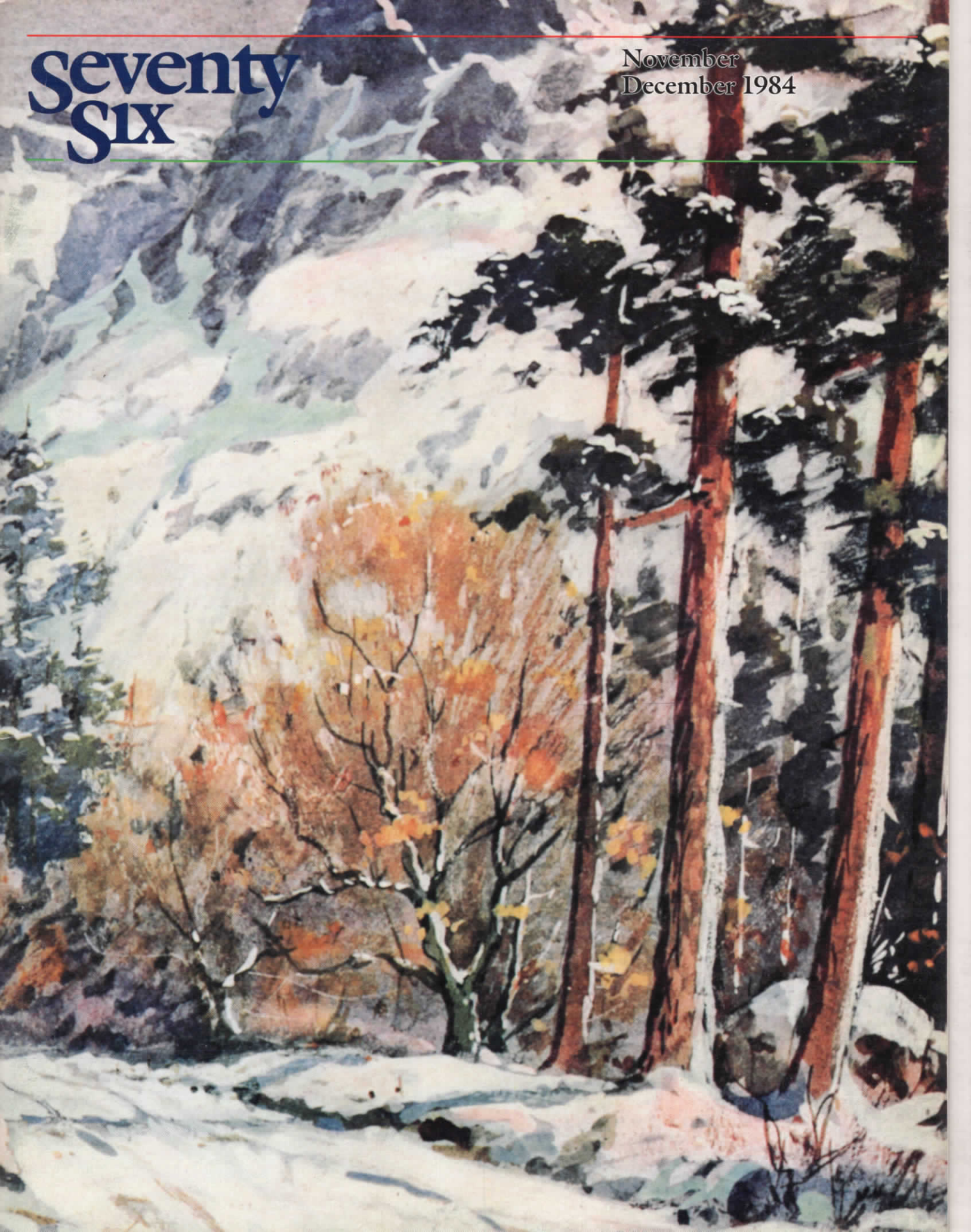


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Seventy  
SIX

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November  
December 1984



# The Oil Industry—Always in Transition

Fred L. Hartley, chairman and president of UNOCAL Corporation and Union Oil Company of California, delivered this speech to the Pacific Energy Association at its annual meeting, held on October 24, 1984. Founded in 1926, the 1,600-member PEA develops technical standards used throughout the oil and gas industry. Hartley received the Association's Lifetime Achievement Award at the meeting.

When we stop to think about it, the changes we've seen in our industry over the past forty years are truly amazing. Production technology, new ideas for exploration plays, refining techniques, changes in the marketplace—these and other elements seem always to be in a state of transition. In fact, I've come to realize that in this business, change itself may be the only constant. Let's examine some of the changes I've seen since joining the Pacific Energy Association over forty years ago.

In 1944, World War II was at its height. Despite national usage of 4.5 million barrels of crude oil per day, we were still able to *export* the crude oil and products needed in the war effort. In fact, between Pearl Harbor and V-J Day, the U.S. supplied 85 percent of the nearly seven billion barrels of oil used by the Allies.

Today, in contrast, we *import* about 30 percent of the 15.6 million barrels per day that we use. Our current imports exceed our total daily usage in 1944.

In 1944, the nation's energy mix was also quite different. Coal made up 53 percent of all energy consumed, while petroleum's share was 31 percent. Today, it is 23 percent coal and 43 percent petroleum.

Natural gas used to be an unwanted by-product that was either re-injected into the reservoir or flared off. Today, it is considered a premium fuel and is moved long distances to its markets. In a relatively few years, natural gas has grown from 12 percent to nearly 25 percent of total U.S. energy consumption.

In 1944, our industry had not yet set a well offshore, out of sight of land—although we would achieve this three years later in Louisiana. Today, our hundreds of offshore wells supply the nation with nearly 13 percent of its domestic crude production, and over 25 percent of its natural gas.

Forty years ago, the average refinery produced 22 percent of residual oil and 40 percent gasoline out of a barrel of crude. But the technological muscle of our refining arm was about to be flexed. We now get an average of nearly 55 percent gasoline, while the residual oil percentage has fallen to seven. Our newer refineries are capable of producing 70 to 80 percent of gasoline, jet fuel, and diesel. Today's refineries are also much larger, with an average capacity of 72,000 barrels per day versus 15,000 in 1944.

While self-serve marketing outlets were practically non-existent in the '40s, self-serve sales now account for almost 70 percent of the gasoline sold in the U.S. Then, there were some 200,000 retail outlets selling an average of 140,000 gallons per year. Now, gasoline sales have nearly quadrupled—although the number of outlets has dropped by one-fifth.

Obviously, all of this didn't happen overnight. Occasionally the changes came smoothly, but every now and then they landed with the force of a major earthquake.

The first two decades following the war were years of quiet growth. There were technological breakthroughs, particularly in offshore exploration and production, in refining processes, and in the construction of long distance natural gas pipelines. But there were few external shocks. During that 20-year period, only 15 percent of our crude oil and seven percent of our gas was produced west of the Rockies. Sixteen percent of our refining capacity could be found out here. These percentages held fairly steady until the mid-1970s.

The low prices and surpluses of the '50s and '60s gave rise to a perception of oil as cheap and plentiful. Fuel economy was not a consideration, either at home or on the road. But the seeds for change were being sown—more than we could ever guess.

In 1948, the U.S. became a net importer rather than an exporter of oil. Domestic exploration was moving increasingly offshore, including into such hostile geographic areas as the north slope of Alaska. Then in 1959, President Eisenhower, in order to protect the viability of the domestic producing industry, imposed a restriction on the level of oil imports. This was necessary because Middle East oil could at that time hit our shores at about \$2 a barrel, compared to U.S. postings of around \$3 a barrel.

Meanwhile, political and economic tensions in the Middle East began to influence the oil decisions of the Arab producing nations. This led, in 1960, to the formation of a new organization. It was called the "Organization of Petroleum Exporting Countries." OPEC's main goal was to prevent or slow down future price cuts.

Many of these changes went almost unnoticed. By the end of the '60s, worldwide energy consumption was increasing rapidly. Economies were growing and oil prices were falling. The perception that there would be plenty of cheap oil available forever continued to prevail throughout the U.S. and the world. That misperception soon would be abruptly corrected.

*Below: A view of Union's Avila Beach pier, where crude oil and products are transferred between tanker ships and a nearby Union Oil tank farm.*

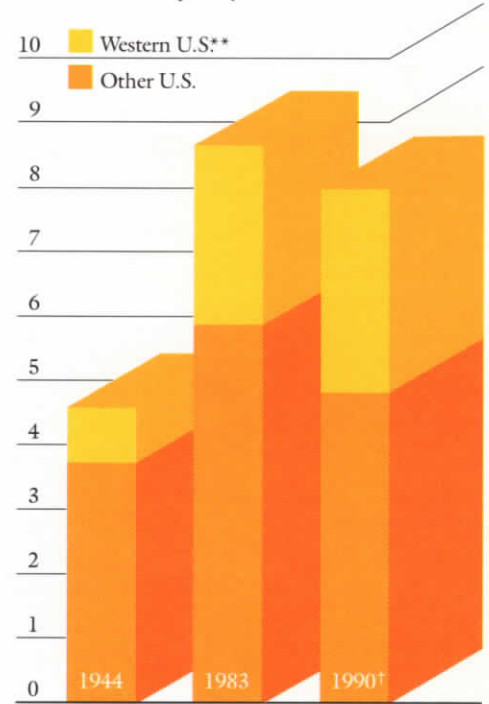
The first four years of the 1970s were a critical transition period for our industry. U.S. crude oil and gas production peaked, consumption of petroleum continued to outstrip production, imports rose to 35 percent of demand, and OPEC took control of the world energy market. The 1973 Arab-Israeli war, U.S. support of Israel, and the ensuing Arab oil embargo on "unfriendly nations" set off an explosion that pushed the price of crude oil from less than \$3 to \$11 per barrel—a 300 percent increase in just three months.

Washington panicked. Although the embargo lasted only five months, a new pattern was set. The government suddenly became an unwelcome partner in the management of our businesses. Energy became a major legislative interest with more than a dozen major laws passed between 1973 and 1980.

By the mid-1970s, federal laws empowered the government to set the prices for domestic crude, gasoline and other petroleum products *below* market levels. Those laws also determined which wholesale customers could get how much of their supply from which refiner. In addition, the government introduced and expanded regulatory schemes to reallocate petroleum or dollars throughout the industry and the nation.

### U.S. CRUDE OIL PRODUCTION\*

Millions of barrels per day



\* Does not include natural gas liquids

\*\* California, Alaska, Oregon, Washington, Nevada, Arizona, Hawaii

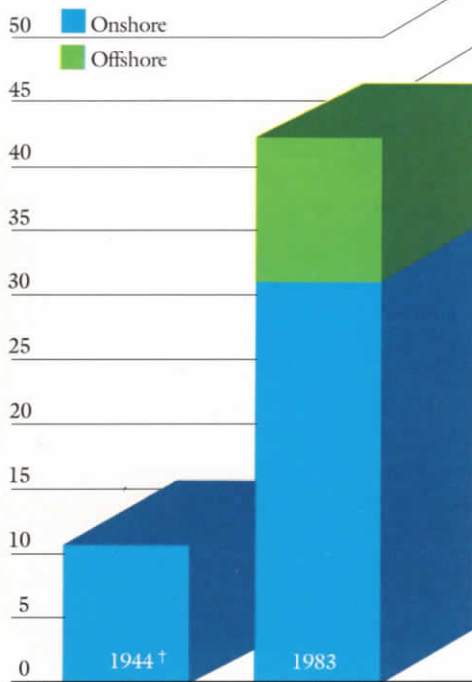
† Union Oil Company estimate.

Source: *20th Century Petroleum Statistics*, DeGolyer & MacNaughton



## U.S. NATURAL GAS PRODUCTION

Billions of cubic feet per day



†Offshore production was less than 1% of total.

Sources: U.S. Bureau of Mines, U.S. Geological Survey

These actions—all in the name of consumer protection—had the effect of discouraging domestic oil and gas production. They encouraged increased consumption, higher levels of imports, and the construction of small, inefficient refineries. By 1975, U.S. crude production had fallen by nearly 13 percent, and natural gas by 10 percent. Refining capacity, however, had increased 17 percent.

By 1978, consumption in the U.S. had risen to nearly 19 million barrels per day—an all-time high—and we were importing over 44 percent of what we used. Then, following the Iranian crisis, prices shot up to more than \$30 per barrel. In 1979, when there was at last a growing consensus that the controls were worse than nothing, President Carter finally started a program to phase out controls.

In 1981, President Reagan, one week after taking office, lifted all remaining controls on domestic petroleum and petroleum products. Reagan's action formally and finally acknowledged that OPEC does, in fact, set the price for the world's crude oil. It also recognized the wisdom of the marketplace.

As I emphasized earlier, change is the only constant in this business. Against that background, I'd like to outline where I feel we are now, and discuss the changes I think we will see over the next few years in the western U.S. and as a nation.

American consumers—both industrial and private—have responded intelligently to decontrolled prices. We now use less energy and we use it more efficiently. Our economy needs less than half the energy that was required a decade ago to achieve a unit of real growth. Petroleum demand has fallen 17 percent since 1977, from 18.7 to 15.6 million barrels per day. Crude and product imports have also dropped from a high of 46 percent in 1977 to 30 percent in 1984.

Turning to oil production, the U.S. is today producing over 8.5 million barrels per day of crude oil, with one-third now coming from the Pacific region. Looking ahead—thanks to imminent production from the large, newly found oil reserves in the Santa Maria and Santa Barbara offshore basins, plus expected stable Alaskan production—the west coast will likely contribute 40 percent of total U.S. production by 1990.

**1948**—U.S. changes from net exporter to net importer of crude oil.

**1959**—President Eisenhower imposes restrictions on level of oil imports.

**1960**—OPEC formed.

**1971**—President Nixon's wage-price freeze includes controls on crude oil prices.

**1973**—Arab OPEC nations impose oil embargo. Oil prices rise 300 percent. U.S. imports reach 35 percent of demand. Domestic price controls implemented.

**1975**—U.S. crude oil production is down 13 percent from 1974.

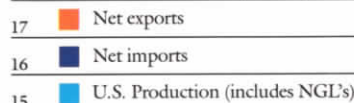
**1977**—Imports peak at 46 percent of demand.

**1978**—Revolution in Iran. Oil prices double. Consumption (which may exceed demand because of volume increases during refining) hits all-time high of nearly 19 million barrels per day.

**1981**—President Reagan lifts price controls on domestic crude oil.

## 19 U.S. DEMAND FOR PETROLEUM

18 Millions of barrels per day



Sources: American Petroleum Institute, U.S. Department of Energy

19 45 50 55 60 65 70 75 80 84

However, it is estimated that by 1990 total U.S. production will drop somewhat, from 8.6 million barrels per day to eight million. The reason is that the production decreases from older fields—primarily onshore California, Louisiana and Texas—will more than offset estimated new production scheduled off California's coast. In addition, exploratory drilling in prime Atlantic coast offshore prospects, such as Baltimore Canyon and Georges Bank, has been disappointing.

Although there is a hopeful promise of great potential in other western areas—including the Beaufort Sea, the St. George, Navarin and Norton Basins, and the Arctic National Wildlife Refuge—results to date are minimal. Potential production from resources yet to be discovered is at least a decade away.

What about demand? I noted earlier that America's energy consumers have taken the conservation ethic to heart. Petroleum demand is expected to rise only slightly over the next few years. But since domestic production will fall during the same time period, imports must increase to meet even a small rise in demand. By 1990, crude and product imports could be back to 40 percent of total demand.

As an aside, I might add that demand is not presently increasing at the gasoline pump. Gasoline sales peaked at 7.4 million barrels per day in 1978, slipped to 6.5 million barrels per day this year, and are expected to decline to six million barrels per day by 1990. Price competition has become ferocious as marketers scramble to retain sales and augment their shares of a shrinking sales dollar. This is transition with a vengeance, and, unfortunately, it means that negative earnings (that is, selling below cost) is the rule rather than the exception for marketers today.

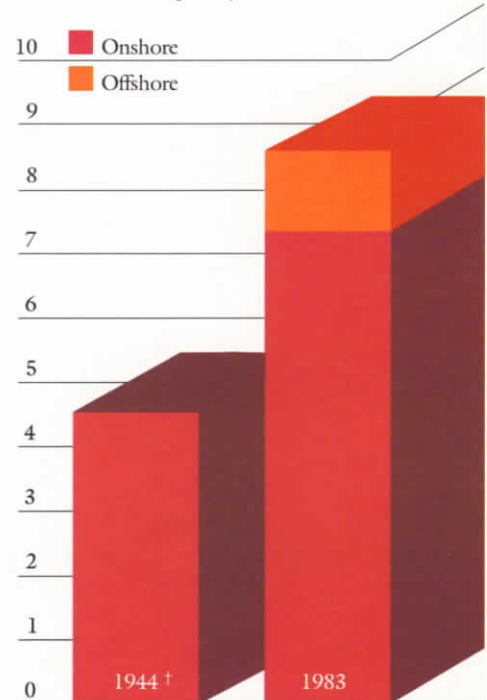
Although the industry has not resorted to the giveaways or trading stamps of the '60s—at least not yet—different companies have adopted varying strategies for dealing with this new environment. Some, for example, have chosen to concentrate on no-frills self-service. Our approach at Union has been a broader one. We stress quality products, including leaded premium, credit cards and a full range of services.

Shifting the focus to refining, I can't think of any segment of our industry that has had a more difficult time in making the transition from the '70s to the '80s. Today the U.S. has 16 million barrels per day of refining capacity, about 20 percent of which is located on the west coast. Total refining capacity increased by one-fourth from 1970 to 1983 in response to overly optimistic demand predictions, as well as government policies that encouraged the building of small, low-conversion and thus inefficient refineries. These could only operate profitably with subsidies.

But starting in 1981, the trend has reversed. U.S. refineries totaling nearly 2.5 million barrels per day of capacity have been closed—86 permanently and another 34 mothballed. All but 12 of these are east of the Rockies.

*By 1990, the western region will likely contribute 40 percent of total U.S. crude oil production.*

**U.S. CRUDE OIL PRODUCTION\***  
Millions of barrels per day



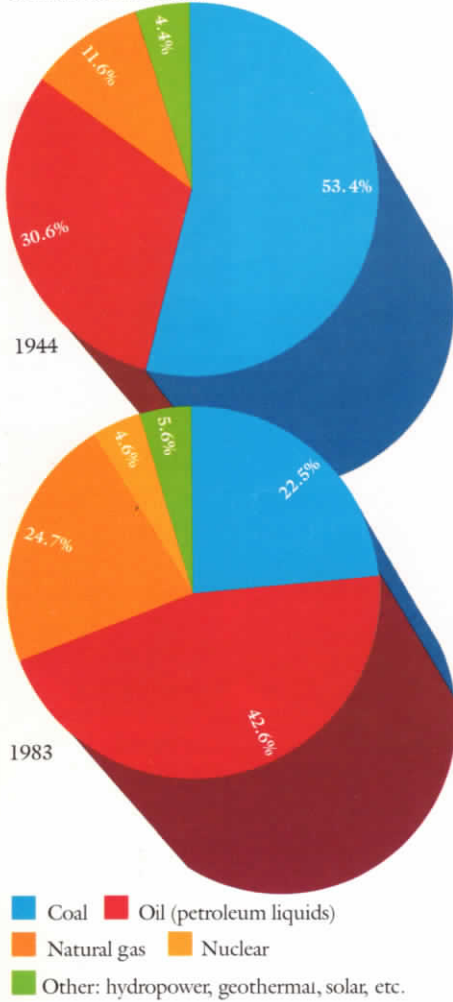
\*Does not include natural gas liquids

†Offshore production was less than 1% of total.

Sources: U.S. Bureau of Mines, U.S. Geological Survey



**SHARES OF U.S. PRIMARY ENERGY CONSUMPTION**



Sources: 1944—*Energy in the American Economy 1850-1975*, Schurr; 1983—U.S. Department of Energy

Even with these shutdowns, the U.S. refining industry still has about 20 percent excess capacity, mostly in the basic distillation process. I foresee little or no increases in capacity utilization by 1990. Production from the new export-oriented refineries in OPEC countries (the total now exceeds one million barrels a day) could more than absorb product demand increases, and thus further throttle down U.S. refinery utilization.

I recognize that I have outlined some disturbing factors with regard to our nation's energy future. What can be done?

First, we must recognize that energy development requires a long-term perspective. It is true that oil and gas are in temporarily ample supply. But this, too, is in process of transition. The easy savings made possible through conservation have largely been taken. As the world economy recovers its vigor, demand will grow stronger. And the earth's limited stock of oil and gas is steadily diminishing. With or without another crisis to interrupt the flow of Middle East oil, the balance of energy supply and demand must inevitably shift from "glut" to "shortage." In other words, we must be patient. And we must be prepared to repulse those who would absorb our markets by predatory pricing.

Second, we must renew our commitment to the development of alternative energy sources. I'm proud to report that our company has a leadership role in the development of two of these alternatives—geothermal and shale.

Union's project at The Geysers in Northern California is the largest geothermal facility in the world. The steam we produce there already generates sufficient electricity to meet the combined needs of San Francisco and Oakland. And we are expanding steadily. The Imperial Valley has even greater geothermal potential—enough to meet the electricity requirements of at least three million people. We believe we will soon be ready to move into commercial production in that area.

Union is also the leader in oil shale technology. Our 10,000 barrels per day plant at Parachute Creek, Colorado—the nation's first commercial oil shale project—is expected to go into operation shortly. This venture is important both to Union and to the nation. Locked up in the oil shale deposits of the western United States is an amount of recoverable oil equal to at least twice the known oil reserves of the Middle East.

*The U.S. refining industry has been especially hard hit by the new energy realities of the 1980s. Excess capacity currently stands at 20 percent, and will most likely remain that high through the rest of this decade.*



A third action we need to take in securing our energy future is the removal of Congressionally imposed moratoriums on offshore California leasing. In addition, we must facilitate the permitting process that slows development of already confirmed discoveries.

Finally, we need to follow up deregulation of oil by removing the natural gas price control program with its waste, confusion and disincentives.

Most of these suggestions are aimed at our government leaders. But government isn't the only force which has the effect of draining away funds needed for exploration, quashing innovation and destroying rather than building.

The same result is often achieved by the financial artists, bankers and corporate leaders intent on showing fast buck profits via mergers and takeovers. I'm referring, of course, to those who prefer to "drill" for oil on Wall Street rather than working to create real wealth by honestly discovering new oil and gas reserves.

The destruction of independent companies making long-term, innovative energy investments is exactly the opposite of what America needs as we seek to promote economic growth and energy security. Let's hope that the merger mania is not just transitory, but that it's over. And let's get on with the real job of providing for our energy future in a tangible, productive fashion. 76



*"We must recognize that energy development requires a long-term perspective. As the world economy recovers its vigor, demand will grow stronger."*



*Two California projects: site development for custom homes near Walnut Creek and the Crestline condominiums in Aliso Hills.*

# **REAL ESTATE COVERS A LOT OF GROUND**





“Around the turn of the century, Union purchased many thousands of acres. Land was cheap, so it was more economical for oil companies, railroads and other concerns with a geographic bent to their operations to buy land rather than negotiate with property owners for mineral rights or rights of way,” explains Bob Koch, president of the Real Estate Division.

Since then, the company’s continuing land purchases for service stations and other facilities have contributed to a considerable property portfolio. Corporate real estate of this kind often accounts for 25 percent or more of the total assets of firms not primarily in the real estate business, according to a Harvard survey. Typically, this hefty investment is undermanaged.

Recognizing an opportunity, Union Oil Company of California formed its Real Estate Division as a separate operating unit in 1973. The job is a big one, involving great numbers of properties acquired over the years and spread throughout the company’s divisions. The task is much larger than buying and selling real estate.

While Real Estate provides counsel to divisional land operations, it also handles a variety of property services for corporate headquarters and for other divisions and departments with no land operations. The 33 members of the Real Estate staff handle activities that range from negotiating with governmental agencies to participating in the operation of a water company.

A water company? Yes. Union is co-owner of the California Domestic Water Company in Brea, whose customers include the Fred L. Hartley Research Center and the Oil and Gas Division operation there. Bill Cotrel, manager of Real Estate’s property services group, sits on the water company’s board of directors.

Property services’ involvement in the sales of company-owned water rights and rights of way, and the management of leases for communication sites, agriculture and grazing, will generate some \$400,000 in revenues for other company divisions this year, Cotrel points out.

But pipelines are the major focus for property services. This involves acquisition of rights of way, relocations, sales of Union’s surplus pipelines and negotiations for franchises to operate within various communities.



**T**he group also monitors and reviews proposed public utility and roadway projects for possible impact on pipelines and other company operations. It is responsible for obtaining leases for several marine terminals. It acquires rights of way, leases and franchises for telephone lines, as well as for sites for microwave stations to meet the company's expanding needs for telecommunications.

In fact, property services keeps track of several thousand rights of way—and that's just one aspect of the division's operation. Property services is one of four groups in the Real Estate Division. The others are properties, government relations and Moreland Development Company.

The properties group is responsible for the management and sales of the company's surplus property. The group monitors all of Union's real estate assets—and that includes more than 50,000 acres in California alone.

"Operating divisions ask us to analyze specific properties to determine if they are surplus to the company's needs," explains Frank Rickman, vice president in charge of properties.

"If we find they are surplus, we'll assess their development potential. Parcels that can be developed are transferred to Moreland Development Company, which can then use its expertise to increase the value of this land," Rickman says.

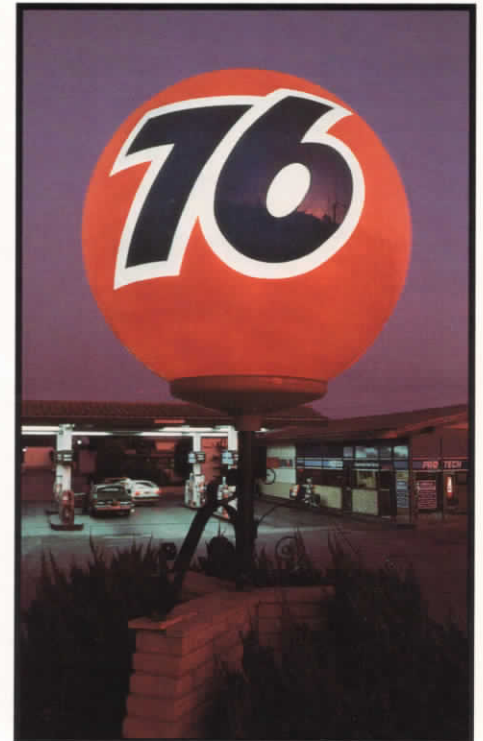
Property with no operational value to the company and no development potential is sold outright or traded for other property. The company will earn some \$3 million on surplus property disposal in 1984.

"Here's an example," says Rickman. "Recently, the relocation of some freeway ramps in Ventura, California made access to a Union 76 service station difficult. When we moved the station to a better location on the site, we were left with an excess of five acres. So, we entered into an agreement with a motel developer. Not only did we improve the station's access, we made a profit for the company as well."

The properties group sometimes takes on special projects. For example, in remote, sparsely-populated areas, a sudden influx of Union employees can create a pressing need for housing. An entire 218-lot subdivision was created in Kenai, Alaska to serve employees of two Chemicals Division plants. And, 358 units of new housing in Rifle and Parachute, Colorado serve employees of the shale oil project.



*Real Estate's activities are wide ranging, including commercial and residential development, lot development and sales, office space leasing, the management of agricultural and grazing leases— anything involving property services where needed, as well as counsel to other land operations within the company.*



One very special project is the administration of the lease on the Imperial Golf Course, a public course in Southern California which is unique because of its location in the middle of a producing oil field. (It is the site of Union's annual golf tournament.)

Administration of the golf course lease involves review and audits of the lessee's operation, as well as rent collection. A current issue, for example, is the resolution of shared concerns between the lessee and the developer of an adjacent 19-acre site which Union sold last year for \$6 million.

Real Estate's government relations group deals with local and state governments and their agencies on development or zoning problems. Specifically, the group is concerned with expediting the application and permitting process for development and construction projects. Government relations also monitors land use and planning regulations, and provides review and comment to the legal department on relevant legislation in Washington, Oregon, California, Arizona, Nevada and Alaska.

"We have been called on by other divisions to assist in particularly knotty areas, such as the expansion of the research center at Brea and ecological preservation of the Pismo Dunes area near the Santa Maria Refinery," explains Bob Woehrmann, manager of Real Estate's government relations. His background includes city management and urban planning.

One of Woehrmann's more unusual assignments is to act as liaison with the Tulalip Indian tribe in Washington State. Union owns 900 acres on the Tulalip Reservation. This site, purchased for a refinery that was never built, is now used in timbering and reforestation operations.

Of the four groups in the Real Estate Division, Moreland Development Company is the major contributor to profits. Originally formed as an outgrowth of an investment partnership in the mid-1960s, it now accounts for about half of the division's 33 employees.



Over the years, Moreland has marketed more than 2,400 prime acres, mostly in California. Another 5,800 acres, carrying a book value of \$110 million, is currently in inventory. In addition, Moreland can call on surplus corporate property as well as acquire property when justified.

Rick Jemison, president, outlines Moreland's development philosophy as follows: "We prefer to operate in forward-looking, well-planned and well-managed cities where we can establish a cooperative relationship with government. We want to develop projects in areas where growth is welcomed and taking place. We will never try to force a project on an unwilling community?"

Moreland's diverse land inventory gives it a degree of flexibility. For example, if the residential market is down, it can turn its attention toward commercial or industrial developments.

Moreland's current Southern California residential projects include the 50-acre Westshore at Lake Arrowhead. Located in the forested San Bernardino Mountains east of Los Angeles, Westshore is the last large undeveloped lakefront property in the popular resort area.

Connemara-By-The-Sea, located on the California coast near San Juan Capistrano, is a luxury oceanview residential community featuring private tennis courts and other amenities.

Aliso Hills in Orange County is a larger community development which began as a 730-acre land parcel. To date, Moreland has sold 644 residential sites, built and sold 269 homes, and developed and sold a shopping center. Now under way are the first phase of the 372-unit Crestline condominium project and 30 additional homes in the Brighton Ridge project.

Moreland's track record also includes the successful development of industrial properties in Southern California. In Brea, three business parks totaling more than 300 acres have already been developed and marketed. In the Simi Valley northwest of Los Angeles, two business parks totaling 120 acres have been sold out. A third, the 250-acre high tech Oak Park Business Center, will be on the market next spring.



**R**eal Estate has expanded its commercial development operations outside of California with its Woodfield Metro Center project in Schaumburg, Illinois, adjoining Union 76 Division headquarters there. The Woodfield joint venture so far consists of a 478-room Hyatt Regency Hotel and a 12-story office building. A second office building is now under construction, and another developer has an option on a third. The remaining 140 acres will be developed and sold by Moreland.

Also outside California, Moreland is developing a 230-acre business/industrial complex—the Aircenter Business Park—next to Cannon International Airport in Reno, Nevada. In mid-October, Porsche Cars of North America became the park's first user with the dedication of its new western distribution facilities.

The park features taxiway access to about one-third of the lots. Soon, rows of flashy sports cars, imported from Germany, will be rolling off jumbo 747 cargo planes directly onto Porsche's loading dock.

From the development of exciting new concepts for industrial parks to the efficient management of corporate property, the Real Estate Division's task is varied and often complex. The division makes an important contribution to the strength of the corporation. ⑦

*Above, Brighton Ridge, part of the Aliso Hills community development in Southern California. Opposite, the division's activities have included the negotiation for marine terminal leases and a range of development projects (clockwise): the Woodfield Metro Center in Schaumburg, several California business parks, and the Westshore residential project at Lake Arrowhead.*

# OUT IN THE COLD: ON THE JOB WITH A MONTANA PUMPER

It's early morning in the gently rolling wheat country of northern Montana. The sun is barely visible in a slate gray November sky. Cold and distant, its rays pierce the thick cloud cover just enough to bathe the snowy landscape in muted tones of blue and magenta. Scattered bales of straw dot the horizon, looking like huge iced cinnamon rolls.

In the midst of this unearthly scene, a lone pickup truck snakes along a narrow gravel road, its thick tires crunching through the freshly fallen snow. Keith Larson, one of seven Union Oil field operators (better known as "pumpers") who tend the wells here in the company's Montana oil fields, is making his daily rounds. Outside the heated cab of Larson's four-wheel drive pickup, the temperature is 17 degrees below zero.

Larson turns off the road, drives through a narrow gate, and continues on into a gently sloping field. A pair of wheel ruts—the barest of indentations in the snow—marks a trail which leads up the hill. Far away on the horizon a solitary beam pumping unit methodically nods away. This is but one of the 28 producing oil wells in Larson's territory, which spans nine separate oil leases.

Near the crest of the hill, just 50 yards from the pump jack, the wheel ruts abruptly disappear. Larson stops the truck and gazes ahead tentatively. The snowdrift appears deep, but not too wide. Given a little speed, it shouldn't be hard to bust right through it. But then again...

After backing down the hill a ways, he shifts the truck into four-wheel drive and barrels up toward the drift. The truck plows into it, spewing snow in every direction. But halfway through the drift, the wheels begin to spin. A moment later the truck comes whining to a halt.

Larson tries shifting in and out of reverse, hoping the tires will dig themselves some traction. But the stubborn snowdrift will not let go. With a sigh of resignation, Larson finally concedes defeat and turns off the ignition. "It looks like it's going to be one of those days," he sighs.

Pulling on his gloves, Larson exits the cab, grabs a shovel from the back of truck, and begins digging snow out from under the rear wheels. His breath comes out in billowing clouds of steam, and it isn't very hard to read his thoughts: "If only Mother Nature would show a little consideration for a guy..."

The workday had begun three hours earlier in Cut Bank, a town of 4,000 where Union's area production office is located. The company has maintained operations in this out-of-the-way region—located just south of the Canadian border and 70 miles east of the mountains of Glacier National Park—ever since the mid-1940s.

Retailing outlets and a small refinery were sold in 1970, but Union retained its oil wells in the area. Today the company's area staff, which numbers 23, operates 197 producing oil wells. All of the oil (around 1,900 barrels a day) is sold or traded to other companies. The wells are located in 12 separate fields—seven in Montana and five in North Dakota. The Montana fields are contained in an area of roughly 190 square miles.

"Many of our wells have been in continuous production for over 30 years—and some even date from the late 1930s," says Bob Loewecke, Union's area superintendent in Cut Bank.

Most of the Cut Bank area wells are stripper wells; that is, they are in the final stage of production and have very low recovery rates. But the pumps still lift enough oil—an average of 10 barrels a day each—to make them profitable. (The poorest well in the area produces under a barrel a day, while the best yields 80.)

It was 7 a.m.—just barely daylight—when Larson headed north out of town to begin making his rounds. "We could have an interesting time out here today," he said. "The first cold snap of the year usually causes some problems. But these old pump jacks are pretty tough. Most of them have been through more winters than I have?"

At 28, Larson has seen his share of Montana winters. He's lived in the area all his life, and knows well the icy blasts of Arctic air that can drive the temperature down to minus 40 and lower. But this is the earliest bout of such frigid weather he can recall. The previous evening, Halloween, the mercury had plummeted to 20 below—a record low for the date.

"Actually, I don't mind the cold as much as the summer heat," he says. "At least when it's cold, you can counter it by piling on layers of clothes?"

This is Larson's fourth year working for Union Oil, and his third working as a pumper. It's a job that requires a lot of oil field know-how, problem solving ability, and a good measure of self-reliance. A pumper works largely on his own each day. He's responsible for checking all the wells in his territory—making sure the units are pumping, recording their daily production, performing maintenance, and diagnosing and reporting problems. He will generally check in with his foreman, field mechanics or other support people only if something is wrong—and then only if it's something he can't remedy himself.



*Union Oil pumper Keith Larson checks one of the 28 producing oil wells in his territory. Oil field know-how, self-reliance, and the ability to diagnose problems are just some of the attributes a pumper must possess.*



*Even in bitter cold, a pumper's work goes on. Above, Larson hand cranks a pumping unit's natural gas engine to restart it. Below, his truck snakes across the snowy Montana landscape.*

Larson drives an average of 125 miles a day covering his territory. "Snow is the hardest thing to deal with on the road," he says. "We get drifts up to eight feet high around here, and that can make it very tough to get into the wells. Sometimes we even have to use snowmobiles. But one way or another, we try to get to each well every day."

A half hour's drive brings Larson to his first lease, located in the Moulton oil field about 35 miles north of town. Each oil lease, which can have from one to dozens of wells, is on land whose mineral rights are owned by one individual, group, or government body. (In some cases, Union itself may own the mineral rights to an area.) Union pays the owners royalties (usually around 12 percent) for the right to produce the oil. Each lease has its own oil treating unit and tank battery.

Most leases have at least two oil storage tanks, so that oil from one can be shipped without interrupting production. By opening sealed valves on the tanks, buyers divert the production into a pipeline system. (If the tank battery isn't connected to a pipeline, the oil is removed by truck.)

The tank battery is usually the first thing a pumper checks when he drives onto a lease. The pair of tanks on this lease each have a capacity of 250 barrels. Larson stops in front of them, then opens his gauge book to the page listing the previous day's reading.



“Checking the tank levels is the quickest way to determine if anything is wrong on a lease,” he explains. “Yesterday this tank read four feet even. The wells in this field should produce nine inches of oil per day—so today’s reading should be four feet, nine inches. If it’s below that, I’ll know there’s trouble somewhere?”

Many storage tanks have automatic gauges which read out what the oil level is. Tanks without the gauges must be measured manually. This requires the pumper to climb up on a catwalk and lower a tape down into the tank, reading the oil level to the nearest quarter inch. “That gets old very fast when it’s this cold,” Larson says. “I’m glad most of my tanks have automatic gauges.”

The gauge on the first tank reads 4’9” on the nose. Larson records the production figure in his logbook, then heads on to check the lease’s four pumping units individually.

Beam pumping units—the rocking, insect-like machines common to most onshore oil production fields—are fairly simple mechanisms that work in much the same way as water well pumps on old homesteads. The pump itself is located at the bottom of the well. A series of “sucker rods”—long steel rods screwed together in 25-foot joints—connect the pump to the pumping unit at the surface.

The rods are stroked up and down by the pumping unit (also called a “pump jack”), which consists of a large steel beam fixed to a pivotal post along with a counter-weight. The pump jack’s rocking motion lifts oil up through the tubing surrounding the rods on each upstroke. At the surface, the oil is diverted into a flow line leading to an oil treater.

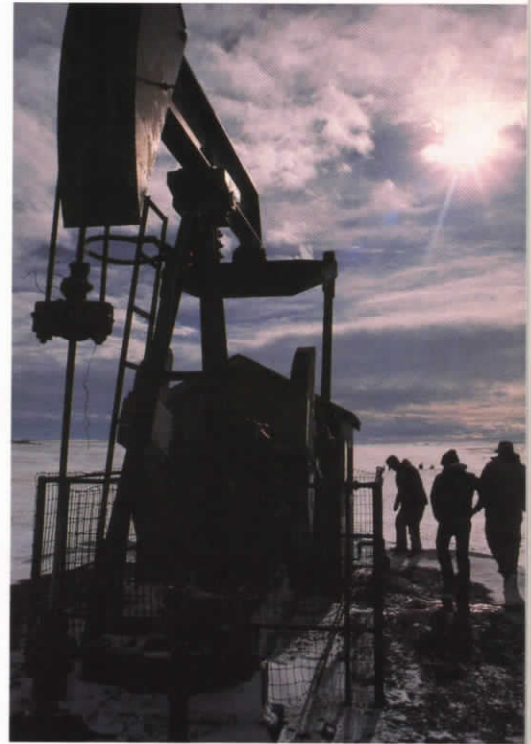
Pump jacks come in many different sizes, depending on how much fluid can be lifted from a given well. They also can be set at different speeds (the average is 10 strokes per minute). To determine how fast to pump a well, fluid levels in the well are measured periodically.

Pumping times also vary. If a well will produce the same amount of oil pumping six hours a day as it will pumping 12, running it less time will save wear on the equipment. Pumping fewer hours will also cut utility costs if the unit is electrically powered.

Larson drives up to the first pump jack, parks the truck and gets out to check the unit. Despite the extreme cold, it nods away methodically. At least a foot of snow covers the ground in every direction, and the stinging cold air is jolting to the lungs.

“The first thing I always do when checking a pump jack is to listen carefully,” Larson says. “If the unit’s pumping quietly, it’s usually okay. Second, I look for signs of fluid coming out of the flow line or valves. ‘Squeaks or leaks,’ that’s what you watch for. Most of the time, everything’s working okay. This one seems to be doing fine.”

Next, Larson steps inside the small shed housing the pump jack’s engine. All beam pumping units are powered either by electric motors or natural gas engines. Both types have their own advantages and disadvantages. Natural gas engines require more care, but their fuel, drawn directly from the well, is free. Electric motors require less maintenance, but their “fuel” must be purchased from a local utility company.



*Simply getting to the wells can pose a challenge during a Montana winter. “Sometimes we have to use snowmobiles,” Larson says.*



*Top priority for a pumper is keeping the production flowing. "If a well goes down, we try to get it back on line the same day."*

Electric-powered pump jacks work on automatic timers, and can be run anywhere from a few hours a week to continuously. All gas units, however, must run 24 hours a day because they have to be hand started.

Depending on production levels, gas-powered pump jacks are not always run seven days per week. But in winter they have to be, in order to keep the gas lines from freezing up.

All four pump jacks on this lease are natural gas-powered. Inside the unit house, the large engine chugs away loudly, fired by a single spark plug. Larson checks the oil and water levels (the engines require an average of two gallons of oil a week), then pours some alcohol into the gas line to further guard against freezing.

"When these engines go down, it's usually something simple like a bad plug or a radiator leak," he explains. "I can fix something like that myself. If it's more serious, like a clutch going out, then I've got to call for help. Either way, we try to get the well back on line the same day."

In a typical week, Keith may need to call for a mechanic two or three times. The electric motors have fewer problems, but extreme cold can sometimes knock out their power, requiring the services of an electrician.

After adding some oil to the engine, Larson hops back into his truck. The warm cab feels like heaven. "The thing I hate most about winter is having to restart those gas engines," he says. "You've got to crank them by hand, and when they're cold that's a real chore?"

The next three pump jacks are all working fine, so Larson heads for the treater house. This is where the oil from all the lease's wells is heated to separate out the water. Water content can be anywhere from a fraction to a large percentage of the total fluid pumped from a given well.

Water removal, known as "oil treating" or "oil dehydration," is done in the treater—a large, cylindrical device with "fire tubes" extending into it. Natural gas burns inside the tubes, heating the oil to 120 degrees or more, depending on the oil's gravity and chemical make-up. This causes the emulsion to break down, allowing the oil and water to separate. Water is removed from the bottom of the vessel and sent to a water disposal system to be pumped back into the ground via injection wells. The oil is sent to the storage tanks.

After inspecting the treater, which was operating perfectly, Larson drives over to the water disposal pump. No problems there, either. Ditto for the chemical injection pump, which injects scale inhibitors and de-emulsifiers into the oil just upstream from the treater.

"This is turning out to be a smooth day so far," Larson says. "Let's head on to the next lease?"

Fifteen minutes later, the truck sits mired in the aforementioned snowbank. When repeated attempts at shoveling snow—and a string of beseeching prayers—prove futile, Larson gets on the radio to call Dennis Buckley, his production foreman. Buckley happens to be close by, supervising work on a well that had downhole problems. Within minutes, he arrives in his truck and pulls Larson's vehicle free with a tow rope.

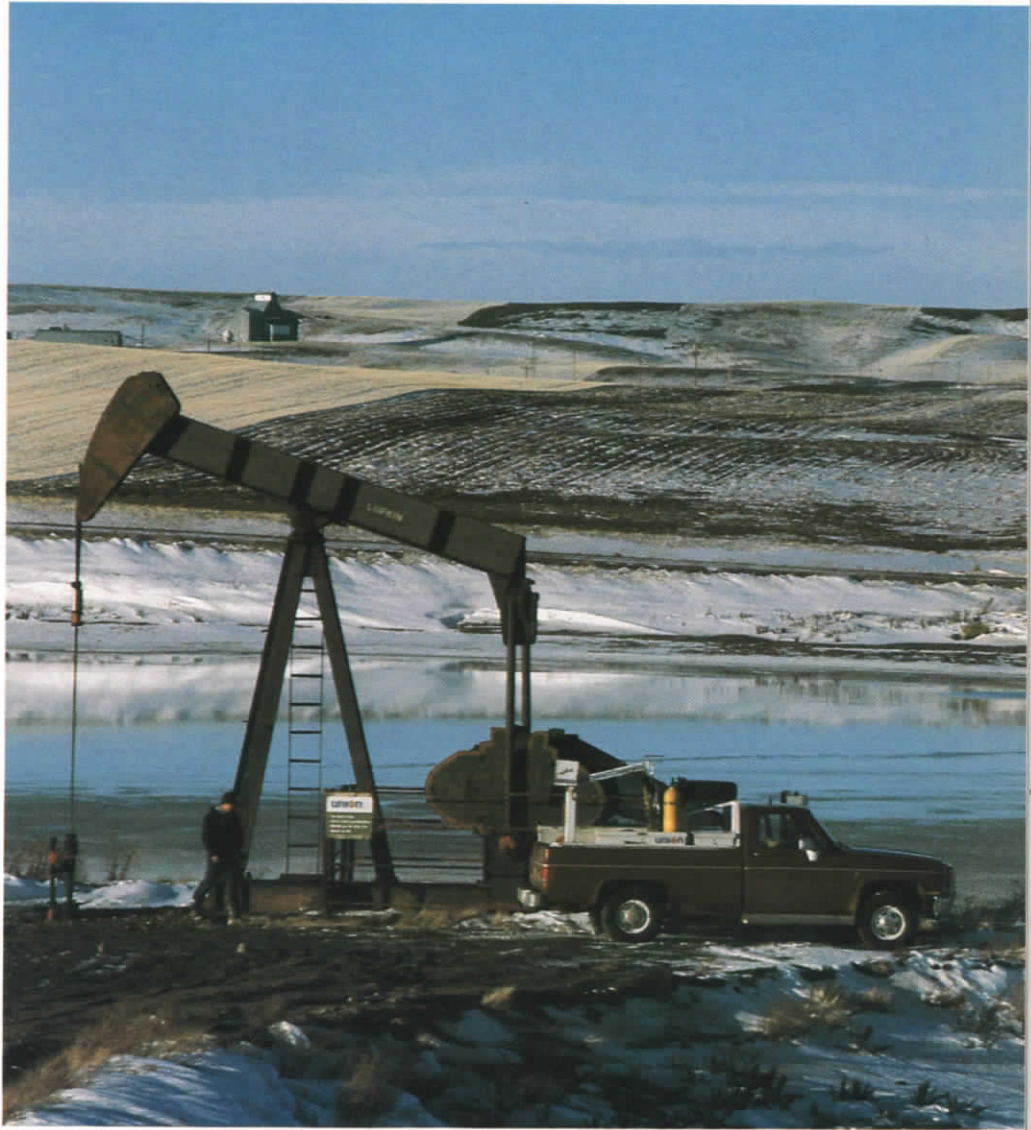
"I didn't know you liked shoveling snow so much, Keith," Buckley says, grinning. "Don't you get enough exercise out here?"

All was well on the next lease. Before proceeding on, Larson decided to head for his shop, located on the south end of his territory about 14 miles from town. There he would fill his water, oil, and alcohol jugs, and have a welcome hot lunch. (The Cut Bank production area has three shops, each stocked with supplies and parts.)

After putting some hamburgers on the skillet, Keith flips through his paperwork from the day before. All pumpers must fill out a field report at the end of each day, detailing the daily production for each lease in their territory. Tank levels must be translated from feet into barrels (a book of conversion tables is on hand for this purpose), and problems with any wells must be reported.

Larson is usually done checking his leases by 3:00, at which time he heads for the shop to complete his paperwork. Then, if there are any problems in the field, he'll usually drive back out to those wells to work on them. "If a well is down, top priority is to get it pumping again as soon as possible," he explains.

After lunch, Larson heads out to check his remaining leases. First stop is a well that he had been forced to shut down late the previous afternoon. This particular well, an electric-powered one, pumps a very small volume of fluids—only a barrel or so each day. This volume hadn't been sufficient to stand up to the extreme cold snap, and the flow line had frozen solid. Keith had radioed in, requesting that a maintenance truck come out to the site the next day to pump hot water over the line and unfreeze it. The truck is parked next to the pump jack when Larson arrives.



*"These pump jacks are pretty tough," Larson says. "Most of them have been through more winters than I have."*



*Above: Larson insulates a flow line with straw to prevent it from freezing. Below: Checking a storage tank's oil level with a tape measure.*

“She’s all ready to go,” says Jim Baughman, the driver, who had just completed the hot water treatment. He and Keith proceed to insulate the exposed portion of the flow line with straw, then cover it with a tarp. (Straw provides excellent cold weather insulation because of its effectiveness at blocking out wind.) Then Keith presses a button to restart the pump.

“Looks like this one is back in business,” he says. “Unless some hungry cow shows up and eats this straw?”

Next stop is another well that’s down, this one due to an unknown downhole problem. A workover rig contracted by the company has been at the well since morning, its three-man crew hard at work “pulling rods” to find out what’s wrong. Earlier in the day, they had pinpointed the problem: a failed pump that was clogged with mud. The crew had already installed a new one, and were now busy replacing the rods. Larson decides to check another lease, then return later to restart the pumping unit.

“I can’t believe it’s this cold already,” one of the workers grumbles. “Didn’t there used to be a fall around here?”

At the next lease, Larson has cause to utter a few laments of his own about the cold snap: another pump jack is standing motionless. This well, one of the biggest producers in Keith’s territory, pumps 35 barrels a day of oil and 800 of water.

Thankfully, its ailment turns out to be a simple problem: a fouled spark plug. Larson replaces it, then has to grunt and strain a bit cranking up the engine to re-start it.

“Sometimes when it’s this cold, you can barely budge the cranks on these things,” he says, kicking in the clutch as the big machine finally sputters to life.

No sooner has Larson reentered the warmth of his truck than he discovers yet another well down nearby, this one electric-powered. Although the fuse box seems okay, when Larson tries to restart the pump jack, it doesn't respond. Back in the truck, he radios the office to see if any power outages have been reported. The office checks with the power company, then calls Keith back.

"Office to Keith," a voice crackles over the radio.

"You got him; go ahead?"

"They say if there's an outage, it's news to them?"

Larson laughs, then signs off. The failure must have been caused by something else. "Sometimes this job is like a being a detective," he says.

Suspecting trouble with a panel on the utility pole, Keith drives over to the road to have a look. Sure enough, the utility box is blown, probably due to snow blowing in and causing a short. He calls an electrician to come out and repair it.

After making rounds on his last two leases, Larson returns to the well that had the bad pump. The workover crew is gone, and the unit is ready to pump oil. Keith restarts it, then screws a gauge onto a valve to check the well's flow line pressure. While waiting the 15 minutes it takes the well to "pump up," Larson calls Dennis Buckley on the radio to fill him in on the blown utility box.

Twenty minutes later, the gauge is still showing little flow line pressure. This could indicate further downhole problems, such as a hole in the tubing. But Keith suspects from a slight shudder in the rods that the unit's plunger is hitting the bottom of the pump assembly, and probably just needs to be raised a few inches.

After consulting Buckley, Keith shuts the pump jack down, raises the rods, and then restarts the unit. He'll return in the morning to regauge the pressure and see if this adjustment did the trick.

The final stop of the day is a return visit to the burnt out utility box. To his surprise, Keith finds that the electrician has already repaired it. Out in the field nearby, the affected well has restarted automatically and is once more pumping away.

By now it's nearing 4:00, time to head back to the shop and then on home. It's been a busy day for Larson, but Mother Nature hasn't been idle, either. Blue skies have replaced the heavy clouds, and bright sunshine streams down, glinting off the snow-covered fields. The welcome change in weather has come about quite abruptly, almost unnoticed in the rush of afternoon activity.

"Feels like it might be a chinook,"

Larson says. "That's a stream of warm air coming over the mountains from the southwest. If it is, she'll warm up pretty fast now." Indeed, by 4:30, the temperature has edged up to a relatively comfortable 34 degrees. The morning's deep freeze seems like a bad dream.

Driving back to town, Larson talks about his job. "Two of the best things about this work are the independence and flexibility," he says. "But most of all, I just enjoy being out here. I like learning how to deal with different problems that come up. Everything is pointed toward a common objective: keeping the production flowing—cleanly, and most important, safely. A pumper has to do all he can to help meet that goal every day?"

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*"Most of all, I just enjoy being out here," Larson says. "I like learning how to deal with different problems that come up."*

# PTCO - Moving Oil Since 1934

The first successful commercial crude oil pipeline was completed in 1865, just six years after Colonel Drake's pioneer well struck oil near Titusville, Pennsylvania.

That first line, the project of Samuel Van Syckel, was a two-inch wrought iron pipe that was 32,000 feet long (slightly more than six miles) and carried 81 barrels of crude oil an hour from Pithole City to the Oil Creek railroad station at Miller's Farm, Pennsylvania.

At first, barrels of crude oil had been transported by horse and wagon from producing fields to the nearest river or railroad shipping point. Teamsters charged up to five dollars a barrel to transport oil that was then selling for seven at the wellhead.

The teamsters' service was dependent on the quality of both the road and the weather, so it was no wonder that pipelines were an attractive alternative. But the first ones failed because of leaks—and because teamsters literally dug up their competition.

Van Syckel learned from the mistakes of his predecessors. His pipe was lap-welded with screw-threaded joints to prevent leaks. He hired armed guards to fend off greedy teamsters, and he installed a telegraph line to keep track of shipments. By charging shippers one dollar a barrel, he had a full return on his investment of \$30,000 in a few months.

He wasn't alone for long, however. The pipeline business mushroomed. The next logical step was to avoid rising railroad tariffs by building trunk pipelines from producing areas to refining centers. Crude oil pipelines got longer and bigger to keep up with new discoveries. Soon, finished petroleum products were also being delivered by pipelines—moving from refining to marketing centers to satisfy America's growing demand for gasoline and other products.

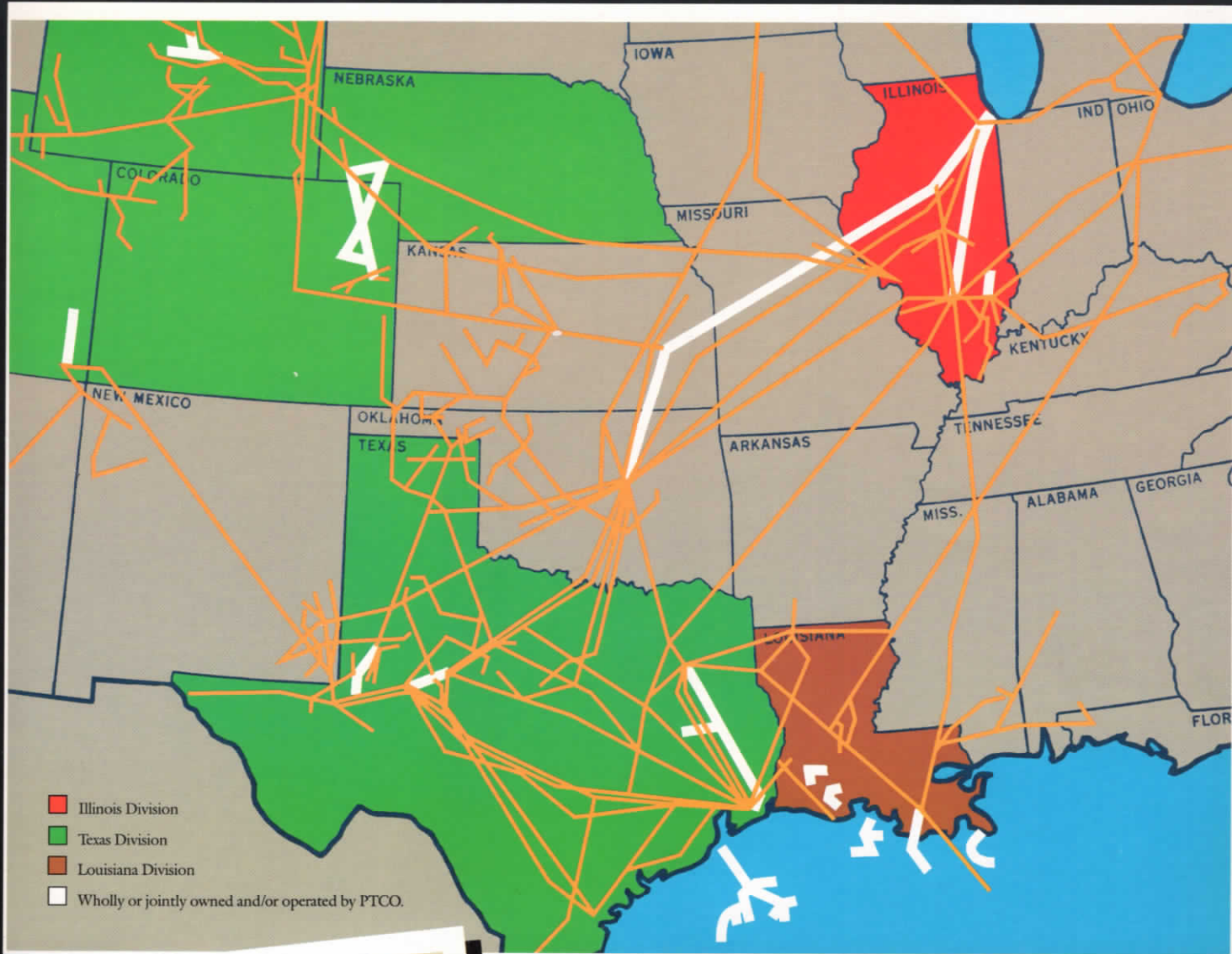
Total pipeline mileage was about 6,800 miles in 1900. By 1911, it was more than twice that. By 1914, pipelining was a regulated industry. In that year, the U.S. Supreme Court ruled that all large interstate crude lines and multiple-owned or used interstate products pipelines were "common carriers." As such, they were subject to regulation by the Interstate Commerce Commission and were required to make their services available to all shippers on a nondiscriminatory basis.

The definition holds true today under a different regulatory agency—the Federal Energy Regulatory Commission. So, Pure Transportation Company (PTCO)—a common carrier crude oil pipeline company formed 50 years ago—operates as a subsidiary of Union Oil, rather than as a division.

As a common carrier, PTCO transports oil not just for Union, but for any other shipper who is going its way. "We run it just like a separate company," says Bill Thacker, PTCO president. Thacker reports to Jim Baird, manager of pipelines, and Baird reports to Ron Runge, vice president of refining and transportation for the Union 76 Division, Eastern Region. PTCO headquarters are in Schaumburg, Illinois.

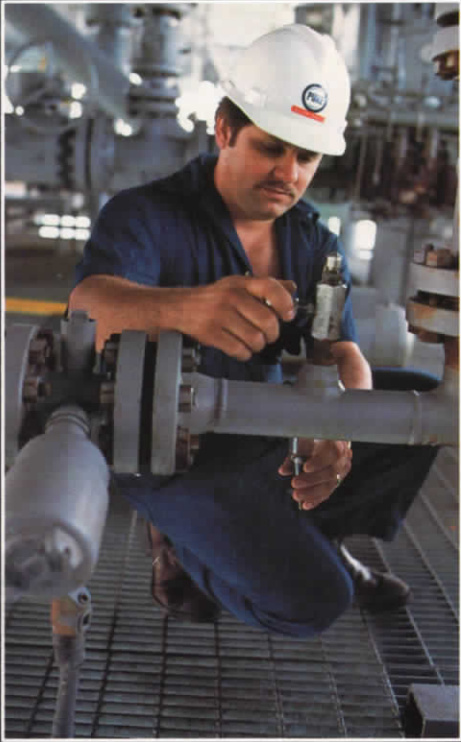
Total U.S. pipeline mileage had reached more than 115,000 miles by 1930, the year the Pure Van Pipe Line Company was formed. The company constructed and operated gathering lines from leases in the Van Field in East Texas, as well as a 10-inch trunk line running 212 miles to the refinery in Beaumont, Texas.

In 1934, the Pure Van Pipe Line Company and the Pure Oil Pipe Line Company, a smaller operation which had started up in the early part of the century, were reorganized to form the Pure Transportation Company. At that time the company operated in four states with the Texas system being by far the largest. Today, PTCO wholly or jointly owns more than 2,500 miles of crude oil and products pipelines in 10 states and moves 325-350,000 barrels per day.



*When Pure Transportation Company was formed 50 years ago, the pipelines laid in East Texas in the early 1930s formed a major part of its operations. Today, PTCO wholly or jointly owns more than 2,500 miles of pipelines, part of a vast U.S. network that moves massive amounts of crude oil and products daily.*

*Below, Allen Savin is one of four operators who rotate shifts to monitor and maintain the equipment on the Whitecap pumping platform offshore Louisiana. Below right, crude oil moves to Chicago area refineries from the pump station at Mokena, Illinois.*





“We parallel very closely Union’s success in finding oil,” says Thacker. Although transportation services are available to all shippers, pipeline construction and development tends to support the parent company’s needs.

A period of major expansion began in 1941, when PTCO merged with the Wabash Pipe Line Company in southern Illinois. Construction highlights of the next several years included new lines from the Beaumont refinery to the Bayou Pipe Line products system in 1943; new gathering systems and trunk lines in Illinois in 1945; and the Dollarhide system in West Texas in 1952.

The development of pipeline systems to serve rapidly growing production in Colorado and Nebraska in the mid-50s resulted in the Arapahoe Pipe Line Company, in which Pure owned a major interest. At its peak in 1960, Arapahoe delivered 120,000 barrels of oil a day to the Cushing-Chicago system serving midwestern refineries including Union’s Chicago Refinery. (PTCO owns 30 percent of Cushing-Chicago.) Although the Arapahoe main line was sold in the 1970s after production declined, PTCO’s operations in Colorado continue to move some 25 percent of that state’s production.

Just before Pure Oil Company became a part of Union Oil Company in 1965, PTCO acquired the Ute Pipe Line in southeast Utah which serves Lisbon Valley area production. This line carries some 2,500 barrels of crude oil a day to the Texas-New Mexico system, a distance of 67 miles, and on to refineries in the Midwest and Gulf Coast.

In the late 1960s when Union’s booming operations in the Gulf of Mexico merited a pipeline, PTCO and two other companies built the Whitecap system. The line, running 44 miles under the Gulf from Ship Shoal Blocks 208 to 28, and a pumping platform on Block 208 were completed in May 1969. PTCO owns an undivided interest of 53.33 percent and operates the system.

Gathering lines flow into the Whitecap pumping platform from several producers in addition to Union Oil. The line’s throughput peaked at 102,000 barrels per day in 1970. Its current average of 85,000 barrels a day is an increase over the last few years, reflecting continued drilling in the Gulf and discoveries in deeper waters. Union’s production requires about 20 percent of PTCO’s space in the pipeline. And that’s where “third party” (or non-owner) revenues come in.

“From this office, we move oil for 28 other companies,” says Ken Emmons, oil movement supervisor working out of Van, Texas. “And that’s new money since about 1980 when we began picking up more outside shippers. The oil was there, and we had the space in the pipelines?”

In the 1980s pipeliners, like the rest of the oil industry, have had to adjust to new energy realities. “In the late ’70s, everybody thought that oil consumption would just keep rising,” says Thacker, who assumed the PTCO presidency in 1981. “When the ’79 crisis hit [triggered by the Iranian revolution], things changed forever.”

Middle eastern exports were cut back and oil prices doubled. Consumers responded. Conservation combined with fuel switching to substantially reduce oil consumption. “Many dislocations of supply were created, and since then, many pipelines have been underutilized,” Thacker explains.

Nationally, there are more than 172,800 miles of regulated crude oil and product pipelines. Industrywide, there is excess capacity in the crude oil lines. In fact, just in the last year, two major trunk lines running from the Gulf of Mexico to the Midwest—the Seaway and Texoma lines—have been converted to transport natural gas.

PTCO’s response to the situation has been to become more aggressive in seeking revenues from shippers with no ownership interest in the pipelines. And, the strategy has proved successful. “We presently serve over 50 different shippers,” says Thacker. “More than 35 percent of our revenues of \$35 million a year are derived from shippers other than Union Oil Company?”

Tariffs are based on the value of the pipeline, the volume of oil that it moves and the distance it covers. High-volume pipelines move oil more cheaply than low-volume lines. For the joint ownership systems in which PTCO participates, each owner determines the tariff for his share of the line. Because all owners have about the same costs, competing tariffs often tend to be close. So, says Emmons, what a pipeline company sells is service.

“You help your customers with their scheduling, you help them balance their oil stocks in storage,” he says. “In short, you stay on the telephone for the eight hours you are in the office every day, and then you give them your number at home?”

Ken and John Clark, crude oil representative, not only try to fill PTCO’s space in the Van and Whitecap lines. They also coordinate the other owners’ shipments. And they try to fill PTCO’s space (40 percent) in the Ship Shoal system, which picks up where Whitecap leaves off, carrying the crude oil to the St. James Terminal on the Mississippi River just north of New Orleans. (PTCO does not operate Ship Shoal.)

“Ken and John do an excellent job of selling our services,” says Ron James, Louisiana division superintendent, whose responsibilities include operation of Whitecap and several gathering systems. In Ron’s view, in one part of his job—the operation of the Whitecap line—he works for three employers, the three owners of the line. Pipeline ownership can be complex.

“Shared interests give each owner economies of scale,” says Bill Thacker. A pipeline that might be too expensive for one company to build and operate by itself might prove profitable if the costs are shared by several owners. So, in addition to its wholly-owned facilities, PTCO has undivided interests (joint ownership) in 10 other pipeline systems. PTCO sells its own space and collects its own tariffs.

PTCO also provides management and personnel support for 12 pipeline companies in which Union Oil owns a percentage of stock. These companies, which pay dividends to their investors, have more than 10,600 miles of pipelines in the Eastern Region.

PTCO is divided into three operating divisions: Illinois, Texas (including Colorado, Nebraska, Utah and Wyoming), and Louisiana. Ron James moved to the PTCO office in Houma, Louisiana, in 1983. His year in Houma, added to his former service in Olney and Schaumburg, Illinois, make him part of the 41 percent of the company’s 142 employees who have 15 or more years of service.

James’ division has some of PTCO’s most interesting geography, including swamplands accessible only by boat. Rumor has it that at the district office for the Gueydan gathering system, the alligators show up in the backyard every day expecting leftovers from lunch.

The division also has PTCO’s only offshore operation. Platform operations are much like onshore, according to James, except that the equipment requires more maintenance because of the severe operating environment. And, when a gauger has to check a tank to see how much oil has been released into the pipeline system— he has to take a helicopter to get there, instead of a truck.

Pipelines cross every type of terrain and jurisdiction. If a pipeline must go under a navigable body of water, it must be approved by the Coast Guard. Other local and state agencies may be involved, as is the federal Environmental Protection Agency. Rights of way must be purchased, usually negotiated with landowners on the basis of so much per rod (16-1/2 feet), plus any damages caused by construction.

And, perhaps most important, the integrity of the pipeline must be carefully guarded. Meters monitor intake and outflow of trunk lines to alert the operator to variations that might mean leaks in the line. Signs are posted all along the lines to alert landowners, construction workers and others to their presence. Airplanes or helicopters “fly the lines” weekly or more often to check for possible leaks and problems from construction. Maintenance crews keep rights of way cleared so that visual air checks can be made. If a leak should occur, crews are dispatched immediately to salvage the oil, clean up the site and repair the line.

In a farming area the pipelines usually have four feet of ground cover. PTCO is vitally interested in protecting both the line and the farmland. So, if a pilot sees a farmer get too close to a pipeline with his harrowing machine, he may drop a small sandbag with a message to stop and a name to contact.

In such a situation, Ed Themig, station foreman and chief dispatcher at Patoka in southern Illinois, goes out to discuss the situation. Themig is in charge of the operation of the Chicap Pipe Line. As such, he wears many hats. His responsibilities include scheduling for the line, which PTCO operates and in which Union has a 48 percent interest.

Chicap is a 26-inch line that runs for 206 miles north from Patoka to Mokena, where it delivers to two Chicago area refineries. Seventy percent of the crude it carries is of foreign origin, arriving from the Gulf of Mexico via the Capline system which begins at the St. James Terminal in Louisiana.

“Pipelines operate packed,” Themig says. That is, they are always full of crude oil—or products—and the volumes are regulated by the speed of the flow. Pump stations are located at regular intervals along trunk lines. Chicap normally ships up to 180,000 barrels of crude oil a day, although volumes have been reduced until Union’s Chicago Refinery can be returned to full operation.

“About the 25th of every month,” Themig says, “I get the nominations from our shippers of how much and what types of oil they expect to be moving. Then I know how much oil we have to move out of the storage tanks at Mokena to have room for what’s coming.” There are five tanks at Mokena, with a total capacity of 940,000 barrels.

The Chicap line carries some 20 different varieties of oil, which must be batched—or kept separate in the lines. No separators are needed. There may be some mixing at the interface of the two crudes, but not enough to make a difference considering the volumes that are shipped. The properties of each oil help keep them separate. The range is from very light Algerian condensate with an API gravity of 62.9 to very heavy Mexican Maya crude with an API gravity of 22.6.

Gravitometers within the pipeline monitor the oil movement, and the computers in the Patoka station are updated on the status every ten seconds. In fact, the operation of the line is controlled from Patoka, where the computers are manned 24 hours a day.

The computers have an interesting failsafe feature to protect both the pipeline and the lone night operators. Every hour it asks, “Are you all right?” If the operator does not answer within the prescribed time limit, the computer calls for help.



*Above, operator Billy O'Hare makes the rounds of the Whitecap platform to check equipment, take readings and test samples of incoming oil. Pipelines cross all types of terrain, from ocean floor to desert, from the rural plains of southern Illinois (far right) to the rugged red rock hills of Utah (right).*



*Right, valves and pumps at Chicap's Patoka station move crude oil in and out of pipelines and storage tanks. Below, storage tanks for the Ute pipeline near Moab, Utah. Center, Ron James (left) and Dick Wilkins inspect incoming crude oil lines on the Whitecap pumping platform. Bottom of page, the pump station built at Van, Texas in the early 1930s is still operating.*



Sometimes in those late night hours when all is well with the pipeline, Al Hinderliter, dispatcher, ponders the value of his charge. The line holds 675,000 barrels of oil over its length. With oil at about \$27 per barrel, the total worth is at least \$18 million.

Ed Themig reports to the Illinois division superintendent, Harold Reed. Headquartered in Olney, Reed oversees one of PTCO's longest continuing operations. "When I came here 17 years ago, they told me the field's production would last maybe another five years," he says. "But they keep finding more oil."

The Olney gathering system consists of 375 miles of pipelines drawing oil from some 2,000 leases. The producing area—the Illinois Basin—covers 1,800 square miles. Production is holding at 7,500 barrels per day. Eight rigs are currently operating, developing new pools. The oil is shipped east for refining.

The drilling activity means that new gathering lines must be laid all the time. "The pipeliner—the man in the ditch—carries us," says Reed. "He works in rain, sleet, snow or heat to lay new line or replace old line?"

Fortunately, his work is not quite as arduous as it once was, according to Dick Wilkins, manager of loss prevention for PTCO. Pipeline gangs used to dig the ditches by hand, then form long lines to heft the pipe with tongs, lower it into the ground and screw the joints together. "There would be as many as 25 guys lifting one section of pipe," Wilkins says.

"When we went west to Colorado in 1953 to build the PTCO line," he continues, "we weren't going to have big pipeline gangs." Instead, the work was done with backhoes, sidebooms, ditching machines and welded joints.

The more recent introduction of PVC (durable plastic) instead of steel pipe for gathering lines has been another boon. PVC goes down quickly and requires only glue instead of welding—ideal for low-pressure lines.

Pipeline replacement and reconditioning is as much of a priority at Van, Texas as it is in Olney. The Van Field was discovered in the 1930s, prior to the development of protective coatings and cathodic protection for pipelines in the 1940s. This coating allows a mild electrical current to be run through the outside of a pipeline, retarding corrosion. "Anything that has been laid since 1950 should last 50 years," says Harlan Adrian, electrical supervisor in Van.

The Van operation has an annual program to replace or recondition old pre-1950s pipe. Much of the pipe runs under residential areas, since Van is a community that appreciates its oil wealth and has literally built into the middle of it. Pump jacks sit next to houses and near the goals posts of the high school playing field.

Potential pipeline problems can be identified by a line-a-log program, in which an electromagnet device is run through the line to measure wall thickness. This helps determine replacement priorities.

Van production is holding at 8-9,000 barrels per day, according to Charlie Blackwell, Texas district superintendent. The Van line to the Beaumont Refinery carries an average of 25,000 barrels a day. "We take production from many different leases along the line," says Blackwell. "It happens that all of the crude in this line is purchased by Union Oil and ends up in Beaumont?"

The line runs two batches: Van crude, which is particularly suitable for refining into lube oils; and the East Texas stream, which takes in all the other area production.

With oil from hundreds of leases flowing into one pipeline, accounting is a very important function. The gauger plays a key role. In Van, most of the producers' storage tanks on individual leases are equipped with Lease Automatic Custody Transfer (LACT) units. These units measure the oil that flows out of the tank, adjusting the volume according to the oil's temperature. (Because crude oil expands or contracts with changes in temperature, volume measurements are adjusted to a uniform 60 degrees Fahrenheit.)

LACTs also take samples to check the oil for BSW—basic sediment and water content. Producers are notified if their oil has quality problems.

Gaugers fill out meter run tickets, recording how much oil is shipped so that the producer is properly paid for his oil and the pipeline receives the proper tariff.

Many storage tanks do not have LACTs. In this case, each tank must be "strapped." That is, its circumference is measured and the volume of any internal structures (deadwood) is calculated, so that a precise capacity can be determined. This is necessary since no tank can be exactly constructed to a certain capacity, and a barrel or two of mislaid oil costing \$27 each can add up quickly.

On tanks without LACTs, the gauger must climb to the top to measure the oil depth both before and after the oil is removed. Then, using charts derived from the "strapping," he calculates volume. He compensates for temperature variation and runs BSW and gravity tests to complete the field run ticket.

Pipelines crisscross the United States, quietly and almost invisibly moving massive amounts of crude oil and petroleum products. Methodical measurement and accounting practices keep revenues flowing to the proper recipients. And alert companies, like PTCO, continually look for new opportunities to increase their profitability.

In October 1984, PTCO purchased and took over the operation of 32 miles of an eight-inch trunk line in Wyoming. With some modification, the line will be used to ship heated and blended heavy oil to Casper. And, says Bill Thacker, always looking ahead, there are some interesting opportunities opening up for pipelining CO<sub>2</sub> to enhanced oil recovery sites. 76

Fifth annual  
Seventy Six  
magazine  
photo contest

# Spirit



“Spirit” is the theme for the 1985 contest, and there are two dictionary definitions that apply. One says that spirit is a particular mood or emotional state characterized by vigor, animation and enthusiasm. Another defines spirit as the real sense of significance of something—that which inspires or enlightens.

So, apply it to people, animals or scenery. Three professional photographers will select the seven photos with the most spirit to be printed in *Seventy Six* magazine next spring.



**Awards:** The seven contest winners will each receive \$100.

**Eligibility:** Employees and retirees of Union Oil (its subsidiaries and divisions) are eligible. Their spouses and children may also enter.

**Entries:** Color only. No more than three per person. We prefer 35 mm. transparencies. If you send prints, please mount them on stiff board. To compete successfully against color slides, prints should be no smaller than 8 by 10 inches.

**Mailing:** Please package your entries carefully, making sure they are identified so that they can be returned to you.

**Liability:** All entries are to be submitted with the understanding that neither Union Oil Company nor any of its employees will be held responsible or liable for loss or damage. Entries may be held beyond the publication date of the contest, but we will attempt to return all of them.

**Right to publish:** Union Oil retains the right to publish or republish any photograph submitted in the contest. Entrants waive any claims for royalty payments or copyright infringement.

**Model release:** Entrants must be able to furnish a written “consent to use” statement upon request for recognizable people appearing in the photographs.

**Judging:** Three professional photographers from outside the company will judge the contest. Their decision will be final.

**Deadline:** Entries should reach the magazine office at Union Oil Center in Los Angeles by Monday, April 1, 1985.

Send to  
Seventy Six Magazine  
Photo Contest  
Union Oil Center, M-17,  
Los Angeles, CA 90051

**Entry Form** (please print)

Name of employee/retiree: \_\_\_\_\_

Job Title: \_\_\_\_\_ Division/Subsidiary: \_\_\_\_\_

Work location: \_\_\_\_\_

Telephone: \_\_\_\_\_ Network: \_\_\_\_\_

Name of entrant (if different): \_\_\_\_\_

Relationship to employee: \_\_\_\_\_

Home address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Phone: \_\_\_\_\_

Title or description of photos—attach separate sheet if necessary: \_\_\_\_\_

\_\_\_\_\_

**Important!** I have read and agree to the contest rules.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

If under 18, signature of parent or guardian: \_\_\_\_\_







# BIG WHEELS AND HEARTY MEALS

With over 150 Auto/TruckStops on major U.S. interstate highways, Union has become a recognized leader in this important field. The operation of a Union 76 Auto/TruckStop is a true team effort between the independent operator and Union Oil Company. The shared goal is for each Auto/TruckStop in the system to maintain the highest standards for service, quality, and dependability.

All of the Auto/TruckStops in the Union Oil system are open 24-hours a day, 365 days a year. To get an up-close look at what's involved in making an Auto/TruckStop a successful enterprise, *Seventy Six* spent a day at the Union 76 I-90 East Auto/TruckStop, located 20 miles east of Buffalo, New York on U.S. Interstate 90. Following, in words and pictures, is an account of those 24 hours.

6 a.m., November 8, 1984

Hot coffee... bacon and eggs... pancakes and syrup... hash browns and gravy... The wonderful mix of aromas wafts through air, waking up even the most road weary travelers. Smiling, uniformed waitresses criss-cross the busy dining room, steaming pots of coffee in hand. Men dressed in jeans, flannel shirts, and baseball caps sit at the tables and counters. They nod to the waitresses gratefully as their cups are refilled.

In another section of the same building, a man and wife browse through the shelves of a store, looking for toothpaste, spark plugs, gloves and beef jerky—all of which the store has. Nearby, three men stand behind the counter of what looks like a small bank. Each is cashing a check that was printed out by a computer just moments before.

Outside, the first hint of approaching daylight brightens the horizon. The deep, powerful rumble of idling diesel engines resonates through the still air. A double row of trucks—more than 100 huge 18-wheelers of every color and description—bends around two sides of the sprawling, floodlit complex. Red and yellow running lights on the trucks glint through the pre-dawn mist, reflecting off polished chrome stacks and painted cabs.

Here and there, a few trucks pull out of line and head to the canopied fuel islands. Others move out toward the exit, marked by a bright orange 76 disc. It's morning in this teeming oasis, but it isn't really the start of a day. This is just one moment in a never-ending montage. Welcome to the Union 76 Auto/TruckStop in western New York state.

8 a.m.

Daylight has arrived now, ushering in a cold and drizzly morning. It's the kind of fall day typical of western New York. But the dreary weather doesn't lessen the traffic on busy Interstate 90. As the major east/west artery across the state, the "Thruway," as it's called, never lacks for vehicles—even when fierce winter snowstorms thunder in from Lake Erie. The route is heavily traveled all year by longhaul truckers. In the summer months, tourists add to the parade, shuttling between New York City, 470 miles away to the east, and Niagara Falls, just 40 miles west.

In the daylight, one can get a feel for the size of a Union 76 Auto/TruckStop. Sitting just beside the twin ribbons of the Thruway, the complex sprawls over more than 20 acres.

"We need that space, too," says Fred Doepel, operator of the TruckStop. "We're only in our third year of operation, but we draw an extremely high volume of traffic." Indeed, the complex will sometimes have over 200 trucks parked in its large lot. Though today isn't a peak day (Mondays and Tuesdays are busiest), there will still be well over 100 rigs present at any given time.

When Doepel and his general manager, Gerry Rogers, arrive at the TruckStop at 8:00, the morning shift of workers has been on the job for just over an hour. (There are three shifts each day, with around 40 employees working at any given time.) As Doepel checks things out at the control desk, the nerve center of the complex, Rogers heads out to take a walk around the lot.

Although many of the truckers who had stopped for the night have already pulled out, some are still sacked out in the "sleepers" behind their truck cabs. Others are just now heading inside for a meal, or a shower in one of the TruckStop's eight private shower rooms, each of which is cleaned after every use.

Posted around the truck parking area are several "No Trespassing" and "Drivers Only" signs. "One of our primary concerns is for our customers' security," Rogers explains. "Drivers don't want to be worried about their rigs, and that's why we patrol the lot and keep the cars and trucks in separate areas. We want to be a secure, safe haven for both truckers and automobile drivers."

After looking around the lot, Rogers stops to chat with a mechanic in one of the complex's two large truck service bays. On a busy day, up to 40 rigs might pass through the bays for a variety of repairs. "Most of our work here is emergency service—tires, brakes, electrical work and other light repairs," he says. The bays are empty now, and the mechanic tells Rogers that the previous night had been a quiet one, with only a couple of flat tires and a few minor repairs to handle.

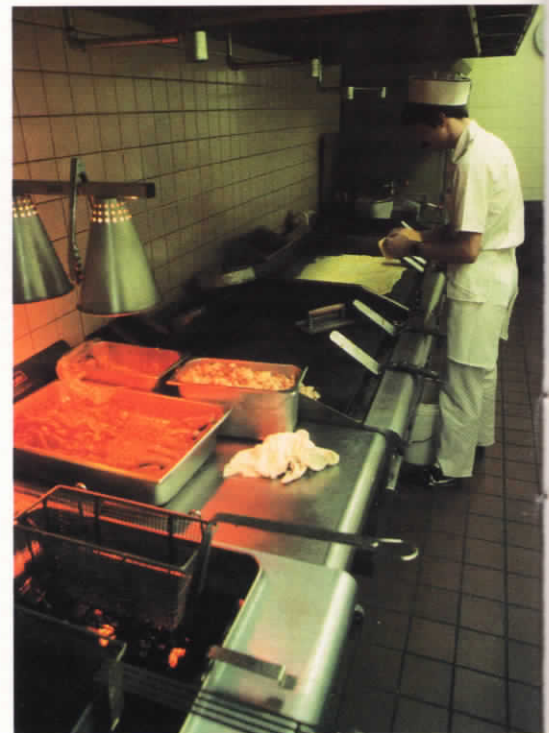
On the other side of the complex, beyond the fuel islands, two large tank trucks have pulled up to the TruckStop's fuel drop area. The 8,500-gallon capacity trucks arrive an average of four times a day to keep the TruckStop supplied with the fuels it needs.

"Our underground tanks have a combined storage capacity of 120,000 gallons," Rogers says, heading over to greet the drivers. "We stock three grades of gasoline and two of diesel fuel. Every morning we measure each tank manually to double check its levels against our computer and pump readouts."

Back inside the restaurant, which seats 165, business is still brisk. Seated at a table, Doepel talks with Charles Billman, the restaurant manager, about plans for a special Thanksgiving menu. Nearby, two truckers wolf down platefuls of steak, eggs, and home fries.

"Breakfast is never a light meal for truckers," Doepel says, smiling. "We serve it here 24 hours a day."

*The control desk, right, is the Auto/TruckStop's nerve center. Below, the kitchen turns out meals around the clock.*





10 a.m.

Although most of the drivers who spent the night are long gone, the TruckStop's control desk is still hopping. "We usually have a lull about now," says Pam Rombough, one of three employees manning the counter. "But things can get busy just about any time."

Busy isn't the half of it. Despite—or perhaps, because of—the computer age, running the control desk is a very complex task. For one thing, the desk is where all fuel charges are paid. With over 90 types of truck credit plans to handle, as well as several different money transmission services, billing is far from simple.

"In addition to credit charges, we process about 8,000 checks a month," Doepel explains. "We handle more in a day than many banks do in a week. It makes for a lot of work, but we want to provide the best and most complete billing services possible for our customers."

The control desk also has Western Union and other information transmission services, and truckers can pick up various permits there. (Fuel permits are required in some states, and drivers may need to obtain special handling permits for overweight, overwidth, or other types of cargoes.)

The control desk is also the nerve center for the TruckStop's fuel islands, all of which can be viewed from windows there. All pumps at both the diesel and gasoline islands are activated and monitored from a computer console at the desk. A communications system links control desk personnel with fuelers at the islands.



“Our volume is now up to about 790,000 gallons of fuel a month,” Doepel says. “That goes to both cars and trucks. But in winter, 98 percent of what we sell is diesel.”

Outside at one of the diesel islands, a worker is fueling up a steel-hauling semi that has just pulled in. It takes a lot longer than filling up the family car. Most big rigs have a pair of tanks which hold a total of from 150 to 250 gallons of fuel.

When he’s finally finished, the fueler gets up on a rolling platform to clean the truck’s windshield. “I can never get used to how big these rigs are,” he says. “It makes my car seem pretty puny.”

*Middle, right: Operator Fred Doepel (left) and general manager Gerry Rogers. Customer service is a top priority for both.*



1 p.m.

By mid-day things have quieted down a bit, but the TruckStop is still alive with activity. Several families have stopped in for lunch (the all-you-can-eat buffet is quite popular), and the TruckStop store, located behind the control desk, has several browsing patrons. Though small, the store is stocked with an amazing array of goods—everything from clothing, snacks and books to souvenirs, television sets, and countless truck appliances and tools.

“Don’t ask if we’ve got something,” says cashier Diana Easterbrook. “Just ask where it is?”

Nearby, a trio of drivers is watching television in the lounge, which is limited to professional drivers only. Just down the hall, two independent truckers stand gazing up at a pair of video screens that sit beside a bank of pay telephones. The screens display data from two separate computerized trucking information systems, “Dial-a-Truck” and the “National Computerized Truck Service?”

These systems give drivers up-to-the-minute information on loads available in a given region, and on any area companies who need drivers. Phone numbers and locations are also listed, so a driver in need of a load can often secure one simply by picking up the phone.

One of the drivers checking the screens, whose “handle” (nickname) is “Blue Fox,” has just dropped off a load of clay pots from Cape Girardeau, Missouri. On his belt is a “Road King Drivers’ Club” buckle. (*Road King* magazine, a Union Oil publication, is published exclusively for professional truckers.)

The other driver—“Big Bruin,” who hails from California—has delivered a load of produce and now is looking for a something to take west. The two converse in truckers’ lingo.

“How’s she shakin’?” Blue Fox asks.

“Well, I’m glad to be on the flip-flop,” Big Bruin responds. “My reefer’s on the fritz, and I bought two pumpkins in Beantown. Be less hassle cartin’ go-go girls on a board?”

(Translation: “How are you?”)

“Well, I’m glad to be heading home. My van’s refrigeration unit is malfunctioning, and I had two flat tires in Boston. I’d have less trouble hauling live hogs on a flatbed trailer.”)

The two continue to watch the screens, as the talk turns to speculation about the weather. Western New York is known for its cold, snowy winters, and trucks are often stranded in the area.

“We’ve learned to cope quickly and effectively with snow here,” Fred Doepel says. “The Thruway has phenomenal snow removal equipment, but blizzards can still cause problems. We’ve had cars and trucks lined up clear back to the highway, trying to get to shelter here?”

Several times, Doepel says, he or an employee has gone out to pick up motorists stranded on the road in blizzards. “People on the highway are really at the mercy of the elements,” he says. “We try to always be aware of that.”

To keep his own lot clear of snow, Doepel has a heavy duty four-wheel drive truck with a snowplow scoop. “But we also have to contract for heavier equipment to clear snow and haul it away. Otherwise it piles up too high for us to handle.”



Top: Drivers looking for work can check out the TruckStop’s computerized information system. A load is often just a phone call away.

5 p.m.

As darkness descends, the temperature drops quickly. Rain continues to drizzle down, and the pace of activity picks up as strings of cars and trucks pull in off the highway. Soon the control desk and fuel islands are crowded once again, and waitresses are taking dinner orders in the restaurant.

At 5:15, several powerful mercury vapor lamps kick on automatically, bathing the entire Auto/TruckStop complex in brilliant white light. Standing in stark contrast against a jet-black sky, the line of floodlit trucks looks all the more imposing.

In the dining room, Fred Doepel stops to chat with a family eating dinner before he heads home for the night. "I like to get feedback from people as much as possible," he explains. "We're virtually a city under one roof here, and talking with customers is one of the best ways to pinpoint and correct problems you might not otherwise be aware of."



11 p.m.

The night shift has taken over now, and things have quieted down. But the never-ending parade of vehicles goes on. New trucks continue to arrive fairly regularly, and occasional cars pull in for gas or late meals. Many truckers, in for the night, are outside asleep in their cabs. A few sit in the lounge watching TV, and one driver pulls his rig over to the TruckStop's electronic scale to weigh his load.

In the service bays, activity has been fairly steady this night. Two mechanics are putting a new tire on one rig, while another inspects a truck's brake lines. A husband and wife driving team, with baby in tow, is doing wash in the laundry room. Nearby, a janitor mops down the floor. Cleaning continues around the clock here, too.

6:30 a.m., November 9

Sunrise announces the start of another day. The familiar morning aromas once again permeate the restaurant, and several early-rising drivers are lined up at the control desk. In the store, a cashier helps a customer looking for playing cards and chewing tobacco.

Outside, many trucks are already heading for the highway. Near the exit, one driver leans out of his cab window to shout a goodbye to another.

"Take her easy, buddy!" he says.  
"Catch you here on the flip-flop!" 76

*Below, left: A mechanic checks out a truck's engine. On a busy day, up to 40 rigs might pass through the service bays.*





**CORPORATE**

**November 1984**

- 25 YEARS Robert M. Vukojevich,  
Union Oil Center
- 20 YEARS Ralph J. Bowman, Union Oil Center  
Douglas L. Jackson, Union Oil Center  
Joe I. Mosteller, Union Oil Center  
Donnelly P. Rogers, Union Oil Center

15 YEARS Jack E. Chiquet, Union Oil Center

10 YEARS Christine Hoffman, Union Oil Center  
John F. Koester, Schaumburg, Il.  
Josephine D. McEachin,  
Los Angeles, Ca.  
Timothy R. Thomas, Union Oil Center

5 YEARS Antoinette Conrad, Union Oil Center  
Ma. Lourdes Simpao Lumarque,  
Union Oil Center  
Michael L. McQueen,  
Union Oil Center

**December 1984**

30 YEARS George C. Bond, Union Oil Center  
Russel F. Groesbeck, Union Oil Center

15 YEARS Miriam E. Ferbrache, Union Oil Center

10 YEARS Eileen C. Burquist, Schaumburg, Il.

5 YEARS James Chang, Union Oil Center  
Janis M. Derrick-Sain,  
Union Oil Center

**UNION SCIENCE AND TECHNOLOGY DIVISION**

**November 1984**

25 YEARS Clarence J. Moderow, Brea, Ca.

10 YEARS John W. Jost, Brea, Ca.

5 YEARS Lorraine P. Bisaha, Brea, Ca.  
Darrell L. Gallup, Brea, Ca.  
Frank J. McKeon, Brea, Ca.  
Loc Huu Nguyen, Brea, Ca.  
Robert J. Varga, Brea, Ca.

**December 1984**

15 YEARS William T. Hosband, Brea, Ca.

5 YEARS Prabha Amin, Brea, Ca.  
Charles F. Griswold, Brea, Ca.  
Paul Hensen, Brea, Ca.  
Priscilla J. Larocque, Brea, Ca.

**UNION REAL ESTATE DIVISION**

**November 1984**

10 YEARS Dennis J. Chapman, Buena Park, Ca.

**December 1984**

20 YEARS Patricia A. Ellis, Union Oil Center  
Oneil Theriault, Union Oil Center

**UNION 76 DIVISION**

**November 1984**

40 YEARS Lois I. Ridge, Indianapolis, In.

35 YEARS William A. Catlett, Birmingham, Al.  
Glynn Delahoussaye,  
Beaumont Refinery  
Cecil P. Fleming, Beaumont Refinery  
Edgar A. McKinney, Schaumburg, Il.  
Dale N. Sellers, Beaumont Refinery

30 YEARS Eugene L. Connor, Coos Bay, Or.  
Charles W. Gilbert, Birmingham, Al.  
Charles L. Higginbotham,  
Columbus, Oh.  
Joseph E. Mason, San Francisco, Ca.  
John H. Moore, Portland, Or.  
William J. Myers, Schaumburg, Il.  
William C. Norton, Columbia, S.C.  
C. D. Vallandingham,  
San Francisco, Ca.

25 YEARS Ruth C. Johnston, Schaumburg, Il.  
Mattie L. Lindemann, Schaumburg, Il.  
Richard D. Rusiewski, Los Angeles, Ca.  
John L. Story, San Francisco, Ca.

20 YEARS Billy E. Bramblett, Bainbridge, Ga.  
Gene W. Burkett, San Francisco, Ca.  
Kathe R. Butt, San Francisco, Ca.  
R. O. Devincenzi, San Francisco, Ca.  
James S. Foster, Jr., Fresno, Ca.  
Duane E. Koehring, Amlin, Oh.  
Martin L. Massey, Richmond, Ca.  
Richard H. Rodgers, Beaumont, Tx.

15 YEARS Joseph M. Chirco, Los Angeles, Ca.  
Stephen K. Colclasure, Torrance, Ca.  
Reuben G. Danielson, Schaumburg, Il.  
Juliana C. Gordijn, San Francisco, Ca.  
Ray J. Hoffpauir, Beaumont Refinery  
Gary J. Nielsen, Minneapolis, Mn.  
Nelly T. Ramirez, San Francisco, Ca.  
Teddy L. Sharp, Beaumont Refinery  
Wayne E. Shaw, Dayton, Oh.

10 YEARS Manuel A. Fernandez,  
Los Angeles Refinery  
Mamoru W. Hamachi,  
San Francisco Refinery  
Starla Ibbs, Los Angeles, Ca.  
Terry L. Mann,  
Pure Transportation Co., Brush, Co.  
Richard W. Mortimer, Bakersfield, Ca.  
Peter J. Rubino, Los Angeles Refinery  
Margaret Jo Wheeler,  
South Holland, Il.  
Dale W. Weidner,  
Pure Transportation Co., Olney, Il.  
Bobby S. Young, Birmingham, Al.

5 YEARS Richard M. Adams,  
San Francisco Refinery  
Pamela K. Brandes, Schaumburg, Il.  
Terry L. Clark, Schaumburg, Il.  
Roy J. Dettloff, Schaumburg, Il.  
Dawn A. Drew, Schaumburg, Il.  
Glenn G. Gerber, Los Angeles, Ca.  
Randel H. Humphries,  
Los Angeles, Ca.  
Kenneth D. James, London, England  
Ronnie C. Johnson, Chicago Refinery  
Richard L. Liss, Los Angeles, Ca.  
Frederick C. Lucas,  
Los Angeles Refinery  
Michael Meszaros, Schaumburg, Il.  
Kenneth D. Moore,  
San Francisco Refinery  
Michael A. Neagle, San Diego, Ca.  
Manuel Perez, Jr., Los Angeles Refinery  
Joan S. Sanders, Schaumburg, Il.  
William A. Sarles, Los Angeles Refinery  
Andrew H. Seed, Avenal, Ca.  
Jerry L. Walker, Los Angeles Refinery  
James E. Yucuis, Schaumburg, Il.

**December 1984**

40 YEARS C. J. Pieterick, San Francisco Refinery

35 YEARS Clarence T. Cheetham,  
Charleston, W.V.  
Wilfred L. Emery, Milwaukee, Wi.  
Veronica M. Ramstad,  
Minneapolis, Mn.  
Donald E. Sanderson,  
Beaumont Refinery

30 YEARS Roy Y. Schellenger, Richmond, Va.  
James E. Sinyard, Albany, Ga.

25 YEARS Mark K. Akaka, Honolulu, Hi.  
Floyd H. Clifton, Phoenix, Az.  
Thomas A. Foster, Eugene, Or.  
Judith A. Haver, Chicago Refinery  
Jorge M. Merel, San Francisco Refinery  
David R. Stewart, Southfield, Mi.

## UNION OIL AND GAS DIVISION

November 1984

35 YEARS Herbert S. Harry, Pasadena, Ca.  
Richard G. Lawson, Houma, La.

20 YEARS A. Russell Allen, Santa Fe Springs, Ca.  
Dukin D. Arceneaux, Houma, La.

15 YEARS Kirby B. Fabre, Houma, La.  
Jerry D. Hedger, Orcutt, Ca.

10 YEARS Clark A. Bagley, Midland, Tx.  
Dennis W. Brown, Orcutt, Ca.  
William L. Davidson, Orcutt, Ca.  
Kenneth W. Doyle, Santa Fe Springs, Ca.  
Lester G. Gimbel, Moab, Ut.  
Everette J. Guidry, Lafayette, La.  
Leslie F. Hammonds, Woodward, Ok.  
Janie L. Joubert, Houston, Tx.  
Clark C. Lucas, Worland, Wyo.  
Richard M. Nattress, Ventura, Ca.  
Janelle C. Paul, Lafayette, La.  
Booker T. Powell, Houma, La.  
Charles A. Schile, Ventura, Ca.  
Robert B. Schultz, Lovington, N.M.  
Lonnie W. Shepard, Clay City, Il.  
Russell C. Speer, Brea, Ca.  
Herman R. Stone, Van, Tx.

5 YEARS Brent O. Bullock, Moab, Ut.  
Gayla E. Cruz, Houston, Tx.  
Lindsey M. Fontenot, Houma, La.  
Steven L. Hart, Ventura, Ca.  
Mary C. Huddleston, Houston, Tx.  
Sonia D. Hudgens, Ventura, Ca.  
Thomas A. Kaldenberg, Taft, Ca.  
Troy C. Kuykendall, Bakersfield, Ca.  
Thomas M. Litton, Jr., Lafayette, La.  
Michael J. Lynch, Houma, La.  
Stephen A. Martinez, Anchorage, Ak.  
Boyd T. Miller, Mobile, La.  
Jude T. Mosely, Houma, La.  
Dale A. Perez, Taft, Ca.  
Willie Rodriguez, Jr.,  
Lovington, N.M.  
Michele L. Shipley, Casper, Wyo.  
Ross A. Sigur, Lafayette, La.  
Millard F. Standifer, Jr., Midland, Tx.  
William D. Watson,  
Oklahoma City, Ok.

December 1984

30 YEARS James E. Schuetz, Union Oil Center  
Russell G. Stansel, Midland, Tx.

25 YEARS Billie E. Reed, Ardmore, Ok.  
Paul D. Sellers, Lafayette, La.

20 YEARS Ronald N. Donaghu,  
Santa Fe Springs, Ca.  
Phyllis T. Larson, Pasadena, Ca.  
Ernest Moore, Houston, Tx.  
Edwin L. Wilbanks, Houma, La.

15 YEARS George J. Jaubert, Houma, La.  
Charles B. Snow, Lafayette, La.  
Richard H. Tingstrom, Ventura, Ca.

Service Awards



10 YEARS Poonsiri Chowsanitphon,  
Pasadena, Ca.  
Bobby G. Cloud, Andrews, Tx.  
Marion L. Earles, Jr., Snyder, Tx.  
Jesse A. Faragan, Orcutt, Ca.  
Michael E. Leavitt, Kenai, Ak.  
Wesley David Patterson,  
Santa Fe Springs, Ca.  
Don Ruffin, Houma, La.  
Anastacio R. Subia, Jr., Andrews, Tx.  
Clarice H. Szeto, Union Oil Center  
Ronald M. Tisdale, Jackson, Ms.

5 YEARS Edward J. Amo, Houston, Tx.  
Andrew G. Blakely, Jr., Taft, Ca.  
Dennis L. Brucker, Ventura, Ca.  
Eugene J. Coates, Houston, Tx.  
Golden J. Gasser, Houston, Tx.  
Lane A. Iver, Houma, La.  
Sandy L. Lightell, Lafayette, La.  
Robert F. Marsalek, Orcutt, Ca.  
Thomas J. McCollum, Santa Paula, Ca.  
Donovan P. Mooney,  
Santa Fe Springs, Ca.  
Craig P. Pitre, Houma, La.  
Beverly A. Scheliga, Houma, La.  
Thomas W. Smith, Kenai, Ak.  
Steven W. Sperry, Casper, Wyo.  
Kenneth H. Toftefeld, Cut Bank, Mt.  
Clark L. Weaver, Anchorage, Ak.

## UNION GEOTHERMAL DIVISION

October 1984

10 YEARS JoAnn Dittner, Santa Rosa, Ca.  
Larry R. Hampshire,  
Imperial Valley, Ca.  
M. Donald Watts, Santa Rosa, Ca.  
Frederick L. Wilson,  
Big Geysers, Ca.

5 YEARS Sandra G. Flores,  
Imperial Valley, Ca.  
Patricia A. Swanson, Santa Rosa, Ca.

November 1984

30 YEARS Grant E. Kelso, Big Geysers, Ca.  
15 YEARS Diane K. Pardini, Santa Rosa, Ca.  
5 YEARS William D. Christensen,  
Santa Rosa, Ca.  
Patricia A. Ellsworth,  
Santa Rosa, Ca.  
Diana B. Lewgot, Santa Rosa, Ca.

December 1984

10 YEARS Patrick A. Nicholson,  
Manila, Philippines

20 YEARS Frank W. Conklin, San Diego, Ca.  
Richard J. Estlin, Schaumburg, Il.  
Stella C. Murphy, San Francisco, Ca.  
Anthony Reed, Los Angeles, Ca.  
Ervine S. Short, Jr., Los Angeles, Ca.  
Hilary A. Singleton, Los Angeles, Ca.  
Joanne M. Vaiana, Los Angeles, Ca.

15 YEARS Neil B. Arnberger, Schaumburg, Il.  
Charles Collins, Beaumont Refinery  
Clinton J. Corbisier, Tukwila, Wa.  
Joseph O. Eldridge, Los Angeles Refinery  
Joan H. Foley, Schaumburg, Il.  
Daniel T. Homerding, Chicago Refinery  
Ronald L. Humphrey, Los Angeles, Ca.  
Thomas L. Jones, Cincinnati, Oh.  
Carole M. Kirchner, Schaumburg, Il.  
James R. Lawrence, Beaumont Refinery  
George F. Masek, Jr., Chicago Refinery  
Roy H. Murata, Honolulu, Hi.  
Catherine L. Norwood, Seattle, Wa.  
Stephen K. Ostafin, Chicago Refinery  
Larry W. Rosenthal, Schaumburg, Il.  
Carol E. Severinghaus, Schaumburg, Il.  
Charles T. Smoak, Savannah, Ga.  
Eugene J. Tolomei, Bakersfield, Ca.  
Donita Ucherek, Schaumburg, Il.  
Michael B. Welty, Colton, Ca.  
Roy A. Wyatt, Beaumont Refinery  
Alfred R. Yurkiewicz, Santa Maria, Ca.

10 YEARS Joan L. Allan, Schaumburg, Il.  
Martin V. Bellamy, San Diego, Ca.  
John L. Connors, San Francisco, Ca.  
Charles O. Cooley, Beaumont, Tx.  
Douglas J. Crick, South Holland, Il.  
John A. Donner, Schaumburg, Il.  
Richard F. Faruzzi, Des Plaines, Il.  
Ruth T. Frogge, Beaumont, Tx.  
Gary F. Gyssler, Schaumburg, Il.  
Mark K. Hebert, Los Angeles, Ca.  
J. V. Jenkins, Birmingham, Al.  
Douglas W. Juras, Southfield, Mi.  
Elizabeth S. Kraus, Schaumburg, Il.  
Robert A. Newton, Phoenix, Az.  
Jerome E. Niesen, Los Angeles Refinery

5 YEARS Sandra L. Allen, Los Angeles, Ca.  
Robert J. Apodaca,  
San Francisco Refinery  
Filemon Baca, San Francisco Refinery  
Ernest K. Clayton, Los Angeles, Ca.  
Cecilia B. Delacruz, San Francisco, Ca.  
William F. Felix, San Francisco Refinery  
Michael P. Fernandez, Los Angeles, Ca.  
Michael A. Hudspeth,  
Los Angeles, Ca.  
Melanie M. Hughes,  
Beaumont Refinery  
Patrick J. McKenna, Schaumburg, Il.  
Kevin Murray, Beaumont, Tx.  
Craig S. Reid, Beaumont Refinery  
Robert G. Roberts,  
San Francisco Refinery  
Sandra L. Robison,  
San Francisco Refinery  
Mike R. Tate, San Francisco Refinery  
Paul S. Tish, Los Angeles Refinery  
Eileen J. Todd, Schaumburg, Il.



5 YEARS Claude L. English, Big Geysers, Ca.  
John D. Grice, Big Geysers, Ca.  
Debbie A. Sandberg,  
Santa Rosa, Ca.

### PHILIPPINE GEOTHERMAL, INC.

November 1984

10 YEARS Concepcion A. Villanueva, Manila

5 YEARS Benjamin M. Amante, Manila  
Alejandro R. Centeno, Manila  
Guillermo V. Malagno, Manila  
Apolinario M. Malamog, Manila  
Elpidio P. Navarette, Manila  
Aurelio U. Oandasan, Manila  
Rolando M. Perea, Manila

December 1984

5 YEARS Leonardo R. Aguila, Manila

### UNION CHEMICALS DIVISION

November 1984

35 YEARS T. Craig Henderson, Union Oil Center

30 YEARS Ernest J. Weber, Carteret, N.J.

25 YEARS John J. Clarke, Union Oil Center

15 YEARS Mitchell Edenfield, Jr., Charlotte, N.C.

10 YEARS Hallam N. Fain, Kenai, Ak.  
Donald Freeman, Brea, Ca.  
Danny K. Martin, Rodeo, Ca.  
Robert C. Roth, Kenai, Ak.

5 YEARS Jerry W. Floyd, Charlotte, N.C.  
Stephen E. Gagel, Charlotte, N.C.  
Ralph F. Kimbrell, Union Oil Center  
David A. Lyons, Brea, Ca.  
Duane Perkins, Newark, Ca.  
Karen Ray, Clark, N.J.

December 1984

25 YEARS Charles J. Hoar, Clark, N.J.

15 YEARS Delores M. Dillman, Lemont, Il.  
Calvin S. Henley, Kenai, Ak.  
Dennis D. Laxton, Kenai, Ak.  
Manuel Perry, East Providence, R.I.  
Joseph W. Pieczynski, Carteret, N.J.  
Robert E. Wright, Union Oil Center

10 YEARS Suzanne P. Bailey, Baltimore, Md.  
Randall N. Everson, Schaumburg, Il.  
Anthony P. Glassman, Denver, Co.  
Jean E. Sperow, Charlotte, N.C.  
Franklin J. Trigg, Kenai, Ak.

5 YEARS James W. Bergevin, Kenai, Ak.  
Leanne D. Waters,  
West Sacramento, Ca.

### UNION INTERNATIONAL OIL DIVISION

November 1984

30 YEARS Donald L. Olson,  
Balikpapan, Indonesia

5 YEARS Arthur T. Foley, Los Angeles, Ca.  
Arthur R. Baker, London, England  
Patrick W. M. Corbett, Netherlands

December 1984

10 YEARS William D. Howard, Los Angeles, Ca.

5 YEARS Gilbert R. Stern, Los Angeles, Ca.  
John L. German, Los Angeles, Ca.  
Sumio T. Goishi, Los Angeles, Ca.  
Neil Mountford, London, England  
Peter Ryalls, Aberdeen, Scotland  
Timothy M. Marquez, Netherlands  
Brian K. Penny, Aberdeen, Scotland

### UNION OIL OF GREAT BRITAIN

June 1984

5 YEARS Lorna de Lord, England

December 1984

5 YEARS P. McIntosh, Scotland  
R. D. Strachan, Scotland

### UNION OIL CO. OF INDONESIA

November 1984

10 YEARS Arbain  
Andoeng Heroe Baskoro  
Buhari  
Ukat Handan Buya  
Johnny Hary Dumais  
Mansyah H. S.  
Arkan Harun  
Kadar Ismanto  
M. Kholil  
Achmad Kosim  
Natan Lamba  
Alex Mamoto Londa  
Albert F. Muntu  
Soekardi  
Djoko Suhadi  
Sujono  
Suprpto  
Surono  
Sutopo  
Sutrisno S.  
Victor Emmanuel Tentoea  
Wagimun  
Willy Worititjan  
Yusran R.  
R. Adang Yusuf

November 1984

Antoeng Bahran  
Bahruddin  
R. A. Hanafi  
Ariansyah Hanafiah  
Soedewo Bambang Irawan  
Muhammad Kasim  
Iskandar Masrur  
Rusmanto  
Syahdan M. Saleh  
Erna K. Soedijarto  
Soejoso  
Sudarto  
Kasut Syuadi  
Soetomo Herman Y



December 1984

10 YEARS Basukijono  
Masranie Effendy  
Ronny Fachrudin  
Adry Lantu  
Asmawati Nuryadi  
Daud Rombedatu  
Rosadi  
Paikan Ati Sajogo  
Asli Simatupang  
Adi Siswanto  
Soeratman  
Suardi  
Eko Asnan Subiyantoro  
Edi Sudaryanto  
I. Ketut Suindra

5 YEARS Sulianto Lubis  
Supardi

### UNION OIL NORGE-NORWAY

December 1984

5 YEARS Sissel Bjoernevik

### UNION OIL CO. OF THAILAND

June 1984

Orawan Luknavongsa  
Teresita S. Piyarom

November 1984

10 YEARS Jesse M. Martinez

5 YEARS Viboon Boonbandit  
Wilai Kriangtantiwongse  
Philip A. Norby  
Ronayuth Puthusima  
Skol Sangthong  
Dhira Soyrayar  
Chirapongs Thipaphandhu

December 1984

5 YEARS Venson L. Brown  
Debra S. Wimolsiri

### UNION OIL CO. OF CANADA LTD.

November 1984

20 YEARS Roger L. Rimbey, Fort St. John, B.C.

December 1984

15 YEARS R. G. Byers, Calgary, Alta.  
Howie R. Stoddart, Calgary, Alta.

5 YEARS Cathy J. Hicks, Calgary, Alta.  
Gerald T. Robinson, Fort St. John, B.C.  
Gary Schmidt, Hinton, Alta.

## UNION ENERGY MINING DIVISION

### November 1984

5 YEARS Daniel F. Brito, Parachute, Co.  
John T. McCarty, Parachute, Co.

### December 1984

15 YEARS John W. Pearson, Parachute, Co.  
Ronald K. Smith, Parachute, Co.

5 YEARS Duane L. Isakson, Parachute, Co.

## MOLYCORN, INC.

### November 1984

20 YEARS Anna L. Ferralli, Washington, Pa.

15 YEARS Roger F. Aragon, Questa, N.M.  
Roger P. Archuleta, Questa, N.M.  
Joe R. Cortez, Questa, N.M.  
Eldon E. Ford, Questa, N.M.  
Elizardo Gurule, Questa, N.M.  
Jose Quintana, Questa, N.M.

5 YEARS Karen J. Culvey, Louviers, Co.  
Peter A. Gillett, Questa, N.M.  
Karen E. McMaster, York, Pa.  
R. A. Mullenix, Nipton, Ca.  
Gladys M. Oakeley, Questa, N.M.

### December 1984

30 YEARS Robert R. Tiffany, Questa, N.M.

15 YEARS Ermy Chacon, Questa, N.M.  
Emilio H. Gonzales, Questa, N.M.  
Christopher P. Leyel, Union Oil Center  
Richard A. Vialpando, Questa, N.M.  
Adelmo E. Vigil, Questa, N.M.  
Richard D. Witham, Nipton, Ca.

5 YEARS Reuben E. Martinez, Questa, N.M.

## POCO GRAPHITE INC.

### November 1984

5 YEARS Margaret J. Blackmon, Decatur, Tx.

## JOBBERS AND DISTRIBUTORS

### November 1984

55 YEARS M. F. Pimentel, Tracy, Ca.

20 YEARS H. O. Anderson, Inc.,  
Martinsburg, W.V.  
Horton Oil Company, Huntsville, Al.

5 YEARS Home Oil Company, St. Paul, Mn.  
Rollins Oil Company, Roseville, Mn.

### December 1984

25 YEARS Jordan Oil Company, Inc., Radrod, Va.

20 YEARS George S. Turner, Republic, Wa.

15 YEARS L. S. Rankin & Sons, Inc.,  
Gastonia, N.C.  
Eugene Toney, Orland, Ca.

10 YEARS Southwest Wisconsin Petroleum, Inc.,  
Reedsburg, Wi.

## Service Awards



## RETIREMENTS

### August 1984

Lloyd M. Abbott, Union 76 Division,  
Bakersfield, Ca., March 9, 1953

Hulan F. Butler, Union 76 Division,  
Cypress, Ca., January 28, 1952

Roy Hall, Union 76 Division,  
Spartanburg, S.C., March 4, 1948

Edward G. Senffner, Union 76 Division,  
Plainfield, Il., August 1, 1954

### September 1984

Leonard Aldridge, Union 76 Division,  
Mt. Olive, Ms., April 24, 1964

Edward C. Ashburn, Union 76 Division,  
Grover City, Ca., September 4, 1953

William T. Cordle, Corporate,  
La Canada, Ca., February 27, 1941

Helen F. Daly, Corporate,  
Rolling Meadows, Il., December 6, 1965

Richard D. Davis, Union 76 Division,  
Arcadia, Ca., February 19, 1946

Sebert W. Estep, Oil & Gas Division,  
Comfort, W.V., April 8, 1936

Loyd R. Hamel, Union 76 Division,  
Long Beach, Ca., February 3, 1947

Harold L. Heiselbetz, Union 76 Division,  
Pensacola, Fl., May 27, 1947

John S. Hurlburt, Union 76 Division,  
El Cajon, Ca., June 5, 1951

Travis W. Mathis, Union 76 Division,  
Jacksonville, Fl., December 26, 1946

Betty J. Neubarth, Union 76 Division,  
Arlington Hts., Il., June 19, 1961

William F. Orr, Union 76 Division,  
Glendale, Ca., May 30, 1949

James F. Rose, Union 76 Division,  
Nederland, Tx., January 6, 1947

James F. Shredl, Union 76 Division,  
Port Richey, Fl., June 3, 1959

Lawrence C. Simon, Union Chemicals Division,  
Decatur, Tx., December 16, 1967

Josephine Tietz, Union Chemicals Division,  
Brookfield, Il., May 29, 1951

Frutoso Vialpando, Molycorp,  
Questa, N.M., February 26, 1968

### October 1984

Edward W. Birnbaum, Union 76 Division,  
Bolingbrook, Il., July 8, 1974

Leonard C. Cervenka, Oil & Gas Division,  
Port Lavaca, Tx., November 15, 1963

William Chitwood, Union 76 Division,  
Unionville, In., June 1, 1946

James F. Clayton, Jr., Union 76 Division,  
Wilmington, Il., July 15, 1952

Warren C. Cline, Union 76 Division,  
Nederland, Tx., December 9, 1948

Bert E. Crego, Union 76 Division,  
Joliet, Il., November 17, 1952

Mary J. Donald, Oil & Gas Division,  
Rosemead, Ca., March 13, 1957

Dorothy E. Fulton, Union 76 Division,  
Palatine, Il., March 10, 1971

W. E. Gearhart, Jr., Union 76 Division,  
Sierra Madre, Ca., November 23, 1951

John C. Griffin, Union 76 Division,  
Lake Wylie, S.C., March 1, 1949

Robert J. Hoyt, Oil & Gas Division,  
Costa Mesa, Ca., February 24, 1949

Alvin B. Irwin, Jr., Union 76 Division,  
Memphis, Tn., October 16, 1946

Julian H. Kimball, Jr., Union 76 Division,  
Greensboro, N.C., September 16, 1941

Irene Lance, Union 76 Division,  
Roselle, Il., November 1, 1970

Ray Mohler, Oil & Gas Division,  
Lakewood, Ca., August 28, 1965

A. B. Moses, Union 76 Division,  
Ft. Lauderdale, Fl., September 8, 1970

Chandler H. Noerenberg, Union 76 Division,  
Castle Rock, Wa., September 25, 1950

Chester L. O'Mohundro, Union 76 Division,  
Garden Grove, Ca., October 17, 1948

Richard C. Peryam, Oil & Gas Division,  
Goliad, Tx., January 10, 1951

Freddie J. Richard, Oil & Gas Division,  
Grand Chenier, La., September 22, 1948

Leo E. Rzepiela, Science & Technology,  
San Gabriel, Ca., August 8, 1955

Donald E. Scully, Union 76 Division,  
Naperville, Il., March 29, 1943

William S. Stahmann, Molycorp,  
Red River, N.M., July 1, 1962

Demetra Staiger, Union 76 Division,  
Arlington Hts., Il., June 19, 1961

Mireya Valjalo, Union Chemicals Division,  
Los Angeles, Ca., September 23, 1963

Eileen R. Vaughn, Corporate,  
Prospect, Il., September 2, 1941

Robert L. Whittaker, Union Chemicals Division,  
Orange, Ca., July 20, 1959

William M. Widell, Oil & Gas Division,  
Tyler, Tx., May 5, 1938

Hewlett N. Williams, Oil & Gas Division,  
Nowata, Ok., November 15, 1945

### November 1984

Robert D. Aasen, Union 76 Division,  
Long Beach, Ca., July 12, 1951

Philip J. Bebar, Union 76 Division,  
Crest Hill, Il., September 1, 1942

Harold J. Breaux, Union 76 Division,  
Nederland, Tx., September 25, 1950



**Robert Brownscombe**, Union Chemicals Division, Santa Monica, Ca., February 1, 1968  
**Joseph S. Friscia**, Union 76 Division, Lockport, Il., June 2, 1951  
**Douglas W. Garner**, Union 76 Division, Beaumont, Tx., September 13, 1950  
**Jack F. Hill**, Union 76 Division, Chatsworth, Ca., February 16, 1953  
**Richard D. Jay**, Union 76 Division, Cypress, Ca., October 14, 1948  
**Harold M. McDowell**, Molycorp, Washington, Pa., January 22, 1941  
**Harold W. Potts**, Union 76 Division, Beaumont, Tx., June 28, 1948  
**Henry B. Reed**, Oil & Gas Division, Harrah, Ok., March 16, 1955  
**Edward L. Wiseman**, Science & Technology, Fullerton, Ca., June 28, 1948

## IN MEMORIAM

### Employees

**Charles R. Clark**, Oil & Gas Division, Casper, Wyo., September 18, 1984  
**Eugene L. Diaz, III**, Union 76 Division, Long Beach, Ca., September 11, 1984  
**Dorothy H. Groff**, Union 76 Division, Port Neches, Tx., August 21, 1984  
**James D. Moore**, International Division, Bangkok, Thailand, August 5, 1984  
**James J. Morley, Jr.**, Union 76 Division, Genoa City, Wi., August 25, 1984  
**Jacob L. Rexroat**, Union 76 Division, Lockport, Il., September 6, 1984  
**Richard W. Schreiner**, Union 76 Division, Roswell, Ga., August 23, 1984  
**Andy M. Throop**, Oil & Gas Division, Joplin, Mo., August 11, 1984  
**Kenneth L. Tucker**, Union 76 Division, Torrance, Ca., August 23, 1984

### Retirees

**Thomas I. Albright, Jr.**, Union Chemicals Division, Decatur, Tx., August 5, 1984  
**Howard L. Birch**, Oil & Gas Division, Great Falls, Mt., September 2, 1984  
**Paul F. Bline**, Union 76 Division, Newark, Oh., August 11, 1984  
**Russell L. Bradfield**, Union 76 Division, Long Beach, Ca., September 11, 1984

**Ray H. Calvert**, Oil & Gas Division, Oblong, Il., August 22, 1984  
**Marie Cone**, Union 76 Division, Toledo, Oh., July 3, 1984  
**Henry J. Dahm**, Union 76 Division, Frankfort, In., August 16, 1984  
**Berl E. Deen**, Oil & Gas Division, Delaware, Ok., September 21, 1984  
**William T. Dockens**, Union 76 Division, Nederland, Tx., August 22, 1984  
**Edward J. Eifert**, Science & Technology, Long Beach, Ca., August 19, 1984  
**Antone A. Faria**, Union 76 Division, Rodeo, Ca., September 12, 1984  
**Dixie Farmer**, Union 76 Division, Nashville, Tx., July 21, 1984  
**Georgina H. Fitzgerald**, Union 76 Division, Tucson, Az., August 1, 1984  
**Alma S. Geonetta**, Union 76 Division, Manhattan Beach, Ca., September 16, 1984  
**Edgar J. Gordon**, Oil & Gas Division, Wichita, Ks., July 21, 1984  
**Alonzo C. Henderson**, Union 76 Division, Brea, Ca., August 29, 1984  
**Edward J. Hinders**, Union 76 Division, Mt. View, Ca., July 16, 1984  
**Blake E. Holloway**, Union 76 Division, Memphis, Tn., July 25, 1984  
**Rusby Pauline Houghton**, Union 76 Division, Beaumont, Tx., August 27, 1984  
**Andrew M. Jones, Jr.**, Union 76 Division, Waynesboro, Va., July 30, 1984  
**Walter E. Keller**, Union 76 Division, West Covina, Ca., September 18, 1984  
**Henry A. Krigbaum**, Union 76 Division, Marion, Oh., August 18, 1984  
**Leonard L. Lewis**, Union 76 Division, Sonoma, Ca., August 23, 1984  
**Joseph A. Lysle**, Corporate, Carmel, Ca., August 6, 1984  
**Chester E. MacLean**, Union 76 Division, Alhambra, Ca., July 30, 1984  
**Michael R. Patterson**, Union 76 Division, Roanoke, Va., August 10, 1984  
**Eloy Rael**, Molycorp, Questa, N.M., August 17, 1984  
**Hubert T. Rogers**, Union 76 Division, Lomita, Ca., August 13, 1984  
**Audie L. Rush**, Union 76 Division, Glenville, Ga., August 25, 1984  
**Ralph E. Sanders**, Oil & Gas Division, Cupertino, Ca., September 7, 1984  
**Walter G. Seefeldt**, Union 76 Division, Elmwood Park, Il., September 6, 1984  
**Robert V. Sherman**, Union 76 Division, St. Paul, Mn., May 30, 1984  
**Robert E. Shields**, Union 76 Division, So. Minneapolis, Mn., September 7, 1984  
**Dorothy Stanley**, Corporate, Carson, Ca., August 21, 1984  
**Truman R. Tinker**, Oil & Gas Division, Whittier, Ca., July 16, 1984  
**Charles F. Ventura**, Union 76 Division, Lockport, Il., September 6, 1984  
**William B. Voltarel**, Union 76 Division, Lemont, Il., July 31, 1984  
**Sten H. Wadin**, Union 76 Division, Carpentersville, Il., August 27, 1984  
**Carl G. Weddin**, Union 76 Division, Washburn, Wi., July 16, 1984  
**James Earl Willey**, Union 76 Division, Seaford, De., July 29, 1984



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UNION OIL COMPANY OF CALIFORNIA

# Seventy Six

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COVER: This painting of Mt. Rainier in Washington graced the cover of the *Union Oil Bulletin* (forerunner of *Seventy Six*) 50 years ago in December of 1934.

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