ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ENFORCEMENT
EPA 330/2-76-013

REPORT ON

State Implementation Plan Air Pollution Inspection of Douglas Oil Company

LOS ANGELES COUNTY, CALIFORNIA

NATIONAL ENFORCEMENT INVESTIGATIONS CENTER
DENVER, COLORADO
AND
REGION IX, SAN FRANCISCO, CALIFORNIA

FEBRUARY 1976

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ENFORCEMENT

STATE IMPLEMENTATION PLAN

INSPECTION OF

DOUGLAS OIL COMPANY OF CALIFORNIA
14708 Downey Avenue
P.O. Box 198
Paramount, California 90723
213/531-2060
September 22, 1975

February 1976

NATIONAL ENFORCEMENT INVESTIGATIONS CENTER - Denver, Colorado
and
REGION IX - San Francisco, California

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INTRODUCTION

Background

Douglas Oil Company of California (Douglas) operates a petroleum refinery at this location with a rated capacity of from 6,360 to 7,160 m^3 (40,000 to 45,000 bbl)/day. Average refinery capacity is 6,680 m^3 (42,000 bbl)/day. The refinery processes heavy crude oils from California (approximately 25% Wilmington and 25% Ventura), Arabia (20%), and Bolivia or Indonesia (30%). This refinery also finishes napthas and other condensates produced at a second Douglas refinery at Santa Maria, California. Finished products from the Paramount, California refinery include gasoline, JP-4 and JP-5 jet fuels, diesel fuel, low sulfur fuel oil and various grades of asphalt.

The Douglas refinery employs 120 people and operates three 8-hour shifts per day, 7 days a week, year around.

On September 22, 1975, a process inspection was conducted at this facility by NEIC personnel. The inspection was preceded by a letter to the Company [Appendix A] on September 8, 1975, announcing NEIC's intention to inspect the facility and requesting substantial amounts of process and source information. Subsequent to the inspection, Douglas personnel mailed NEIC the requested information.

During the inspection, an examination was made of the manufacturing equipment, potential air pollution sources, and air pollution control equipment. The purpose of this inspection was to evaluate the degree of compliance of this facility with the requirements of the Federally approved State Implementation Plan as required by Section 110 of the Clean Air Act, as amended.

Company personnel were very cooperative during this inspection. They supplied all EPA requested information during the inspection interview or by subsequent letter.

Inspection Participants

Mr. H. E. McFarlin-Chief Engineer, Douglas
Mr. J. J. Lusardi-Senior Engineer, Douglas
Mr. R. M. Robinson, Coordinator Environmental Conservation, Conoco Oil Company, Houston, Texas
Mr. Raak Veblen, State of California Air Resources Board (ARB)
Mr. Royce R. Haley, Los Angeles County Air Pollution Control District (LAAPCD)
Mr. Lloyd Kostow, USEPA, Region IX
Dr. Wayne C. Smith, USEPA, NEIC
Mr. David L. Brooman, USEPA, NEIC

Applicable Regulations

The following rules contained in the Rules and Regulations of the Los Angeles County Air Pollution Control District (LAAPCD) [details in Appendix B] are applicable to the State Implementation Plan for this facility.

Rule 50. Ringelmann Chart
Rule 51. Nuisance
Rule 53. Sulfur Compounds-Concentration
Rule 53.2 Sulfur Recovery Units
Rule 56. Storage of Petroleum Products
Rule 59. Effluent Oil/Water Separators
Rule 61. Organic Liquid Loading
Rule 62. Sulfur Content of Fuels
Rule 67. Fuel Burning Equipment
Rule 68.1. Fuel Burning Equipment-Combustion Contaminants
Rule 69. Vacuum Producing Devices or Systems
Rule 70. Asphalt Air Blowing
Rule 71. Carbon Monoxide
Rule 72. Pumps and Compressors
Rule 73. Safety Pressure Relief Valves

PROCESS DESCRIPTION

The major processes at the Douglas refinery are crude desalting, atmospheric distillation, vacuum distillation, catalytic reforming, distillate hydrotreating, gas/oil desulfurization, naptha desulfurization, asphalt blowing, and sulfur recovery. A simplified process block flow diagram for the facility is shown in Figure 1. Table 1 lists the unit capacities for each of these processes.

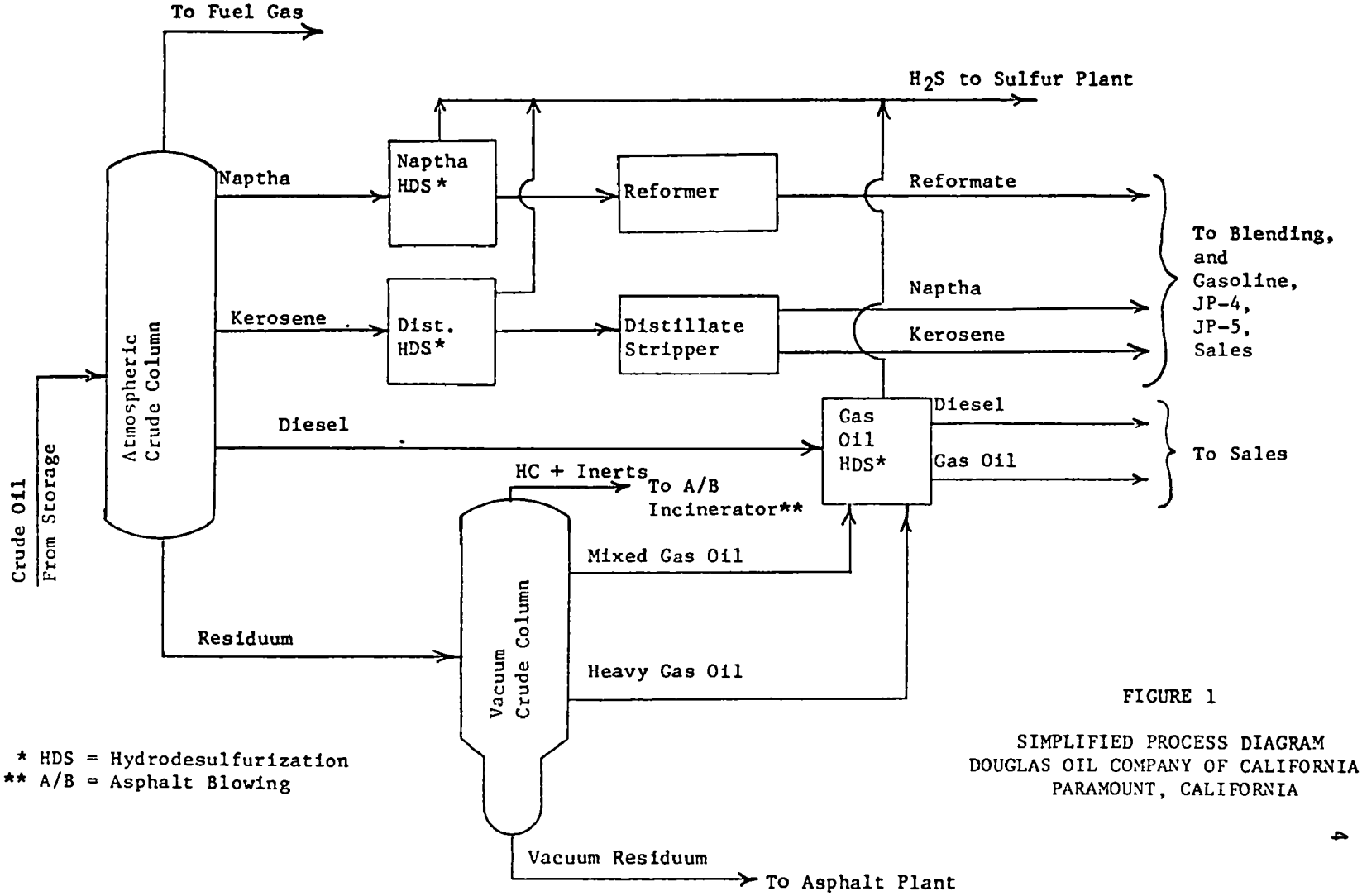
POTENTIAL SOURCES OF AIR POLLUTION EMISSIONS AND RELATED CONTROL EQUIPMENT

The major unit processes at this refinery are closed systems. Release of materials to the atmosphere is discouraged because such releases would result in loss of product. The process heaters attendant to these units and the steam boilers constitute the main emission sources. There are also a large number of relatively small potential sources of emissions related to the operation of the refinery. Such sources include leaks from valve seals, pump seals, and pipe flanges, and evaporative losses from storage tanks and process wastewater drains. Potential sources of emissions and their related control equipment are discussed herein.

Process Heaters and Boilers

There are twenty-two process heaters and four steam boilers at this refinery, ranging in size from 0.3×10^6 kg cal (1.3×10^6 Btu)/hr to 10.6×10^6 kg cal (42×10^6 Btu)/hr. A complete listing of these units is presented in Table 2.

The majority of these units can utilize natural gas or refinery fuel gas and/or fuel oil as fuel. The remainder are fueled with natural gas or fuel gas only. The fuel oil is a low sulfur variety



* HDS = Hydrodesulfurization
** A/B = Asphalt Blowing

FIGURE 1

SIMPLIFIED PROCESS DIAGRAM
DOUGLAS OIL COMPANY OF CALIFORNIA
PARAMOUNT, CALIFORNIA

Table 1

PROCESS UNITS AND RATED CAPACITIES
Douglas Oil Company of California - Paramount, California

Process Unit	Capacity (m^3/SD)†	Capacity (bbl/SD)†
No. 1 Crude Unit	3,580	22,500
No. 2 Crude Unit	3,580	22,500
Catalytic Reformer	1,910	12,000
Distillate Hydrodesulfurizing	1,270	8,000
Gas/Oil Hydrodesulfurizing	1,590	10,000
Naptha Hydrodesulfurizing	1,910	12,000
Asphalt Blowing	160	1,000
Claus Sulfur Plant		
Unit No. 1	25 m tons/day	25 tons (l)/day
Unit No. 2	7 m tons/day	7 tons (l)/day

† *SD = Stream DAy; All units are m^3/SD or bbl/SD unless noted.*

TABLE 2
PROCESS HEATERS, BOILERS, AND INCINERATORS
Douglas Oil Company of California - Paramount, California

Unit No.	Identification	Rated Capacity Heat Absorber/hr		Fuel Gas Usage per hr		Fuel Oil Usage per hr		Stack Height		Stack Cross Section Area		Stack Temp		Estimated Stack Velocity	
		10^6 kg cal	10^6 Btu	$10^3 m^3$	10^3 ft^3	liters	gals	m	ft	m^2	ft^2	°C	°F	m/sec	ft/sec
H-1	Asphalt Oxidizing Plant Heater	1.3	5	0.24	8.5	210	55	22	72	0.46	4.9	416	780	4.0	13
H-2	Asphalt Oxidizing Plant Heater	1.3	5	0.24	8.5	210	55	22	72	0.46	4.9	416	780	4.0	13
H-101	Naptha Desulf. Charge Heater†	4.7	18.8	0.86	30.4	None		10	34	1.00	11	482	900	7.0	23
H-102	No.2 Crude Unit Vacuum Heater	5.2	20.5	0.80	28.4	695	183	20	67	0.52	5.6	416	780	5.5	18
H-301	Gas Oil Desulf. Rerun Tower Htr.†	6.8	27	1.14	40.3	None		15	48	1.9	20	504	940	5.5	18
H-302	Gas Oil Desulf.Charge Heater†	3.8	15	0.63	22.4	None		15	50	0.4	4	482	900	7.3	24
H-303	Reformer Charge Heater†	7.1	28.3	1.30	45.8	None		16	51	2.2	24	343	650	4.0	13
H-304	Reformer Charge Heater†	7.1	28.3	1.30	45.8	None		16	51	2.2	24	324	615	4.0	13
H-305	Reformer No.1 Intermed. Heater†	4.8	19.0	1.05	36.9	None		14	47	1.9	20	346	655	4.0	13
H-306	Reformer No.2 Intermed. Heater†	3.5	13.7	0.75	26.6	None		14	47	1.42	15.3	354	670	3.7	12
H-452	SCOT Unit Charge Heater	0.3	1.3	0.06	2.2	None		6	20	0.07	0.8	260	500	13	43
H-501/ H-502	Distillate Hydrotreater Charge/Reboiler Heater†	5.3	21	0.82	29	None		15	50	0.89	9.6	349	660	6.4	21
H-601	No.2 Crude Unit Charge Heater	9.6	37.9	1.49	52.6	1280	338	24	80	1.82	19.6	399	750	5.8	19
H-701	Asphalt Loading Heater	2.8	11	0.53	18.8	460	121	20	66	0.46	4.9	399	750	8.2	27
H-702	Asphalt Loading Heater	2.8	11	0.53	18.8	460	121	20	66	0.46	4.9	399	750	8.2	27
H-703	Asphalt Blend. & Loading Heater	1.8	7	0.34	12	290	77	12	38	0.7	7	399	750	3.7	12
H-704	Asphalt Blend. & Loading Heater	2.8	11	0.53	18.8	460	121	12	40	0.7	7	399	750	5.8	19
H-705	Asphalt Blend. & Loading Heater	2.8	11	0.53	18.8	460	121	12	40	0.7	7	399	750	5.8	19
H-801	No.1 Crude Unit, Flash Tower Reboiler	5.0	20	0.90	31.7	775	204	18	60	1.0	11	416	780	6.4	21
H-802	No.1 Crude Unit, Fuel Tower Charge Heater	10.1	40.2	1.54	54.5	1330	350	29	96	2.21	23.8	416	780	5.2	17
H-805	No.1 Crude Unit Vacuum Tower Charge Heater	5.0	20	0.90	31.7	270	71	20	65	1.0	11	416	780	6.4	21
H-860	Depentanizer Reboiler	3.0	12	0.54	19	465	122	14	45	0.55	5.9	399	750	7.0	23
No. 6	Steam Boiler	7.4	29.4	1.42	50.3	1230	323	8	25	0.81	8.7	316	600	1.2	4
No. 7	Steam Boiler	7.4	29.4	1.42	50.3	1230	323	8	25	0.81	8.7	316	600	1.2	4
No. 8	Steam Boiler	7.4	29.4	1.42	50.3	1230	323	8	25	0.81	8.7	316	600	1.2	4
No. 9	Steam Boiler	10.6	42	1.90	66.7	1630	429	8	25	0.81	8.7	260	500	1.2	4

† *Unit receives predominantly natural gas.*

produced at the refinery with sulfur content of <0.5% and a heating value of 9300 kg cal/liter (140,000 Btu/gal). The refinery fuel gas produced from the refinery operations has a heat content of 235 kg cal/m^3 (930 Btu/scf) and a sulfur content of approximately 0.2 gm/m^3 (10 grains/100 scf). Natural gas purchased from the Southern California Gas Company has a heating value of 260 kg cal/m^3 (1030 Btu/scf) and a sulfur content of 0.2 gm/m^3 (10 grains/100 scf). Natural gas accounts for 30-50% of the gas burned at this facility.

The refinery fuel gas and natural gas piping at the refinery are such that certain heaters and boilers receive predominately fuel gas while others receive mostly natural gas. Table 2 indicates which units receive natural gas or fuel gas.

Douglas is on an interruptible natural gas supply. During interruption periods, those units which can utilize fuel oil are operated in this mode. During 1975, the natural gas interruption frequency was approximately 8% of the time.

Since the process heaters and steam boilers are operated on natural gas, refinery fuel gas, or fuel oil, none of these units are equipped with emission control devices. There are no stack gas opacity detectors and alarm systems on these units either.

Sulfur oxide emissions from these units are controlled by limiting the sulfur content of the fuels burned to comply with the LAAPCD Rule 62. Refinery fuel gas must be desulfurized to less than 1.1 gm/m^3 (50 grains per 100 ft^3) of sulfur compounds. Fuel oil must contain less than 0.5% by weight sulfur. The fuels are tested routinely to insure compliance.

Internal Combustion Engines

There are three stationary internal combustion engines at this

refinery. Table 3 summarizes the available information on these units. Only unit C-120, the hydrogen recycle compressor engine, is used daily. The other two units are for emergency use only. None of the internal combustion engines have emission control equipment.

TABLE 3

STATIONARY INTERNAL COMBUSTION ENGINES
Douglas Oil Company of California - Paramount, California

Engine Designation	C-120	E-704	E-800
Function	Hydrogen Recycle Compressor	Spare Fire Water Pump	Emergency Generator
H.P.	880	300	180
Fuel Type	Nat. Gas (1050 Btu/cf)	Nat. Gas (1050 Btu/cf)	Diesel (32°API)
Daily Fuel Consumed	207.1 x 10^3 ft^3	None-Normally	None-Normally

Storage Tanks

There are 105 storage tanks at this facility, ranging in size from 32 to 24,000 m^3 (200 to 150,000 bbl), used to store a wide variety of hydrocarbon materials. Since some of these compounds are volatile, hydrocarbon vapors may escape from these tanks. Where such a potential exists, the materials are stored in specially constructed tanks, such as pressure vessels and floating roof tanks.

A summary of the storage tanks at this refinery, their configuration, and the materials stored within is presented in Appendix C.

Blowdown Systems

All major process units have emergency relief valves which are connected to a manifolded header system. If it becomes necessary to rapidly

release quantities of liquids and gases from a unit, they are routed to the manifold system and ultimately combusted in a flare unit.

The flare is a John Zink Company Model STF-S18 unit with a rated capacity of 23,000 kg (50,000 lb)/hr of hydrocarbon. The flare is 30.5 m (100 ft) high with a tip diameter of 0.5 m (1.5 ft). The flare incorporates pilot burners with an ignition flame front generator. It also has a steam ring with steam jets.

Asphalt Air Blowing

Off-gases from the asphalt air blowing operations are treated in four scrubber units, from which they are routed to a fume incinerator. The incinerator is a Douglas designed unit and incorporates a Leahy combination oil and gas burner. It is refinery fuel gas fired with low sulfur fuel oil as standby fuel. The incinerator has an estimated heat release of 5×10^5 kg cal (2×10^6 Btu)/hr. It is estimated that approximately 1,900 kg (4200 lb)/hr of inerts and 41 kg (90 lb)/hr of hydrocarbon vapors are fed to the incinerator from the asphalt air blowing operations. In addition, the incinerator receives approximately 455 kg (1,000 lb)/hr of inerts and hydrocarbon vapors from the vacuum jets attendant to the vacuum crude distillation units.

The incinerator exhaust stack is 16 m (51 ft) high and has a cross sectional area of 1.2 m^2 (12.6 ft^2). Estimated exhaust gas velocity is 3 m (10 ft)/sec and gas temperature is 650 °C (1,200 °F).

Vacuum Jets

The only vacuum jets at this refinery are attendant to vacuum crude distillation units No. 1 and 2. Both jet systems ultimately discharge to the asphalt blowing fume incinerator discussed above.

Product Loading Racks

Gasoline, diesel fuel, low sulfur fuel oil and various asphalt products are loaded from loading racks into trucks and rail cars for shipment to customers. Since hydrocarbon vapors may evolve from these loading operations, the loading racks are equipped with vapor recovery systems.

There are four separate, but similar, vapor recovery systems in the asphalt loading area. The product fill pipes are equipped with vapor collection hoods and vacuum piping. Vapors which escape from the truck or tank car during filling are captured by the hoods and routed via the vacuum piping to a manifold system and ultimately to the emission control device.

The four emission control devices are Brink's glass fiber mat mist eliminators manufactured by Monsanto Envirochem Systems, Inc. Typical details for such a unit are presented in Appendix D. The manufacturer claims that these devices will collect essentially 100% of all mist particles larger than 3 microns and 99.5% of all other particles. No claim is made as to the collection efficiency of gaseous hydrocarbon emissions.

The gasoline truck loading rack is equipped with a Rheem Superior vapor recovery system. The gasoline loading pipes are equipped with tight fitting neoprene seals and vacuum piping. Vapors evolving from the truck during a filling operation are captured by the vacuum piping and routed to equipment which essentially saturates the vapors by countercurrent scrubbing with gasoline liquid and then condenses the saturated vapors. Details of this system are presented in Appendix D. The manufacturer claims the system has a 92.9% recovery efficiency with a capacity of 2.8 std m^3 (100 scf)/min of gasoline vapors.

Wastewater Treatment Facilities

Douglas' wastewater discharges amount to approximately 720 m^3 (190,000 gal)/day. Sources of process wastewater include; 1) water which settles in storage tanks, 2) desalter water, 3) cooling tower blowdown, 4) quench water from asphalt air blowing, 5) water collected in the flare knockout drum, 6) water produced in sulfur recovery plant, 7) water collected in salt filter, and 8) water collected in process vessels such as vacuum overhead accumulators, separator drums, and reflux drums.

Sulfides in the sour water streams are removed by steam stripping and ultimately converted to sulfur at the sulfur plant. Sulfides remaining in the wastewater are converted to thiosulfate by adding hydrogen peroxide to the wastewater at the oil/water separator traps.

All wastewater passes through oil/water separators before being discharged to the Los Angeles County Sanitation District sewer system. Oil which is skimmed off at these units is returned to slop storage tanks and is ultimately reprocessed. There are two oil/water separators at this facility. The separator in the hydroprocessing area has a floating cover to minimize hydrocarbon emissions. Currently, the other separator is not covered, but plans have been made to do so during 1976.

Sulfur Plant

Sour gases from the naptha, distillate, and gas/oil hydrodesulfurizing units are processed in di-isopropanolamine (DIPA) absorption units where they are scrubbed with "lean" amine solution. The hydrogen sulfide (H_2S) is selectively absorbed in the solution and removed from the gas stream. The cleansed gases are then introduced into the refinery fuel gas system.

The H_2S is stripped from the "rich" amine solution and recovered as a concentrated gas stream. The resulting "lean" solution is recycled to the sour gas absorbers mentioned above. The concentrated H_2S stream is used as a feed stock to the sulfur recovery plant.

Sour water which results from several refinery processes is another source of H_2S. The sour water is steam stripped in stripping towers and the resulting H_2S is used as feed stock to the sulfur recovery plant.

Douglas recovers elemental sulfur with two 3-stage Claus sulfur plants, the larger unit rated at 25 m tons (25 long tons)/day of elemental sulfur and the smaller at 7 m tons (7 long tons)/day. Normal refinery operations necessitate that only the larger Claus unit be on stream, with the second unit held in reserve. A schematic diagram of a typical Claus plant is presented in Appendix E.

In the Claus process, H_2S is burned to form sulfur dioxide (SO_2). The SO_2 and H_2S react in the presence of a bauxite catalyst to form elemental sulfur and water vapor. Typical sulfur recovery efficiencies for Claus plants are 85% for one catalytic stage, 94% for two stages, and 97% for three stages.

The tail gases (i.e. exhaust emissions) from the Claus plants contain H_2S in excess of the concentrations allowable under LAAPCD Rule 53.2. In the past, it was commonplace in the industry to burn the tail gases in an incinerator unit thus converting the H_2S to SO_2. However, the resulting SO_2 emissions were well in excess of the 500 ppmv allowable under the current requirements of Rule 53.2. To meet the new requirements, Douglas has installed a Shell Claus off-gas treating (SCOT) tail gas treatment system.

A diagram of the SCOT process is presented in Appendix E. In the SCOT process, tail gases from the Claus plants are routed to a cobalt/molybdenum catalyst reactor where all sulfur compounds and free sulfur

are completely converted to H_2S in the presence of a reducing gas. From the reactor section, the tail gases contain less than 100 ppmv of carbonyl sulfide (COS) and carbon disulfide (CS_2) and less than 10 ppmv of SO_2. These tail gases are then cooled, and excess water is condensed and sent to sour water stripping.

The cooled tail gases contain 20,000 to 40,000 ppmv of H_2S. The H_2S is removed from the gas stream by scrubbing with di-isopropanolamine (DIPA) solution in an absorption column. The H_2S-rich DIPA solution is regenerated by stripping the H_2S in a conventional steam stripping column. The concentrated H_2S stream is recycled as feed to the first stage of the Claus units. The lean DIPA solution is recycled back to the H_2S absorption column.

Off-gases from the DIPA absorption column contain less than 300 ppmv H_2S (vendor guarantee). These off-gases are burned in a SCOT incinerator which has a single John Zink fuel gas burner rated at 1.3×10^6 kg cal (5×10^6 Btu)/hr heat release. The incinerator, using natural gas as an auxiliary fuel, burns material at a rate of 810 kg (1,777 lb)/hr and a tail gas flow rate of 3,680 std. m^3 (130,000 scf)/hr. The incinerator has a stack height of 18.3 m (60 ft) and a stack cross sectional area of 0.37 m^2 (4 ft^2). The stack gas temperature is 870 °C (1600 °F) and the gas velocity is 11 m (36 ft)/sec.

EMISSIONS DATA

Source Test Data

NEIC personnel requested that Douglas supply copies of all stack tests conducted at the facility since 1972. The LAAPCD was requested to do likewise. The only data obtained was from a stack test conducted on the SCOT unit incinerator by KVB Engineering, Inc., under contract to the State of California Air Resources Board. The test was conducted on June 25, 1975.

During the test period, the H_2S gas feed rate to the Claus-SCOT process was 12,200 std. m^3 (430,000 scf) per day with a H_2S content of 89.4%. Sulfur production rate was approximately 16 m tons (16 long tons)/ day. The incinerator stack gas volume was 80 std. m^3 (2840 scf)/min. Stack gas contained 12% oxygen, 10.7% water vapor, 3 ppmv sulfur trioxide (SO_3) and 104 ppmv sulfur dioxide (SO_2). Total sulfur in the stack gas amounted to 17.7 kg (39 lbs)/day as elemental sulfur. The Claus-SCOT complex was thus demonstrated to be 99.9% efficient during the test.

Computed Emission Rates

Theoretical emission factors for typical emission sources found at petroleum refineries are listed in Table 9.1-1 of the EPA publication AP-42 *Compilation of Air Pollutant Emission Factors*, Second Edition (second printing with Supplements 1-4). These emission factors were used to compute the following emission rates. Emissions from hydrocarbon storage tanks have not been calculated for this report; rather, they will be included in a separate report being prepared by NEIC which will summarize storage tank emissions from all refineries in Los Angeles County.

Boilers and Process Heaters. As can be seen from the listing of process heaters and steam boilers in Table 2, a substantial number of these units can be fired with both fuel gas and fuel oil. Theoretical emissions from these units are calculated using different factors for each fuel type used. It can be seen that a range of emissions can exist depending on the available fuel situation. Table 4 summarizes the theoretical emissions for two possible situations: 1) all units in operation and *all* units operating on refinery fuel gas or purchased natural gas where applicable and 2) all units in operation and natural gas is curtailed so that fuel oil is being used in those units which can use fuel oil. For these calculations, the fuel usage figures for the

Table 4

CALCULATED EMISSION RATES FROM VARIOUS UNIT OPERATIONS
Douglas Oil of California - Paramount, California Refinery

Emission Source	CALCULATED EMISSIONS													
	Particulates		Sulfur Oxides (SO_2)		Carbon Monoxide (CO)		Hydrocarbons		Nitrogen Oxides (NO_2)		Aldehydes		Ammonia	
	(kg/hr)	(lb/hr)	(kg/hr)	(lb/hr)	(kg/hr)	(lb/hr)	(kg/hr)	(lb/hr)	(kg/hr)	(lb/hr)	(kg/hr)	(lb/hr)	(kg/hr)	(lb/hr)
Process Heaters and Steam Boilers														
Condition 1†	7.4	16.4	1	2.3	Neg.		11.2	24.6	85.6	188	1.1	2.5	Neg.	
Condition 2††	32.8	72.1	122	269	Neg.		8.5	18.7	131	289	1.2	2.7	Neg.	
Stationary Internal Combustion Engines	Neg.		0.01	0.02	Neg.		4.7	10.3	3.5	7.8	0.4	0.9	0.8	1.7
Blowdown Systems with Flaring	Neg.		Neg.		Neg.		4.0	8.8	Neg.		Neg.		Neg.	
Wastewater Treatment	Neg.		Neg.		Neg.		0.7	1.5	Neg.		Neg.		Neg.	
Pipeline Valves & Flanges	Neg.		Neg.		Neg.		22	49	Neg.		Neg.		Neg.	
Vessel Relief Valves	Neg.		Neg.		Neg.		8.8	19.3	Neg.		Neg.		Neg.	
Pump Seals	Neg.		Neg.		Neg.		13.5	30	Neg.		Neg.		Neg.	
Compressor Seals	Neg.		Neg.		Neg.		4.0	8.8	Neg.		Neg.		Neg.	
Miscellaneous	Neg.		Neg.		Neg.		8.0	17.5	Neg.		Neg.		Neg.	
Totals†††	32.8	72.1	122	269	Neg.		74.2	163.9	135	297	1.6	3.6	0.8	1.7

† *All units operating at rated capacity and all units are fired with refinery fuel gas or natural gas.*
†† *All units operating at rated capacity, natural gas supply curtailed, and those units which can burn fuel oil are doing so. All other units burning refinery fuel gas.*
††† *Totals include only condition (2) for process heaters and boilers. Considered worst situation.*

units were those supplied by Douglas as rated unit capacities. Also, all units at the refinery were considered to be operating and at rated capacity, thereby yielding maximum emissions estimations.

The process heaters and boilers are major contributors of nitrogen oxides. Depending on the fuel use pattern at the refinery, calculated nitrogen oxides emissions for these units range from 85.6 to 131 kg (188 to 289 lb)/hr as NO_2. If the refinery is on natural gas curtailment, these units are also potential large sources of particulate matter, 32.8 kg (72.1 lb)/hr and sulfur oxides 122 kg (269 lb)/hr as SO_2.

Other Sources. Table 4 summarizes the calculated theoretical emission rates from other sources within the refinery. In general, AP-42 gives only hydrocarbon emission factors for these sources. The major source appears to be leakage from pipeline valves and flanges which amounts to 22 kg (49 lb)/hr.

SUMMARY OF VIOLATIONS

A review of the LAAPCD records indicates that a citation was issued to Douglas on June 13, 1975 for visible emissions and nuisance caused by emissions of excessive sulfur oxides from the incinerator unit attendant to the sulfur plant. The disposition of this citation is not known.

LAAPCD personnel also verbally informed NEIC personnel that a second citation was issued to Douglas on August 18, 1975, again for a nuisance violation. The details pertaining to this citation and its final disposition are also unknown.

INSPECTION SUMMARY

At the time of this inspection, all major process units were in operation, except the SCOT tail gas treatment unit at the sulfur plant which had been taken out of service because of continuing malfunctions. The Claus unit tail gas exhausts were being routed directly to the SCOT incinerator unit, bypassing the SCOT tailgas treatment system. No sulfur based odors were detected in this area.

All process units, storage vessels, potential emission points and pollution control devices in use at the refinery were observed during the inspection. No visible emissions were detected from any process heaters, steam boilers or incinerators. The flare system also appeared to be operating correctly.

NEIC personnel climbed atop several tanks at this facility to inspect vents, floating roofs, etc. Moderate to strong asphalt odors were noted near the vents of asphalt storage tanks. Asphalts are stored at temperatures of from 120° to 205 °C (250-400 °F) which undoubtedly contributes to the odors detected.

Truck loading of hot asphalt was observed at loading station No. 13. White fumes were observed escaping from the truck loading ports. The vapor recovery system serving this loading station was only partially effective. It appeared that insufficient vacuum was available at the vapor collection hood.

In general, housekeeping at this facility was about average for the industry. No major leaks or spill areas were noted throughout the inspection.

APPENDIX A

NEIC Information Request Letter to
Douglas Oil Company of California

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ENFORCEMENT
NATIONAL FIELD INVESTIGATIONS CENTER—DENVER
BUILDING 53, BOX 25227, DENVER FEDERAL CENTER
DENVER, COLORADO 80225
September 8, 1975

Dear

Pursuant to the authority contained in Section 114 of the Clean Air Act, as amended, representatives of the EPA will conduct, within the next year, inspections of the Allied Chemical Corp. operations to ascertain compliance with the Federally approved California State Implementation Plan.

Representatives from the Environmental Protection Agency will observe the facility's process operations, inspect monitoring and laboratory equipment and analytical methods, review source test data, examine appropriate records, etc. A process and air pollution flow diagram or a blueprint of the facility and production information should be available for the EPA personnel at the start of the inspections.

Detailed information about air pollution sources will be discussed during these inspections. Attached is a partial list of the information that will be needed in order to complete these inspections. We would appreciate it if you could inform the appropriate company personnel about the forthcoming inspections so that the necessary information will be readily available and the inspection can be expedited.

If you have any questions concerning these inspections, please feel free to contact Arnold Den, Chief, Air Investigations Section, Region IX, San Francisco, at 415/556-8752.

A representative of the EPA (Dr. Wayne Smith or Mr. David Brooman, 303/234-4658) will contact you within the next 30 days concerning this visit.

Sincerely,

Thomas P. Gallagher
Director

Attachments

A. Refinery Capacity in Barrels/Day

B. Furnaces, Boilers and Process Heaters (for each furnace boiler and heater)

1. Rated capacity in 10^6 BTU/hr heat input.
2. Maximum capacity as per cent of rated capacity.
3. For oil fired units:

   a. Rated capacity in gals/hr or 10^3 bbl/hr.
   b. Heating value in BTU's/gal.
   c. Per cent sulfur and ash in oil by wt.
   d. Specific gravity of oil.
   e. Firing pattern (atomization, etc. for furnaces).

4. For gas fired units:

   a. Rated capacity in 10^3 SCF/hr.
   b. Type of gas burned (list principal constituents in % by weight).
   c. Density lb/SCF.
   d. Heating value of gas in BTU's/SCF.
   e. Sulfur content of gas in % S by vol and grains/SCF.

5. Type(s) of control equipment and collection efficiency(s) (design and actual).
6. Pressure drop (inches of water) across collection devices(s).
7. Elevation above grade of stack outlets and other discharge points.
8. Identification of stacks equipped with recording monitors for determining opacities of stack effluents.
9. Existing stack test data. The full test reports describing methods used, test data, calculations, test results and process weights should be available.
10. Inside diameters of each stack (ft).
11. Temperature of effluent gas stream from each stack (°F).
12. Exit velocity of each stack effluent (ft/sec).

C. Incinerators: (For each incinerator)

1. Rated capacity in 10^6 BTU's/hr; include auxiliary burners separately.
2. Auxiliary burner fuels:
   oil - 10^3 bbl/hr and specific gravity.
   gas - 10^3 SCF/hr and density in lb/SCF.
   other - (describe) - lbs/hr (Heating value of each fuel).

3. Maximum capacity as per cent of rated capacity for auxiliary burners.
4. Sulfur and ash content of fuel as % by weight for auxiliary burners.
5. Type of material incinerated.
6. Rated capacity for material incinerated in lb/hr.
7. Sulfur and ash content of material incinerated as % by weight.
8. Heating value of material incinerated.
9. The gas flow rate reported at dry standard conditions (DSCFH).
10. Type(s) of control equipment and collection efficiency(s) (design and actual).
11. Pressure drop (inches of water) across collection device(s).
12. Elevation above grade of stack outlets and other discharge points (ft).
13. Identification of stacks equipped with recording monitors for determining opacities of stack effluents.
14. Existing stack test data. Data should include the full test reports describing methods used, test data, calculations, test results and process weights.
15. Inside diameter of each stack (ft).
16. Exit velocity of each stack effluent (ft/sec.).
17. Temperature of effluent gas stream from each stack in °F.

D. Catalytic Cracking Units, Coker Units: (For each unit)

1. Rated capacity - 10^6 BTU/hr and indicate the type of unit such as PCC, Coker, etc.
2. Maximum capacity as per cent of rated capacity.
3. Type of feed-stock used and barrels of fresh feed used per yr.
4. Sulfur content of feed-stock (% by weight).
5. Types of control equipment and collection efficiency(s) (design and actual).
6. Pressure drop (inches of water) across collection devices(s).
7. Elevation above grade of stack outlets and other discharge points (ft).
8. Identification of stacks equipped with recording monitors for determining opacities of stack effluents.
9. Existing stack test data. Data should include the full test reports describing methods used, test data, calculations, test results and process weights.
10. Inside diameter of each stack (ft).
11. Exit velocity of each stack effluent (ft/sec).
12. Total flow through unit in 10^3 bbl/hr and ton/hr.
13. Temperature of effluent gas stream from each stack in °F.
14. Indicate disposition of waste gas stream, i.e., burned in afterburner, etc.

15. Average hours of operation per month and average monthly catalyst makeup for the catalytic cracking units.
16. Indicate date of installation or latest modification.

E. Blowdown Systems:

1. Indicate type and efficiency of each air pollution control device.

F. Flares: (For each flare)

1. Type
2. Height and diameter of stack (ft).
3. Velocity of stack effluent (ft/sec).
4. Temperature of gas effluent (°F).
5. Rated capacity 10^6 BTU/hr and tons/hr (of flared material).
6. Amount of material flared and percent of time material being flared.
7. Maximum capacity as per cent of rated capacity.
8. Type of flare ignition device at top of stack.
9. Sulfur content of flared input (% by wt).
10. Where material comes from that is burned in flare.

G. Storage Vessels: (For each vessel)

1. Indicate type of tank (fixed roof, floating roof, vapor recovery, etc.)
2. Give storage capacity of each tank in 10^3 gallons or barrels.
3. Indicate type of material stored in each tank (crude oil, gasoline, finished petroleum product) and give annual average true vapor pressure (TVP) and seasonal maximum for actual storage condition of product stored in lbs/sq. in. absolute.
4. State tank diameter (ft).
5. Indicate if tank is equipped with submerged fill pipe.
6. Indicate if the tank is a pressure tank capable of maintaining working pressure sufficient at all times to prevent vapor or gas loss to the atmosphere.
7. State type of air pollution control equipment on each tank, i.e., conservation vent, vapor recovery system, etc.
8. Indicate average and seasonal maximum temperature of each tank.
9. Indicate date of installation or latest modifications.
10. Indicate if tank is used for multiple product storage.

H. Wastewater Treatment Systems:

1. Indicate gallons of waste water discharged daily.
2. Indicate source of such drains (process discharged).

3. Indicate type and efficiency of each air pollution control device and any existing test data indicating actual emissions. Data should include the full test reports describing methods used, test data, calculations, test results and process weight.

I. Internal Combustion Engines: (Stationary)

1. Type of engine.
2. Amount of fuel burned per day.
3. Type of fuel.

J. Vacuum Jets and/or Barometric Condensers

1. Indicate type and efficiency of each air pollution control device.
2. Indicate disposition of exhaust gases (eg. To afterburners, fireboxes, etc.).

K. Loading Rack Vapor Recovery:

1. Actual product throughput in 10^3 gallons per day and year.
2. Type of material loaded.
3. Type of vapor recovery system and rated collection efficiency.
4. Existing test data. The full test reports describing methods used, test data, calculations and test results should be submitted.

L. Submit schematic diagrams showing stacks and their respective process associations and control equipment.

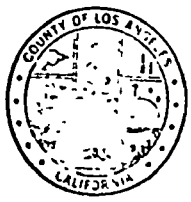
M. List any other significant (25 tons/yr. potential uncontrolled emission) sources of particulates, sulfur dioxide, carbon monoxide, oxides of nitrogen, and hydrocarbons not covered by Items B-L. Include:

1. Type of process and rated capacity.
2. Type of material processed.
3. Types of collection equipment and collection efficiency(s) (design and actual).
4. Pressure drop (inches of water) across collection devices.
5. Existing stack test data applicable to current operating conditions. The full test reports describing methods used, test data, calculations, test results and process weights should be submitted.

APPENDIX B

Select LAAPCD Rules and Regulations

APPENDIX B



County of Los Angeles
Air Pollution Control District

Rules and Regulations

IV

Prohibitions

Rule 50. Ringelmann Chart.

(Effective January 6, 1972 for any source not completed and put into service. Effective for all sources on January 1, 1973.)

A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is.

a. As dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or

b. Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection (a) of this Rule.

This amendment shall be effective on the date of its adoption for any source of emission not then completed and put into service. As to all other sources of emission this amendment shall be effective on January 1, 1973.

Rule 51. Nuisance.

A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property.

Rule 52., Particulate Matter - Concentration.

(Effective January 6, 1972 for any equipment not completed and put into service. Effective for all equipment on January 1, 1973.)

A person shall not discharge into the atmosphere from any source particulate matter in excess of the concentration shown in the following table: (See Rule 52 Table)

Where the volume discharged falls between figures listed in the table, the exact concentration permitted to be discharged shall be determined by linear interpolation.

The provisions of this rule shall not apply to emissions resulting from the combustion of liquid or gaseous fuels in steam generators or gas turbines.

For the purposes of this rule "particulate matter" includes any material which would become particulate matter if cooled to standard conditions.

This amendment shall be effective on the date of its adoption for any

equipment not then completed and put into service. As to all other equipment this amendment shall be effective on January 1, 1973.

Table For Rule 52

Volume Discharged--Cubic Feet Per Minute Calculated as Dry Gas at Standard Conditions	Maximum Concentration of Particulate Matter Allowed in Discharged Gas-Grains Per Cubic Foot of Dry Gas at Standard Conditions	Volume Discharged--Cubic Feet Per Minute Calculated as Dry Gas at Standard Conditions	Maximum Concentration of Particulate Matter Allowed in Discharged Gas Grains Per Cubic Foot of Dry Gas at Standard Conditions
1000 or less	0.200	20000	0.0635
1200	.187	30000	.0544
1400	.176	40000	.0487
1600	.167	50000	.0447
1800	.160	60000	.0417
2000	.153	70000	.0393
2500	.141	80000	.0374
3000	.131	100000	.0343
3500	.124	200000	.0263
4000	.118	400000	.0202
5000	.108	600000	.0173
6000	.101	800000	.0155
7000	.0949	1000000	.0142
8000	.0902	1500000	.0122
10000	.0828	2000000	.0109
15000	.0709	2500000 or more	.0100

Rule 53. Sulfur Compounds - Concentration.

A person shall not discharge into the atmosphere sulfur compounds, which would exist as a liquid or gas at standard conditions, exceeding in concentration at the point of discharge, 0.2 per cent by volume calculated as sulfur dioxide (SO_2).

Rule 53.1. Scavenger Plants.

Where a separate source of air pollution is a scavenger or recovery

plant, recovering pollutants which would otherwise be emitted to the atmosphere, the Air Pollution Control Officer may grant a permit to operate where the total emission of pollutants is substantially less with the plant in operation than when closed, even though the concentration exceeds that permitted by Rule 53(a). The Air Pollution Control Officer shall report immediately in writing to the Air Pollution Control Board the granting of any such permit, together with the facts and reasons therefor.

Effective July 1, 1973, this Rule is repealed for sulfur recovery units.

Effective January 1, 1974, this Rule is repealed for sulfuric acid units.

Rule 53.2. Sulfur Recovery Units.

A person shall not, after June 30, 1973, discharge into the atmosphere from any sulfur recovery unit producing elemental sulfur, effluent process gas containing more than:

1. 500 parts per million by volume of sulfur compounds calculated as sulfur dioxide.
2. 10 parts per million by volume of hydrogen sulfide.
3. 200 pounds per hour of sulfur compounds calculated as sulfur dioxide.

Any sulfur recovery unit having an effluent process gas discharge containing less than 10 pounds per hour of sulfur compounds calculated as sulfur dioxide may dilute to meet the provision of number (1) above.

Rule 53.3. Sulfuric Acid Units.

A person shall not, after December 31, 1973, discharge into the atmosphere from any sulfuric acid unit, effluent process gas containing more than:

1. 500 parts per million by volume of sulfur compounds calculated as sulfur dioxide.

2. 200 pounds per hour of sulfur compounds calculated as sulfur dioxide.

Rule 54. Solid Particulate Matter - Weight.

(Effective January 6, 1972 for any equipment not completed and put into service. Effective for all equipment on January 1, 1973.)

A person shall not discharge into the atmosphere from any source solid particulate matter, including lead and lead compounds, in excess of the rate shown in the following table: (See Rule 54 Table)

TABLE FOR RULE 54

(Amended January 6, 1972)

Process Weight Per Hour–Pounds Per Hour	Maximum Discharge Rate Allowed for Solid Particulate Matter (Aggregate Discharged From All Points of Process)–Pounds Per Hour	Process Weight Per Hour–Pounds Per Hour	Maximum Discharge Rate Allowed for Solid Particulate Matter (Aggregate Discharged From All Points of Process)–Pounds Per Hour
250 or less	1.00	12000	10.4
300	1.12	14000	10.8
350	1.23	16000	11.2
400	1.34	18000	11.5
450	1.44	20000	11.8
500	1.54	25000	12.4
600	1.73	30000	13.0
700	1.90	35000	13.5
800	2.07	40000	13.9
900	2.22	45000	14.3
1000	2.38	50000	14.7
1200	2.66	60000	15.3
1400	2.93	70000	15.9
1600	3.19	80000	16.4
1800	3.43	90000	16.9
2000	3.66	100000	17.3
2500	4.21	120000	18.1
3000	4.72	140000	18.8
3500	5.19	160000	19.4
4000	5.64	180000	19.9
4500	6.07	200000	20.4
5000	6.49	250000	21.6
5500	6.89	300000	22.5
6000	7.27	350000	23.4
6500	7.64	400000	24.1
7000	8.00	450000	24.8
7500	8.36	500000	25.4
8000	8.70	600000	26.6
8500	9.04	700000	27.6
9000	9.36	800000	28.4
9500	9.68	900000	29.3
10000	10.00	1000000 or more	30.0

Where the process weight per hour falls between figures listed in the table, the exact weight of permitted discharge shall be determined by linear interpolation.

For the purposes of this rule "solid particulate matter" includes any material which would become solid particulate matter if cooled to standard conditions.

This amendment shall be effective on the date of its adoption for any equipment not then completed and put into service. As to all other equipment this amendment shall be effective on January 1, 1973.

Rule 55. Exceptions.

The provisions of Rule 50 do not apply to:

a. Smoke from fires set by or permitted by any public officer if such fire is set or permission given in the performance of the official duty of such officer, and such fire in the opinion of such officer is necessary:

1. For the purpose of the prevention of a fire hazard which cannot be abated by any other means, or
2. The instruction of public employees in the methods of fighting fire.

b. Smoke from fires set pursuant to permit on property used for industrial purposes for the purpose of instruction of employees in methods of fighting fire.

c. Agricultural operations in the growing of crops, or raising of fowls or animals.

d. The use of an orchard or citrus grove heater which does not produce unconsumed solid carbonaceous matter at a rate in excess of one(1) gram per minute.

e. The use of other equipment in agricultural operations in the growing of crops, or raising of fowls or animals.

Rule 56. Storage of Petroleum Products.

A person shall not place, store or hold in any stationary tank, reservoir or other container of more than 40,000 gallons capacity any gasoline or any petroleum distillate having a vapor pressure of 1.5 pounds per square inch absolute or greater under actual storage conditions, unless such tank, reservoir or other container is a pressure tank maintaining working pressures sufficient at all times to prevent hydrocarbon vapor or gas loss to the atmosphere, or is designed and equipped with one of the following vapor loss control devices, properly installed, in good working order and in operation:

a. A floating roof, consisting of a pontoon type or double-deck type roof, resting on the surface of the liquid contents and equipped with a closure seal, or seals, to close the space between the roof edge and tank wall. The control equipment provided for in this paragraph shall not be used if the gasoline or petroleum distillate has a vapor pressure of 11.0 pounds per square inch absolute or greater under actual storage conditions. All tank gauging and sampling devices shall be gas-tight except when gauging or sampling is taking place.

b. A vapor recovery system, consisting of a vapor gathering system capable of collecting the hydrocarbon vapors and gases discharged and a vapor disposal system capable of processing such hydrocarbon vapors and gases so as to prevent their emission to the atmosphere and with all tank gauging and sampling devices gas-tight except when gauging or sampling is taking place.

c. Other equipment of equal efficiency, provided such equipment is submitted to and approved by the Air Pollution Control Officer.

Rule 58. Disposal of Solid and Liquid Wastes.

a. A person shall not burn any combustible refuse in any incinerator except in a multiple-chamber incinerator as described in Rule 2 (p), or in equipment found by the Air Pollution Control Officer in advance of such use to be equally effective for the purpose of air pollution control as an approved multiple-chamber incinerator. Rule 58 (a) shall be effective in the Los Angeles Basin on the date of its adoption, and in the Upper Santa Clara River Valley Basin on January 1, 1972. In all other areas of Los Angeles County, this Rule shall be effective on January 1, 1973.

b. A person shall not discharge into the atmosphere from any incinerator or other equipment used to dispose of combustible refuse by burning, having design burning rates greater than 100 pounds per hour, except as provided in subsection (d) of this rule, particulate matter in excess of 0.1 grain per cubic foot of gas calculated to 12 per cent of carbon dioxide (CO_2) at standard conditions. Any carbon dioxide (CO_2) produced by combustion of any liquid or gaseous fuels shall be excluded from the calculation to 12 per cent of carbon dioxide (CO_2).

c. A person shall not discharge into the atmosphere from any equipment whatsoever, used to process combustible refuse, except as provided in subsection (d) of this rule, particulate matter in excess of 0.1 grain per cubic foot of gas calculated to 12 per cent of carbon dioxide (CO_2) at standard conditions. Any carbon dioxide (CO_2) produced by combustion of any liquid or gaseous fuels shall be excluded from the calculation to 12 per cent of carbon dioxide (CO_2).

d. A person shall not discharge into the atmosphere from any incinerator or other equipment used to dispose of combustible refuse by burning, having design burning rates of 100 pounds per hour or less, or for which an application for permit is filed before Janaury 1, 1972, particulate matter in excess of 0.3 grain per cubic foot of gas calculated to 12 per cent of carbon dioxide (CO_2) at standard conditions and shall not discharge particles which are individually large enough to be visible while suspended in the atmosphere. Any carbon dioxide (CO_2) produced by combustion of any liquid or gaseous fuels shall be excluded from the calculation to 12 per cent of carbon dioxide (CO_2).

Rule 59. Effluent Oil Water Separators.

(Effective June 29, 1971 for any equipment not completed and put into service. Effective for all equipment after July 1, 1972)

A person shall not use any compartment of any vessel or device operated for the recovery of oil from effluent water which recovers 200 gallons a day or more of any petroleum products from any equipment which processes, refines, stores or handles hydrocarbons with a Reid vapor pressure of 0.5 pound or greater, unless such compartment is equipped with one of the following vapor loss control devices, except when gauging or sampling is taking place:

a. A solid cover with all openings sealed and totally enclosing the liquid contents of that compartment.

b. A floating pontoon or double-deck type cover, equipped with closure seals to enclose any space between the cover's edge and compartment wall.

c. A vapor recovery system, which reduces the emission of all hydrocarbon vapors and gases into the atmosphere by at least 90 per cent by weight.

d. Other equipment of an efficiency equal to or greater than a, b, or c, if approved by the Air Pollution Control Officer.

This rule shall not apply to any oil-effluent water separator used exclusively in conjunction with the production of crude oil, if the water fraction of the oil-water effluent entering the separator contains less than 5 parts per million hydrogen sulfide, organic sulfides, or a combination thereof.

This amendment shall be effective at the date of its adoption for any equipment not then completed and put into service. As to all other equipment this amendment shall be effective on July 1, 1972.

Rule 60. Circumvention.

A person shall not build, erect, install, or use any article, machine, equipment or other contrivance, the use of which, without resulting in a reduction in the total release of air contaminants to the atmosphere, reduces or conceals an emission which would otherwise constitute a violation of Division 20, Chapter 2 of the Health and Safety Code of the State of California or of these Rules and Regulations. This Rule shall not apply to cases in which the only violation involved is of Section 24243 of the Health and Safety Code of the State of California, or of Rule 51 of these Rules and Regulations.

Rule 61. Organic Liquid Loading.

(Effective June 29, 1971 for any equipment not completed and put into service. Effective for all equipment after July 1, 1972)

A person shall not load organic liquids having a vapor pressure of 1.5 psia or greater under actual loading conditions into any tank truck, trailer, or railroad tank car from any loading facility unless the loading facility is equipped with a vapor collection and disposal system or its equivalent approved by the Air Pollution Control Officer.

Loading shall be accomplished in such a manner that all displaced vapor and air will be vented only to the vapor collection system. Measures shall be taken to prevent liquid drainage from the loading device when it is not in use or to accomplish complete drainage before the loading device is disconnected.

The vapor disposal portion of the vapor collection and disposal system shall consist of one of the following:,

a. An absorber system or condensation system which processes all vapors and recovers at least 90 per cent by weight of the organic vapors and gases from the equipment being controlled.

b. A vapor handling system which directs all vapors to a fuel gas system.

c. Other equipment of an efficiency equal to or greater than a or b if approved by the Air Pollution Control Officer.

This rule shall apply only to the loading of organic liquids having a

vapor pressure of 1.5 psia or greater under actual loading conditions at a facility from which at least 20,000 gallons of such organic liquids are loaded in any one day.

"Loading facility", for the purpose of this rule, shall mean any aggregation or combination of organic liquid loading equipment which is both (1) possessed by one person, and (2) located so that all the organic liquid loading outlets for such aggregation or combination of loading equipment can be encompassed within any circle of 300 feet in diameter.

This amendment shall be effective at the date of its adoption for any equipment not then completed and put into service. As to all other equipment this amendment shall be effective on July 1, 1972.

Rule 62. Sulfur Contents of Fuels.

A person shall not burn within the Los Angeles Basin at any time between May 1 and September 30, both dates inclusive, during the calendar year 1959, and each year thereafter between April 15 and November 15, both inclusive, of the same calendar year, any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions, or any liquid fuel or solid fuel having a sulfur content in excess of 0.5 per cent by weight.

The provisions of this rule shall not apply to:

a. The burning of sulfur, hydrogen sulfide, acid sludge or other sulfur compounds in the manufacturing of sulfur or sulfur compounds.

b. The incinerating of waste gases provided that the gross heating value of such gases is less than 300 British Thermal Units per cubic foot at standard conditions and the fuel used to incinerate such waste gases does not contain sulfur or sulfur compounds in excess of the amount specified in this rule.

c. The use of solid fuels in any metallurgical process.

d. The use of fuels where the gaseous products of combustion are used as raw materials for other processes.

e. The use of liquid or solid fuel to propel or test any vehicle, aircraft, missile, locomotive, boat or ship.

f. The use of liquid fuel whenever the supply of gaseous fuel, the burning of which is permitted by this rule, is not physically available to the user due to accident, act of God, act of war, act of the public enemy, or failure of the supplier.

Rule 62.1 Sulfur Contents of Fuels.

a. A person shall not burn within the Los Angeles Basin at any time between the days of November 16 of any year and April 14 of the next succeeding calendar year, both dates inclusive, any fuel described in the first paragraph of Rule 62 of these Rules and Regulations.

b. The provisions of this Rule do not apply to:

1. Any use of fuel described in Subsections a,b,c,d,e, and f of said Rule 62 under the conditions and for the uses set forth in said Subsections.
2. The use of liquid fuel during a period for which the supplier of gaseous fuel, the burning of which is not prohibited by this Rule, interrupts the delivery of gaseous fuel to the user.

c. Every holder of, and every applicant for a permit to operate fuel-burning equipment under these Rules and Regulations shall notify the Air Pollution Control Officer in the manner and form prescribed by him, of each interruption in and resumption of delivery of gaseous fuel to his equipment.

Rule 62.2 Sulfur Contents of Fuels.

Notwithstanding the provisions of Section (f) of Rule 62 or any pro-

vision of said section as incorporated into Rule 62.1 or any provision of Subsection (2) of Section b of Rule 62.1, a person shall not burn within the Los Angeles Basin any liquid fuel or solid fuel having a sulfur content in excess of 0.5 per cent by weight.

It shall not be a violation of this rule to burn such fuel for a period of not to exceed three calendar days (and in addition for that period of time necessary for the Hearing Board to render a decision, provided that an application for a variance is promptly filed) when other fuel which complies with this Rule is not used due to accident, strike, sabotage, or act of God.

Rule 63. Gasoline Specifications.

a. A person shall not, after June 30, 1960, sell or supply for use within the District as a fuel for motor vehicles as defined by the Vehicle Code of the State of California, gasoline having a degree of unsaturation greater than that indicated by a Bromine Number of 30 as determined by ASTM Method D1159-57T modified by omission of the mercuric chloride catalyst.

b. For the purpose of this rule, the term "gasoline" means any petroleum distillate having a Reid vapor pressure of more than four pounds.

Rule 64. Reduction of Animal Matter.

A person shall not operate or use any article, machine, equipment or other contrivance for the reduction of animal matter unless all gases, vapors and gas-entrained effluents from such an article, machine, equipment or other contrivance are:

a. Incinerated at temperatures of not less than 1200 degrees Fahrenheit for a period of not less than 0.3 second, or

b. Processed in such a manner determined by the Air Pollution

Control Officer to be equally, or more, effective for the purpose of air pollution control than (a) above.

A person incinerating or processing gases, vapors or gas-entrained effluents pursuant to this rule shall provide, properly install and maintain in calibration, in good working order and in operation devices, as specified in the Authority to Construct or Permit to Operate or as specified by the Air Pollution Control Officer, for indicating temperature, pressure or other operating conditions.

For the purpose of this rule, "reduction" is defined as any heated process, including rendering, cooking, drying, dehydrating, digesting, evaporating and protein concentrating.

The provisions of this rule shall not apply to any article, machine, equipment or other contrivance used exclusively for the processing of food for human consumption.

Rule 65. Gasoline Loading Into Tanks.

A person shall not after January 1, 1965, load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in Rule 56, or is a pressure tank as described in Rule 56.

The provisions of the first paragraph of this rule shall not apply to the loading of gasoline into any tank having a capacity of less than 2,000 gallons which was installed prior to the date of adoption of this rule nor to any underground tank installed prior to the date of adoption of this rule where the fill line between the fill connection and tank is offset.

Any person operating or using any gasoline tank with a capacity of 250 gallons or more installed prior to the date of adoption of this rule shall

apply for a permit to operate such tank before January 1, 1965. The provisions of Rule 40 shall not apply during the period between the date of adoption of this rule and January 1, 1965, to any gasoline tank installed prior to the date of adoption of this rule provided an application for permit to operate is filed before January 1, 1965.

A person shall not install any gasoline tank with a capacity of 250 gallons or more unless such tank is equipped as described in the first paragraph of this rule.

For the purpose of this rule, the term "gasoline" is defined as any petroleum distillate having a Reid vapor pressure of 4 pounds or greater.

For the purpose of this rule, the term "submerged fill pipe" is defined as any fill pipe the discharge opening of which is entirely submerged when the liquid level is 6 inches above the bottom of the tank. "Submerged fill pipe" when applied to a tank which is loaded from the side is defined as any fill pipe the discharge opening of which is entirely submerged when the liquid level is 18 inches above the bottom of the tank.

The provisions of this rule do not apply to any stationary tank which is used primarily for the fueling of implements of husbandry, as such vehicles are defined in Division 16 (Section 36000, et seq.) of the Vehicle Code.

Rule 66. Organic Solvents.

a. A person shall not discharge into the atmosphere more than 15 pounds of organic materials in any one day, nor more than 3 pounds in any one hour, from any article, machine, equipment or other contrivance, in which any organic solvent or any material containing organic solvent comes into contact with flame or is baked, heat-cured or heat-polymerized, in the presence of oxygen, unless said discharge has been reduced by at least 85 per cent. Those portions of any series of articles, machines, equipment or other

contrivances designed for processing a continuous web, strip or wire which emit organic materials and using operations described in this section shall be collectively subject to compliance with this section.

b. A person shall not discharge into the atmosphere more than 40 pounds of organic materials in any one day, nor more than 8 pounds in any one hour, from any article, machine, equipment or other contrivance used under conditions other than described in section (a), for employing or applying, any photochemically reactive solvent, as defined in section (k), or material containing such photochemically reactive solvent, unless said discharge has been reduced by at least 85 per cent. Emissions of organic materials into the atmosphere resulting from air or heated drying of products for the first 12 hours after their removal from any article, machine, equipment, or other contrivance described in this section shall be included in determining compliance with this section. Emissions resulting from baking, heat-curing, or heat-polymerizing as described in section (a) shall be excluded from determination of compliance with this section. Those portions of any series of articles, machines, equipment or other contrivances designed for processing a continuous web, strip or wire which emit organic materials and using operations described in this section shall be collectively subject to compliance with this section.

c. A person shall not, after August 31, 1974, discharge into the atmosphere more than 3,000 pounds of organic materials in any one day, nor more than 450 pounds in any one hour, from any article, machine, equipment or other contrivance in which any non-photochemically reactive organic solvent or any material containing such solvent is employed or applied, unless said discharge has been reduced by at least 85 per cent. Emissions of organic materials into the atmosphere resulting from air or heated drying of products for the first 12 hours after their removal from any article, machine,

equipment, or other contrivance described in this section shall be included in determining compliance with this section. Emissions resulting from baking, heat-curing, or heat-polymerizing as described in section (a) shall be excluded from determination of compliance with this section. Those portions of any series of articles, machines, equipment or other contrivances designed for processing a continuous web, strip or wire which emit organic materials and using operations described in this section shall be collectively subject to compliance with this section.

d. Emissions of organic materials to the atmosphere from the clean-up with photochemically reactive solvent, as defined in section (k), of any article, machine, equipment or other contrivance described in sections (a), (b) or (c), shall be included with the other emissions of organic materials from that article, machine, equipment or other contrivance for determining compliance with this rule.

f. Emissions of organic materials into the atmosphere required to be controlled by sections (a), (b) or (c), shall be reduced by:

1. Incineration, provided that 90 per cent or more of the carbon in the organic material being incinerated is oxidized to carbon dioxide, or
2. Adsorption, or
3. Processing in a manner determined by the Air Pollution Control Officer to be not less effective than (1) or (2) above.

g. A person incinerating, adsorbing, or otherwise processing organic materials pursuant to this rule shall provide, properly install and maintain in calibration, in good working order and in operation, devices as specified in the authority to construct or the permit to operate, or as specified by the Air Pollution Control Officer, for indicating temperatures, pressures, rates of flow or other operating conditions necessary to determine the degree and

effectiveness of air pollution control.

h. Any person using organic solvents or any materials containing organic solvents shall supply the Air Pollution Control Officer, upon request and in the manner and form prescribed by him, written evidence of the chemical composition, physical properties and amount consumed for each organic solvent used.

i. The provisions of this rule shall not apply to:

1. The manufacture of organic solvents, or the transport or storage of organic solvents or materials containing organic solvents.
2. The use of equipment for which other requirements are specified by Rules 56, 59, 61 or 65 or which are exempt from air pollution control requirements by said rules.
3. The spraying or other employment of insecticides, pesticides or herbicides.
4. The employment, application, evaporation or drying of saturated halogenated hydrocarbons or perchloroethylene.
5. The use of any material, in any article, machine, equipment or other contrivance described in sections (a), (b), (c) or (d), if:

(i) the volatile content of such material consists only of water and organic solvents, and

(ii) the organic solvents comprise not more than 20 per cent of said volatile content, and

(iii) the volatile content is not photochemically reactive as defined in section (k).

j. For the purposes of this rule, organic solvents include diluents and thinners and are defined as organic materials which are liquids at standard

conditions and which are used as dissolvers, viscosity reducers or cleaning agents, except that such materials which exhibit a boiling point higher than 220°F at 0.5 millimeter mercury absolute pressure or having an equivalent vapor pressure shall not be considered to be solvents unless exposed to temperatures exceeding 220°F.

k. For the purposes of this rule, a photochemically reactive solvent is any solvent with an aggregate of more than 20 per cent of its total volume composed of the chemical compounds classified below or which exceeds any of the following individual percentage composition limitations, referred to the total volume of solvent:

1. A combination of hydrocarbons, alcohols, aldehydes, esters, ethers or ketones having an olefinic or cyclo-olefinic type of unsaturation: 5 per cent;
2. A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene. 8 per cent;
3. A combination of ethylbenzene, ketones having branched hydrocarbon structures, trichloroethylene or toluene: 20 per cent.

Whenever any organic solvent or any constituent of an organic solvent may be classified from its chemical structure into more than one of the above groups of organic compounds, it shall be considered as a member of the most reactive chemical group, that is, that group having the least allowable per cent of the total volume of solvents.

l. For the purposes of this rule, organic materials are defined as chemical compounds of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides, metallic carbonates and ammonium carbonate.

Rule 66.1. Architectural Coatings.

a. A person shall not sell or offer for sale for use in Los Angeles County, in containers of one quart capacity or larger, any architectural coating containing photochemically reactive solvent, as defined in Rule 66(k).

b. A person shall not employ, apply, evaporate or dry in Los Angeles County any architectural coating, purchased in containers of one quart capacity or larger, containing photochemically reactive solvent, as defined in Rule 66(k).

c. A person shall not thin or dilute any architectural coating with a photochemically reactive solvent, as defined in Rule 66(k).

d. For the purposes of this rule, an architectural coating is defined as a coating used for residential or commercial buildings and their appurtenances; or industrial buildings.

Rule 66.2. Disposal and Evaporation of Solvents

A person shall not during any one day dispose of a total of more than 1½ gallons of any photochemically reactive solvent, as defined in Rule 66(k), or of any material containing more than 1½ gallons of any such photochemically reactive solvent by any means which will permit the evaporation of such solvent into the atmosphere.

Rule 67. Fuel Burning Equipment.

A person shall not build, erect, install or expand any non-mobile fuel burning equipment unit unless the discharge into the atmosphere of contaminants will not and does not exceed any one or more of the following rates:

1. 200 pounds per hour of sulfur compounds, calculated as sulfur

dioxide (SO_2);

2. 140 pounds per hour of nitrogen oxides, calculated as nitrogen dioxide (NO_2);
3. 10 pounds per hour of combustion contaminants as defined in Rule 2m and derived from the fuel.

For the purpose of this rule, a fuel burning equipment unit shall be comprised of the minimum number of boilers, furnaces, jet engines or other fuel burning equipment, the simultaneous operations of which are required for the production of useful heat or power.

Fuel burning equipment serving primarily as air pollution control equipment by using a combustion process to destroy air contaminants shall be exempt from the provisions of this rule.

Nothing in this rule shall be construed as preventing the maintenance or preventing the alteration or modification of an existing fuel burning equipment unit which will reduce its mass rate of air contaminant emissions.

Rule 68. Fuel Burning Equipment -- Oxides of Nitrogen.

A person shall not discharge into the atmosphere from any non-mobile fuel burning article, machine, equipment or other contrivance, having a maximum heat input rate of more than 1775 million British Thermal Units (BTU) per hour (gross), flue gas having a concentration of nitrogen oxides, calculated as nitrogen dioxide (NO_2) at 3 per cent oxygen, in excess of that shown in the following table

NITROGEN OXIDES - PARTS PER MILLION PARTS OF FLUE GAS

FUEL	EFFECTIVE DATE	
	DECEMBER 31, 1971	DECEMBER 31,1974
Gas	225	125
Liquid or Solid	325	225

Rule 68.1. Fuel Burning Equipment - Combustion Contaminants.

A person shall not discharge into the atmosphere combustion contaminants exceeding in concentration at the point of discharge, 0.3 grain per cubic foot of gas calculated to 12 per cent of carbon dioxide (CO_2) at standard conditions.

Rule 69. Vacuum Producing Devices or Systems.

A person shall not discharge into the atmosphere more than 3 pounds of organic materials in any one hour from any vacuum producing devices or systems including hot wells and accumulators, unless said discharge has been reduced by at least 90 per cent.

This rule shall be effective at the date of its adoption for any equipment not then completed and put into service. As to all other equipment this rule shall be effective on July 1, 1972.

Rule 70. Asphalt Air Blowing.

A person shall not operate or use any article, machine, equipment or other contrivance for the air blowing of asphalt unless all gases, vapors and gas-entrained effluents from such an article, machine, equipment or other contrivance are:

a. Incinerated at temperatures of not less than 1400 degrees Fahrenheit for a period of not less than 0.3 second, or

b. Processed in such a manner determined by the Air Pollution Control Officer to be equally, or more, effective for the purpose of air pollution control than (a) above.

This rule shall be effective at the date of its adoption for any equipment not then completed and put into service. As to all other equipment this rule shall be effective on July 1, 1972.

Rule 71. Carbon Monoxide.

A person shall not, after December 31, 1971, discharge into the atmosphere carbon monoxide (CO) in concentrations exceeding 0.2 per cent by volume measured on a dry basis.

The provisions of this rule shall not apply to emissions from internal

combustion engines

Rule 72. Pumps and Compressors.

A person shall not, after July 1, 1973, use any pump or compressor handling organic materials having a Reid Vapor Pressure of 1 5 pounds or greater unless such pump or compressor is equipped with a mechanical seal or other device of equal or greater efficiency approved by the Air Pollution Control Officer.

The provisions of this rule shall not apply to any pump or compressor which has a driver of less than one (1) horsepower motor or equivalent rated energy or to any pump or compressor operating at temperatures in excess of 500°F.

Rule 73. Safety Pressure Relief Valves.

A person shall not, after July 1, 1973, use any safety pressure relief valve on any equipment handling organic materials above 15 pounds per square inch absolute pressure unless the safety pressure relief valve is vented to a vapor recovery or disposal system, protected by a rupture disc, or is maintained by an inspection system approved by the Air Pollution Control Officer.

The provisions of this rule shall not apply to any safety pressure relief valve of one (1) inch pipe size or less.

APPENDIX C

Storage Tank Listing

Douglas Oil Company of California
Paramount Refinery
Tank List

TANK IDENTIFICATION	NOM. CAP. (bbl)	NOM. DIAM. FT.	CONTENTS	REID VAPOR PRES., PSIA AVG.	REID VAPOR PRES., PSIA MAX.	ROOF TYPE	FILL NOZZLE	AIR POLLUTION CONTROL DEVICE	TEMPERATURE OF AVG.	TEMPERATURE OF STAS. MAX.	DATE INST. OR MOD.
150,001	150	140	No. 2 Gas Oil	0.1	0.1	Fixed	Submerged	None	75	95	1974
150,002	150	140	Low Sulf. dist. Fuel Oil	0.1	0.1	Fixed	"	None	120	150	1974
125,001	125	150	Crude Oil	5	6	Floating	Submerged	Floating Roof	82	100	1961
125,002	125	150	Light Crude Oil	5	7	Floating	"	Floating Roof	76	100	1963
100,001	100	113	Paving Asph. AR1000	0.1	0.1	Fixed	Submerged	None	210	250	1974
100,002	100	113	Paving Asph. AR4000	0.1	0.1	Fixed	"	None	210	250	1974
80,001	80	118	Crude Oil	5	6	Fixed	Submerged	None	80	100	1937
80,002	80	117	Paving Asph. AR8000	0.1	0.1	Fixed	"	None	200	250	1957
80,003	80	118	Crude Oil	5	6	Floating	"	Floating Roof	80	100	1975
50,001	50	89	Reg. Gasoline	10.5	13.5	Floating	Submerged	Floating Roof	82	100	1966
50,002	50	86	Jet Fuel JP5	0.2	0.3	Floating	"	Floating Roof	82	100	1958
50,003	50	90	No. 2 Gas Oil	0.1	0.1	Fixed	"	None	75	100	1970
50,004	50	90	Heavy Naphtha	2.7	3.5	Floating	"	Floating Roof	72	100	1973
50,005	50	86	Low Sulf. Fuel Oil	0.1	0.1	Fixed	"	None	170	200	1974
50,006	50	86	Low Sulf. Dist. Fuel Oil	0.1	0.1	Fixed	"	None	130	150	1974
50,007	50	86	No. 2 Gas Oil	0.1	0.1	Fixed	"	None	92	100	1974
50,008	50	86	No. 2 Gas Oil	0.1	0.1	Floating	"	Floating Roof	88	100	1974
35,001	35	80	Flux	0.1	0.1	Fixed	Both	None	210	250	1962
25,001	25	60	Reformate	10.5	13.5	Floating	Submerged	Floating Roof	92	100	1966
25,002	25	60	Reformate	10.5	13.5	Floating	"	Floating Roof	90	100	1975
25,003	25	60	Light Naphtha	10.5	13.5	Floating	"	Floating Roof	80	100	1975
25,004	25	60	Heavy Naphtha	2.7	3.5	Floating	"	Floating Roof	85	100	1974
25,005	25	60	Unleaded Gasoline	10.5	13.5	Floating	"	Floating Roof	80	100	1966
25,006	25	60	Prem. Gasoline	10.5	13.5	Floating	"	Floating Roof	80	100	1966
25,007	25	60	Desulf. Auto. Diesel	0.1	0.1	Fixed	"	None	95	125	1966
25,008	25	60	Kerosene Dist.	0.5	0.6	Floating	"	Floating Roof	86	100	1970
25,009	25	60	Kerosene Dist.	0.5	0.6	Floating	"	Floating Roof	80	100	1970

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Douglas Oil Company of California
Paramount Refinery
Tank List

TANK IDENTIFICATION	NOM. CAP. MBbl	NOM. DIAM. FT.	CONTENTS	REID VAPOR PRES., PSIA AVG.	REID VAPOR PRES., PSIA MAX.	ROOF TYPE	FILL NOZZLE	AIR POLLUTION CONTROL DEVICE	TEMPERATURE OF AVG.	TEMPERATURE OF SEAS. MAX.	DATE INST. OR MOD.
20,001	20	60	Paving Asph. AR4000	0.1	0.1	Floating	Submerged	Floating Roof	375	400	1974
20,002	20	60	Paving Asph. AR1000	0.1	0.1	Fixed	"	None	350	400	1974
20,003	20	60	Jet Fuel JP4	2.5	3.0	Floating	"	Floating Roof	78	100	1963
20,004	20	60	Heavy Naphtha	2.7	3.5	Floating	"	Floating Roof	78	100	1963
20,005	20	60	No. 2 Gas Oil	0.1	0.1	Fixed	"	None	115	150	1963
12,501	12.5	48	No. 1 Gas Oil	0.1	0.1	Fixed	Submerged	None	98	125	1961
12,502	12.5	48	No. 1 Gas Oil	0.1	0.1	Fixed	"	None	98	125	1961
10,002	10	48	No. 3 Gas Oil	0.1	0.1	Fixed	Submerged	None	185	225	1974
10,003	10	60	No. 3 Gas Oil	0.1	0.1	Fixed	"	None	185	225	1974
10,004	10	45	Paving Asph. AR2000	0.1	0.1	Fixed	"	None	375	400	1958
10,005	10	60	Desulf. Naphtha	2.7	3.5	Fixed	"	None *	72	100	1958
10,006	10	60	Kerosene Dist.	0.5	0.6	Fixed	"	None	88	100	1958
10,007	10	54	Kerosene Dist.	0.5	0.6	Fixed	"	None	88	100	1958
10,008	10	39	Kerosene Dist.	0.5	0.6	Floating	"	Floating Roof	90	100	1966
6,001	6	32	Vacuum Tops	0.1	0.1	Fixed	Submerged	None	92	100	1961
6,002	6	32	Kerosene Dist.	0.5	0.6	Fixed	"	None	85	100	1961
5,501	5.5	36	Paving Asph. AR8000	0.1	0.1	Fixed	Submerged	None	375	400	1974
5,001	5	35	Paving Asph. AR1000	0.1	0.1	Fixed	Overhead	None	250	300	1950
5,002	5	35	Flux	0.1	0.1	Fixed	"	None	225	250	1950
5,003	5	36	Flux	0.1	0.1	Fixed	Submerged	None	350	375	1953
5,004	5	35	Flux	0.1	0.1	Fixed	"	None	250	275	1975
5,005	5	35	Flux	0.1	0.1	Fixed	"	None	300	325	1960
5,006	5	30	Paving Asph. AR1000	0.1	0.1	Fixed	"	None	280	300	1963
5,007	5	30	Paving Asph. AR4000	0.1	0.1	Fixed	"	None	280	300	1963
3,501	3.5	40	Slop	5	6	Fixed	Submerged	None	180	225	1974

* Floating Roof Scheduled for Installation

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Douglas Oil Company of California
Paramount Refinery
Tank List

TANK IDENTIFICATION	NOM. CAP. M'bbl	NOM. DIAM. FT.	CONTENTS	REID VAPOR PRES., PSIA AVG.	REID VAPOR PRES., PSIA MAX.	ROOF TYPE	FILL NOZZLE	AIR POLLUTION CONTROL DEVICE	TEMPERATURE °F AVG.	TEMPERATURE °F SEAS. MAX.	DATE INST. OR MOD.
2,001	2	30	Slop	5	6	Fixed	Both	None	160	200	1956
2,002	2	30	Slop	5	6	Fixed	"	None	160	200	1956
2,013	2	30	Slop	5	6	Fixed	"	None	150	200	1974
2,014	2	30	Slop	5	6	Fixed	"	None	150	200	1974
2,044	2	24	Flux	0.1	0.1	Fixed	Overhead	None	325	350	1949
2,045	2	24	Flux	0.1	0.1	Fixed	"	None	350	400	1949
2,046	2	24	Flux	0.1	0.1	Fixed	"	None	350	400	1949
2,047	2	24	Flux	0.1	0.1	Fixed	"	None	95	150	1949
2,048	2	30	Saturant -	0.1	0.1	Fixed	Submerged	None	400	450	1957
2,049	2	30	Saturant -	0.1	0.1	Fixed	"	None	400	450	1957
1,012	1	21.5	Saturant	0.1	0.1	Fixed	Submerged	None	300	425	1950
1,013	1	21.5	High Melt Asph.	0.1	0.1	Fixed	"	None	300	425	1950
1,014	1	21.5	SC Asphalt	0.1	0.1	Fixed	"	None	180	225	1974
1,015	1	21.5	SC Asphalt	0.1	0.1	Fixed	"	None	180	225	1974
1,016	1	21.5	Asph. Cutback Spec.	0.1	0.1	Fixed	Overhead	None	80	120	1951
1,019	1	18	Specialty Apsh.	0.1	0.1	Fixed	Submerged	None	250	375	1957
1,020	1	21.5	Asph. Emulsion	0.1	0.1	Fixed	"	None	100	150	1957
1,021	1	21.5	Asph. Emulsion	0.1	0.1	Fixed	"	None	100	150	1957
1,022	1	21.5	Paving Asph. AR4000	0.1	0.1	Fixed	"	None	250	275	1957
1,023	1	21.5	Asph. Emulsion	0.1	0.1	Fixed	"	None	100	150	1957
1,024	1	21.5	Asph. Emulsion	0.1	0.1	Fixed	"	None	100	150	1957
1,025	1	21.5	Asph. Emulsion	0.1	0.1	Fixed	"	None	100	150	1957
1,026	1	21.5	Asph. Emulsion	0.1	0.1	Fixed	"	None	100	150	1962
1,027	1	21.5	Asph. Emulsion	0.1	0.1	Fixed	"	None	100	150	1962
1,028	1	21.5	Asph. Emulsion Base	0.1	0.1	Fixed	"	None	100	150	1962
775	.7	24	Resin			Fixed	Submerged	None	70	90	1960
776	.7	16	Wax Emulsion Base Stock	0.1	0.1	Fixed	"	None	150	200	1960
777	.7	15	Wax	0.1	0.1	Fixed	"	None	300	375	1960

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Douglas Oil Company of California
Paramount Refinery
Tank List

TANK IDENTIFICATION	NOM. CAP. Mbbl	NOM. DIAM. FT.	CONTENTS	REID VAPOR PRES., PSIA AVG.	MAX.	ROOF TYPE	FILL NOZZLE	AIR POLLUTION CONTROL DEVICE	TEMPERATURE OF AVG.	MAX.	DATE INST. OR MOD.
751	.75	9	Desulf. Naphtha	2.7	3.5	Horiz.Pres.	Submerged	Pressure Vessel	65	90	1950
752	.75	9	Desulf. Naphtha	2.7	3.5	Horiz.Pres.	"	Pressure Vessel	65	90	1950
507	.5	15	Specialty Asph.	0.1	0.1	Fixed	Submerged	None	250	300	1951
508	.5	15	Asph. Cutback Spec.	0.1	0.1	Fixed	Overhead	None	80	100	1952
509	.5	15	Out of Service	---	---	Fixed	Submerged	None	---	---	1952
510	.5	15	Out of Service	---	---	Fixed	"	None	---	---	1952
511	.5	15	Asph. Emulsion	0.1	0.1	Fixed	"	None	100	150	1945
512	.5	15	Asph. Emulsion	0.1	0.1	Fixed	"	None	100	150	1945
513	.5	15	Asph. Emulsion	0.1	0.1	Fixed	"	None	100	150	1945
514	.5	15	Paving Asph. AR1000	0.1	0.1	Fixed	"	None	250	275	1957
515	.5	15	Wax Emulsion Base Stock	0.1	0.1	Fixed	"	None	240	270	1962
516	.5	13	Purch. Solvents	2.5	3.5	Fixed	"	None	60	80	1963
201	.2	10	Asph. Emulsion	0.1	0.1	Fixed	Submerged	None	100	150	1950
202	.2	10	Water Make-up	---	---	Fixed	"	None	180	210	1950
203	.2	10	Water Make-up	---	---	Fixed	"	None	180	210	1950
204	.2	10	Out of Service	---	---	Fixed	"	None	---	---	1950
205	.2	10	Out of Service	---	---	Fixed	"	None	---	---	1950
206	.2	10	Out of Service	---	---	Fixed	"	None	---	---	1950
207	.2	10	Out of Service	---	---	Fixed	"	None	---	---	1950
208	.2	10	Out of Service	---	---	Fixed	"	None	---	---	1950
209	.2	10	Asph. Emulsion	0.1	0.1	Fixed	"	None	60	100	1952
210	.2	10	Asph. Emulsion	0.1	0.1	Fixed	"	None	60	100	1952
211	.2	10	Asph. Cutback Spec.	0.1	0.1	Fixed	"	None	80	100	1952
212	.2	8	Asph. Cutback Spec.	0.1	0.1	Fixed	"	None	80	100	1953
213	.2	8	Asph. Mastics	0.1	0.1	Fixed	"	None	80	100	1953

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APPENDIX D

Vapor Recovery Systems

Monsanto Enviro-Chem Systems

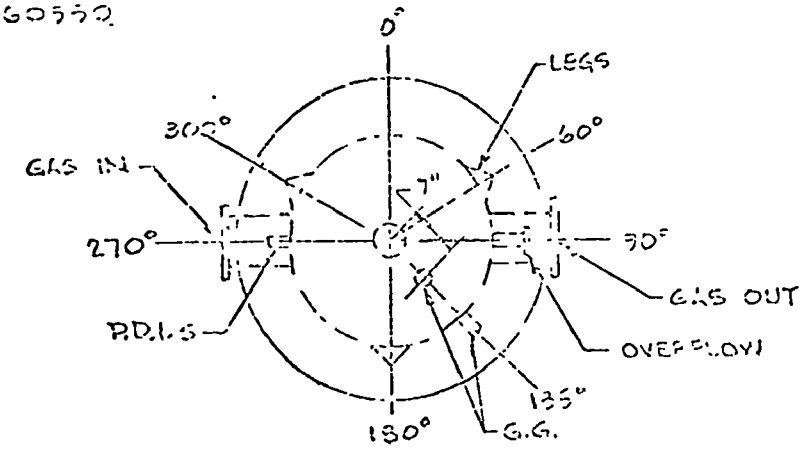
BRINK SYSTEMS

St. Louis, Missouri

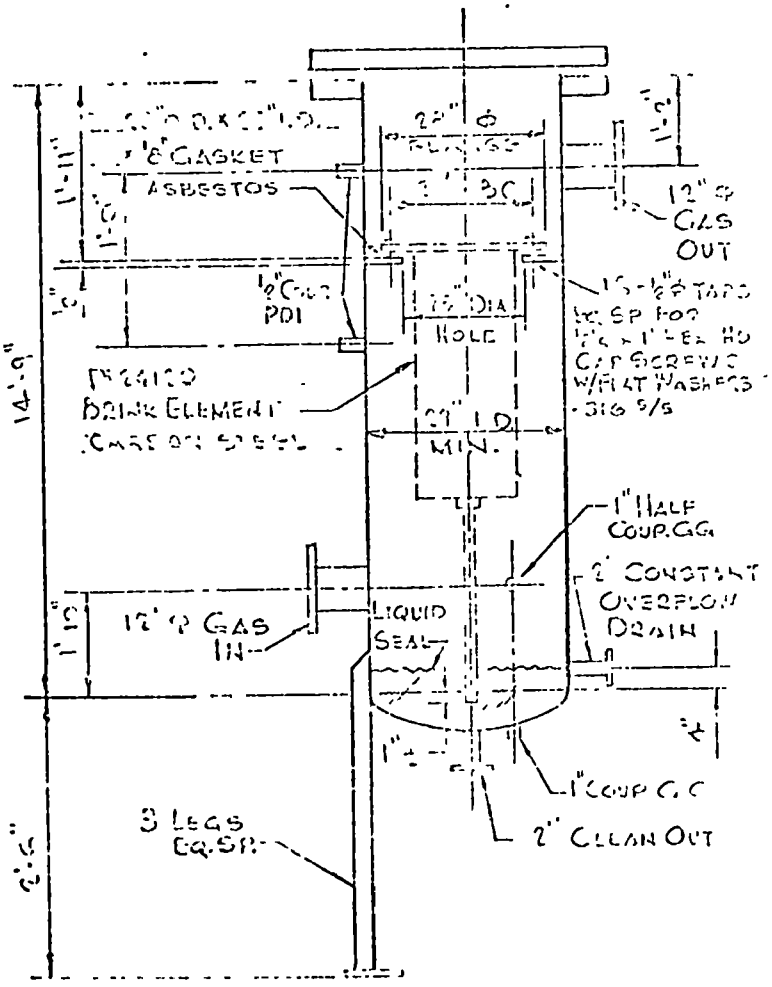
Project	Made by	Date	Revision	Page	of Pages
DOUGLAS OIL CO.	J.I.	11-21-72		1	5

Item No.	Description
MC-B-35-35-4.3	BRINK MIST ELIMINATOR ASSEMBLY

P.O.# 60550



PLAN VIEW



TANK BY CUSTOMER

RHEEM SUPERIOR VAPOR RECOVERY SYSTEM

The installation of a patented RHEEM SUPERIOR VAPOR RECOVERY SYSTEM at your gasoline loading terminal will:

1. Recover gasoline vapors and convert them back into gasoline, a salable product normally lost into the air.

2. Substantially reduce air pollution.

3. Increase safety factor of installation by reducing fire hazard.

4. Greatly reduce loading time inasmuch as one loader can load several compartments simultaneously using the automatic shut off devices incorporated in the vapor recovery loading arms and meters.

5. Improve operating conditions for personnel, since vapors are eliminated.

6. Improve environment for the community.

PROCESS DESCRIPTION

The operation of the RHEEM SUPERIOR VAPOR RECOVERY SYSTEM can be followed by referring to Drawing No. D-70-310-10007.

When gasolines are loaded into tank trucks, rail cars, or barges, vapors will evolve due to evaporation to as much as thirty-five per cent hydrocarbon. This percentage is dependent on the type of fuel, temperature, and the vapor pressure of the fuel. These vapors are collected in special loading arms and conducted to the process unit.

In the interest of safety, your unit is protected by a 'SUPERIOR' inline flame arrester mounted near the saturator. The purpose of the saturator is to insure a uniform composition of hydrocarbon in air which is substantially above the combustible limits for mixtures of gasoline. At no point in the system is the composition an explosive mixture. For this reason all vapors are conducted through the saturator and thence to the vapor holder.

At the instant that loading starts a relay is energized which automatically starts P-1 and P-2 pumps which circulate gasoline through the saturator. The other parts of the plant may not be in operation as they are actuated independently by the quantity of vapors in the vapor holder.

The vapor holder is a necessary part of the equipment in that it serves to allow steady operation of the entire unit. Compressor, pumps, and controls are all compatible and operate most efficiently in steady operations, whereas the loading operation is intermittent.

The vapor holder is provided with a diaphragm. The incoming vapors are contained beneath the diaphragm. When this diaphragm is raised to a predetermined level an electric switch is actuated which energizes the starter of the P-1 and P-2 pumps and compressor in sequence.

The compressor is a two stage operation with inter-cooling being effected by the gasoline circulated in the system. After-cooling is effected by an aerial section of fintube.

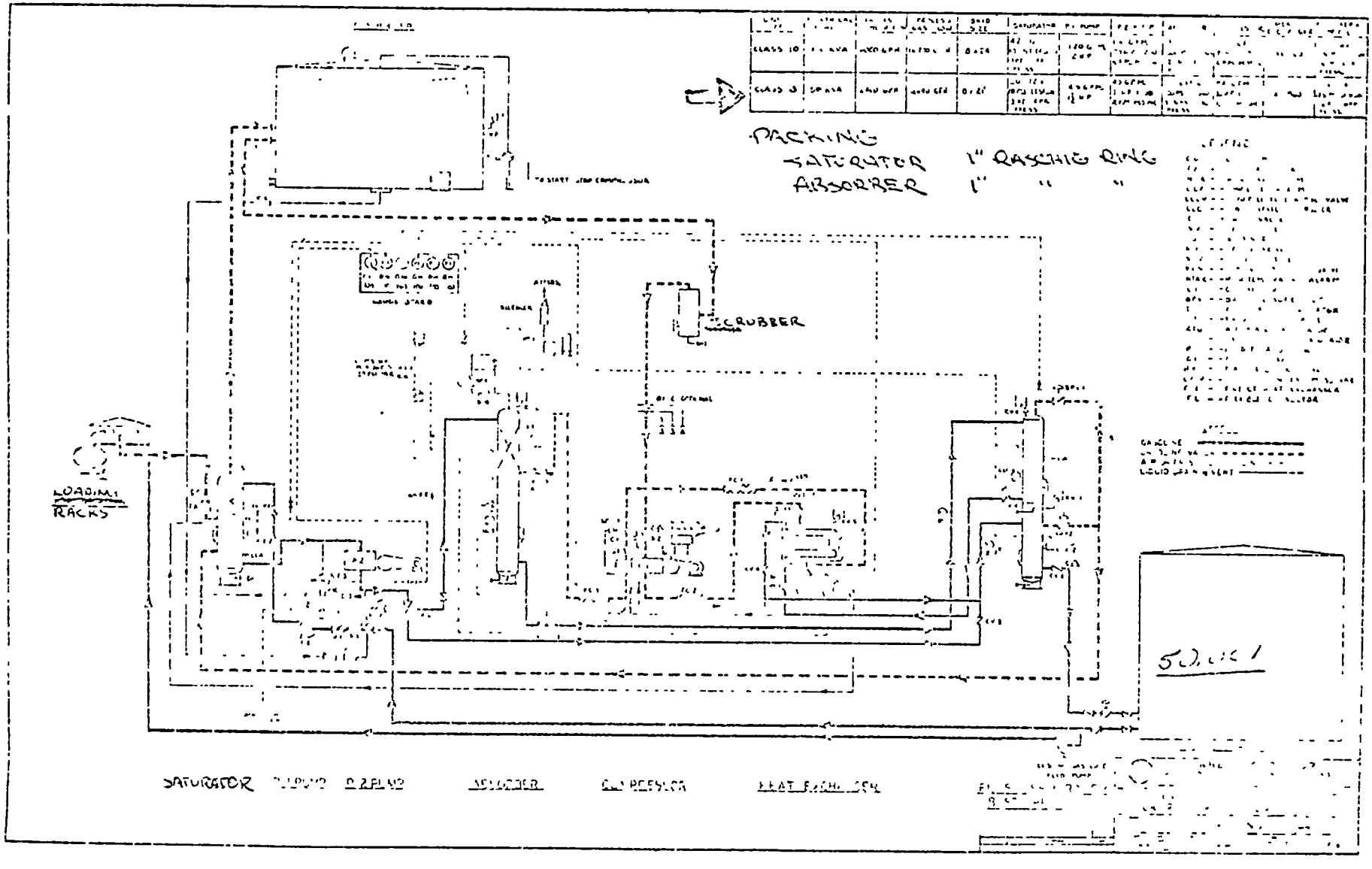
The compressed gas, at approximately 210 PSIG, is introduced near the bottom of the absorber column, and the gasoline from the P-2 pump is introduced at the top of the same column. The absorber column is a counter current liquid-gas absorption process utilizing an inert tower packing of Intalox saddle. The liquid gasoline absorbs the gasoline vapors and the uprising air is discharged from the top of the tower through a back pressure control valve and exhaust muffler. This air will contain less than 10% gasoline vapor.

Adequate safety shut off controls with suitable visual and audible alarms prevent operation of the process during abnormal conditions.

The electrical equipment is designed to operate in hazardous environment as defined in the National Electrical Code under Class I, Group D, Division I.

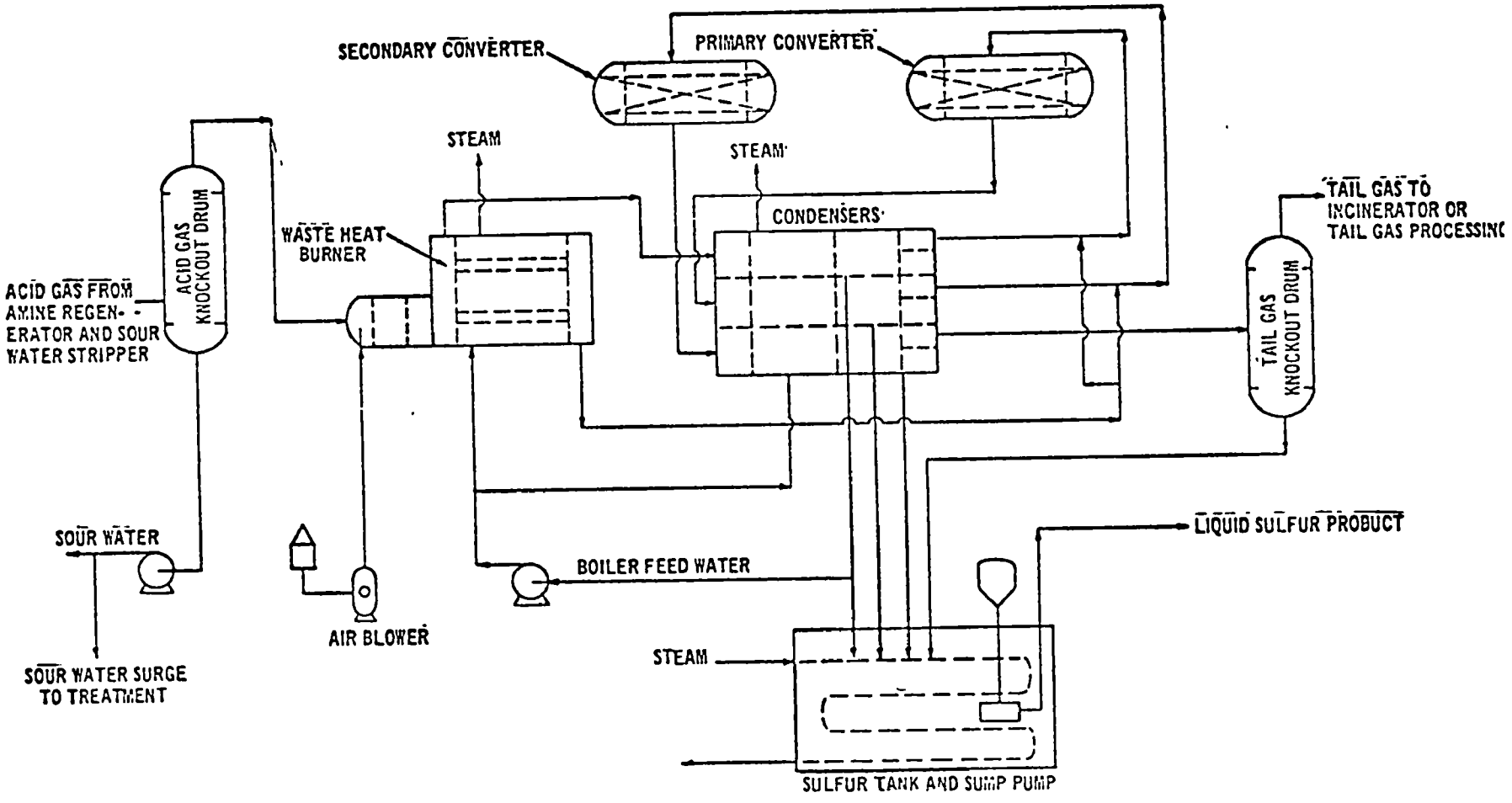
The Rheem Superior Vapor Saver is available in several sizes; each installation is designed to meet the individual situation involved for optimum operation.

We would be happy to submit a preliminary proposal for your specific requirements without obligation.


PACKING
SATURATOR 1" RASCHIG RING
ABSORBER 1" " "
SCRUBBER
LOADING RACKS
SATURATOR
ABSORBER
CONDENSER

APPENDIX E

Sulfur Plant Details



Typical packaged claus plant (2 stage).

DOUGLAS OIL COMPANY OF CALIFORNIA

SUMMARY AND CONCLUSIONS

Douglas Oil Company of California (Douglas) operates a 6,680 m^3 (42,000 bbl)/day petroleum refinery at Paramount, California. An air pollution related inspection was conducted at Douglas by NEIC personnel on September 22, 1975. Substantial amounts of process and air pollution control equipment information were requested of, and received from, Douglas. The Los Angeles County Air Pollution Control District (LAAPCD) was requested to supply information pertaining to stack testing conducted at this facility and any violation notices issued to Douglas.

The following conclusions were derived from the inspection and information obtained:

1. Douglas has had considerable operating problems with the Claus sulfur recovery units and the SCOT tail gas treatment unit. At least one LAAPCD violation notice has been issued to Douglas because of visible emissions and nuisance conditions related to these operations.

   The SCOT tail gas unit was not operating during this inspection due to equipment malfunctions.

2. The vapor collection system attendant to several asphalt loading racks was not operating correctly during this inspection. Asphalt fumes were noted escaping from one truck loading operation. The problem appeared to be related to insufficient vacuum on the vapor collection piping.

3. One of the two effluent oil/water separator units at the facility does not have a covered forebay as required by LAAPCD Rule 59. Douglas is aware of the problem and has scheduled the installation of such a cover for early 1976.

4. Based on calculations using approved EPA emission factors, the process heaters and boilers at this facility appear to be significant sources of nitrogen dioxide emissions. There are no LAAPCD regulations which apply to these units.

5. General housekeeping at the refinery appeared to be about average for the industry.

RECOMMENDATIONS

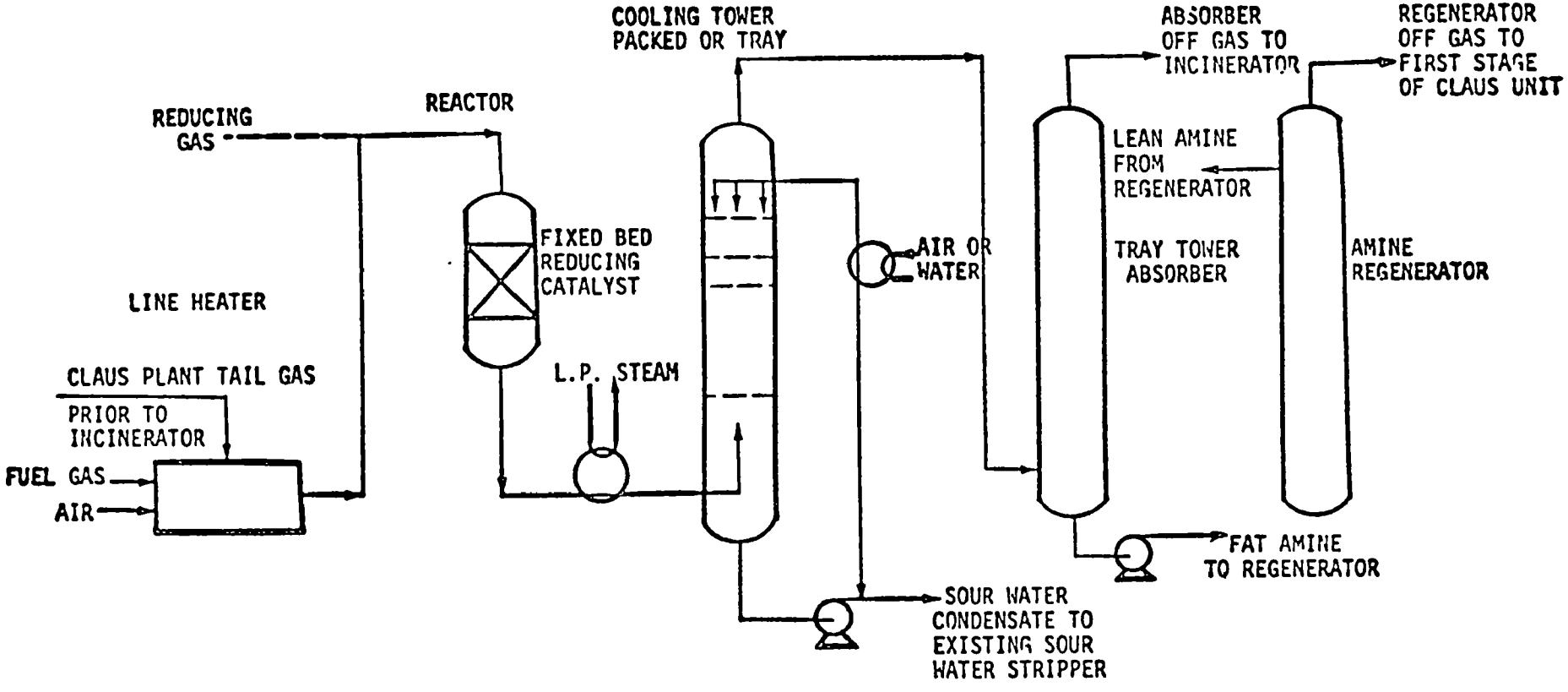
1. Douglas should be required to modify the Claus and SCOT units to ensure reliable operation.

2. Douglas should be required to stack test the SCOT tail gas treatment system at least once per year.

3. Douglas should be required to improve the vapor collection system attendant to the asphalt truck loading racks. Clogging of the vacuum piping by build-up of condensed asphalt fumes should be investigated as a possible source of the problems.

4. Douglas should install a cover on the one effluent oil/water separator which is not currently covered.

5. Reports confirming the above modifications and stack tests should be submitted to the Enforcement Division, LAAPCD and to the Director, Enforcement Division, USEPA, Region IX.



Flow diagram for the Shell Claus off-gas treating process.