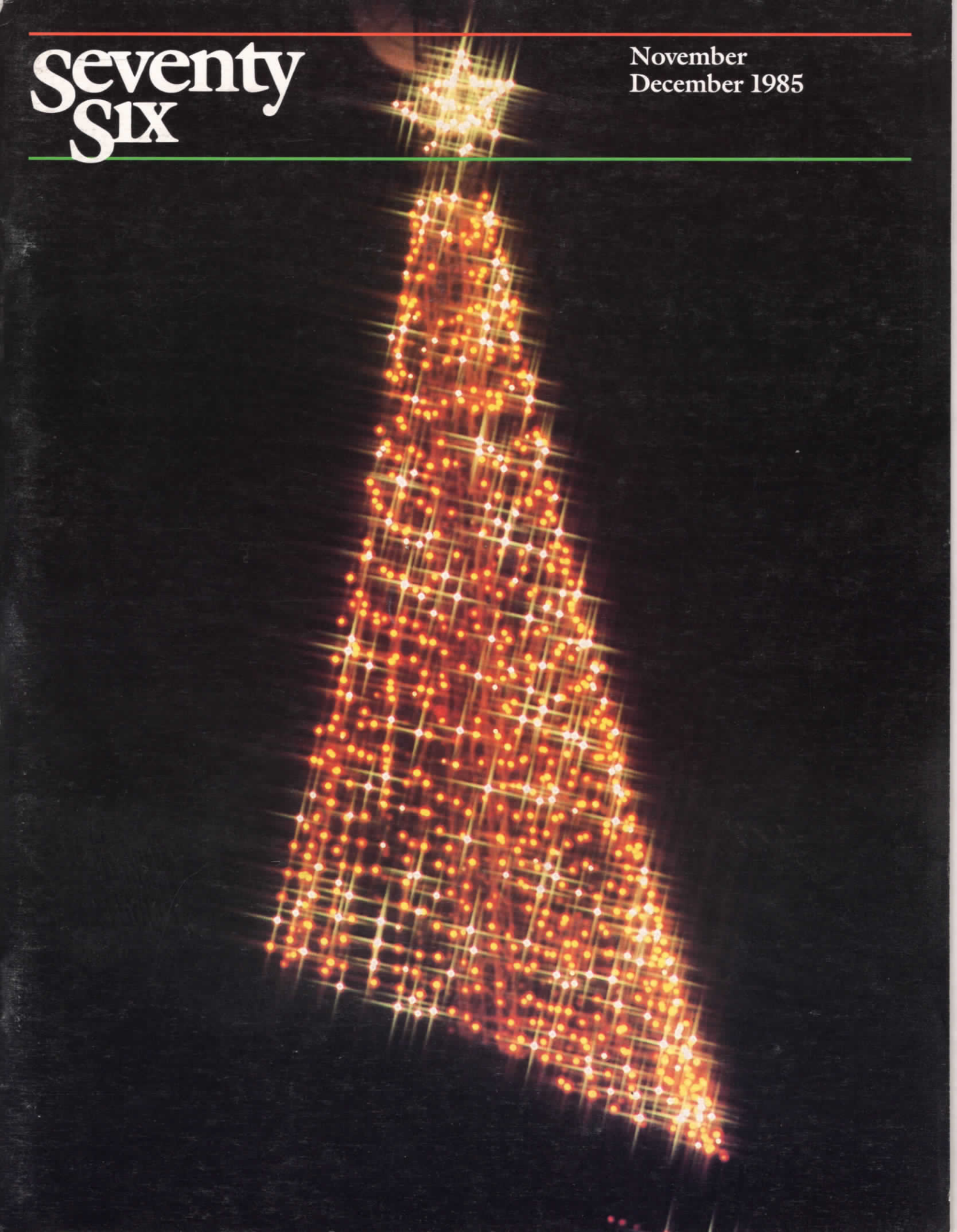
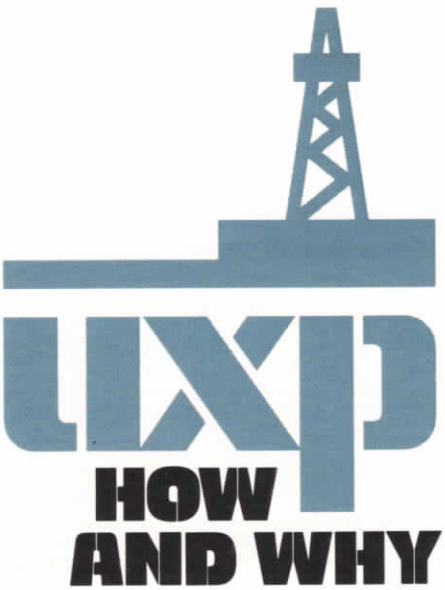
Seventy Six

November
December 1985





HOW AND WHY

Union Exploration Partners, Ltd., (UXP), formed as of the first of August, provides a unique investment opportunity.

"In no other way can a small individual investor participate directly with a major oil company with a proven record of success in one of the most prolific areas of the United States," says Philip Blamey, Unocal vice president of finance.

UXP was formed from substantially all of the assets of the Unocal Oil & Gas Division's Gulf Region. Union Oil Company of California, the operating subsidiary of Unocal Corporation, serves as UXP's managing general partner and holds more than 90 percent of the units issued. The balance of the units are traded on the New York Stock Exchange (NYSE). As of the end of November, 220 million units have been issued; Unocal holds 211,375,000.

The Gulf Region is one of Unocal's "crown jewels," according to Ray A. Burke, executive vice president, Energy Resources. Burke joined Unocal in Corpus Christi, Texas, in 1951 and played a key role in the company's early exploration efforts in the Gulf Coast region—both onshore and offshore.

"Those early efforts met with a great deal of success, beginning what has proved to be an impressive record of achievement and growth," says Harry E. Keegan, president of the Unocal Oil & Gas Division.

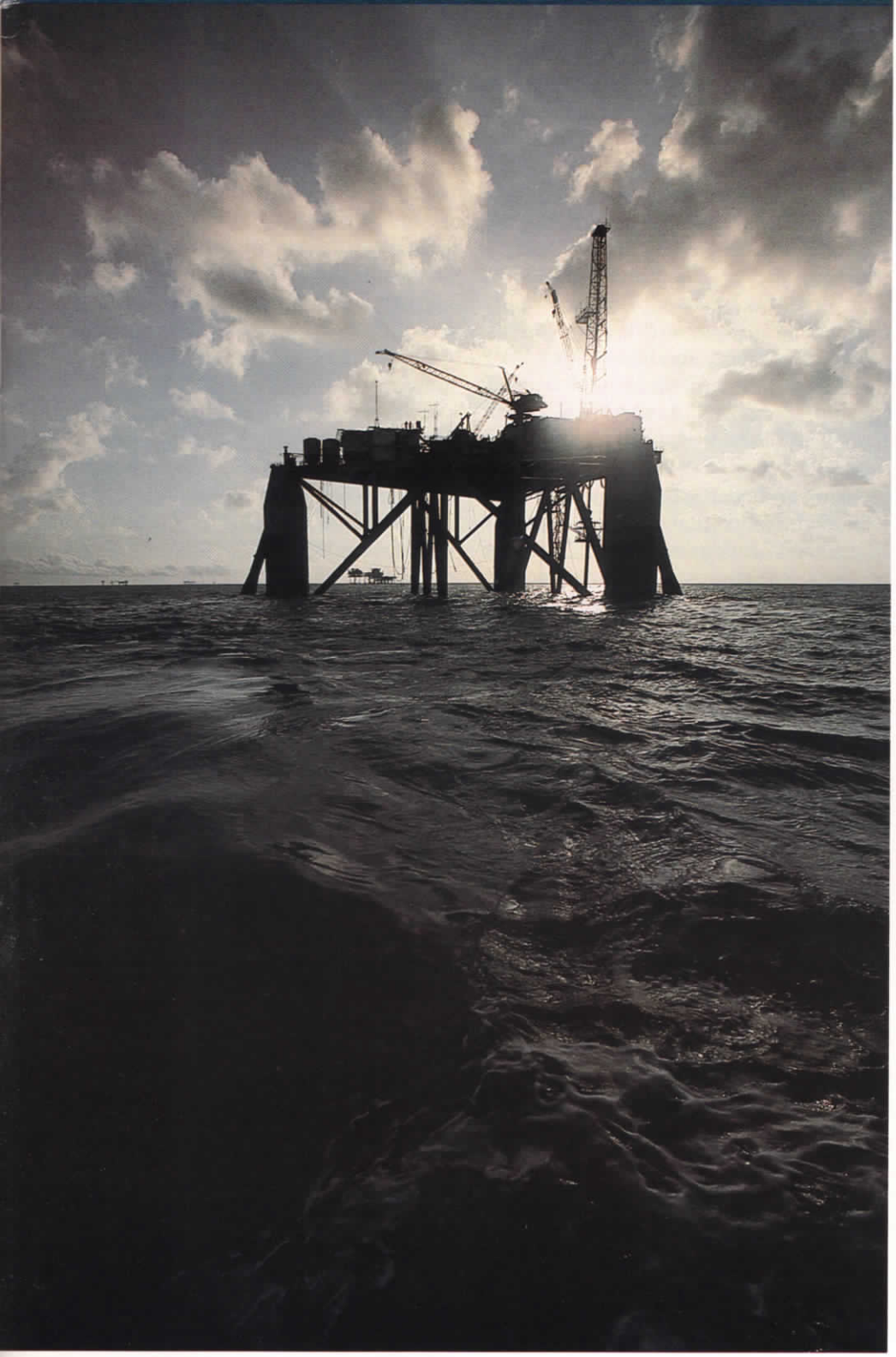
UXP's prospects from the investor's point of view are certainly exciting. UXP has the largest inventory of exploratory acreage in the history of Unocal's Gulf Region operations. It is a proven leader in new technologies that are taking the oil search into deeper formations and deeper waters, and it continues to build on a long record of success.

"It would be a mistake to say we're going to make big changes because of the formation of UXP," says Tom Stoy, vice president, Gulf Region, Unocal Oil & Gas Division. "Essentially the region remains as it was, except we have some new partners as owners. We have to do what's prudent for them, and we think we were doing that before."

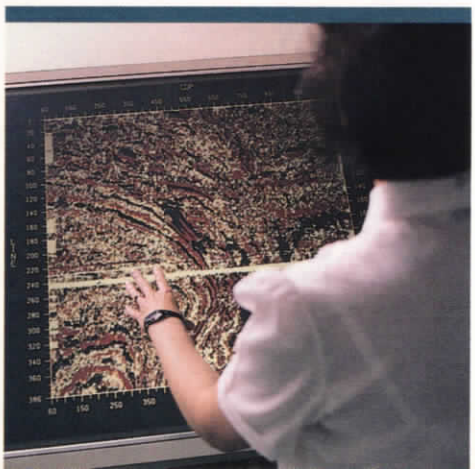
In a master limited partnership such as the UXP, investors get a chance to participate in the business. That is, the managing general partner runs the business. But unitholders, as "limited partners," share in the profits and industry tax advantages. Quarterly, the managing general partner tallies revenues and expenses, distributing the balance on a per-unit basis.

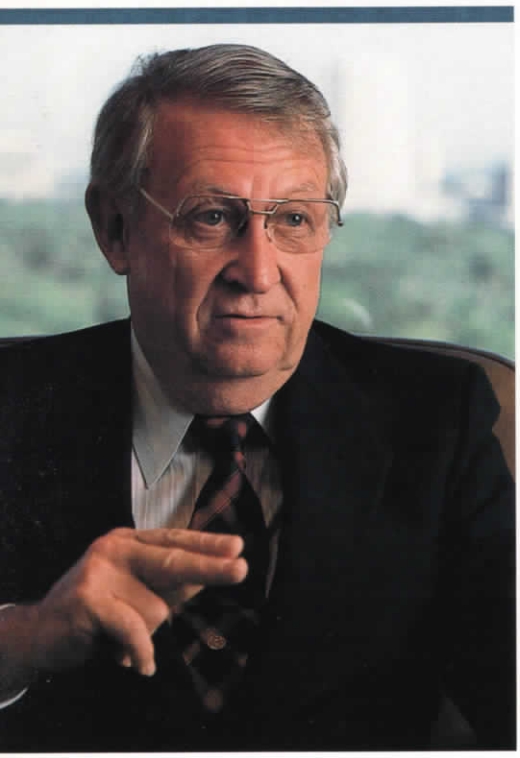
In the case of UXP, all of the available cash will be distributed. In fact, the first such distribution was made November 15. Unitholders of record November 1 received a cash distribution of 41.125 cents per unit. This represents the partnership's net distributable cash flow of $90.5 million for the initial two months of operation, August 1 through September 30, 1985.

"From Unocal's point of view, UXP provides us with another financial tool," Blamey says. "Since the units are liquid (easily convertible to cash), Unocal can use them for dividends, acquisitions or borrowing. We now have the ability to pay dividends not only in cash, but in the form of direct partnership interests in our producing properties. We believe this will tend to widen our shareholder base. Some people would like to be partners but don't want to hold shares, and vice versa."



Phil Blamey calls UXP a unique opportunity for the investor. Offshore and geophysical expertise have contributed to the Gulf Region's record of success.





Tom Stoy: "Our reputation for finding oil and gas is outstanding...and everybody knows it." Right, Bob Morton and Bill Bolding review some of the 12,000 documents that had to be transferred to UXP.

In fact, Unocal will issue its first dividend to include UXP units for the fourth quarter of 1985. In addition to a cash dividend of 30 cents per share, Unocal's board voted a special dividend of 0.0285 units for each share of Unocal common. Since their listing on the NYSE in July, the UXP units have been trading in the range of $22 to $24 per unit. Based on a market price of $23 per unit, the special unit dividend would equal 65-1/2 cents per share—more than double the cash dividend.

All shareholders, including the Unocal profit-sharing and employee stock ownership plans, will receive the unit dividends. However, both Unocal plans will sell the units they receive because of legal and tax considerations. The money will be reinvested in Unocal stock.

"I can't put my finger on the first time the subject of a master limited partnership was mentioned," Blamey continues. "But any number of people were aware of it. It was natural for us to wonder and study to see if there would be any application to Unocal. The idea certainly got much more attention when we were doing the defensive strategy work related to the Mesa takeover attempt."

On April 19, 1985, less than two weeks after the Mesa group announced its bid for a controlling interest in the company, Unocal's executive committee announced that it would recommend to the board of directors the formation of a master limited partnership. Shortly afterwards, the board approved the formation and Dick Goddard, Oil and Gas Division comptroller, received instructions to proceed.

The first major task was the production of a prospectus — a document detailing the structure, assets and operations of the proposed master limited partnership. This document would have to be approved by the U.S. Securities and Exchange Commission before units in UXP could be offered for sale.

The formation of the partnership was truly a team effort. "Most of the theoretical work as to the structure and basic policies of our particular master limited partnership was done in Los Angeles by Unocal's financial, planning and legal groups," Blamey says.

Putting these policies into partnership form took many hours of thought and discussion in Houston on the part of about 35 securities, accounting and tax specialists, including both Unocal staff and hired consultants. Dick Goddard, associate counsel Bob Bermingham, assistant comptroller Chuck McDowell, and other members of the team headquartered at Unocal Center in Los Angeles found themselves residing in Houston during the month of May.

The securities attorneys, tax attorneys, accountants and underwriters each had different concerns about the partnership. "It was like getting a group of chefs, each with a gourmet specialty, to agree on a menu," says Bermingham. "We had to change the structure of the partnership at least three times to satisfy everyone," he notes.

Meanwhile, the Houston staff was assembling information about the Gulf Region's assets and operations for the prospectus. One of the key players was Steve Ohnimus, who had been manager of planning for the Gulf Region for less than a year. "Steve's group did a yeoman's chore—turning out volumes and volumes of information in a very short period of time," Stoy says.

"Specifically," Ohnimus recalls, "we coordinated information from the engineering, accounting, land and legal groups to accumulate the necessary materials and make projections for the prospectus.

"The SEC asked that our information be as current as practical," Ohnimus says. "Once the SEC reviewed our preliminary prospectus, we had to update the data for the final version. Most of the numbers weren't readily available and had to be worked up. On top of that, some of the numbers— average oil and gas prices, for example—can change very quickly."

"We wanted to start off the partnership with as clean and appropriate a set of records as possible," notes Fred Kirby, accounting manager for the Gulf Region. "We considered what would be fair and equitable as we transferred items from the Oil & Gas Division to UXP."

Some assets, including a pipeline, potash properties, and real estate, were transferred to other company divisions. But substantially all the oil and gas assets of the Gulf Region — from boats to platforms—were transferred to UXP. (Only the assets were transferred. UXP has no employees. It is operated by Unocal Gulf Region employees.)

"The fact that the company's cost centers are decentralized made our job a lot easier," Kirby says. Because of the decentralization, pertinent numbers for the prospectus were available for the Gulf Region for the current year and past years. The numbers did not have to be sifted out of totals for the entire Oil & Gas Division.

The Gulf Region land department also played a pivotal role. Before the prospectus could be filed with the SEC, Unocal had to have "consents to assign" properties to UXP from the landowners who held Gulf Region leases, the partners in working interest agreements, and others. This presented the land group with the monumental task of examining roughly 12,000 agreements in order to take the necessary action on each one.

"We brought people in from our district offices in Jackson, Houston and Louisiana to assist us," says Bill Bolding, manager of land for the Gulf Region. About 20 people worked to review the leases and agreements and communicate with the landowners by letter or phone. In some cases, owners had to be tracked down in person. "We moved mountains in minutes," says Bob Morton, supervisor of lease processing.

After consents to assign were received, the documents that would convey title to UXP had to be prepared. These were filed with the appropriate state, local or federal authorities — each complying with the applicable state or federal laws.

Vance Lynch, (right), heads one of the Gulf's finest geophysical operations.

Dick Goddard: "The partnership became effective August 1." Bottom right, Steve Ohnimus talks with Tom Stoy. Ohnimus had to find the right numbers to describe UXP in the prospectus.

There were several editions of the prospectus, and last-minute changes were made during the all-night session at the printer. "We received approval of the prospectus from the SEC in July," says Goddard, "and the partnership became effective August 1."

Goddard now has responsibility for administering the UXP, and it is no small assignment. "We must allocate earnings to each one of the partnership units every month, so record-keeping becomes more detailed," he says. "We have to know who held what and when, because that will affect the unitholder's tax basis. Intangible drilling costs, for example, are a tax deduction—but they change every month. So we must know who held the units for which months, and how much each unitholder is entitled to."

A UXP unitholder will receive two things: quarterly cash distributions representing a share of UXP revenues and, at year end, a tax statement and instructions on how to report. These will be supplied to those who have purchased UXP units and to Unocal shareholders who opt to hold (rather than sell) units they receive as dividends.

"We have developed an administrative group of 12 in Los Angeles led by Dave Miller, formerly assistant manager of our Western Region accounting office. This group will keep unitholders' records, distribute the necessary information to them and answer their questions," notes Goddard. "The group will probably double in size during tax season. We've also installed an accounting software program developed for master limited partnerships that is specifically tailored to meet UXP's requirements."

When UXP was formed earlier this year, it was the largest MLP to date in the domestic oil industry. Had the Gulf Region been a separate oil company in 1984, it would have ranked sixteenth in reserves and profits among U.S. oil companies, and first in return on assets and profit per employee.

"There have been very few times when investors could buy into an exploration team like ours which has such a wonderful record over such a long period of time," says Tom Stoy. "Our reputation for finding oil and gas on the Gulf Coast is outstanding and everybody knows it.

"Frankly, our exploration potential now is as good as it's been in years," he continues. "We have the best inventory of land that we've ever had, both in number of acres and locations. I know you can't pump acres through a pipeline, but we think we have quality acreage. We're exploring all the time—and we're making discoveries.

"We have performed well in the past," he adds, "and we will continue to do so. We have the same bunch of people."

The people are an impressive group, having put together the details for the complex process of forming a master limited partnership in a very short period of time. "It was a tremendous paperwork burden both in Houston and in Los Angeles," Goddard says. "To my knowledge, there have been no hitches. It's a real credit to our people."

Fred Kirby (right), and assistants Ron Spratt (left) and Bob Marquez, are in charge of accounting for the Gulf Region.

STAYING AHEAD IN THE GULF

Harry Lee (right) and Bill Bolding discuss offshore tracts and potential.

Performance and potential combined to make Unocal Oil & Gas Division's Gulf Region the choice when Unocal decided to form a master limited partnership earlier this year (see accompanying story). Sometime in 1985, the Gulf Region will produce its billionth equivalent barrel of oil. The region holds 33 percent of Unocal's domestic oil reserves and 42 percent of its domestic natural gas reserves.

Not only has the Gulf Region proved highly productive for Unocal up to now. Its future—as Union Exploration Partners, Ltd. (UXP)—looks decidedly promising. In 1984 and '85, Unocal announced 12 discoveries in the Gulf Region. And, UXP has a terrific acreage position in the two hottest geologic plays in the region, if not in the world: the Flexure trend and the Norphlet gas play, both offshore.

"We've been operating here for more than 40 years," says Harry Lee, manager of exploration for Unocal's Gulf Region. "What makes it so thrilling now is the exploration potential in our prospect inventory."

What's happened is that the oil industry has looked a little deeper into the Gulf of Mexico and made some exciting finds. "So far there have been 14 wells drilled beyond 20,000 feet in the Norphlet gas play without really a dry hole," notes Lee. "A couple of holes have been junked because of mechanical problems—but you've really got to say that there have been 14 straight strikes, which is phenomenal."

The Norphlet play is located offshore Alabama in Mobile Bay and adjacent federal waters. UXP, the second largest leaseholder in the area, has discovered two new gas fields in its first two exploratory wells. The area has already produced eight new gas fields, and industry observers believe it will be a prime source of new natural gas for decades to come. It's particularly good for UXP, because of Unocal's experience and expertise in deep drilling. The objective zone is located about 22,000 feet below the sea floor.

"We've got a beautiful position in the Norphlet gas play," says Lee. "We've got 26 blocks, three in state waters and 23 in federal waters. Each of our blocks is on a structure."

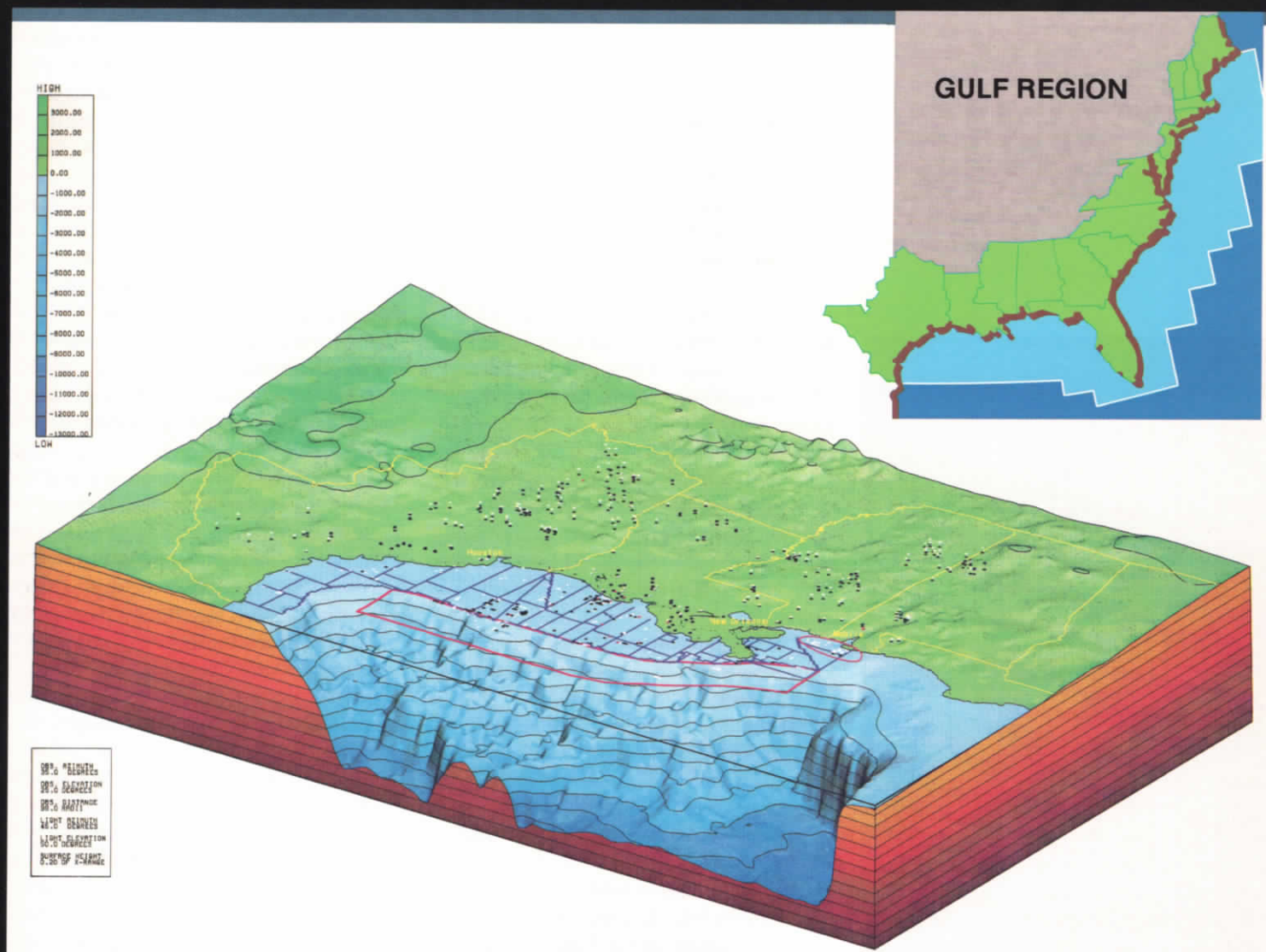
UXP is also well represented in the Flexure trend, sometimes called the "deep-water Pliocene-Pleistocene play." This area runs offshore along Louisiana and Texas. It is a deep-water area, 600 feet or more. Estimates of potential reserves amount to more than a billion barrels of oil equivalent, according to the *Oil & Gas Journal*.

"There have been a lot of strikes out there," says Lee. "Some of them have quite a bit of oil." UXP holds 44 blocks in this Plio-Pleistocene trend, on which two discoveries have been made this year.

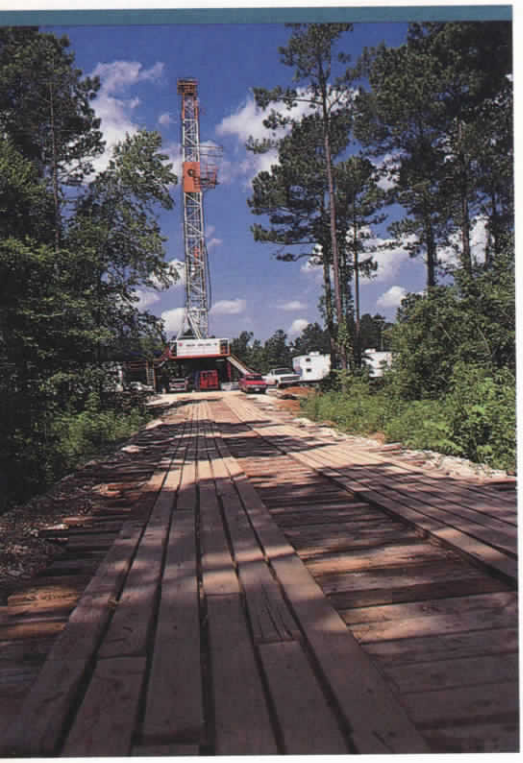
Unocal's interest in the Gulf Region began in 1939 when company geologist Sam Grinsfelder (later vice president in charge of domestic exploration) recommended that the company open an office in Houston. In part, his report read:

"Regionally, the Gulf Coast is located on the periphery of a great synclinal basin, the axis of which is in the Gulf of Mexico. The extent of this producible oil province can be appreciated when it is realized that the distance from the Rio Grande to the Mississippi River is approximately 630 miles, and the continuation of this feature can be extended as far as the island of Cuba. The width of this province in the area surveyed is from 100 to 150 miles."

Grinsfelder probably hadn't guessed at that time that the width would more than double later in the century, as oil companies pushed out 100 miles and more into the Gulf waters. He estimated the cost of a Houston office at $6,000 per month, including salaries and overhead for an eight-person staff (not including about $14,000 per month for geophysical contract work). The results have long since proved the worth of that initial investment. (Since then, the Gulf Region has grown from eight employees to approximately 960.)



Generated by computer, the above map of the UXP properties was put together through a joint effort of Oil and Gas Division and Science and Technology Division personnel. Black and red blocks indicate producing properties in UXP, the red being the 16 major producers. White blocks are prospective acreage. The large section outlined in red on the surface of the Gulf waters indicates the Flexure trend; the smaller section denotes the Mobile Bay area. Inset shows the full extent of the UXP area.



Onshore drilling is less costly, providing an important balance against higher risk offshore prospects in UXP's portfolio.

Two years earlier, in 1937, the Pure Oil Company, with whom Unocal would later merge, was a partner in the first successful well drilled from a free-standing offshore platform. It was only one mile offshore and set in 14 feet of water, but it was a great adventure for the pioneers who built it. When the well was completed in March 1938, it flowed at 200 barrels of oil and 200,000 cubic feet of gas a day.

That first platform was made of wood treated with creosote, an oily liquid, to protect it from the saltwater. There was no room for living quarters, so the drill crews had to travel in small boats over 13 miles of choppy waters to and from work every day. The platform would be dwarfed by the the massive steel structures that dot the Gulf today, but it provided welcome inspiration for what would soon be a giant offshore industry.

"We started on the land in the Gulf Region, moved into the marshes, out into the bay, and finally really got our feet wet in federal waters," says Tom Stoy, vice president, Gulf Region, Unocal Oil & Gas Division. Unocal's early discoveries onshore in southeast Texas were followed by onshore discoveries in Louisiana.

Ray A. Burke, Unocal executive vice president for Energy Resources, was the district geologist in New Orleans from 1952 to '55 and chief geologist in Houston from 1955 to '59. His aggressive stance led the company into the Gulf waters offshore Louisiana.

"Our company was among the first to recognize the large oil and gas potential present in the offshore Gulf of Mexico and, early on, we prepared to participate," Burke says. Initial efforts resulted in a highly successful discovery in the Vermilion offshore, still ranked as one of the Gulf's largest offshore natural gas fields, and many other discoveries.

Unocal was active in the Gulf throughout the 1950s, especially after federal legislation was passed in 1953 to resolve the debate over state versus federal ownership of submerged lands. In 1960, a company report, "Operation Bluewater," recommended the rather daring move into water depths as great as 300 feet. (Tom Stoy, then division petroleum engineer in Houston, helped write the report. "Bluewater" refers to the change in color of the Gulf waters as you move from the green shallows out into the deeper water.)

"We were swimming with the big boys on that one," Stoy says, recalling that Unocal was one of three oil companies— the other two much larger— venturing so deep.

The company took an active role in the second federal lease sale held in 1960 (the first was held in 1954). "We've participated in every federal lease sale in the Gulf since 1960," notes Stoy, "and I think that continuity is one reason for our success." Today, UXP ranks as the eighth largest oil producer in Gulf federal waters and the fifth largest gas producer.

During the 1960s, Unocal made more and more discoveries and, in 1965, further improved its position with the acquisition of The Pure Oil Company, which had extensive onshore and offshore oil and gas properties in the Gulf Region.

During the 1970s and '80s, oil companies pushed out into deeper and deeper waters. A few years ago, 600 feet of water was the limit. However, now there are platforms in 1,000 feet of water and exploration is pushing out into greater depths. (The world record water depth to date was set in the Atlantic in 1984, when an exploratory well was drilled in 6,952 feet of water.)

Unocal has been one of the leaders in deep-water exploration, acquiring its first deep-water acreage in the Gulf in 1974. "Company management showed a great deal of confidence in its offshore exploration and engineering people," says Harry Keegan, who has been president of the Unocal Oil & Gas Division since 1973. "We bid on tracts in 900 feet of water at a time when few companies were venturing so deep. Subsequent discoveries and development have secured the Gulf Region's leadership in deep-water operations."

Of six platforms now standing in more than 600 feet of water, UXP operates two and has an interest in two others. The two UXP-operated platforms, Cerveza and Cerveza Ligera, stand in more than 900 feet of water in the East Breaks field located about 100 miles offshore Texas.

Cerveza, installed in 1981, is the largest offshore platform jacket ever built and launched in one piece. The jacket is 952 feet tall and stands in 935 feet of water. In 1982, Unocal installed a sister platform, Cerveza Ligera, which is only 10 feet shorter and stands in 925 feet of water. Development drilling is underway and production from both platforms is scheduled to begin by the end of 1986.

Unocal's discoveries in the East Breaks field were made in 1976. "Not many companies got interested in deep-water prospects until the first area-wide sales in 1983," notes Harry Lee. By that time, the data gathered by the deep-water leaders had been made public, and interest was growing rapidly.

Area-wide lease sales in the Gulf opened up a lot more acreage to competing companies. Until then, the federal government would take nominations for offshore lease blocks and offer a limited number of blocks at each sale. But, since 1983, the whole Gulf has been offered in three different sections in seven lease sales. Companies have leased more than 10.5 million acres. Since 1983, Unocal has doubled its offshore position in the Gulf— from interests in 141 blocks to interests in 283. UXP's net acreage acquired in area-wide sales is 465,000.

"We've concentrated on areas from less than 600 feet to about 1,500 feet deep," says Lee. "The deepest waters we have yet operated in are just outside the mouth of the Mississippi. We are drilling an exploratory well there now in 1,411 feet of water.

"We see the potential farther out in the Gulf," he continues. "There are a lot of open blocks in the deep water, but the economics have got to catch up with the geology. Sometime in the future they will, there's no doubt about it, and those prospective blocks further out will become attractive."

Cerveza set a record for size of platform jackets when it was set in 952 feet of water in 1981. The Chunchulla natural gas processing plant, left and top of page, is operated by UXP, which has interests in 17 such facilities in Texas, Alabama and Louisiana.

Geophysical technology (right) helps reduce the risk of drilling dry holes. This is vital in situations where the cost of drilling is high, as it is in the deep-water Flexure trend where Cerveza Ligera (below) is located, and in the Mobile Bay area (bottom) where the objective zone is very deep, some 22,000 feet below the sea floor.

The community of Van, Texas has grown up around its oil field (above and far right). The field, producing since 1929, is one of the 16 major producers in UXP. New geophysical techniques applied to old fields like this one reveal more oil and gas.

The problem is the cost of production in very deep water. Conventional methods can be used to construct platforms designed for use in as much as 1,500 feet of water. Beyond that, a conventional platform would have to be higher than Chicago's Sears Tower. Instead, new technologies are being developed for floating platforms.

The cost of this kind of pioneering development is high. To justify the expense, hydrocarbon reservoirs have to be big and deep enough so that they can be effectively produced from a minimum number of platforms. "We have to look for 'elephants,'" notes Lee.

The U.S. government recognizes that deep water presents greater challenges to the industry. So, while federal offshore leases normally run for five years, the term is extended to 10 years for prospects located at depths greater than 900 meters (about 2,950 feet).

"We have a couple of prospects with 10-year lease situations," says Lee. These include five blocks in waters averaging 3,200 feet deep.

Not too long ago, geologists thought that the Gulf's oil and gas producing sands didn't extend very far offshore. But studies have revealed that the type of deposition that occurs in the Mississippi delta occurs all along the Gulf coast. The rivers carry sediment south from the plains, and the sands creep out into the Gulf and drift over the continental shelf. Sands have been laid down and covered over for millions of years, and hydrocarbons have formed far out into the Gulf.

"It's given a new breathing spell to the Gulf," says Lee. "A lot of people thought that the Gulf was on its last leg, but it's not. It's still good oil and gas country."

A major factor in overcoming the difficulties presented by deep drilling and deep-water drilling has been the technological advance in the collection and analysis of geophysical data. "About a year ago, we installed a state-of-the-art geophysical data processing center here in the Gulf Region," says Stoy. "We now have the ability to process data better than we've ever been able to process it before. In a very short period of time, we have become one of the leaders in this area."

"We use the center for reprocessing data, modeling studies, bright spot analyses and other techniques to get the most out of our data and, basically, to reduce the risk of drilling dry holes," says Lee. "It's made us extremely competitive."

The geophysical advances not only greatly improve the evaluation of offshore prospects. They are also proving very useful in taking new looks at older producing areas in shallower waters and onshore. These properties are less costly to develop, and so provide an important balance in UXP's portfolio against the higher risk offshore prospects.

"UXP has interests in 135 fields," says Lee, "and a lot of these are good producing properties where we have done some snooping around and found offsets, deeper pools and attic oil—new reserves that were not on the books before."

Many of the onshore properties have been producing for years and were first developed using less sophisticated geophysical techniques than are now available. New techniques provide more and better information, with higher energy signals able to penetrate deeper into the earth. "We are exploring a whole new area that's very deep—15,000 to 20,000 feet," says Lee.

Between the extensive offshore acreage and onshore prospects, UXP has the largest inventory of prospects ever acquired by the Gulf Region—about one million acres that need evaluation. A five-year drilling program calls for expenditures of about $100 million a year to drill some 130 exploratory wells.

Of the 135 fields in which UXP has interests, 16 contain approximately 66 percent of the estimated proved reserves. UXP operates all but one of these major fields. No single field accounts for more than 11 percent of the estimated total net proved reserves. At the end of 1984, reserves totaled 178 million barrels of crude oil and 2.6 trillion cubic feet of natural gas. Based on current production levels, the reserve lives of these holdings equal 11 years for oil and 17 years for gas, well above industry averages.

To stay ahead of the industry, new reserves must be found to replace production. That job falls to the exploration staff. "We've got strong leaders who have been around a while, and highly qualified, well educated younger people to back them up," says Lee. The average age of the Gulf Region's exploration staff is 35.6 years.

These people know that their search never ends. "A good explorer is like a detective," says Lee. "You've got to scrape for information and have a good imagination. You've got to look for new ideas, find some elephants, and remember that there are a lot of eyes looking at the same data."

The Gulf is a highly competitive area. Backed by a wide range of experience and expertise, Union Exploration Partners is building on Unocal's impressive record of achievements.

PHILIPPINE GEOTHERMAL: FULL STEAM AHEAD

Shifting into four-wheel drive, Tiwi field manager Joe Bowen gunned his land rover up the steep gravel road. Further up on the hillside ahead, the steel derrick of a large drilling rig poked up out of the thick grass and swaying coconut palms. Drilling had been proceeding for several days now at this new development well, and Bowen was visiting the site on a routine progress check.

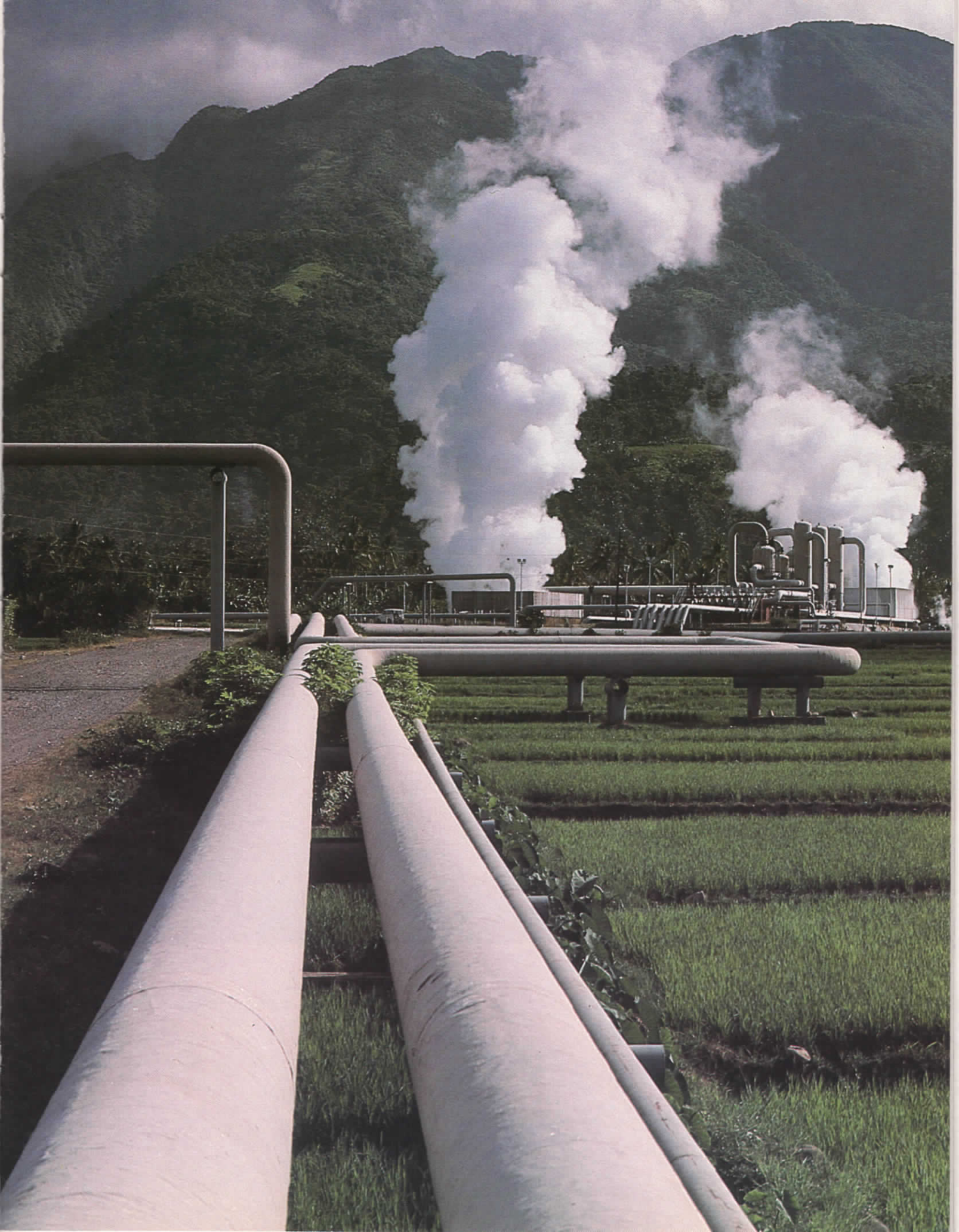
Parking at the base of the rig, Bowen stepped out and headed up the stairs to the drilling floor. After nodding his greetings, the toolpusher shouted out a status report over the roar of the rig's diesel engine: the drill was making hole at a steady rate, there had been no delays or serious problems, and the anticipated pay zone—around 4,000 feet below the surface—should be reached right about on schedule.

Satisfied that all was well, Bowen stepped over to the edge of the deck and gazed out. The vantage point afforded a beautiful view of the 6,000-acre Tiwi field, one of two geothermal projects under development here in the Philippines by Unocal's wholly owned subsidiary, Philippine Geothermal, Inc. (PGI).

Located 220 miles south of Manila on the island of Luzon, Tiwi sits on a lush peninsula of rice fields, small villages and palm-fringed beaches surrounded by an azure sea. A huge active volcano, Mayon, dominates the landscape—a testament to the volatile forces lying just beneath the tranquil surface here. Indeed, Mayon's latest eruption, in September of 1984, leveled several dwellings near the Tiwi area. But PGI is putting Tiwi's natural energy to more productive use, channeling geothermal steam tapped by wells like this one to three 110-megawatt power plants. The electricity generated helps feed the energy needs of metropolitan Manila (pop. 6 million) and the rest of Luzon.

"We've reached the stage here where our main task is to keep things running smoothly and efficiently," Bowen said over the steady din of the drilling. "But we always seem to have a rig working somewhere."

Steam billows up from a satellite separation station in the Tiwi geothermal field, the Philippines. PGI now supplies 30 percent of the electrical requirements of the nation's principal island of Luzon.



Right, a worker inspects portion of a turbine at one of the Bulalo field's three power plants. Below, workers fit a Tiwi steam pipe with new insulation.

Although "keeping things running" might seem less involved than initial development of a field, Bowen smiles at the notion that activity here has become routine. At Tiwi, he and his staff of 300 must keep tabs on over 100 producing wells delivering steam to the three power plants. The plants are operated by National Power Corporation (NPC), the Philippines' government-owned utility company.

"Keeping our production flowing is a lot more involved than you'd think," Bowen explained. "We're dealing with steam and hot water under very high pressures. We've got to watch closely for temperature and pressure fluctuations, cold water inflows, corrosive intervals, a million different things. The work is full of surprises, but we learn a little more every day."

With PGI operations now spanning nearly 15 years in the Philippines (the company was formed as a Unocal subsidiary back in 1971), that amounts to a lot of learning. And all that acquired knowledge has paid off for PGI, both in Tiwi and at the company's other geothermal project, the Bulalo field, located in the Makiling-Banahao (Mak-Ban) area just 35 miles south of Manila.

Production has risen steadily since 1979, when the first commercial power was generated at both Tiwi and Bulalo. PGI's current generating capacity of 660 megawatts (330 in each field) was reached in the fall of 1984, when two new 55-megawatt power plant units at Bulalo began operating. In terms of total production, PGI operations comprise one of the largest geothermal development projects in the world. Its output is second only to The Geysers, located outside of Santa Rosa in northern California.

"I'd characterize our operations here as being successful in a number of ways," says PGI resident manager Tom Minette, a Montana native who has spent several years in the Philippines. "We've developed a solid, cooperative working relationship with both NPC and the Philippine government, which has allowed us to consistently meet our development goals. PGI now supplies 30 percent of the electrical requirements of the principal island of Luzon. Development of geothermal, a domestic energy resource, has helped the country's foreign exchange. It's also created new tax revenue and provided a lot of jobs."

"We always seem to have a rig working somewhere."

Based at Tiwi, Bulalo, and at PGI's main office in Manila, the company's staff currently totals 620. Over 97 percent of these employees are Filipino. "At one time we had over 50 expatriates on staff, but now we're down to less than 15," Minette says. "I think that's a tribute both to the success of our training program and the quality of our employees. Many of PGI's Filipino employees have been with the company for more than a decade."

Sofronio Amores, assistant manager of PGI's Bulalo field, is one of these senior employees. Seated at his cluttered desk across from field manager Pat Dobrocke, Amores unfolded a detailed map of Bulalo for a visitor. Discovered in 1974, two years after the Tiwi field, Bulalo (where 187 PGI employees are stationed) is only one-third the size of Tiwi in acreage. But with three power plants that can put out a total of 330 megawatts, the field's production capacity now matches Tiwi's.

"Bulalo has proven to be an excellent geothermal resource," Amores said. "We now have 55 producing wells, and at our current production level we're projecting a 30-year lifespan. The idea is to produce as much steam as we can without depleting the reservoir. So far, we've had no evidence of productivity decline."

One procedure that may be helping maintain the reservoir at Bulalo is the reinjection of geothermal fluids. Fully 100 percent of the field's produced fluids are now returned to the reservoir via injection wells. "Right now this is the largest geothermal reinjection project in the world," Dobrocke said, pointing out Bulalo's 16 injection wells on the map. "The fluids are all reinjected on the outskirts of the field, and we hope this will serve to recharge the reservoir." At Tiwi, where fluids from some wells are quite acidic and the reservoir structure is more complex, only 60 percent of the fluids produced are being reinjected. But PGI researchers are studying the possibility of increasing Tiwi's reinjection rate to 100 percent as well.

In addition to the reinjection studies being performed at Tiwi, PGI has several other research projects underway. "Our people are working with (Unocal Geothermal's) Santa Rosa reservoir group on reservoir simulation studies, and with the Brea lab on well stimulation work," Tom Minette says. "We're also exploring new completion procedures designed to isolate corrosive zones and deal with problems such as cold water inflows."

Overall, PGI researchers are continually trying to learn more about the behavior of the Tiwi and Bulalo reservoirs. "It's detailed research that requires a close interfacing of our geologists and reservoir people," Minette says. "But everything we learn can help us develop better ways of managing the reservoirs."

Another area of ongoing research for PGI is in the environmental sphere. At the Tiwi chemistry laboratory, PGI Senior Chemist Christina Aquino and her staff of 11 closely monitor the impact of geothermal development on the Tiwi region. In addition to testing geothermal fluids for chemical content and acidity, the group also analyzes water, air and soil samples. "We also look at fish samples to check for any possible contamination that could be linked to the geothermal project," Aquino says. Another lab performs similar studies for the Bulalo field.

The Mak-Ban area contains a second geothermal resource discovered by PGI, the Maibarara field. A much smaller field than Bulalo, Maibarara has only six productive wells, none of which is being produced at this time. "Maibarara has good wells, but the field isn't big enough to be developed economically for power generation," Minette says. "We're currently examining the prospect of using the steam for other purposes."

Clockwise from left: Analyzing fluids at the Tiwi chemistry lab; drilling underway at Tiwi; view of a Bulalo power plant.

PGI operations in the Philippines now span nearly 15 years. Current generating capacity of 660 megawatts was reached in the fall of 1984.

Among the ideas being explored is the possibility of smaller industries utilizing Maibarara's steam. "Manufacturers could use the steam as process heat," Minette explains. "If they needed a boiler, for example, we could serve as the boiler. The only necessity would be locating the plants close enough to the resource to make use of the steam. I think the potential is excellent for these kinds of geothermal applications."

For now, these and other types of expansion projects are down-the-road propositions for PGI. This is primarily because a downturn in the Philippine economy has dried up many sources of development capital. But according to Minette, the adverse economic conditions currently besetting the Philippines have not seriously impacted PGI operations or its future outlook.

"Up until the economic problems of the last 18 months, energy demand in the Philippines was growing seven percent per year," Minette says. "That growth has flattened out now. But when the economy turns around, energy demand will rebound very quickly. As a large, proven domestic energy producer, I think PGI is extremely well-positioned to meet that demand."

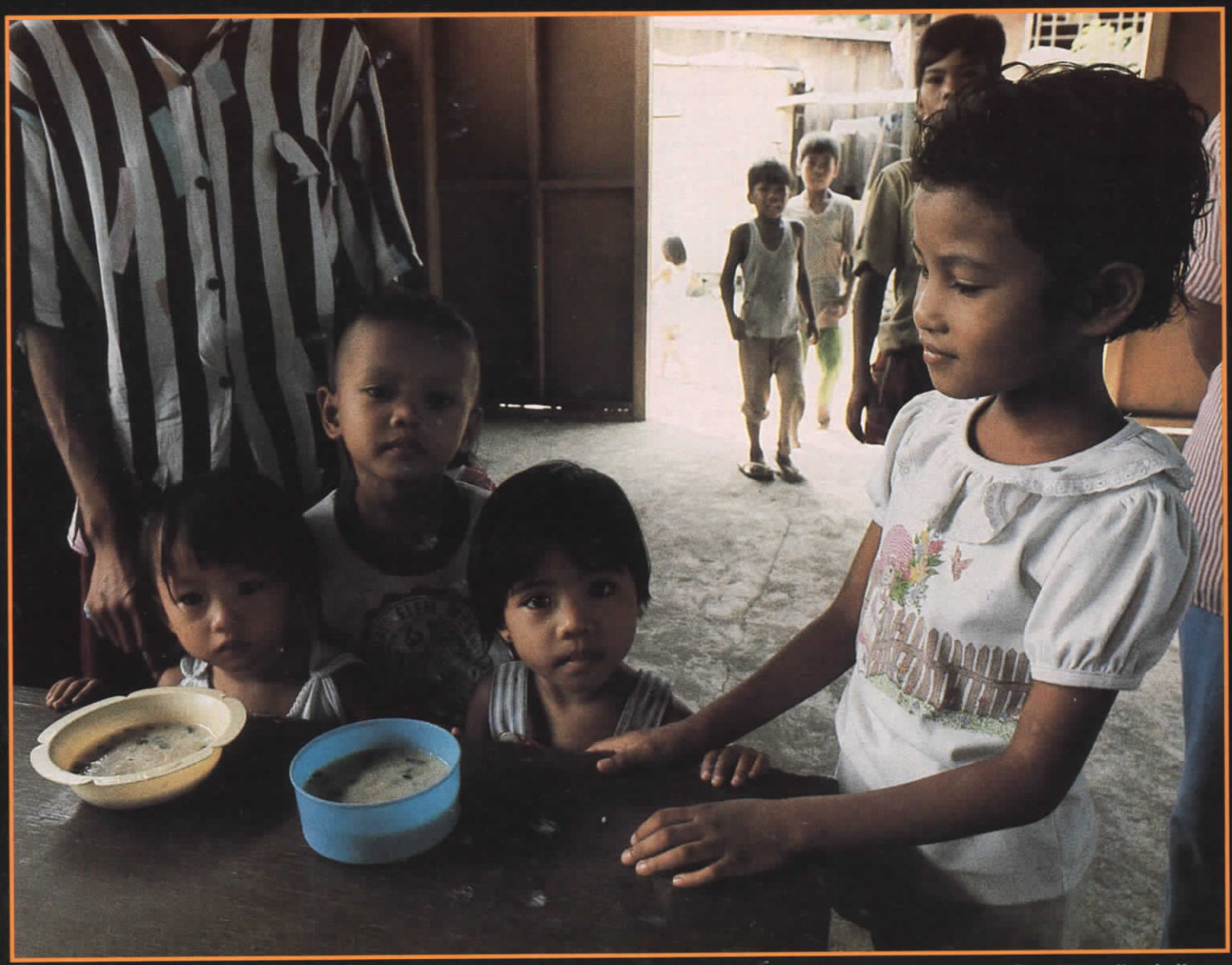
Minette's positive outlook is borne out by PGI's continuing development activity. Geophysical and chemical analyses are ongoing at both Tiwi and Bulalo, with an eye towards increasing productive potential. Additional development wells are being drilled, and several new exploration wells will be drilled in portions of the Mak-Ban area next year. In the meantime, PGI's fields are continuing to supply steam for NPC's 660-megawatt capacity.

Late one afternoon, Bulalo field manager Pat Dobrocke detoured from his rounds to visit one of the field's three power plants. Steam billowed up from the cooling towers of one roaring 55-megawatt unit, while the other, temporarily shut down for routine maintenance, was quiet. Stepping inside the plant, Dobrocke walked over to a partially dismantled turbine to get a closer view of the gigantic piece of machinery.

"How's she look?" he asked a man who was inspecting the turbine blades. The worker smiled and gave Dobrocke the thumbs-up sign. "We'll be back up soon," he said. "Full steam ahead!" ⑯

As a large, proven domestic energy producer, PGI is extremely well-positioned to meet future demand.

REACHING



Funded by a grant from Unocal's wholly owned subsidiary, Philippine Geothermal Inc., the Mothercraft Child Nutrition Center maintains a feeding program for Manila's malnourished children.

O U T

It's mid-morning in Mandaluyong, a densely populated section of metropolitan Manila located some five miles from the city center. Pedestrians scurry along the noisy and narrow streets, dodging cars and jeepneys—the colorful, stylized mini-buses (constructed from jeeps) that are a Philippine trademark. Oblivious to the tropical heat, the crowds stream through sidewalk markets, seeking out bargains and haggling over prices. Corner foodstands offering everything from fresh fruit to spicy rice dishes are doing a brisk business. All in all, the locale exudes an atmosphere of vibrant prosperity.

Just two blocks away, it's quite a different story. In this particular spot, some 1,000 families, all of them squatters, live wedged into a two-acre plot of land. The lot is almost entirely covered with small dwellings—shacks and hovels constructed of corrugated tin, cardboard, old burlap rice bags and anything else that can be used to form a wall or roof. Piled up against each other, these tumbledown shanties are separated only by narrow, muddy pathways interspersed with patches of weeds and piles of debris. There is no plumbing, no electricity, no gas, no sewage system. Dogs, cats, pigs and chickens are everywhere, and children by the score dart about. Many are dressed in tatters, many all too obviously suffer from disease and malnutrition.

"You'll find pockets of poverty like this all over Metro Manila," Sue Barker says as she slowly walks through the heart of the squatters' town. "Seeing it firsthand just tears you apart. But the resiliency and spirit of these people is truly inspiring."

Finding such spirit amidst the intense poverty inspired Sue, wife of Philippine Geothermal Inc. (PGI) district engineer Ben Barker, to do something to help. Back in 1981, a similar desire spurred Trish Melosh, wife of then-PGI geologist Glenn Melosh, to take action. She sent a proposal to PGI and Unocal Geothermal management: why not establish a feeding center in Mandaluyong for malnourished children?

Shortly thereafter, the Mothercraft Child Nutrition Center was born. Funded by a grant from PGI and run in part by PGI volunteers, Mothercraft is now in its fifth year of operation. The center, which moves to a new location in Mandaluyong about every six months, aims primarily to organize and maintain a supplementary feeding program for the malnourished preschool children of low income families. Weekly lectures and instruction to mothers of the enrolled children is also part of the Mothercraft program. Topics covered range from nutrition and health to infant care and family planning. In addition, an immunization program is conducted at the center, and self-help projects give mothers training in such skills as sewing and vegetable gardening.

The first Mothercraft Center opened in early 1981 in a vacant chapel situated in the midst of a squatter area. The center now occupies a large wood-frame building in a different poverty area of Mandaluyong—its sixth home since the program began. Residents of the community pitched in to refurbish the building and construct the center's tables, cabinets and other furniture from donated materials.

In addition to Sue Barker, Jeanne Powell (wife of geologist Thomas Powell) is also currently involved in the center's activities and finances. Other PGI staffers and spouses volunteer their time to help raise extra money and organize additional activities such as clothing drives.

It's nearing 11 o'clock, time for the first of two daily feeding sessions, when Sue Barker arrives at the Mothercraft Center. More than 50 children are gathered around the building, and at least a dozen mothers stand by, each holding a small baby. Stepping up to greet Sue and a visitor, the mothers proudly display their infants.

Before long, nutritionist Rosita Mercado arrives and opens the building. Mercado, who holds a degree in nutrition from the University of the Philippines, supervises the nutrition center and conducts the learning program for mothers. A cheerful, dedicated woman who is well known and appreciated in each of the communities where Mothercraft has operated, Mercado has been instrumental in the program's success.

"At each location, we've enrolled at least 70 children and 30 mothers," Mercado says as she helps several community volunteers begin preparing the morning meal. "That may not seem like many, but the children and infants we're feeding are the most severely malnourished. Without this program, many could sustain permanent physical damage from malnutrition."

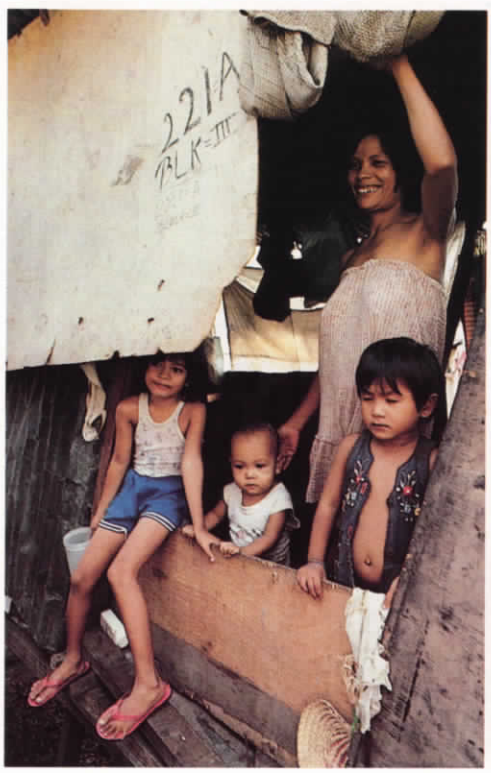
Twice a day during the week, children enrolled at the center are fed a protein-rich blend of soya meal, corn, vegetables, rice, milk and sometimes meat. Fruit and daily vitamin supplements are part of the menu as well. The children are weighed and examined weekly by Mercado and volunteers from local medical clinics.

"The gains these children make are really remarkable," Mercado says. "Not just in weight, but in overall health and stamina."

At the end of each six-month session a "graduation party" is held, with incentive awards and certificates of participation presented to the mothers and children. The party formally ends a session in one area, and the center then moves on to a new location. Mercado and other volunteers visit the previous locations from time to time, both to check on the children's development and to see if the mothers are practicing what they've been taught about health and nutrition.

"We encourage mothers who have been enrolled in the center to pass on what they've learned to other families in their communities," Mercado says. "In that way, the program has a broader, long-term impact."

The more immediate impact is apparent during the morning meal. Seated at several long wooden tables, the children eagerly spoon up the hot, nutritious stew. Singing and giggling, they seem healthy and happy as children could be. Nearby, Sue Barker is busy dispensing spoonfuls of a liquid vitamin supplement to babies.



Top, Sue Barker dispenses vitamins at the Mothercraft Center. Below left, a family looks out from their squatter hut. Below right, nutritionist Rosita Mercado (right) greets a group of children. "The gains they make are really remarkable," she says.

"Sometimes being involved here can be frustrating, because you feel what you're doing can never be enough," says Barker, who along with her husband adopted an orphaned boy they met through Mothercraft. "But I think it's very important to make an effort to reach out. And it's very gratifying to get results. You can see these children getting stronger each day."

Two hundred and twenty miles from Manila in southern Luzon, PGI is involved in another kind of reaching out: the Tiwi Human Development Project (THDP), a wide-ranging effort with the goal of helping Tiwi's small rural communities uplift themselves.

"The Tiwi region is made up mainly of small farming and fishing villages (called *barangays*)," says PGI environmental scientist Mary Hernando, who has helped coordinate the company's involvement in the project. "PGI is very visible in the area, and we feel it's important to help the local communities. The key is to support projects that will generate income for the barangays as well as contribute to their social development."

This is precisely the aim of THDP, which is administered by an organization called the Institute of Cultural Affairs (ICA), a private, non-profit international service group which establishes community self-help development projects in nations all over the world.

Down from top: Ceramic vessels drying at Putsan; view of a Tiwi rice field; finished pots await shipment on the Putsan shore. "People here have learned to work together," the barangay's captain says.

"ICA's basic philosophy is that a community's greatest resource is its own people," Hernando says. "Their approach is to stimulate residents of a community to help themselves by becoming directly involved in shaping their own future." With that end in mind, ICA staff works closely with community residents to get a self-help program initiated. But after two years, management of the project is turned over to the community itself.

"When we begin a project, we don't promise anything but a lot of hard work," explains ICA staffer Tim Karpov, an American who has lived in the Philippines for three years. "But we do promise that hard work coupled with commitment will bring results."

In the spring of 1982, the Unocal Foundation agreed to fund a pilot human development project in Putsan, one of 25 barangays in the Tiwi region. "Putsan (pop. 1,200) was an ideal place for the pilot program," recalls Neal Prasad, an ICA staffer working in Tiwi who hails from India. "Neither of the town's two main industries, ceramics and fishing, was doing well at the time. The village was dilapidated and the people demoralized. We knew if Putsan could turn things around, other barangays could as well."

The project began with a series of community forums, where residents aired their hopes and dreams—and gripes and frustrations—concerning their community. The next step was to identify the obstacles blocking the realization of those dreams, and plot strategies for overcoming them.

Clockwise from top: Feeding time at the Mothercraft Center; the Putsan ceramics workshop; weaving abaca mats at Naga. "Hard work coupled with commitment brings results."

"Once they got talking, people were very articulate in stating their ideas on what Putsan needed," Karpov recalls. "By the time we wrapped up the meetings, they'd come up with a list of 17 projects."

Putting these plans into action came next, and Putsan residents mobilized for the effort by establishing "community work days" where everyone pitched in on a variety of projects. One of the major ones was construction of a new ceramics building, including the installation of a more efficient rock crusher. This improved daily production of ceramic pots and vessels, and greatly increased the barangay's income.

A new pre-school and community poultry farm were also built, and a village-wide beautification program was launched. Roads and drainage ditches were repaired, new street lights were put in, and family gardens were planted. (PGI assisted in the road improvement by widening and grading the roads.) A community health project was also undertaken, including a free clinic and first aid training session conducted by PGI doctor Generosa Gonzales. Finally, government experts were invited in to conduct classes in such areas as fish preservation and agriculture.

The result of all this was that in two short years, Putsan became the showpiece village of the Tiwi area. By the time management of the Putsan Human Development Project was officially turned over to the barangay residents in May of 1984, the village had achieved a 20 percent increase in average family income.

There was also a 100 percent increase in children going on to secondary school, demonstrating the vital link between social and economic development.

At Putsan today, there is no evidence that the pace of progress has slackened. Stopping by the ceramics center, a visitor can watch workers busily pounding and shaping clay, turning out a steady stream of pots, pitchers, and bricks that are shipped to neighboring towns and provinces for sale. Other residents are hard at work in backyard gardens, while children fill the community school.

"The biggest change in Putsan is that people are so much busier now," says barangay captain Ben Torrente. "People here used to argue all the time, but now they have learned to work together."

Due to the success of the Putsan project, PGI management decided in the spring of 1984 to fund an extension of the program to four additional Tiwi barangays over the next two years. The expanded Tiwi Human Development Project is already yielding results in these communities. At Cararayan, just a few miles from Putsan, 80 residents worked together to dig a new irrigation channel for a community agricultural project. In the village of Naga, a community-run weaving center turns out an assortment of table mats, handbags and other products woven from hemp fibers of the native abaca tree. The items are sold for eventual export.

"Naga is a shining example of what people can do for themselves if they're determined," Tim Karpov says. "Last year the barangay decided to build a basketball court, but they lacked the money for materials. They wound up raising what they needed by staging a beauty contest involving all the neighboring towns.

"Now Naga has its basketball court—and more important, they know they got it by using their own resources, both human and financial. That knowledge builds tremendous confidence in the community. And the more confidence the people in a community have, the more they'll want to continue on and see what else they can do for themselves."

In his office at PGI headquarters in Manila, Tom Minette smiles as a visitor recounts this basketball court story. "That's a good illustration of why it's important for PGI and other companies here to support projects like this," he says. "It's not only our civic responsibility; our support helps motivate people to work together to realize their dreams. And that's really what it's all about, isn't it?" *T.S.* ⑯

THE GEYSERS AT 25

Steam rising from power plants dotting the rolling green landscape billowed brilliantly in the brisk morning air. "I haven't seen so much hot air since my last visit to the U.S. Congress," said California Governor George Deukmejian. The occasion was the 25th anniversary celebration of commercial power generation at The Geysers. The governor, who arrived by helicopter, had been treated to an aerial view of this unique installation.

The celebration was held on October 23 at The Geysers, located about 90 miles north of San Francisco in Sonoma and Lake counties. Unocal is the major steam producer for the project; Pacific Gas and Electric Company uses the steam produced to generate electricity.

Representatives of PG&E and Unocal Corporation greeted some 500 guests who had braved the twisting mountain roads that lead into The Geysers. The guests gathered in a spacious tent for the ceremony, then adjourned to tour one of the power plants and share their impressions over lunch.

Frederick W. Mielke, Jr., PG&E's chairman and chief executive officer and the host for the celebration, said: "The Geysers has grown tremendously since PG&E started-up Unit 1 a quarter century ago. It has been the world's largest geothermal energy source for more than a decade and produces enough electricity to serve the populations of San Francisco and Oakland combined. More importantly, in PG&E's energy mix, only hydroelectric power is less expensive than power from The Geysers."

Recognizing PG&E's quarter century of achievement at The Geysers, the American Society of Mechanical Engineers designated Unit 1 as a National Historic Mechanical Engineering Landmark at the ceremony.

Governor Deukmejian made The Geysers the first stop on his Energy Day Tour, which was designed to highlight California's diverse energy supply. Other stops on his tour were a cogeneration facility, a solar power project and a coal gasification project.

"We need secure and cost-effective supplies of power to maintain the quality of life in this great state of ours," the governor noted in his remarks to the crowd. "The Geysers is a very critical component of California's energy supply."

The governor emphasized the need for a diverse energy supply, so that the state need not depend on one source for all its power. "A diverse energy supply means more jobs, more comfort and convenience, more security," he said.

Other speakers included Barton W. Shackelford, PG&E's president, and Fred L. Hartley, chairman and president of Unocal Corporation. (On December 2, Hartley's title became chairman and chief executive officer.)

"It can truly be said that PG&E and Unocal have been partners in a great commercial venture," Hartley said. "As a result, it's quite clear that geothermal energy is a proven reality. It is here to stay, increasing America's energy security and diversity, while helping to ease our balance of payments problem."

Hartley spoke of the project's history: "Geothermal steam in commercial quantities was first discovered at The Geysers in 1955 by Magma Power Company under the leadership of B.C. McCabe. After the completion of PG&E's Unit 1 in 1960, progress was slow in expanding geothermal production, primarily because of the technical challenges and high costs involved in finding and recovering the underground energy.

"But a few people kept pushing ahead," Hartley noted. "In the early 1960s, Dr. Carel Otte, now president of Unocal Geothermal Division, recognized that The Geysers field had enormous, although still unrealized, potential. Prompted by Carel's recommendations, we drilled our first well at The Geysers in 1965, and we have worked closely with PG&E since then to develop the field's energy."

Governor George Deukmejian unveils the plaque commemorating The Geysers 25th anniversary, with the assistance of PG&E Chairman Frederick W. Mielke Jr. (left) and Unocal Chairman Fred L. Hartley.

Now the world's largest geothermal energy production project, The Geysers started off with one PG&E power plant—Unit 1—on September 25, 1960. That first plant had the capacity to produce 11,000 kilowatts of electricity. Thermal and Magma power companies provided the steam.

Soon, thanks to Dr. Otte's foresight, Unocal acquired a large leasehold position in the field. In 1967, Unocal, Magma and Thermal combined their holdings. Unocal became The Geysers field operator with a 50 percent interest in the joint venture. In January 1985, Unocal increased its interest in the field to 75 percent by purchasing Magma's interest.

With the addition of Unocal's technology in the late 1960s, growth at The Geysers quickened. By 1973, 10 generating units were in operation and the field had achieved its present status as the world's largest geothermal power complex. Unocal now produces 20 times the geothermal energy it did in 1967, and PG&E's geothermal capacity has grown from 55,000 kilowatts to 1.3 million kilowatts.

By 1988, PG&E and Unocal expect to have the steam and units at The Geysers capable of generating 1.5 million kilowatts of electricity, enough to meet the average needs of about 1.5 million people.

Last year, PG&E's operating units at The Geysers produced roughly 95 percent of the U.S. geothermal production and 15 percent of all the electricity produced by PG&E. Unocal, as the field's largest steam producer, supplies geothermal energy to power nearly 1.1 million kilowatts of PG&E's installed electrical generating capacity.

Unocal Geothermal's Mike Shoaff, Santa Rosa district land manager (second from left); Erick Mack, vice president, business development; Joe Wilson, vice president and general representative; Steve Lipman, vice president, domestic operations; Chet Budd, vice president, foreign operations and others enjoy lunch after the ceremony. Top right, Barton W. Shackelford, president of PG&E (left) talks with Fred L. Hartley.

Left: From left, Joel Robinson, Santa Rosa district operations manager; Ray A. Burke, executive vice president, Energy Resources; and Carel Otte, Unocal Geothermal president, share a festive moment at the celebration. Below, Governor George Deukmejian chats with Fred L. Hartley.

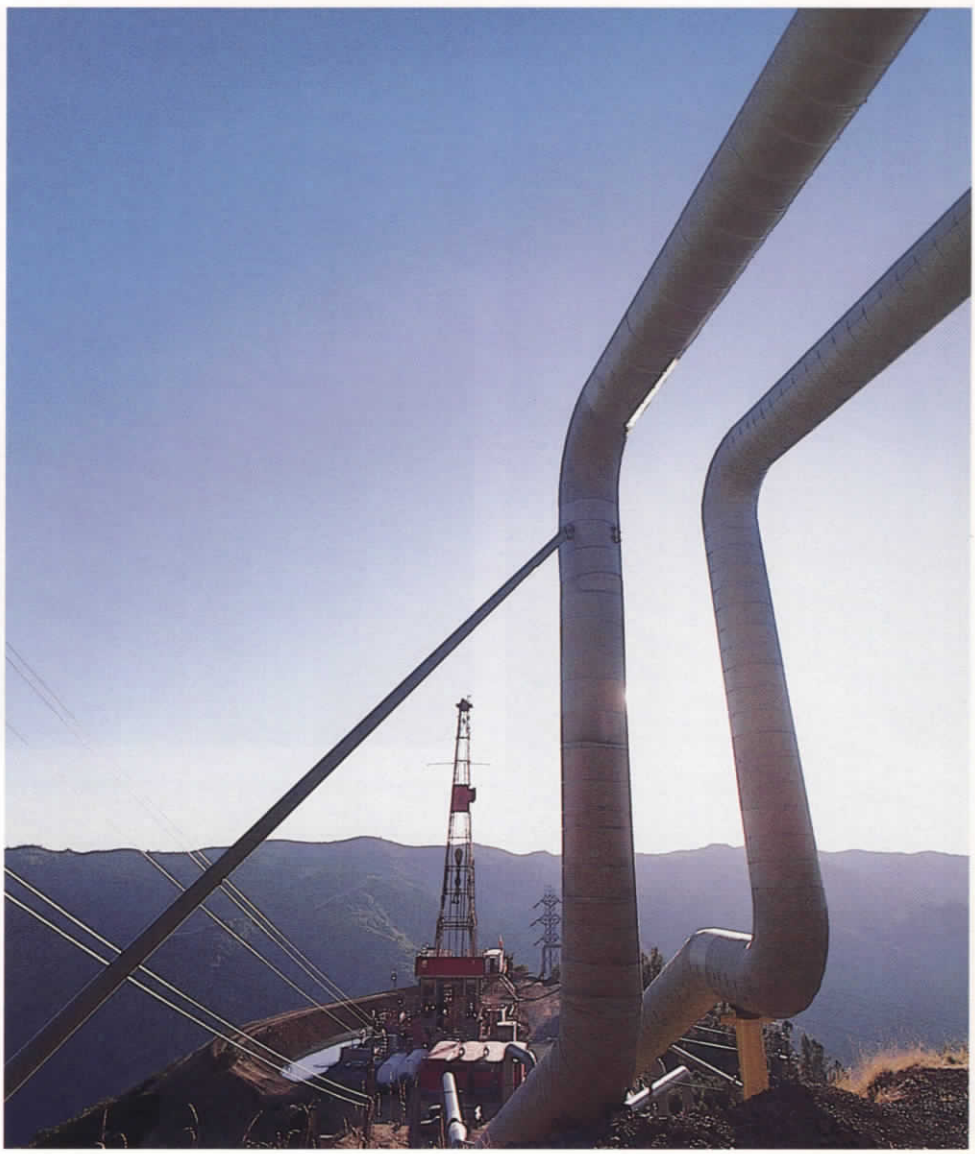
Geothermal Update: The Imperial Valley

California provides more than one rich geothermal resource. The Imperial Valley in the southern end of the state has been called the "Saudi Arabia" of geothermal energy resources.

Two new geothermal plants have just begun operations at the Heber field, representing the first large-scale use in the Imperial Valley of their respective geothermal technologies. Unocal and Chevron are the resource suppliers to both plants.

A dual flash power plant, dedicated October 31, incorporates a two-step process to "flash" steam from the pressurized, moderate-temperature geothermal fluids. The steam spins a turbine to generate electricity. A binary plant, dedicated December 6, transfers geothermal heat in a heat exchanger to a hydrocarbon stream producing vapors, which in turn spin a turbine. Each plant will generate approximately 50,000 kilowatts of electricity. The Imperial Valley community welcomes the plants, which will provide jobs, local purchases and taxes, in addition to energy.

The green hills at The Geysers (this page) stand in stark contrast to California's southern geothermal country in the irrigated desert of The Imperial Valley.



Less than an hour's drive from Heber is Unocal's Salton Sea pilot project, which has been in operation since 1982. It supplies enough geothermal energy to a Southern California Edison power plant to produce 10,000 kilowatts of electricity.

The Salton Sea plant was designed to study ways to develop the Imperial Valley's largest resource more efficiently. Unlike The Geysers' dry steam, the Imperial Valley resource consists of hot fluids containing high levels of dissolved salts and other minerals. These fluids can cause corrosion and scale build-up on wells, production pipelines and other equipment.

The Salton Sea plant has just completed a periodic "turnaround" after an 18-month continuous run. During this six-week shutdown of operations, plant equipment was thoroughly inspected for wear and damage, and the performance of test materials and processes was evaluated. Plant operations have been so successful that another turnaround will not be necessary for two years. In fact, this plant has achieved the best on-line performance of all of Southern California Edison's generating plants.

Some of the Salton Sea project's success is due to knowledge gained from the operation of the Brawley geothermal project, which started up in 1980. Unocal and Southern California Edison recently closed this small-scale project, having fulfilled its major objective: to further geothermal technology. As development continues, that technology makes a growing contribution to our nation's energy mix.⑯

The Heber dual flash plant (top left) was dedicated October 31. Top right, Unocal's Dr. Carel Otte (left) chats with his Chevron counterpart, Al Cooper. The other two photos are of Unocal's Salton Sea pilot project.

Sixth annual Seventy Six magazine photo contest

YOUR WORLD

A PERSONAL VIEW

World photo courtesy of NASA.

Show us your world—that's the challenge presented by this year's photo contest. Use your photographer's eye to give us your personal interpretation of the people, places, scenes or moods around you. Three professional judges will select the entries which best create vivid statements about you—the photographer—and your surroundings.

Awards: The first-place winner will receive a grand prize of $200. Six merit awards of $76 each will also be given. All seven winners will be published in *Seventy Six* magazine and will receive *Seventy Six* T-shirts. At their option, the judges may designate photos for Honorable Mention. While these pictures may or may not be published, the photographers will receive T-shirts.

Eligibility: Employees and retirees of Unocal Corporation, its subsidiaries and divisions are eligible. Their spouses and children may also enter.

Entries: Color only. No more than three entries per person. We prefer 35 mm. slides. If you enter prints, they should be 5-by-7 inches or larger and *un*mounted.

Liability: All entries are to be submitted with the understanding that neither Unocal Corporation nor any of its employees will be 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 in a timely fashion.

Mailing: Please package your entries carefully, making sure they are identified individually so they can be returned to you. Enclose a signed entry form (or photocopy) with each photo.

Right to publish: Unocal Corporation 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 who appear in the photographs.

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

Deadline: Entries should reach the magazine office at Unocal Center in Los Angeles by Tuesday, April 1, 1986.

Entry Form (please print)

Name of employee/retiree:

Job title:

Division/Subsidiary:

Work location:

Telephone: Network:

Name of entrant (if different):

Relationship to employee/retiree:

Home address:

City: State: Zip:

Daytime telephone:

Description of photo:

Important!

I have read and agree to the contest rules.

Signature:

Date:

If under 18, signature of parent or guardian:

Send to:
Seventy Six Magazine Photo Contest
Unocal Corporation
P.O. Box 7600, Room M-17
Los Angeles, CA 90051

Helping Locals Make Good

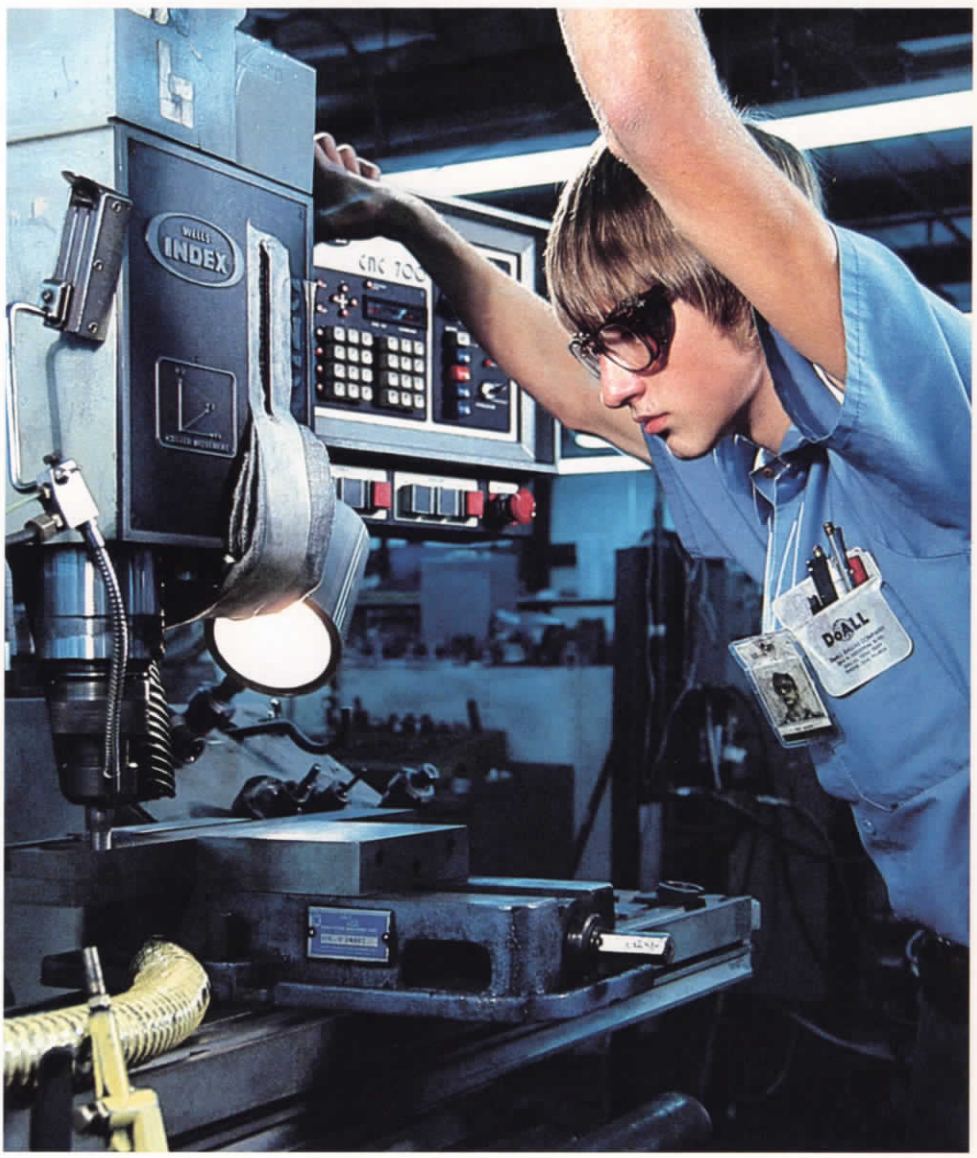
Skilled machinists are a scarce commodity in the farm country of North Texas. But because of a program launched two years ago by Poco Graphite, Inc., they're not as rare as they once were.

Poco, which makes specialty graphite products at its plant in Decatur, started the first permanent apprentice program in Texas to allow students to earn high school and college credits while working in a closely supervised machinist training course. They also earn regular wages while they train.

The students begin the five-year course as juniors at Decatur High School. By the time they receive an associate of science degree in machining technology under a special program at Cooke County College at Gainesville, they are qualified machinists. Poco pays for their tuition, fees and books.

Accredited by the Texas Education Agency and overseen by the U.S. Bureau of Apprenticeship, the program consists of 8,000 hours of on-the-job training at Poco, in addition to 144 hours of related instruction for each 2,000 worked.

Students entering the program are paid 47 percent of Poco's journeyman rate. Wages are increased after each 1,000 hours of training, which takes six months. Upon graduation from high school, students are paid wages totalling 74 percent of the journeyman rate. When they complete the program, after having attended night college classes for three years, the students receive the full journeyman rate.



Left, Apprentice machinist Don Adams (left) receives instruction from Rick Tarpley, Poco Graphite general machinist. Below, trainee Sergio Galindo is tutored by machine parts inspector John Brown.

"The program accomplishes a civic purpose by giving some of these youngsters who probably would not go to college on their own a chance to earn an associate degree in machining technology," says Robert K. Carlson, president of Poco. "It's a great program for Poco as well, because it provides us with a pool of talent that can be hard to come by in a small rural community."

Each year, Poco selects two new students for admission to the program. Upon reaching full enrollment in the fall of 1987, the program will have a total of 10 students per year in various stages of training. The first two trainees, Don Adams and Sergio Galindo, are freshmen this year at Cooke County College.

"When Poco announced the program, it looked like it might be a good career, so I decided to try it out," Adams says. "It's a good job, I get a lot of training out of it and hopefully I'll have a lasting future in it."

Under the supervision of Bob Pasciak, manager of machining operations, Poco employees conduct basic courses for the students in such machining techniques as milling, drilling, grinding and band sawing. Company instructors also teach courses in basic geometry and blueprint reading.

"During the course of the program, we expose the students to all elements of machine shop operation," Pasciak says. "The curriculum also includes periodic tests, and the students are graded." On completion of the training, students receive a certificate from the Bureau of Apprenticeship, part of the U.S. Department of Labor.

"I feel good about the program because Decatur is a small town, and sometimes young people in small towns don't have the same opportunities as those in larger cities," says John Piekarski, consultant for the Bureau. "But here's an opportunity for a local student to learn a trade—and the day he graduates, he's got full-time employment in it. The program enables young people who don't want to leave the Decatur area to stay there and be gainfully employed."

"The people we have in the program now are really going to start paying off for the company in another year or two," adds Carlson. "And the program has lasting value for the students whether they choose to stay in Decatur or not. Those who complete it are going to be fixed for life." ⑯

Author Art Bentley is a Unocal public relations representative.

At left, some of the precision-machined products that Poco apprentices will ultimately help produce. "This is a great program for Poco as well as the students," Poco president Robert K. Carlson says.

Service Awards

UNOCAL 76

CORPORATE

November 1985

30 YEARS **H. R. Broussard,** Unocal Center
Wilbur H. Cotrel, Unocal Center

25 YEARS **John D. Murphy Jr.,** Unocal Center

5 YEARS **Danny K. Beelman,** Unocal Center
Romaine E. Branham, Unocal Center
Robert C. Dulcich, Bakersfield, Ca.
Oleg J. Garanda, Unocal Center

December 1985

35 YEARS **William C. Weldon,** Unocal Center

30 YEARS **John M. Reid,** Unocal Center

15 YEARS **Lilli Henson,** Brea, Ca.
Thomas F. Wylie, Unocal Center

10 YEARS **Jean H. Allen,** Unocal Center
Della S. Chapman, Unocal Center

5 YEARS **Gordon T. Durham,** Unocal Center
Fredric G. Lebrecht, Unocal Center
Mark R. McNeil, Pasadena, Ca.
Jeannette E. Sayes, Unocal Center
Martin W. Scott, Bremer, Ca.

CORPORATE DEVELOPMENT

ENERGY MINING

November 1985

5 YEARS **Arlene A. Bennett,** Parachute, Co.
Brian F. McGunegle, Parachute, Co.
Terri Jo White, Parachute, Co.

December 1985

10 YEARS **Gregory H. Nibler,** Parachute, Co.

ENGINEERING & CONSTRUCTION

November 1985

35 YEARS **William L. Baker,** Chicago, Il.

SCIENCE & TECHNOLOGY

November 1985

40 YEARS **Robert F. Buhl,** Brea, Ca.

25 YEARS **Robert F. Arnold,** Brea, Ca.

20 YEARS **David E. Mears,** Brea, Ca.

15 YEARS **James A. Miller,** Brea, Ca.

5 YEARS **Mankin K. Chan,** Brea, Ca.
Teresa L. Christolini, Brea, Ca.
Donald L. Gabbe, Brea, Ca.
Joe L. Gallardo, Brea, Ca.
Gregory S. Hewgill, Brea, Ca.
Jerome Hollander, Brea, Ca.
Scott J. Napp, Brea, Ca.
Jeffrey W. Pferd, Brea, Ca.
Sidney Y. Shen, Brea, Ca.
Gary L. Sidora, Brea, Ca.
Dennis P. Stack, Brea, Ca.

December 1985

25 YEARS **James A. Klotz,** Brea, Ca.

10 YEARS **Lorene T. Ishii,** Brea, Ca.

5 YEARS **Paula J. Bosserman,** Brea, Ca.
Sheri W. Brand, Brea, Ca.
Emiliano de la Fuente, Brea, Ca.
Robert J. Floran, Brea, Ca.
David L. Olstad, Brea, Ca.

ENERGY RESOURCES

OIL & GAS

November 1985

40 YEARS **Fred Nanini,** Cut Bank, Mt.

35 YEARS **Larry D. Lantrip,** Houma, La.
Fred A. Montgomery, Santa Fe Springs, Ca.
Florin V. Morris, Taft, Ca.
Louis B. Trimble, Houston, Tx.
Clifford Vaughan, Lafayette, La.
Ernest R. Zoeter, Brea, Ca.

30 YEARS **James A. Allen,** Coalinga, Ca.

25 YEARS **E. Bernard Brauer,** Pasadena, Ca.
Roy E. Kreps, Orcutt, Ca.
A. B. McAdoo, Midland, Tx.

20 YEARS **Billy Lee Freeman,** Brea, Ca.
John F. Hojnacke, Orcutt, Ca.

15 YEARS **Susie D. Null,** Houma, La.
Raymond E. Ortiz Jr., Santa Paula, Ca.

10 YEARS **Gene T. Forbes,** Cut Bank, Mt.
John F. Gaudet, Houma, La.
Richard S. Johnston, Taft, Ca.
Donald R. Kilbourne, Houma, La.
Ronald L. Krist, Moab, Ut.
Tony J. Martinez, Santa Paula, Ca.
Everett McCormick Jr., Comfort, W.V.

5 YEARS **John A. Besch,** Houston, Tx.
Kathy L. Carmack, Midland, Tx.
Randy L. Edwards, Ventura, Ca.
Patricia J. Houser, Bakersfield, Ca.
Julie A. Owens, Bakersfield, Ca.
Reta L. Peel, Snyder, Tx.
Wendy L. Stolz, Casper, Wy.

December 1985

35 YEARS **Richard B. Adams,** Orcutt, Ca.
Bernal D. Reynolds Jr., Lafayette, La.

30 YEARS **Weldon Brice,** Midland, Tx.

25 YEARS **Irving S. Broussard,** Lafayette, La.
John H. Kosarek, Lafayette, La.

15 YEARS **Roy E. Briggs,** Lafayette, La.
Robert L. Hungate, Houma, La.

10 YEARS **Kirby J. Domingue,** Lafayette, La.
Richard Herschman, Cut Bank, Mt.

5 YEARS **Steve E. Gayle,** Houston, Tx.
Michelle A. Hanson, Ventura, Ca.
Dorothea L. McPheeters, Midland, Tx.
Robert C. Nims, Casper, Wy.
Steve R. Ordonez, Casper, Wy.
Howard Parfait, Houma, La.
Elworth J. Petry Jr., Lafayette, La.
Thomas E. Poche, Houma, La.
Steven L. Thibodeaux, Lafayette, La.
Robert H. Wright, Oklahoma City, Ok.

INTERNATIONAL OIL & GAS

November 1985

30 YEARS **Dennis R. Mett,** Unocal Center
William Sax, Unocal Center

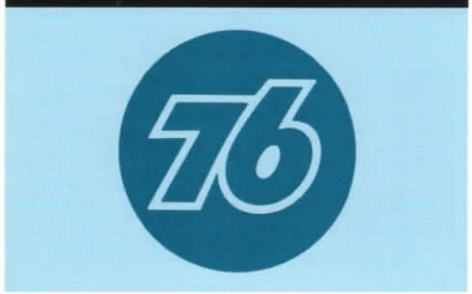
10 YEARS **William D. Cowan,** Balikpapan, Indonesia
Ana D. Rosales, Unocal Center

5 YEARS **Kim D. Alsop,** Unocal Center
Lesley M. Carroll, Unocal Center

December 1985

5 YEARS **Leslie F. Alnas,** Los Angeles, Ca.

Service Awards



Unionoil Co. of Great Britain

November 1985

5 YEARS **Elizabeth van Heyningen,** The Hague, Netherlands

December 1985

5 YEARS **Oddbjoerg Amundsen,** Sandnes, Norway

Union Oil Co. of Indonesia, Inc.

November 1985

15 YEARS **Herry Pinontoan**

10 YEARS **Anas**
Firdaus
Husain
Muchtar
Sunaryo
Sunding
Syamsudin
Zainuddin
Ramli Abas
Neni Alimen
Achmad Aman
Abd Azis
Achmad Benny
M. Aras Bide
S. P. Gantiaman
M. Jufri H.
Sihar Hutagaol
Pasang Jama
Simon Karel
R. Solihin Kostaman
Johanes Lake
Johanis Sanda Lembang
Titus Limbong
Baharuddin M.
Marzuki D. M.
Yan Mallisa
Bana Pengke
Paulus Pongtasik
Sunaryo R
Sri Rahayu
Kurdiansyah Abd Rasyid
Daniel Sule Ratu
Muh. Tawil S.
Petrus Sappe
N. Sawolo
Arya Ketut Subawa
Geger Sukirmanto
Aty Sunarti
Tommy Tampubolon
Paul Wenas

5 YEARS **Makmuri**
Suparno Aryono
Aloisius Sulistyono

December 1985

10 YEARS **Aliansyah**
Daryono
Ismail
Kusharsono
Kusmin
Legiman
Mulyanto
Musaib
Sabino
Samidjo
Sawarto
Soepardjono
Sudiharsono
Suherdjoko
Sukarman
Sumadi
Sunardi
Supaedi
Supardi
Supono
Wirasto
Erwin Datuk
Achmad Hidayat
Judin Jumail
Mamat K
Eduard Karaeng
Albert Mamahit
Johan Panda
Nasib Pandjaitan
Michael E. Pinontoan
Ferry Roring
Gregorius Saceira
M. Bihler Samosir
Trisasono Subagijo
Agustinus Sumbung
Augustinus Sutiman
Nico Tumiwa
Ngasiman Widji

5 YEARS **Uke Umar Rachmat**

Union Oil Limited—Singapore

December 1985

10 YEARS **Carole A. Morier**

UNION OIL CO. OF CANADA LTD.

November 1985

30 YEARS **Bruce Freeborn,** Calgary, Alta.

5 YEARS **Annabel Copeland,** Calgary, Alta.
Bert Dergousoff, Calgary, Alta.
Julie MacInnis, Calgary, Alta.
Laszlo Hovany, Calgary, Alta.

December 1985

25 YEARS **John J. Graham,** Calgary, Alta.

5 YEARS **Stacy L. Campbell,** Fort St. John, B.C.

UNION OIL CO. OF THAILAND

November 1985

5 YEARS **Gary G. Adams**
Kannika Kampanatsanyakorn
William H. Odell
Harry S. Takara

GEOTHERMAL

November 1985

10 YEARS **David G. Crayford,** Santa Rosa, Ca.

December 1985

15 YEARS **Garth M. Lyon,** Jakarta, Indonesia

10 YEARS **Dennis W. Lawrence,** Big Geysers, Ca.
Calvin J. Strobel, Santa Rosa, Ca.

5 YEARS **Jose L. Beltran,** Imperial Valley, Ca.
Stephen J. Blake, Santa Rosa, Ca.
Walter B. Britton, Imperial Valley, Ca.
Michael Hill, Big Geysers, Ca.
Richard E. Rote, Santa Rosa, Ca.

Philippine Geothermal, Inc.

November 1985

10 YEARS **Vicente V. Adlaon**
Prudenico R. Flores
Jesus P. Jerusalem
Florencio D. Ortal

5 YEARS **Ricardo S. Amador**
Edilberto V. Go
Melvin D. Jaurigue
Rustico A. Sahagun

December 1985

10 YEARS **Sofronio V. Amores**
Placido A. Bautista
Myrna L. del Rosario
Alberto J. Devilleres
Elmer D. Lagrosa
Gaspar L. Minga

5 YEARS **Albert C. Buban**
Juan C. Combo
Alejandro C. Contacto
Oriel C. Dacir
Elias C. Dalde
Justino M. Luna
Eden C. Pena

REFINING & MARKETING

November 1985

45 YEARS **John J. Sandstrom,** Schaumburg, Il.

35 YEARS **John P. Hill Jr.,** Houston, Tx.

25 YEARS	**Judith E. Harvey,** Schaumburg, Il. **Edward A. Jezior,** Schaumburg, Il. **Walter H. Jezior,** Schaumburg, Il.
15 YEARS	**Michael A. Casey,** San Francisco, Ca. **Marguerite R. Godzicki,** Schaumburg, Il. **Judith A. Kloog,** Schaumburg, Il.
10 YEARS	**Stephanie L. Capellos,** Schaumburg, Il. **William E. Peterson,** Schaumburg, Il. **Bonnie L. Vanhaften,** Schaumburg, Il.
5 YEARS	**Myrna L. Calloura,** Lafayette, La. **Wendy M. Hogrewe,** Schaumburg, Il. **Susan C. McDunn,** Schaumburg, Il. **Elma D. Photikarmbumrung,** Schaumburg, Il. **Carol A. Sandsmark,** San Francisco, Ca. **Wanda Szajowski,** Schaumburg, Il. **Robert J. Totten,** Schaumburg, Il. **Steven E. Walter,** Schaumburg, Il.

December 1985

40 YEARS	**Gerald H. O'Leary,** San Francisco, Ca.
35 YEARS	**William Graffenius Jr.,** Schaumburg, Il.
15 YEARS	**Irene W. Koepke,** Schaumburg, Il.
10 YEARS	**Laura J. Lobocki,** Schaumburg, Il.
5 YEARS	**Steven H. Ritter,** Schaumburg, Il. **Kenneth E. Stoddard,** San Francisco, Ca.

EASTERN REGION

November 1985

35 YEARS	**John W. Ratkovich,** Chicago Refinery
25 YEARS	**Samuel E. Peavey,** Schaumburg, Il.
15 YEARS	**Ben E. Andrews,** Beaumont Refinery **Junius W. Barkley,** Wildwood, Fl. **Frank W. Fronek Jr.,** Chicago Refinery **Larry B. Kwasniewski,** Chicago Refinery **Oliver Renfro,** Beaumont Refinery **Dennis K. Vail,** Pure Transportation Co., Olney, Il. **Wilfrid White,** Beaumont Refinery
5 YEARS	**John E. Chesser,** Beaumont Refinery **James P. Furbish Jr.,** Beaumont Refinery **Rhonda L. Hart,** Schaumburg, Il. **David L. Jones,** Pure Transportation Co., Olney, Il. **Roy E. Reed,** Tampa, Fl.

December 1985

35 YEARS	**William E. Herchline,** Atlanta, Ga.
30 YEARS	**Raymond A. Askew,** Norfolk, Va. **Donald F. Evans,** Schaumburg, Il. **Thomas J. Justice,** Birmingham, Al. **James L. Markey,** Schaumburg, Il.
20 YEARS	**Larry J. Bealmear,** Southfield, Mi. **Arnie G. Sasser,** Savannah, Ga.
15 YEARS	**James M. Smith,** Tampa, Fl. **Kathy J. Valenziano,** Schaumburg, Il. **Jeanette M. Voyda,** Schaumburg, Il. **George S. Wilcox,** Minneapolis, Mn. **Gary L. Woods,** Chicago, Il.
10 YEARS	**William F. Burcham,** Chicago Refinery **Daniel J. Conner,** Chicago Refinery **Jose E. Contreras,** Chicago Refinery **Robert H. Ericksen,** Chicago Refinery **Jesus Flores,** Schaumburg, Il. **Thomas N. Frenzel,** Chicago Refinery **Arthur W. Harrison,** Wildwood, Fl. **Robert W. Jackson,** Pure Transportation Co., Olney, Il. **Jerry L. Lucas,** Chicago Refinery **George J. Novotny,** Chicago Refinery **Thomas J. Novotny,** Chicago Refinery **Gary C. Peterson,** Chicago Refinery **Cornelius R. Plug,** Chicago Refinery **Gregory E. Quid,** Madison, Wi. **Walter Robinson,** Chicago Refinery **Raymond F. Terzick,** Chicago Refinery **Larry F. Taylor,** Pure Transportation Co., Olney, Il. **Duwell Welcome,** Wildwood, Fl. **Barbara J. Williams,** Chicago Refinery **Mark B. Wirth,** Chicago Refinery
5 YEARS	**Raymond L. Brandolino,** Chicago Refinery **Douglas D. Dyson,** Beaumont Refinery **Jay W. Saylor,** Beaumont Refinery **Gary R. Steele,** Schaumburg, Il.

WESTERN REGION

November 1985

40 YEARS	**David E. Garber,** Orange, Ca. **Morris C. Teitgen,** San Francisco Refinery
35 YEARS	**William E. Dutro,** Los Angeles Refinery **Robert F. Foushee Jr.,** Sacramento, Ca.
30 YEARS	**Sam P. Squibb,** Pasadena, Ca.
25 YEARS	**Gary O. Thomas,** Richmond, Ca.
20 YEARS	**Edward Carney Jr.,** Richmond, Ca. **Rodney R. Puppe,** Seattle, Wa.
15 YEARS	**Kenneth S. Casson,** Nederland, Tx. **Eugene R. Chavez,** Avenal, Ca. **James R. Diedrich,** San Francisco Refinery **Michael W. Dressel,** San Francisco Refinery **Alfred E. Lewis,** Los Angeles, Ca. **Bobbie J. Morrow,** Santa Maria Refinery **Charles S. Murch,** San Francisco Refinery **Richard A. Pannell,** San Francisco Refinery

Service Awards

10 YEARS	**Charles F. Astrouski,** San Diego, Ca. **Rolando Espat,** Torrance, Ca. **Christie Hope,** Seattle, Wa. **Ronald H. Lopez,** Santa Maria Refinery **Nancy A. Malm,** Los Angeles, Ca. **Richard A. Stern,** Cerritos, Ca.
5 YEARS	**Paul L. Bartholomae,** Colton, Ca. **Tyree B. Burrell,** Los Angeles Refinery **Michele A. Cammareri,** Los Angeles Refinery **David D. Deerman,** Los Angeles, Ca. **Brian L. Doherty,** Pasadena, Ca. **Richard A. Grace,** Los Angeles Refinery **Frederick K. Martin,** Los Angeles Refinery **Gary S. Mills,** Los Angeles Refinery **Augustus R. Naylor,** Los Angeles Refinery

December 1985

45 YEARS	**S. F. Deaderick Jr.,** Los Angeles Refinery
40 YEARS	**Gino Orsi,** San Francisco Refinery **Ernest J. Goularte,** San Francisco Refinery
35 YEARS	**Donald Eichman,** Los Angeles Refinery **Mary Anne Smith,** San Francisco Refinery
30 YEARS	**William J. Lewis,** Los Angeles Refinery
25 YEARS	**Douglas E. Akau,** Honolulu, Hi. **Edward H. Garcia,** Richmond, Ca.
20 YEARS	**Gerhart D. Breitling,** San Francisco Refinery
15 YEARS	**Adyjair P. Cavalcanti,** Colton, Ca. **Stanley Kirchgessner,** San Francisco Refinery **Danny L. M. Lecce,** San Francisco Refinery **Andrew W. Lojo,** San Francisco Refinery **James D. McDaniel,** San Francisco Refinery **James E. Ward,** Los Angeles Refinery **Robert L. Woodson,** San Francisco Refinery

10 YEARS	**Josephine L. Alvarez,** Los Angeles, Ca. **Richard G. Bingham,** Nederland, Tx. **Edward Brummett,** Los Angeles Refinery **Harrison Greenwood,** Los Angeles Refinery **Kenneth A. Johnson,** Richmond, Ca. **Blanca E. Martin,** Los Angeles, Ca. **Ronald S. Sunda,** Pasadena, Ca.
5 YEARS	**David A. Bryan,** Nederland, Tx. **Kenneth H. Daniel,** Santa Maria Refinery **Anthony G. Day,** San Francisco Refinery **Patt A. Emerson Jr.,** Los Angeles Refinery **Barnett H. Hughes,** Los Angeles Refinery **Donald M. Kinehan,** Richmond, Ca. **Robin E. Lees,** Santa Maria Refinery **Mark H. Moberg,** San Francisco Refinery **Kathleen O'Malley-Pailin,** Los Angeles, Ca. **Allen J. Scopesie,** San Francisco Refinery **Randal C. Stude,** Los Angeles, Ca. **William O. Woo Jr.,** Los Angeles Refinery

MARKETERS & DISTRIBUTORS

November 1985

50 YEARS	**Frank Adams,** Casa Grande, Az.
40 YEARS	**J. H. Williams Oil Co., Inc.,** Tampa, Fl.
35 YEARS	**Stuart H. Davis,** Toledo, Or.
30 YEARS	**Buddy Nesmith Oil Co., Inc.,** Hawkinsville, Ga.
25 YEARS	**Leemon Fuel Oil Co.,** Novi, Mi.
15 YEARS	**K & L Car Wash, Inc.,** Oak Lawn, Il. **Rettinger Brothers Oil Co.,** Long Lake, Mn.
5 YEARS	**James W. Ayling,** Grants Pass, Or.

December 1985

30 YEARS	**Daniels Oil Co.,** Elberton, Ga.
10 YEARS	**Hartley Oil Co.,** Washington Court House, Oh.

CHEMICALS

November 1985

30 YEARS	**W. B. Vanderburg,** Brea, Ca. **Arnold G. Wilbur,** Schaumburg, Il.
25 YEARS	**Robert C. Briscoe,** Kansas City, Mo. **Charles S. Dunn,** Arroyo Grande, Ca. **William R. Ptack,** Schaumburg, Il.
20 YEARS	**Robert H. Ramsey,** Unocal Center
15 YEARS	**Perry L. Murata,** Unocal Center
10 YEARS	**Salvador Garcia,** Bridgeview, Il. **Donald R. St. John,** Kenai, Ak.
5 YEARS	**Marcia M. Harris,** Schaumburg, Il. **Beverly C. Kendig,** Schaumburg, Il. **William R. Martindale,** Kenai, Ak. **Martha L. Pope,** Unocal Center **David A. Przybylski,** Lemont, Il. **Stephen Spangler,** Fresno, Ca.

December 1985

20 YEARS	**David Santistevan,** Unocal Center
15 YEARS	**Joe R. McAuley,** Charlotte, N.C.
10 YEARS	**Brian L. Christensen,** Kenai, Ak. **Merlin D. Crumpacker,** Kenai, Ak. **Robert C. Dent,** Kenai, Ak. **Frank J. Vlk,** Lemont, Il.
5 YEARS	**Steven E. Donnelly,** Kenai, Ak. **Richard R. Hostetter Jr.,** Kenai, Ak. **Kenneth W. Nussbaum,** Lemont, Il. **John D. Singletary,** Lemont, Il. **Roy F. Stuart,** Kenai, Ak. **James L. Swick,** Lemont, Il. **John L. Yanak,** Kenai, Ak. **James S. Hunter,** Wilmington, N.C.

MOLYCORP, INC.

November 1985

20 YEARS	**Norman A. Baker Sr.,** Washington, Pa. **Wayman F. Boudineer,** Questa, N.M. **David L. Buchanan,** Washington, Pa. **Charles L. Church,** Questa, N.M. **Guy Desmond,** Washington, Pa. **John E. Rogers,** Washington, Pa. **Joe O. Velasques,** Questa, N.M. **Marcello Vialpando,** Questa, N.M.
5 YEARS	**Glen A. Blair,** Nipton, Ca. **John G. Gibson,** Nipton, Ca. **Pamela S. Haschets,** Washington, Pa. **Greta E. Nickerson,** Louviers, Co. **Steve Soto,** Nipton, Ca. **Kenneth H. Walker Jr.,** Nipton, Ca. **Penny K. Whetstone,** Nipton, Ca.

December 1985

25 YEARS	**Fabian J. Archuleta,** Questa, N.M.
20 YEARS	**Elias R. Chavez,** Questa, N.M **Ernest E. Cisneros,** Questa, N.M. **John W. Gallagher,** Questa, N.M. **Charles I. Velasquez,** Questa, N.M.
10 YEARS	**Mary Ann Jenkins,** Washington, Pa. **Lawrence A. Padilla,** Louviers, Co.
5 YEARS	**David A. Rosko,** Washington, Pa. **Robert S. Thompson,** Louviers, Co.

POCO GRAPHITE, INC.

October 1985

15 YEARS	**Jimmy J. Sherman,** Decatur, Tx.
5 YEARS	**Garry L. Musser,** Decatur, Tx. **Walter M. Rainwater,** Decatur, Tx.

November 1985

5 YEARS	**Jody W. Bridges,** Decatur, Tx. **Ted A. Young,** Decatur, Tx. **Judy E. Zarantonello,** Decatur, Tx.

Service Awards

RETIREMENTS

August 1985

George A. Griffith, Refining & Marketing, Orange City, Fl., January 24, 1955

September 1985

Roger W. Downing, Refining & Marketing, Portland, Or., May 5, 1952
Robert D. Furey, Science & Technology, Placentia, Ca., February 19, 1960
Orrin C. Holbrook, Science & Technology, Fullerton, Ca., September 1, 1949
Samuel Hoover, Corporate, Arcadia, Ca., February 13, 1950
Lamar G. Hunt, Chemicals, Cypress, Ca., May 13, 1969
Floyd M. Lowe, West Coast Shipping Co., Diamond Bar, Ca., August 24, 1965
Richard H. Rodgers, Refining & Marketing, Pompano Beach, Fl., November 27, 1964
Harry B. Rogers, Refining & Marketing, Chula Vista, Ca., August 24, 1950
Stillman F. Sawyer, Engineering & Construction, San Pedro, Ca., June 26, 1950
William T. Sherar, Refining & Marketing, San Diego, Ca., February 1, 1950
Virgilio A. Trujillo, Molycorp, Questa, N.M., March 1, 1969
Forrest H. Terry, Refining & Marketing, San Pedro, Ca., September 1, 1966

October 1985

Harold E. Anderson, Chemicals, Denver, Co., February 1, 1946
Frank C. Andruski, Chemicals, Brea, Ca., March 26, 1954
Ford A. Bankston, Oil & Gas, Houston, Tx., August 8, 1950
Wilton J. Dunaway, Refining & Marketing, Lumberton, Tx., May 24, 1948
Arthur E. Fangerow, Oil & Gas, Fullerton, Ca., October 7, 1948
Fred H. Forester, Corporate, Anaheim, Ca., August 2, 1948
Fred H. Griffin Jr., Refining & Marketing, Lakewood, Ca., March 27, 1953
Agnes H. Hamous, Refining & Marketing, Rolling Meadows, Il., March 23, 1959
Edgar Helms, Refining & Marketing, Kermit, Tx., April 21, 1950
Delbert B. Holm, Refining & Marketing, Garden Grove, Ca., July 5, 1946
Basil C. Loftis, Oil & Gas, Santa Maria, Ca., June 5, 1939

Andrew Lucas Jr., International Oil & Gas, Las Vegas, Nv., September 26, 1972
Joseph T. Myers, Refining & Marketing, Mauldin, S.C., September 28, 1955
Robert C. Otis, Corporate, Flintridge, Ca., May 19, 1952
Norman H. Pedersen, Corporate, Los Alamitos, Ca., February 18, 1948
Earle L. Poole, Refining & Marketing, Joliet, Il., July 7, 1952
Rosemary Radicek, Refining & Marketing, Elmwood Park, Il., October 1, 1945
Lila M. Russell, Refining & Marketing, Vallejo, Ca., September 15, 1970
Carolyn R. Stark, Chemicals, Schaumburg, Il., September 9, 1974
Waino A. Taipale, Chemicals, Anaheim, Ca., July 1, 1970
Emilio A. Valerio, Molycorp, Taos, N.M., February 9, 1964
Eleanor K. Vallon, Corporate, Laguna Hills, Ca., May 8, 1972
David J. Watanabe, Science & Technology, Orange, Ca., October 1, 1951
Mary E. Wiley, Corporate, Los Angeles, Ca., June 25, 1941
Ralph H. Wills, Refining & Marketing, Palatine, Il., July 12, 1954

November 1985

Gloria F. Alley, Corporate, Forest Hills, N.Y., June 23, 1969
Elliott B. Bartlett, Refining & Marketing, Grover City, Ca., March 4, 1948
Barbara A. Childs, Corporate, College Park, Ga., February 3, 1954
Charles H. Clark, Oil & Gas, San Marino, Ca., June 1, 1949
Vaughn G. Deal, Corporate, Hinsdale, Il., February 4, 1957
Harold T. Finney, Oil & Gas, Midland, Tx., June 21, 1943
Dorothy R. Hanson, Corporate, La Mirada, Ca., October 11, 1948
John M. Hopkins, Energy Mining, Arcadia, Ca., June 3, 1942
Michael J. Hrubos, Refining & Marketing, Joliet, Il., June 30, 1952
William F. Krick, Corporate, Glenn Ellyn, Il., October 25, 1943
Kathryn M. Kuck, Refining & Marketing, Hoffman Estates, Il., July 23, 1952
Marshall N. Madsen, Corporate, Stone Mountain, Ga., January 1, 1953

IN MEMORIAM

Employees

Mary D. Altonen, Oil & Gas, Houma, La., July 30, 1985
Thomas J. Lenihan, Refining & Marketing, Superior, Wi., August 31, 1985
Neal F. Morrow Sr., Refining & Marketing, Bellflower, Ca., September 5, 1985
Glenn Pabst, Chemicals, Kenai, Ak., August 25, 1985

Retirees

Wilford C. Allen, Refining & Marketing, Nederland, Tx., September 13, 1985
Monroe P. Anthony, Oil & Gas, Ben Wheeler, Tx., August 12, 1985
Matthew B. Barulich, Refining & Marketing, Rodeo, Ca., August 3, 1985
Charles N. Beard Sr., Refining & Marketing, Beaumont, Tx., September 3, 1985
Arthur J. Bels, Oil & Gas, Bakersfield, Ca., August 30, 1985
James Howard Brickey, Oil & Gas, Santa Maria, Ca., June 25, 1985
Herbert M. Bridgman, Refining & Marketing, Pasadena, Ca., September 17, 1985
Noble Cantrell, Oil & Gas, Van, Tx., August 8, 1985
Stanley B. Clevenger, Oil & Gas, Santa Maria, Ca., September 19, 1985
George R. Daigle, Refining & Marketing, Iowa, La., September 19, 1985
Ray V. Dysinger, Oil & Gas, San Diego, Ca., August 7, 1985
Elmer F. Egbert, Oil & Gas, St. Louis, Mi., September 2, 1985
Robert W. Evans, Refining & Marketing, Newark, Oh., September 5, 1985
Joseph F. Fife, Oil & Gas, Port Gibson, Ms., August 8, 1985
Frank M. Grabil, Oil & Gas, Nipomo, Ca., August 18, 1985
Colin S. Haddow, Molycorp, Hudson, Fl., August 14, 1985
Eleanor D. Heath, Oil & Gas, Fort Worth, Tx., August 14, 1985
Frank H. Holley, Refining & Marketing, Turlock, Ca., August 8, 1985
Orville S. Isom, Oil & Gas, Clay City, Il., July 3, 1985
Alice M. Jones, Oil & Gas, San Angela, Tx., August 14, 1985
Sam Marshall, Chemicals, Belle, W.V., August 13, 1985
Mervin S. Matson, Pure Transportation Co., Sterling, Co., August 23, 1985
Edd F. Middleton, Pure Transportation Co., Manteno, Il., August 29, 1985
Edward J. Murphy, Refining & Marketing, Crystal River, Fl., September 16, 1985
Walter B. Nealy, Refining & Marketing, Arlington Heights, Il., August 15, 1985
Alfred Paget, Corporate, Redondo Beach, Ca., August 6, 1985
Kenneth M. Pape, Refining & Marketing, Louisville, Oh., July 18, 1985
Donald A. Reed, Refining & Marketing, South Laguna, Ca., August 3, 1985
William A. Roberts, Chemicals, Riverside, R.I., August 11, 1985
Charles N. Schemm, Chemicals, Pasadena, Md., September 2, 1985
Arthur L. Schwartz, Refining & Marketing, Plymouth, Mn., September 14, 1985
Wilfred T. Swisher, Refining & Marketing, Defiance, Oh., July 5, 1985
Raymond M. Teal, Corporate, Huntington Beach, Ca., July 25, 1985
Laurence E. Toner, Refining & Marketing, Olympia, Wa., July 11, 1985
Douglas L. Wallace, Refining & Marketing, Port Neches, Tx., August 13, 1985
Richard C. Webb, Oil & Gas, Olney, Il., July 26, 1985
William L. Wilson, Refining & Marketing, Laurel, De., August 12, 1985
George L. Worrell, Oil & Gas, Flora, Il., July 28, 1985
James W. Yates, Refining & Marketing, Macon, Ga., July 8, 1985

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Unocal Corporation
P.O. Box 7600
Los Angeles, California 90051

GARY L FOY
16823 LIGGETT STREET
SEPULVEDA CA 91343

Seventy Six

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COVER: The 2,600 lights of the Christmas tree atop Unocal Center were turned on the day after Thanksgiving. The tree, including its seven-foot star, stands almost 120 feet tall. **Photo by Ray Engle.**

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