute representing its industry or trade?

- 1 ☐ YES
2 ☐ NO

42. Do you have a program under which you regularly monitor the presence of fumes, gases, mists, vapors, dusts, noise, vibration, radiation, or other similar conditions?

- 1 ☐ YES
2 ☐ NO

43. Do you use a private sewage treatment plant or a septic tank to dispose of this facility's non-process sewage?

- 1 ☐ YES, PRIVATE SEWAGE TREATMENT PLANT
2 ☐ YES, SEPTIC TANK
3 ☐ YES, BOTH
4 ☐ NO

44. Do you have any drinking water other than that provided through a public water supply?

- 1 ☐ YES (Specify:)

2 ☐ NO (Skip to Question 46)

45. Is the private water supply routinely tested for bacteriological quality?

- 1 ☐ YES
2 ☐ NO
3 ☐ NOT APPLICABLE

ABS-013129

LAM 030519

PART I—(Continued)

46. Do you have any piped liquids other than drinking water?

☒ 32

1 ☒ YES (Specify:)

2 ☐ NO

47. Is there a separate identified eating area for your work area employees?

☒ 33

1 ☐ YES

2 ☐ NO (Skip to Question 49)

48. Are hand washing facilities provided within 200 feet of the eating area?

☒ 34

1 ☐ YES

2 ☐ NO

3 ☐ NOT APPLICABLE

49. May I see the Summary of Occupational Injuries and Illnesses (OSHA Form 102)?

Occupational injuries

35

Occupational Illnesses

Occupational skin diseases or disorders

38

Dust diseases of the lungs (pneumoconioses)

41

Respiratory conditions due to toxic materials

44

Poisoning (systemic effects of toxic materials)

47

Disorder due to physical agents (other than toxic materials)

50

Disorders due to repeated trauma

53

All other occupational illnesses. (Specify)

56

50. How many months are covered by the preceding figures?

59

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ABS-013130

NATIONAL SURVEILLANCE NETWORK
NATIONAL OCCUPATIONAL HAZARD SURVEY FORM

PART III—SURVEYOR CONFIDENTIAL

1. Revision Code

4

2	6	6	9	4
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2. Date Survey started (mo./da./yr.)

5										10
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3. State Code

11			12
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4. Facility Identifier Code

13											18
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5. Disposition of survey:

19

- 1 ☐ COMPLETED
- 2 ☐ PARTIALLY COMPLETED
- 3 ☐ REFUSED TO BE INTERVIEWED
- 4 ☐ COULD NOT BE LOCATED
- 5 ☐ OUT OF BUSINESS
- 6 ☐ TEMPORARILY CLOSED
- 7 ☐ OTHER (Specify:)

6. Number of Part II forms completed as a result of this survey

20				22
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7. How much time in hours and minutes, was spent on each of the following activities?

	HOURS		MINUTES	
TRAVEL TO AND FROM FACILITY	23	24	25	26
CONDUCT OF SURVEY	27	28	29	30
SAMPLE AND MEASUREMENT	31	32	33	34
WAITING AND DISCUSSIONS	35	36	37	38
COMPLETION OF SURVEY FORMS	39	40	41	42

8. Surveyor Identifier

43				45
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ABS-013131

PART III--(Continued)

9. Comments

LAM 030522

ABS-013132

HOUSTON REFINERY

<u>DEPARTMENT</u>	<u>STAFF</u>	<u>OPERATING</u>	<u>TOTAL</u>
<u>Engineering</u>			
Engineering Field - General	29	92	121
Engineering Field - Crafts			
Boilermakers	5	35	40
Bricklayers		2	2
Carpenters	1	15	16
Electricians	4	32	36
Linemen	1	8	9
Instrument Men	7	47	54
Insulators	2	17	19
Machinists	9	50	59
Painters	2	18	20
Pipefitters	8	77	85
Riggers		3	3
Tinners	1	5	6
Transitmen - Surveyors		4	4
Welders - W	2	26	28
Engineering Services	20	-	20
<u>Operations - East</u>			
Aromatics-East	5	28	33
Aromatics-West	5	19	24
Catalytic Cracking	5	24	29
Catalytic Reforming	5	22	27
Environmental Conservation	1	6	7
Gas Recovery	5	24	29
Hydrocracking	4	19	23
<u>Operations - West</u>			
Alkylation	5	23	28
Distilling	5	32	37
Lubricating Oils	16	100	116
Solvents and Treating	4	19	23
Thermal Cracking	5	19	24
<u>Others</u>			
Dispatching	14	72	86
Purchasing Stores		11	11
Refinery Laboratory	26	53	79
Safety	7		7
Utilities	12	56	68
<u>Managers, Professionals, Office Workers</u>	258		258
<u>SUBTOTAL - REFINERY</u>	473	958	1431
<u>MTM Process R & D Laboratory</u>			
Managers	4		4
Professionals	87		87
Supporting Staff	117		117
<u>SUBTOTAL - RESEARCH</u>	208		208
<u>TOTAL - REFINERY & MTM PROCESS R & D</u>	681	958	1639

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ABS-013133

Houston Refinery Lab - Reagents used at
least once per week
or cumulative 24 hr
per year.

Hydrocarbons & Solvents-

Isooctane
Benzene (H)
Toluene (H)
n-Heptane
n-Butane
Isocetane
Isopentane
n-Pentane
Butylones
Various Proprietary Hydrocarbon Solvents

Halogenated Hydrocarbons-

Chloroform
Methylene Chloride

Hetero-Organics -

Acetone
Acetic acid (various dilutions)
Isopropyl Alcohol
Methyl Alcohol
Methyl Isobutyl Ketone
Methyl Ethyl Ketone
Dimethylsulfoxide
Phenolphthalien (solution)
Potassium Acid Phthalate (solution)
s-Diphenylcarbazine

Inorganics-

Hydrochloric Acid (various conc. Solutions)
Sodium Hydroxide
Sulfuric Acid
Nitric Acid
Potassium Iodide
Silver Nitrate
Sodium Thiosulfate
Lead Oxide
Potassium Bromide
Potassium Bromate
Potassium Chloride
Sodium Fluoride
Sodium Carbonate
Potassium Dichromate
Ammonium Hydroxide
Iodine
Potassium Permanganate
Sodium Borohydride

Misc.-

Silica Gel, Clay, Starch, Alumina, Celite, Searls (magnesia)

LAM 030524

ABS-013134

MATERIALS USED FOR JANITORIAL NEEDS

<u>Description</u>	<u>Manufacturer</u>
HAND SOAPS:	
Boraxo Powder Soap	US Borax Company
Liquid Hand Soap	Brawner Paper Company
Dial Bar Soap	Armour Dial Company
Palmolive Bar Soap	Colgate Palmolive Company
Lava Bar Soap	Proctor & Gamble Company
SCRUB STRIPPER & MOP:	
NL Concentrate	National Laboratories, Inc.
Liquid Power	" "
Brawnco Concentrate	Brawner Paper Company
Solorene Stripper	Solorene Company
CLEANSING CREMES:	
SBS Hand Cleanser	Sugar Beet Products
NL Creme Cleanser	National Laboratories, Inc.
Lab Brite Creme	Lab Automated Chemical Co.
DISINFECTANTS & DEODORANTS	
Urinal deodorants	Brawner Paper Company
Soft Pine	(TM) Pop Company
Lysol Spray	Lehr & Fink Company
Drip Deodorant	Research Chemical Co.
Springtime Air Freshner	Chase Products Company
Apple Blossom Spray	Brawner Paper Co.
Car Wash Soap	Triangle Chemical Company
RUG SHAMPOO & BOWL CLEANSER	
Rug Shampoo	Standardized Sanitation System
Babo	Babbitt Products Company
Santi-Flush	Boyle Midway Company
Mule Kick	J. A. Sexaun Company
Brawnco Bowl Cleanser	Brawner Paper Company
Chlorox	Chlorox Company
FLOOR WAXES	
Super West Wax	West Chemical Products
Metalist Floor Wax	National Laboratories

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<u>Description</u>	<u>Manufacturer</u>
FLOOR SEALERS	
Duration Floor Seal	National Laboratories
Cork Floor Seal	Johnson's Wax
Velvashene	Majestic Wax Co.
FURN. POLISH & GLASS CLEANER	
Spray Windex	Drackett Company
Scratch Remover	Boyle Midway Company
Lemon Pledge Polish	Johnson's Wax
MISCELLANEOUS	
Salt Tablets	Cesco Safety Product Co.
Shell Tox	Shell Oil Company
Metal Polish	Dars Met All Industries
Boot Bath	Onox, Inc.

7/73

LAM 030526

ABS-013136

MATERIALS NOTED BY J. RANDELL DURING NIOSH HEALTH HAZARDS SURVEY

Catalytic Cracking

Slurry oil
 H_2SO_4
 Na_3PO_4
Silica-alumina catalyst
Chlorine
Wrico cooling water additive
Soda ash
Sodium sulfite
LGO
HGO
Hydrotreater feed
Laboratory reagents

West Aromatics

Sulfolane
 H_2SO_4
— Monoethylamine
Benzene, toluene, xylene
 C_6 paraffin
 C_7 paraffin
Ionol
Cleanup detergent - Cesco
Lubricating oils - Turbo 33, 41
Wrico cooling water additive
Chlorine

Catalytic Reforming

Reformer product (60% aromatic)
Isopropyl alcohol
Sodium nitrite
Sodium phosphate
Sodium sulfite
Turbo 25 lubricating oil
Cesco detergent
Chlorine
Chromate additive to cooling water

Gas Recovery

Hydrogen
Methane
Ethane
Hydrogen sulfide
Light hydrocarbons (mixed C_3 and C_4)
— Diethanolamine
Laboratory reagents - sulfuric acid
potassium iodide
sodium thiosulfate
Doctor's solution

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ABS-013137

Sodium hydroxide
Distillate hydrotreater - sour gasoline
 kerosene
 heavy gas oil
Sour water stripper - sour water - H₂S
 - NH₃
Turbo 27, 33, 34 lubricating oils
Molecular sieves

Hydrocracking

Hydrogen plant - sulfolane
sulfanol
diisopropyl alcohol
caustic
H₂S in feed stream

Hydrocracker - difluoroethane
triethylane glycol
furnace oil additive
H₂S
Turbo 25 lubricating oil
Cesco detergent

Aromatics East

Paraxylene plant - xylenes
 HDU - sweet and sour kerosene
 " " " naphtha
 H₂S
 Platformer II - platformate
 sweet naphtha
 trichloroethylene
 Turbo 27 lubricant
 Tellus 33, 69 oils
 Darina AX grease

Lubricating Oils

Lubricating oils
Extracts, raffinates
Phenol
MEK
Toluene
H₂S
NH₃
Ionol
Bauxite (Ransdell took special note of dusty condition.)
Silicone aerosol - wax plant

Alkylation

H₂SO₄

Caustic

NH₃ (small releases periodically)

Alkylate streams

Propane, butane, butylene streams

Lubricating oils - Turbo 27, 33, 40, 41, 69

Mysella Oil

Talona 40 Oil

49A Solvent

Dispatching

Aromatic solvents

Aliphatic solvents

Olefins (in gasoline)

Gasolines

Fuel oils

Kerosene

Lubricating oils

DD

Dichloroethylene

ECH

EC

Ketones

Alcohols

Crude oil

Refinery solvents

Aviation gasoline

Jet fuel

Diesel fuel

TEL

Solvents and Treating

Cyclosol 53 and 63

Shell Sol 140, 340, 71

VM&P Naphtha

N-pentane, isopentane

Sulfolane

H₂SO₄

Caustic

Aniline (laboratory)

HCl (laboratory)

LAM 030529

ABS-013139

Thermal Cracking

Naphtha
Flash distillate
Thermal gas oil
Flashed residue
No. 6 fuel oil
Heavy flasher tops
Pitch
Dow-Corning silicone additive
Shell Chemical slop stream

Distilling

Heavy flash distillate
Toluene (lab)
Butane
Gasolines and naphthas
Turbine fuel
Heavy gas oil
Extra heavy gas oil
Residues
Pitch
Wrico cooling water additive
Kontrol 424 additive
Kontrol 430 W additive
Shell parts loosener (aerosol)
IPA (winter)
Laboratory - Doctor solution
 phenolphthalein
 silver nitrate
 acetic acid
 methyl orange indicator
 potassium chromate

Utilities

Sodium sulfite
Glycol antifoam
Sodium nitrate
Caustic
H₂SO₄
Disodium phosphate
Liquid alum
Chlorine
Metaphosphate
Sodium chromate

LAM 030530

ABS-013140

Laboratory - n amino acid solution
 oxalic acid solution
 molybdate solution
 Nitrover 4
 methyl orange indicator
 acetic acid
 Lubricating oils - Turbo 27, 33
 Darina grease

Maintenance

I. Boilermakers and Riggers

UV (assist welders)
 SO₂ (from cutting out trays)
 Shell parts loosener (aerosol)
 Smoke/fumes from abrasive saw
 Cutting oils (Drumms B)
 Silica (from sandblasting)
 Noise - surface grinder
 impact wrenches
 turbining operation
 Dust - surface grinder - steel
 copper
 stainless steel
 aluminum
 Bundle cleaning - dilute HCl
 Aquaness Chronox 650 inhibitor
 aromatic gas oil
 neutralizer - calgon phosphate

 H₂S
 Actex detergent
 Cesco detergent
 49A solvent
 Dowell detergent

II. Bricklayers

Dust from brick saw
 " " mortar - portland cement
 - asplit cement
 " " chipping guns
 Ceil Kote Corobond acid (dry and liquid)
 Gen. refractory plastic chrome ore
 Litecast 50 refractory

LAM 030531

ABS-013141

III. Carpenters

Wood dust (pine, redwood)
Plexiglass dust
Formica dust
Noise
Ace vinyl tile adhesive
Armstrong cone base cement
Weldwood - contact cement
 panel adhesive
 white glue
 plastic resin glue
Epoxy glues

IV. Electricians

Yellow 77 wire pulling lubricant
Glyphol
WD-40 aerosol
LPS-3 rust inhibitor
49A solvent
Shell parts loosener (aerosol)

V. Linemen

Tallow flux
Chico A sealing compound
Lead (lead burning)

VI. Instrument Men

Same materials as electricians
Freon
Carborundum lapping cpd.
Rosin core soldering
Shell parts loosener

VII. Insulators

Kaylo insulation
Johns Manville Thermal 12
Polyurethane insulation
Pabco Super Cal Temp
Silicated soda glue (premixed liquid)
Benjamin Foster weatherproofing
Miracle construction adhesive

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ABS-013142

VIII. Machinists

Shell parts loosener
 49A Solvent
 Drummus B cutting oil
 Lubricating oils - Turbo 33, 27
 Lathe off fluid (prussian blue)
 White lead
 Teflon dust
 Metallizing fume (very little done)

IX. Painters

Silica (sandblasting)

MEK

Naphtha

Paints - Matcote

1. Epoxy Phenol 850
 No. 76 thinner (50% toluol)
2. Shell green 2-LD-591 (epoxy ester)
 Naphtha thinner
3. Black Hi build Chemical Resistant
 (Coal tar epoxy)
 No. 60 thinner
4. Acid Resistant Coating No. 5-950
 (Butyl rubber)
 Naphtha thinner
5. 0-2 resin
 0-3 Bisphenol polyester
6. 1-26 Epoxy mastic
- Randolph Co. - Epoxy Mastic Ring 101
- Cooks - Polyamide catalyzed epoxy primer with 255-C-5 thinner
- Napco
 1. Interior and exterior latex
 2. Napseal
- Carboling Co.
 1. Inorganic zinc No. 11 primer
 No. 33 thinner
 2. HB 190 Epoxy coating
 No. 33 thinner
- Shell standard
 1. Read lead epoxy ester - Naphtha thinner
 2. White epoxy ester - Naphtha thinner
 3. Catalyzed epoxy white - Naphtha thinner
 4. Catalyzed epoxy light grey - Naphtha thinner
 5. " " dark " " "
 6. Black epoxy ester - Naphtha thinner
 7. Internal coat High build epoxy catalyst - white - Naphtha thinner
 8. High build cold cure - white - Naphtha thinner
 9. Epanol zinc primer - MEK thinner

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Paints - G.E. - Gyptal water resistant coating for motors
 " - Sherwin Williams
 Bulletin enamels
 Black #105058
 Red #105589
 White #105619
 Yellow #105732
 Green #105201
 Blue #105384
 Scotchlite finishing clear #700
 Pastes - Roseanna burnt and raw umber
 " " " " sienna
 Black
 Naphtha thinner
 Devcon plastic steel

X. Pipefitters

Shell parts loosener
 Hi Temp-Low Temp pipe thread lubricant
 Pipe dope
 Drumms B cutting oil

XI. Tanners

Lead tin soldering (Muriatic acid flux)
 Silver soldering - 1601 rod
 1601 flux (60% Ni)
 Brazing-brass rod
 Brass, Cu, galvanized soldering - No. 18 rod
 - No. 18 flux
 Lead soldering - No. 430 allstate flux
 - No. 430 solder
 Stainless steel - 2520 heliarc rod
 Electrical work - acid core solder
 - rosin core solder
 Argon gas shield welding

XII. Welders

Weld on carbon steel
 " " stainless steel
 " " chrome
 " " brass
 " " Hastelloy
 Brazing - brass

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Refinery Laboratory - See attached list of materials plus below.

I. UV Section

Cyclosol 53 and 63
Sulfolane
Lube oils
Acetone
Isooctane
Methanol

II. Wax Section

Waxes
Lube oils
Extracts (Dutrexes)
MEK (hood)

III. Refractive Index Section

Benzene (hood)
Toluene (hood)
Xylene (hood)
Aliphatic solvents
Cyclosol 53 and 63
Aniline (hood)
Gasoline
Fluorescent dye
Sulfur
Iridium

IV. Gasoline Distillation Section

Solvents - aliphatic
Gasoline
Turbine fuel
Gas oils
Diesel fuel
Light lube fraction
Heavy fuels
Cyclosol 53 and 63
Benzene, Toluene, Xylene (hood)

V. Vapor pressure section

Gasoline
Furnace oil
Diesel fuel
Lube oils
Doctor's solution (hood)

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VI. Viscosity Section

Diesel fuel
 Fuel oil
 Lubricants
 Aromatic and aliphatic solvents
 Acetone

VII. Routine Analysis

Karl Fisher reagent
 Gasolines
 Turbine fuel
 Aromatic and aliphatic solvents
 Fuel oils

VIII. Miscellaneous Analysis

Silica Alumina catalyst
 Turbine fuels
 Solvents - aromatic and aliphatic

IX. Motor Laboratory

TEL (hood)

Automotive

49A solvent
 Shell parts loosener
 Asbestos brake lining
 Welding (no ventilation)
 Tire repair - cold vulcanizing fluid
 - special vulcanizing cement
 - Shell rubber lubricant (Donax R)
 Body shop - white streak plastic solder
 (polyester resin) and cream
 hardener (50% benzoyl peroxide,
 50% benzyl phthalate).
 -Duroglass filler and cream hardener
 -Du Pont 303 S polishing cpd.
 -E-716 windshield repair sealant
 -Bordon's sparver spray primer
 - " " " finish
 -Krylón high heat spray paint

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Body shop - Du Pont 80S red oxide high speed lacquer type primer surfacer
(cont.)

" 3661S Mid temp acrylic lacquer thinner
" 3919S Prep sol solvent
" 3864S Varitemp Enamel Reducer
" 3924S Gun and Equipment Cleaner
" 3979S Acrylic Lacquer Retarder
" 22S Refinish Sealer
" 826S Corlar Epoxy Activator
" Corlar Epoxy Resistent Enamel
" Delux Enamel - different colors
Cook Maintenance Finisher No. 112 Epon polyamide primer
" Curing Agent 256-C-047
Lucite acrylic lacquers - different colors

(Ransdell recorded respirators used for spraying and sanding.)

First Aid - Medical

Zephiran chloride
PhisoHex
Septisol
Chlorophenyl
Benzene (very little used)

Engineering Services (Inspectors)

Glycerine (lubricant)
Shell ETRD grease
Fluorescent powder (Zaglow weld inspection)

Duplicating

AB Dick 4-1235 offset automatic blanket cleaner solution (kerosene and alcohol)
" " 4-4315 offset roller cleaner and blanket wash
" " offset glaze remover
" " offset etch
" " offset ink
Eastman multilith stop bath
" " activator
Fountain solution pro 3
Multilith platex solution
3M "R" process gum
" " developer
Zerex toner
Waterless hand cleaner
UV light - Carbon Nu Arc platemaker

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Secretaries

Liquid paper

Drafting

Higgins and Pelican india inks
NH₃ - blueprint machine (vented)

Janitorial

List of supplies is attached.

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MTM Research & Development

Analytical (J. Mortimer)

Gasolines
Aliphatic and aromatic hydrocarbons
Ketones
Alcohols
Isooctane
CCl₄ (hood)
CS₂ (hood)
Acetone and IPA (cleaning)
Toluene (cleaning)

Analytical (Hodgson)

I. Product Characterization

IPA
Fluorescent dye
Acetic acid
Potassium bromate
Toluene
Maleic anhydride
Ethyl ether
Caustic
Pentane
Karl Fisher reagent

II. Physical Measurements

Benzene (hood)
Xylene (cleaning)
Acetone (cleaning)

III. Catalyst Characterization

Ascarite-caustic on asbestos (respirator used)
Dehydrite-magnesium perchlorate
Acetone (hood)

IV. Catalyst Composition

Acids (hoods)

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V. Organic Elemental

Ascarite
 H_2SO_4
 3% H_2O_2
 $BaCl_2$
 SO_2
 Hg (hood)

Petroleum Processing and Engineering

I. Catalytic Cracking and Alkylation Section

Silica alumina catalyst
 H_2SO_4
 Petroleum distillates
 Propylene, butylene, light olefins, isoparaffins

II. Special Projects Section

Distillate fuels
 Turbine fuel
 Water based emulsions
 Naphtha (cleaning)
 H_2S
 Diisopropylamine
 Motor oils
 Crude oils
 Lube pilot plant - Toluene, MEK, Phenol (seldom used)
 Asphalt lab - asphalt, xylene, heptane, MEK, lube oil extracts,
 pyroforic acid, ferric chloride, cutback oils
 Jet fuel lab - NaOH, acetone, IPA, Karl Fisher reagent, DIPA, Ionol

III. McCullough Section

Cat cracking - silica alumina catalyst
 radioisotope tagging (film badge worn)
 acetone, toluene
 surfactants
 Pyrolysis - ethylene
 gas oils
 Hydrotreating - naphtha
 heavy oils
 radioactive HC (film badge worn)
 Gamma sources (to measure levels in vessels)

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Petroleum Chemistry and Catalysis

I. R. H. Coe Section

Gasolines

Various catalysts - alumina impregnated with nickel, cobalt, etc.
(prepared in dry box)

Pentanes, hexanes

Methyl bromide

Heavy oils

HCl (hood)

II. W. Hinds Section

C7-C9 feedstocks

Benzene, toluene, xylene (In building - general mechanical ventilation
plus local exhaust over sample spots)

Lube oils

Waxes

Nickel salt and phosphine compounds (handled in dry boxes and hoods)

Toluene (cleaning)

H₂S (hood)

HCl (hood)

Cl₂ (hood)

Acetone

Silicone lubricants

III. C. Adams Section

EPC - Cat. cracked gas oil (400-700°F bp)

H₂S

CO

Toluene (cleaning out vessels)

Annex A - hexane, pentane

C₅-C₈

xylene

Wet chemistry - silicates

aluminates

caustic

HCl

n-hexane

benzene (hood)

toluene and acetone (cleanup)

x-ray diffraction (film badge worn)

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Photography Lab

Kodak - D-76 developer
kodalith developer
dectol developer
ectomatic activator
rapid fixer
stop bath (dil. acetic acid)
sequestering agent
ectomatic stabilizer
foto flow solution
Nu Arc glass cleaner
3M color key developer
Photocolor matte spray
NH₃

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ADMINISTRATION: Protection
Health
General
1978

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