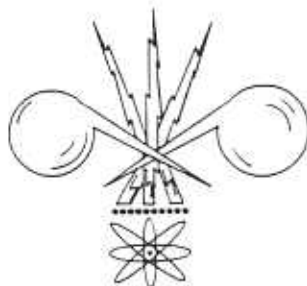


OVERVIEW OF ISSUES FACING LOUISIANA'S
PETROLEUM REFINING INDUSTRY



Prepared by

T. Michael French, P.E.
Director, Division of Technology Assessment

Louisiana Department of Natural Resources
Baton Rouge

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Overview of
Issues Facing Louisiana's
Petroleum Refining Industry

SUMMARY

Background

The problems facing Louisiana refineries directly parallel what is occurring in the U.S. refining industry as a whole. Louisiana is maintaining its relative share of total U.S. refining capacity. Over the past three years, Louisiana's share of U.S. operable refinery capacity has remained stable at 14% of U.S. capacity. As of January 1985, Louisiana operable crude distillation capacity at 21 refineries was 2,174,000 barrels per calendar day out of a total U.S. capacity of 15,722,000 barrels per calendar day at 229 refineries. Only Texas and California exceed Louisiana's refinery capacity.

The refining industry in Louisiana is as diverse as the difficulties facing it. The problems facing it are by no means insurmountable. The rash of shutdowns in Louisiana (See Table I) and throughout the U.S. does not spell the doom of the industry in the state. The refining industry has undergone drastic changes since the 1973-74 Arab embargo. These changes have resulted in a highly competitive industry that has forced out the inefficient and non-competitive refiners. To better understand these changes, it is helpful to examine four key issues: (1) Overcapacity, (2) Competitiveness of Majors versus Independents, (3) Imports, and (4) Refinery Profits as a Matter of Perspective. These issues are summarized below.

(1) Overcapacity - There is currently significantly more refining capacity in the U.S. than there is demand for refined products. This has been the major cause of the rash of shutdowns across the U.S. It is the independents that have been hardest hit by closures in Louisiana. Although refinery closures have slowed over the past year, there will probably be more until supply comes more into balance with demand.

(2) Competitiveness of Major vs. Independent - Generally, independents are at a severe disadvantage when forced to compete with the majors in an over supplied market condition. The main weaknesses for the independents are (a) deregulation of the oil industry which ended the crude oil entitlements program that enabled independents to obtain crude oil at costs competitive with the majors, (b) the lack of downstream processing facilities, (c) the EPA - mandated phase out of lead antiknock compounds, (d) the loss of market niches once ignored by the majors, and (e) the lack of captive crude supplies.

(3) Imports - Importation of foreign crude and refined products is essential because the U.S. is not self-sufficient in petroleum production. Imports of foreign crude and refined products presently supply about one third of the nation's petroleum needs. One third of the crude supply to Louisiana refineries is imported. Foreign product imports are beginning to put some pressure on U.S. refineries in the form of downward pressure on prices. Over the next few years, product imports are unlikely to pose a serious threat to U.S. or Louisiana refineries. In the long run, however, the expansion of export refineries in the overseas producing countries creates a cause for alarm. This issue will have to be followed closely.

(4) Refinery Profits as a Matter of Perspective - For major oil companies that are integrated from exploration and production to refining and downstream petrochemicals to retail sales, refining is an essential structural element to facilitate maximum business flexibility and maximum total return on the companies' crude holdings. For this reason, the majors will probably always continue their refining activities whether or not the refining aspect of their activities is very profitable. Most of the independent refiners, however, do not have the resource of profits from upstream and downstream activities to carry the refining activities through the bad times. To the independent refiner, low profits or no profits in refining is likely to force the independent out of business.

Outlook

As domestic production declines, the ability to receive foreign crude, refine it, and ship the products to end use markets will become increasingly important to the survival of a domestic refining industry. Louisiana's ocean going port facilities, Mississippi river transportation, and pipeline network, combined with the state's refining industry's ability to process a wide range of crude types and qualities, place Louisiana's major refiners in an excellent position to continue leading the country as a major refining state.

Louisiana's refining industry as a whole is well on its way in making the necessary changes to ensure a competitive future. The few remaining small independent refiners in the state, however, will continue having difficulty surviving in a demand-limited market such as the current "oil glut."

DISCUSSION

Overcapacity

Louisiana's refining industry has seen drastic reductions in capacity in recent years. These reductions were a necessary part of a refining industry restructuring that is evolving a more stable and healthy industry for the future. The restructuring has enabled U.S. refiners to transcend from the era of a Federally regulated industry that underwent uncontrolled expansion in the Arab embargo inspired oil boom to the present era of an overbuilt, deregulated industry operating in an oil glut in the wake of a worldwide economic recession.

Excess capacity still plagues the industry. Refined product demand is finally increasing again, but at such a slow rate that demand will not come into balance with supply for at least several^{1,2} more years, industry observers note, unless there are more shutdowns. The utilization or operating rates of refineries still running have increased as a result of the nationwide shutdowns of the last three to four years. Existing operating rates, however, are not high enough to give a refiner any opportunity to mark up his product as long as all of his competitors have plenty of excess capacity. One recent analysis reports that a reasonable degree of profitability will return to the U.S. refining industry in 1987 when utilization rates are expected to again exceed 80%.¹ Over the nine month period ending in February 1985, Louisiana Gulf Coast refinery utilization rates averaged 78.3% versus 76.4% for the U.S. industry as a whole.³ Analysis of industry data over the past four years indicates that, with the exception of the few refineries in North Louisiana, Louisiana's refineries consistently operate at higher rates than the U.S. average.

Competitiveness of Majors vs. Independents

Several paradoxes exist within Louisiana's diverse refining industry. The major oil companies in the state have recently spent hundreds of millions of dollars on modernizations and expansions to increase their flexibility to handle heavy and/or sour crudes and to increase energy efficiency. These major refiners in Louisiana have been pacesetters for the industry as a whole; some have even cut back or shutdown capacity in other states while expanding in Louisiana. Louisiana's independent refiners, on the other hand, have been rapidly disappearing.

In Louisiana, 13 of the 14 refineries shutdown since January 1981, representing 94% of shutdown capacity, have been independents. Noteable is the fact that this has all occurred during a period in which the diversification programs of the major oil companies across the country to handle heavy and sour crudes has resulted in driving down the prices of light and sweet crudes, which are all most independents are able to process. This advantage for the independents is overshadowed by the combination of (a) the loss of the crude oil entitlements program as a result of deregulation, (b) the lack of downstream processing facilities to produce the light products in demand (e.g., high octane gasoline), (c) the EPA-mandated reduction, and ultimate ban, in the use of lead antiknocks, and (d) the loss of market niches ignored by the majors when the industry was less competitive before the present "oil glut".

The efforts of the majors to become more competitive by increasing heavy and sour crude processing capacity were planned on economics existing prior to the present glut when the world oil market was supply-limited. At that time the price differential between light and heavy crudes justified the massive capital expenditures envisioned. Ironically, those facilities have been coming on stream during the present demand-limited market, thus driving down the price difference between light and heavy crudes.

Imports

There is also the imports controversy. With the increasing volume of both crude and product imports into the U.S., many in the industry are calling for the imposition of import fees or quotas on the basis that these imports threaten the survival of the domestic refining industry. This is a complicated issue of international supply and demand as well as trade policy in a world market. Imports are needed because the U.S. cannot supply its own petroleum needs. Currently about one third of all petroleum consumed in the U.S. is obtained from imported crude oil or imported refined products. Also, approximately one third of the crude input to Louisiana refineries is foreign crude.

Basically, domestic capacity will always be required to refine U.S. produced oil. Refining capacity beyond that level will depend on the industry's ability to compete with imported refined products as more export capacity for light products comes onstream in producing areas of the world. For the near term, imports are primarily just putting additional pressure on domestic refiners' struggle to make a profit in an over supplied market. There is not sufficient foreign export capacity in light products such as high octane gasoline to seriously threaten U.S. refiners for the next few years. After that, the situation may have changed significantly enough to require the judicious application of a combination of both crude and product import quotas or fees.

Refinery Profits as a Matter of Perspective

Whether or not a refinery "turns a profit" or "loses money" usually means one thing to a major oil company and something else to an independent refiner. Prudent business practice dictates that all aspects of a business provide a reasonable return on investments. To a major oil company that has integrated activities from exploration and production to refining and downstream petrochemicals to retail sales, refining is an essential structural element of the business. Upgrading lower value crude oil to higher value refined products and petrochemicals in demand generally provides greater economic opportunity than merely producing and selling crude. When it is difficult to make a desirable profit on refining in an over supplied market, as exists today, the major oil company has the rest of its integrated activities to carry refining throughout the hard times, and it is still possible for the company to make a significant overall profit.

Independent refiners in Louisiana, however, usually have little or no captive crude production and very limited retail marketing investments. Since they are dependent on outside sources of crude, independents cannot sustain a no profit or loss situation in refining when it is their main, or sometimes only, petroleum related business activity. To most independent refiners, a sustained no profit situation in refining will likely result in the company going out of business.

The refined product margin, or difference between refined product revenues and refined product costs, can be used as an index to compare overall economic performance of refining from year to year. From 1982 to 1986, the refined product margin for the majors has ranged from \$0.85 to \$0.67 per barrel as shown below.⁵

Year	Major Oil Companies ⁷ Refined Product Margins (\$/barrel)
1982	0.85
1983	0.71
1984	0.01
1985	1.09
1986	0.67

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The figures may vary significantly from company to company, depending on each company's actual operating, raw materials, and marketing costs and internal accounting practices. Likewise, margins for independents may vary above or below the average shown for majors. Historically, ⁶petroleum refining has generated a profit of 4 to 6% of gross selling price.

Cited References

- ¹ "Refining Needs Even More Consolidation," Hydrocarbon Processing; February 1985, p.15.
- ² "H P Impact," Hydrocarbon Processing; March 1985, p. 11.
- ³ Petroleum Supply Monthly, DOE/EIA-0109, Energy Information Administration, U.S. Department of Energy, Washington, D.C.
- ⁴ Petroleum Supply Annual, DOE/EIA-0340(83)/1, Energy Information Administration, U.S. Department of Energy, Washington, D.C.; June 1984.
- ⁵ Performance Profiles of Major Energy Producers 1983, ^{1984, 1985, 1986} Energy Information Administration, U.S. Department of Energy, Washington, D.C.; February 1985. JAN. 1988
- ⁶ Meyers, Robert A., ed., Handbook of Energy Technology and Economics, John Wiley & Sons, New York; 1983, p. 248-249.

Table 1
1985 Refining Product Yield Distributions*

Commodity	La. Gulf Coast	No. La., Ark.
Finished Motor Gasoline	42.5	26.0
Finished Aviation Gasoline2	.0
Liquefied Refinery Gases	5.1	1.5
Naphtha-Type Jet Fuel	1.1	3.5
Kerosene-Type Jet Fuel	12.3	.1
Kerosene8	.6
Distillate Fuel Oil	21.6	29.2
Residual Fuel Oil	5.2	5.1
Naphtha < 400 Deg. F. Petro. Feed. Use6	.0
Other Oils > 400 Deg. F. Petro. Feed. Use	3.1	.0
Special Naphthas	-.1	2.7
Lubricants	1.1	8.0
Waxes1	1.1
Petroleum Coke	4.6	1.4
Asphalt and Road Oil	1.7	18.3
Still Gas	3.9	2.9
Miscellaneous Products	1.0	.7
Processing Gain(-) or Loss(+)	-4.8	-1.1

* U.S. Department of Energy, Energy Information Administration

TABLE II
Operable Capacity of Operating Petroleum Refineries and Capacity[#]
Downstream as of January 1, 1984
(Barrels per Stream Day, Except Where Noted)

[#]Principal source: U.S. Department of Energy, Energy Information Administration

Refinery	Location	Crude Capacity		Charge Capacity						Production Capacity						Complexity Factor		
		Barrels per Calendar Day	Barrels per Stream Day	Vacuum Distillation	Catalytic Thermal Operation	Catalytic Cracking (Fresh)	Catalytic Cracking (Recycled)	Catalytic Reforming	Hydro-cracking	Hydro-treating	Alkylation	Asphalt	Aromatics	Isomerization	Lubricating Oils		Hydrogen (MNEFD)	Petroleum Coke
		Total	Total	tion	Operation	(Fresh)	(Recycled)	Reforming	cracking	treating					Oils		(MNEFD)	Coke
Calcasieu Refining Co	Lake Charles	14,000	14,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00
Calumet Refining Co	Princeton	3,162	4,400	4,400	0	0	0	0	0	0	723	0	0	2,535	0	0	32.46	
Cameron Resources	Cheydon	7,400	8,000	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	
Canal Refining	Church Point	8,000	8,800	0	0	0	0	1,900	0	0	0	0	0	0	0	0	1.86	
Citgo Petroleum Corp	Lake Charles	320,000	330,000	83,000	63,000	150,000	0	91,000	37,000	145,000	20,200	0	2,300	9,000	0	15,000	10.11	
Claiborne Gasoline Co	Lisbon	6,500	6,700	0	0	0	0	2,000	0	0	0	0	2,000	0	0	0	3.09	
Conoco Inc	Westlake (Lake Charles)	154,500	164,000	63,000	60,800	30,400	0	27,400	0	134,500	6,000	0	0	0	28	15,800	6.93	
Conoco Inc	Egan	10,000	13,750	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	
Exxon Co. U.S.A.	Baton Rouge	455,000	474,000	205,000	76,000	155,000	0	95,000	24,000	171,500	29,800	28,900	0	17,400	0	20,015	8.47	
Hill Petroleum Co	Krotz Springs	55,300	57,500	24,000	0	28,000	0	12,500	0	12,500	0	0	0	0	0	0	5.57	
International Processors	St. Rose	28,356	35,000	14,000	0	0	0	0	0	0	0	0	0	0	0	0	1.80	
Kerr-McGee Refining Corp	Dubach	10,000	11,000	0	0	0	0	2,200	0	2,200	0	0	0	0	2	0	2.20	
Kerr-McGee Refining Corp	Cotton Valley	7,800	8,500	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	
Marathon Petroleum Co	Caryville	255,000	263,000	125,000	0	75,000	14,000	50,000	0	143,500	20,000	25,000	0	7,000	0	0	6.69	
Murphy Oil U.S.A. Inc.	Meraux	92,500	95,000	40,000	0	35,300	3,000	23,000	0	44,000	10,300	12,000	0	0	0	0	8.39	
Peasazon Products Co	Shreveport	46,200	50,000	24,300	0	0	0	10,000	0	20,100	0	600	0	0	8,500	6	12.12	
Plyacid Refining Co.	Port Allen	45,000	48,000	18,000	0	18,000	2,000	7,000	0	7,000	4,200	0	0	0	0	0	5.54	
Shell Oil Co.	Norco	218,000	225,000	78,000	124,500	100,000	2,000	30,000	27,700	127,000	13,500	0	0	0	70	5,200	8.69	
Standard Oil Co	Belle Chasse (Alliance)	198,500	205,000	73,000	21,000	89,000	2,300	40,000	0	88,000	28,400	0	22,500	0	0	3,400	11.62	
Tenneco Oil Co.	Chalmette	137,000	144,000	62,000	27,000	45,000	0	45,000	18,000	55,000	19,000	0	7,000	0	24	7,280	10.13	
Teacac Refining & Marketing Covent		225,000	240,000	75,000	12,000	70,000	20,300	40,000	35,000	142,000	12,500	0	0	0	63	0	6.93	

TABLE III A

Capacity of Louisiana's Shutdown Refineries as of Last Date of Operation
(Barrels per Stream Day, Except Where Noted)

Refinery	Location	Crude Capacity		Charge Capacity						Production Capacity						Complexity Factor		
		Barrels per Calendar Day	Barrels per Stream Day	Vacuum Distillation	Thermal Operation	Catalytic Cracking (Fresh)	Catalytic Cracking (Recycled)	Catalytic Reforming	Catalytic Hydro-cracking	Catalytic Hydro-treating	Alkylation	Asphalt	Aromatics	Isomerization	Lubricating Oils		Hydrogen (MHCFO)	Petroleum Coke
		Total	Total															
Bayou State Oil Corp.	Hosston	3,000	4,000	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	
Celeron Oil & Gas Corp.	Mermentau	11,000	15,000	0	0	0	0	0	0	0	0	0	0	0	0	1.00		
Clark Oil & Refining	Mount Airy	23,000	23,000	11,000	16,000	0	0	0	0	0	0	0	0	0	0	4.04		
Evangeline Refining Co.	Jennings	4,500	5,000	0	0	0	0	0	0	0	0	0	0	0	0	1.00		
GHR Energy Corp.	Good Hope	300,000	300,000	200,000	120,000	110,000	0	3,000	0	0	12,000	0	0	0	0	5.77		
Gulf Oil Corp.	Venice	28,700	29,100	0	0	0	0	18,000	11,500	16,800	0	0	0	0	0	7.00		
Hansborough Energy	Crowley	0	0													-		
Ida Gasoline	Belcher	0	0													-		
Lake Charles Refining Co.	Lake Charles	28,000	30,000	0	0	0	0	0	0	0	0	0	0	0	0	1.00		
McTan Refining Corp.	St. James	19,300	20,000	0	0	0	0	0	0	0	0	0	0	0	0	1.00		
Port Petroleum Inc.	Stonewall	3,200	4,000	0	0	0	0	0	0	0	0	0	0	0	0	1.00		
Schulze Processing Inc.	Tallulah	1,760	2,000	0	0	0	0	0	0	0	0	0	0	0	0	1.00		
Shepard Oil Co.	Jennings	10,000	10,500	0	0	0	0	0	0	0	0	0	0	0	0	1.00		
Sooner Refining Co.	Darrow	8,000	10,000	0	0	0	0	0	0	0	0	0	0	0	0	1.00		
T & S Refining Co.	Jennings	10,500	13,000	0	0	0	0	0	0	0	0	0	0	0	0	1.00		
Texas MAPCO Inc.	St. James	20,000	20,000	20,000	0	0	0	0	0	0	0	0	0	0	0	3.00		
Total		470,960	485,600	231,000	136,000	110,000	0	21,000	11,500	16,800	12,000	0	0	0	0			

TABLE III B

Capacity of Louisiana's Shutdown Refineries as of Last Date of Operation
(Barrels per Stream Day, Except Where Noted)

Refinery	Location	Date of Years				Comments
		Last Operation	Date Shutdown	Years in Operation	Shut-down	
Bayou State Oil Corp.	Hosston	1/81	3/82	25+	Y	
Celeron Oil & Gas Corp.	Mermentau	2/83	8/84	6	Y	Formerly - Slapco
Clark Oil & Refining	Mount Airy	12/82			Y	Formerly - Mt. Airy Refining Co.
Evangeline Refining Co.	Jennings	12/82	12/82	25+	Y	
GHR Energy Corp.	Good Hope	12/82	9/83	15	Y	Recently Sold - 77
Gulf Oil Corp.	Venice	4/81	12/81	13	Y	Disassembled and Moved
Hansborough Energy	Crowley	?	?	?	Y	Used as storage
Ida Gasoline	Belcher	?	?	?	Y	Used as storage
International Processors	St. Rose	9/82	2/85	6	Y	Sold to Hill Petroleum & Restarted 1986
Lake Charles Refining Co.	Lake Charles	4/81	2/82	2	Y	
McTan Refining Corp.	St. James	7/81	8/83	6	Y	Formerly - Bruin Refining Inc.
Port Petroleum Inc.	Stonewall	12/83	2/84	4	Y	
Schulze Processing Inc.	Tallulah	5/81	8/82	4	Y	
Shepard Oil Co.	Jennings	5/81	2/82	4	Y	Converted to Ethanol Production
Sooner Refining Co.	Darrow	1/82	2/82	2	Y	
T & S Refining Co.	Jennings	7/81	3/82	2	Y	
Texas MAPCO Inc.	St. James	12/83			Y	Formerly - LaJet Inc.

TABLE IV
Louisiana Refineries by Complexity
(Barrels per Stream Day, Except Where Noted)

Refinery	Location	Total Crude Capacity	Complexity Factor
		Barrels per Stream Day	
Calumet Refining Co.	Princeton	4,400	32.46
Pennzoil Products Co.	Shreveport	50,000	12.12
Standard Oil Co.	Belle Chasse (Alliance)	205,000	11.62
Tenneco Oil Co.	Chalmette	144,000	10.13
Citgo Petroleum Corp.	Lake Charles	330,000	10.11
Shell Oil Co.	Norco	225,000	8.69
Exxon Co. U.S.A.	Baton Rouge	474,000	8.67
Murphy Oil U.S.A. Inc.	Meraux	95,000	8.39
Gulf Oil Corp.	Venice	29,100	7.00
Conoco Inc.	Westlake (Lake Charles)	164,000	6.93
Texaco Refining & Marketing	Convent	240,000	6.93
Marathon Petroleum Co.	Garyville	263,000	6.69
GHR Energy Corp.	Good Hope	300,000	5.77
Hill Petroleum Co.	Krotz Springs	57,500	5.57
Placid Refining Co.	Port Allen	48,000	5.54
Clark Oil & Refining	Mount Airy	23,000	4.04
Claiborne Gasoline Co.	Lisbon	6,700	3.09
Texas NAPCO Inc.	St. James	20,000	3.00
Kerr-McGee Refining Corp.	Dubach	11,000	2.20
Canal Refining	Church Point	8,800	1.86
International Processors	St. Rose	35,000	1.80
T & S Refining Co.	Jennings	13,000	1.00
Calcasieu Refining Co.	Lake Charles	14,500	1.00
Sooner Refining Co.	Darrow	10,000	1.00
Evangeline Refining Co.	Jennings	5,000	1.00
McTan Refining Corp.	St. James	20,000	1.00
Kerr-McGee Refining Corp.	Cotton Valley	8,500	1.00
Celeron Oil & Gas Corp.	Meraunteau	15,000	1.00
Bayou State Oil Corp.	Hosston	4,000	1.00
Cameron Resources	Gueydan	8,000	1.00
Port Petroleum Inc.	Stonewall	4,000	1.00
Conoco Inc.	Egan	13,750	1.00
Schulze Processing Inc.	Tallulah	2,000	1.00
Lake Charles Refining Co.	Lake Charles	30,000	1.00
Hansborough Energy	Crowley	0	-
Ida Gasoline	Belcher	0	-
Shepard Oil Co.	Jennings		(Converted to Ethanol)