

## Business

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## Robotics engineer paints a pretty picture for GMF

By Pat Murphy  
staff writer

As a youngster, Hadi Akeel was a "linker," fascinated by machines and always "looking for a better mouse trap" to invent. Today Akeel is still tinkering — but the stakes are much higher.

Instead of tinkering with scooters and bicycles, as he did growing up in Egypt, Akeel tinkers with multi-million dollar robotic systems.

Akeel, a Rochester Hills resident, is vice president and chief engineer of GMF Robotics Corp., the company that builds robots for automated industrial systems. "I don't tinker with them as much as I used to," he said, "I'm more into the design. But I tinkered a lot with the early models, and I still love it."

That tinkering has paid big dividends. In 1988, Akeel was presented the Joseph F. Engelberger Award, the industry's highest honor named after the person considered to be the father of industrial robots. In October he was honored with the Trailblazer Award from the Detroit Science Center.

Akeel studied mechanical engineering at Cairo University and as a teaching assistant won his choice of scholarships, including one in the Soviet Union. He took a scholarship at the University of California, Los Angeles, partly because of the personal freedoms available in the United States and partly because of the lure of California and Tinseltown.

"The thought of living near Hollywood was very exciting," he said. "It was a whole new world."

From UCLA Akeel went to the University of California at Berkeley where he obtained a doctorate in mechanical design.

HIS FIRST job out of college was with the aerospace division of the Bendix Corp. in South Bend, Ind., where he was part of a team that worked on landing systems for aircraft like the 747 and Voyager spacecraft.

It was there that Akeel registered two of the 21 patents he holds. One pertained to aircraft brakes and the other to a landing gear assembly.

Akeel was not into robots or automated systems at that time. "The technology was not available. Even the computers at that

time were very primitive," he said.

In 1969 Akeel returned to Egypt and taught engineering at Ain Shams University, where he initiated a graduate study program. He returned to the United States in 1973 to work on an engineering education project sponsored by Ain Shams and the University of Michigan.

"It was there that I started to realize the opportunity with General Motors," he said. "And I decided to stay (in the United States)."

Akeel went to work at the GM Tech Center in Warren where he was assigned to flexible automation systems. "Robots and automation were starting to catch on," he said. "I was asked to take a look at automating the paint shop." It was a project that would shape his life.

Painting is crucial to any automotive process, Akeel said. But the work is dirty, noisy, repetitious and potentially hazardous to human health. It's also a job that demands quality and reliability.

The project gave birth to the NC (numerically controlled) painter that revolutionized the painting of automobiles. Company officials preferred the term "numerically controlled," Akeel said, because at that time anything "robotically controlled" was considered a threat to jobs.

Besides being capable of opening doors to get at inside nooks and crannies, the NC painter included a vision system that enabled robots to recognize different car models and communicated with central computers to match paint colors and coordinated production schedules.

"It took three years to develop a prototype," Akeel said. "But it was a real breakthrough because different parts worked together as a fully integrated robotics system."

As revolutionary as the NC painter was, Akeel and others quickly improved on it. They replaced the hydraulic system and developed the first electric painter, a move that not only simplified auto painting but made the process safer and more reliable.

While developing the system, Akeel registered three more patents and came to be known as the "father of the NC painter." Its electric successor is standard equipment in all GM's high-tech facilities including the Saturn plant in Tennessee.

THE NC PAINTER triggered another development, Akeel said. It convinced GM that automated systems were feasible and prompted the giant automaker to look for a way to tap into the potentially lucrative field of robotics.

The importance of the NC painter can not be underestimated, according to Jack Saunders, public relations for GMF. "Without the success of the NC painter, GM might never have continued in robotics," he said, "and there probably wouldn't be a GMF today."

"GM had a lot of expertise, especially in the mechanical and marketing areas," Akeel said. "But we wanted a partner with expertise in control systems and capability in electronics. We looked at 20 different companies and conducted on-site visitations at six."

The result was a joint venture with FANUC Ltd. of Japan, a company Akeel describes as a "world leader in electronics."

In 1982 the two companies formed GMF Robotics Corp., a separate entity housed in the GM Tech Center and employing about 60 people.

The company's first five years had its peaks and valleys. Including a difficult 1986 when more than \$50 million in automotive orders were cancelled as GM went through a streamlining and GMF Robotics went through a painful reduction in its workforce.

But the next year, as GM rebounded and automotive orders increased, GMF prospered. In 1987 sales surpassed \$102 million. By the end of that year, GMF boasted of a better than 2-1 sales lead over its closest North American competitor and a 25 percent share of the robotics market. By the close of that year, GMF had installed more than 6,000 robots for more than 1,000 customers.

Besides GM, Ford, Chrysler, BMW, Saab and other automakers, GMF's customers include Caterpillar, Digital Equipment, Pepsico, IBM, Honeywell, Bendix, PPG, Goodyear and General Dynamics.

Also in 1987, GMF Robotics opened its \$22.5 million world headquarters in Rochester Hills where it has nearly 500 employees.

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PAT MURPHY/staff photographer

Hadi Akeel pauses with the electric painter, a highly sophisticated automated system instrumental in the success of GMF Robotics Corp.

## Trade act influences lowering of gas bills

By Tim Richard  
staff writer

Natural gas customers will see a stabilizing of Consumers Power Co.'s supply and a decline in their bills, a top official says.

"Twin reasons," said Michael G. Morris, are the new Free Trade Agreement with Canada and new rules for interstate gas sales.

"We experienced back in 1978, a phenomenon where the Canadian government stepped in and changed the price of export gas at the border, notwithstanding the terms of contracts that had been in place for years and had been negotiated by two private enterprises," said Morris, 41, of Northville.

"Our people — particularly Bill McCormick, chairman of the company — worked in a joint committee with the American Gas Association and were instrumental in putting into the agreement some language protecting arm's-length negotiated contracts from (Canadian) governmental interference.

"It was critical for us in the gas industry because we do bring in a lot of Canadian gas, particularly in Michigan."

SINCE AUGUST, Morris has had the newly created post of executive vice president of natural gas for the Jackson-based utility.

Although CP has been known primarily as an electric utility since it was founded 103 years ago, it also delivers gas to three million lower peninsula residents, about one-third of the state's population. Half of those are in the southeastern Michigan metro region.

Morris' appointment signals the firm will put new emphasis on being more competitive in natural gas.

"We are the lowest cost, major gas utility in the state, and we intend to maintain our competitive position in 1989," Morris said of the new rate cut.

In January, a homeowner burning a typical 25,000 cubic feet will pay \$120 compared to \$136 for the same consumption in December, he said.

A typical industrial gas customer will save about \$615 a month. How'd they do it?

"THERE ARE TWO principal reasons," Morris said.

"One, we have continued to work with our interstate pipeline suppliers and in our overall strategies to lower the cost of gas.

"Secondly, we were able, in the last quarter of 1988, to make a significant collection of our alternative



Michael G. Morris  
executive VP for gas

'take-or-pay' costs that we will owe our interstate pipelines."

Stripped of the lawyer's language, it worked like this: In recent years, gas supplies mounted. "We distribution companies had a 'minimum bill contract' with interstate suppliers — we would take a certain volume of gas or pay for it if we didn't take it. We never could live with the latter situation," Morris said.

"At the wellhead in the early '80s, you began to see an excess of supply. It put a lot of pressure on federal regulators to change the business so that we and other (distributors) would be free to contract with any source of supply. We've seen partial freedom granted us by the federal government."

CP's suppliers — Panhandle Eastern Pipe Line and its subsidiary, Trunkline Gas — had to negotiate their ways out of these contracts.

Until December, those costs were passed on to distributors and customers.

"We made provision to collect those dollars in our 1988 costs," said

Morris, "so we're a bit ahead of the game. The other gas distribution utilities in this state have not done so and will collect (take or pay buyout) costs in 1989 and '90, I assumed."

ON OTHER ISSUES, Morris said:

- Composting of yard wastes, under Oakland County's new solid waste plan, will yield some methane gas, but it's premature to say how much. Currently CP pipes some gas from a sanitary landfill in western Oakland to the Ford Wixom plant. Gas from trash "will not be a principal supplier, but it won't be an unimportant supplier."

- The company stands to gain some gas sales as southern Oakland redevelops along the corridor of the I-69 freeway, whose missing link is to open late this year in the Royal Oak-Southfield area. Company officials serve on community growth alliances and local economic development committees.

- Although the Michigan Public Service Commission used to be the bane of utilities, Morris now rates it "surely in the upper echelon, and I do have familiarity with most central midwestern states. Michigan regulators do a pretty good job of understanding the kinds of things we need to have."

- A thorny technical problem will be what it can charge for "transportation" gas — supplies bought by big industrial firms that CP doesn't own but merely carries for them. "This business has grown substantially. The regulator is trying now to figure out how to handle the tariffs and what you do with the revenue streams."

AN OHIO native, Morris earned two degrees in biology from Eastern Michigan University and in 1975 went to work for Commonwealth Associates in Jackson where he helped plan routes for electric transmission lines.

Later he joined ANR Pipeline Co. and worked his way up to executive vice president of marketing, transportation and gas supply.

Going to Detroit College of Law at night, he earned a law degree. He also has been president of Colorado Interstate Gas Co. and ANR Gathering Gas Co. All are subsidiaries of The Coastal Corp.

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