HIGH-TECH TRAINING WHEELS

Nuclear power plant employees sharpen their skills on Arvind Patel's computerized mock-ups.

by Deborah Marquardt

From a rooftop in Baroda, India, a young Arvind Patel played a kite game with his companions. With a skillful tug on the string and a sharp air current, he could clip his opponents one by one, sending their kites hurtling to the ground. Years later and continents away, Patel still finds himself in a dogfight—a high-stakes game in a high-tech world played not only against business competitors but against technology itself. The 35-year-old engineering whiz and entrepreneur thrives on the challenge.

Patel is president of Simulation Associates Inc., a Newport News firm that creates computer-simulated environments that train people to operate ex-

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Arvind Patel in control room at North Anna nuclear power plant. It's not the real control room, however. It's the simulator he built to train those who operate the real one.

Arvind Patel can use hand-held remote device to call up varied scenarios on the simulator he built at the North Anna plant.

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tremely expensive equipment. Pilots and astronauts have used simulators for years. Patel uses them for nuclear and fossil power plants: Better to train a novice on a simulator than to turn him loose in the control room.

There was no simulating the business world, however, when Patel and two contemporaries, James D. Koskamp and Paul A. Lawrence, undertook their venture in the spring of 1980, entering an arena dominated by giants like Westinghouse. They had no capital. Not a bank was willing to take a chance on them. But they did have a job: Virginia Power had contracted with them for modifications to the simulator at its Surry plant. As Patel says, "You don't need capital to use your brain." They borrowed the utility's own computer when it wasn't needed, usually late at night.

SAI's sales have grown from $40,000 to $3 million in less than five years, its staff from four to 45. It has moved from a tiny trailer to modern offices at Oyster Point, from domestic markets to overseas. Its clients include not only Virginia Power but Duquesne Light Co., Arizona Public Service, the United Nations Development Programme and Krupp-Atlas Elektronik of West Germany. It has completed 12 training simulation projects. And recently SAI has solidified its posture by striking up an alliance with a Newport News Shipbuilding subsidiary.

With new Nuclear Regulatory Commission rules proposing the use of custom simulators for all nuclear power plants, Simulation Associates' near-term future looks good. But Patel and his partners nurture an ambition to become a $50 million, maybe even a $100 million, business someday. That will take developing markets beyond the company's established expertise in nuclear power. But, as a needlepoint sign in Patel's office says, "No problem."

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Three Mile Island. It was March 28, 1979, when some puffs of radiation escaped through the giant stacks near Middletown, Pa. A malfunction in the cooling system and human error nearly caused a core meltdown. Three Mile Island had no simulator, and it wasn't long before the NRC declared that simulator training was a must for power plant operators.

While the industry itself cooled down—many utilities delayed or canceled plans to put additional nuclear plants on line—the simulator industry heated up. Simulation Associates' Lawrence puts it this way: "We could have become a company without TMI, but it made it easier." Suddenly there was a market for 60 to 70 simulators.

Virginia Power was one of the first to have its very own simulator, and that was before Three Mile Island. In the early years, power plants traditionally had sent personnel to Westinghouse to learn on a generic simulator. "The training was better than nothing, but not as good as having your own [simulator]," recalls Harry Miller, now assistant station manager at Surry Station. So the Virginia power company hired a New Jersey firm, Electronic Associates Inc., which sent two of its sharpshooters, Arvind Patel and Jim Koskamp, to develop a simulator specifically for the Surry plant.

After the Surry project, a restless Patel took a job with a New York firm doing design and engineering work for the nuclear industry. Six months later, he got an intriguing phone call. Virginia Power wanted to make some changes in its simulator but was having trouble reaching Electronic Associates. The utility asked Patel if he could help out.

Patel agreed to work weekends, but the commute between his job assignment in New Orleans and Surry convinced him to form his own business. With Koskamp, the hardware expert, and later Lawrence, who had worked in the Navy's nuclear submarine program, he undertook a $40,000 modification contract for Virginia Power. In December 1981, the tiny firm landed another contract for the utility's North Anna simulator—this one for $5.2 million. "No other vendors had their innovative ideas," remembers Miller, who was helping make the decision. "Technically, they appeared to be the best."

But capturing the confidence of one utility did not guarantee other contracts. Early in the simulator rush, some companies failed to deliver. That was both good and bad for Simulation Associates: It narrowed the number of competitors from 12 to four, but because of the high cost of the projects and the three-year lead times to complete them, many utilities wanted the work bonded. That put the tiny Newport News company in a bind.

Better to train a novice on a simulator than turn him loose in the control room.

"Bonding arrangements are based on two factors, track record and financial strength, and they were not as strong financially," says Thomas R. Tucker, senior commercial officer for First American Bank of Virginia, who approved the firm's first business loan while with the old First & Merchants. But he was impressed with the company's technical expertise and the confidence it inspired in Virginia Power executives.

Another major challenge was the Krupp contract in West Germany. "It was a big job for our size, and there was some distrust because of the distance as well as a language barrier," Patel says. Payments were slow and cash flow became a problem. "We had to tell our friends in Germany to have trust and faith in us. Because their engineers couldn't do it, they had no choice." Patel admits that 1984-1985 was rough. "We survived. We could have gone broke."

North Anna plant's simulated control room. From here instructors call up make-believe situations for trainees.

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Such tenacity is one of the things that intrigued Lu Lazo, president of Newport News Industrial. Patel, says Lazo, "is a classic case of a very hard-driven entrepreneur and a good leader. He has done an excellent job of maneuvering between the shoals and the reef."

Lazo can't remember who got them talking, but it was a little over a year ago. Lazo's group, a subsidiary of the giant shipbuilder, has specialized for years in the repair and overhaul of nuclear power systems. In Simulation Associates, Lazo noticed a "small, struggling company with good people and a good track record" that lacked the financial wherewithal to get into the big leagues. Lazo, on the other hand, recognized that his company was weaker in computers. Pairing the financial muscle and mechanical expertise of Newport News Industrial with the electronic expertise of SAI was "a natural

alliance of interests," he says. "They were as much as four to five years ahead of state-of-the-art," he says.

The two companies have bid several projects together, sometimes trading places as prime contractor or subcontractor. Says Lazo: "We learned we could work together very well."

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Simulation Associates is a melting pot of cultures, an atlas under one roof. Employees come from all over the world: China, Malaysia, Korea, Iran, India, Canada. It is also a potpourri of advanced degrees. Among the firm's 45 employees, six are Ph.D.'s and 15 have master's degrees, says marketing support manager Barbara Burris.

The preponderance of skilled foreign workers is due not to any proclivity of Patel's but to the marketplace: The Defense Department absorbs many American graduates for highly technical jobs requiring a security clearance, leaving a vacuum in the civilian sector to be filled by the brightest from other countries. Loon Kar Tan is an example. A native of Malaysia, he is a computer science and mathematics graduate of Hampden-Sydney College.

The disparity of cultural backgrounds can create problems. "You have to be more flexible in understanding the English language," says Fred Preller, a senior systems analyst who joined Simulation Associates from NASA because he wanted more excitement and more opportunity. "People with different cultural backgrounds sometimes perceive things differently. Sometimes there are misunderstandings," he says. Nothing major. You just have to be aware it can happen, he says.

But the diversity is just as likely to contribute to an atmosphere of excitement and challenge. Tan is teaching his American officemate Chinese in exchange for help with English.

Work at Simulation Associates is intense. Employees work long, hard hours when deadlines loom. "You set your own standards and work toward them," Preller says. Patel is no exception. "It's hard to keep up with him," Tan says. "His mind works very fast." Adds a Virginia Power associate: "If a project is going astray, he brings his sleeping bag and becomes the engineer to get the project back on track."

Yet hours are flexible, and the atmosphere can be relaxing. Patel has been known to pick up a badminton racket and knock around with the troops. Yes badminton. In the back of the shop, in the shadow of a mini-simulator board, sit a badminton net and a pingpong table. Sometimes the programmers use them during the day, but matches are more common after work.

Never does Patel let his employees lose sight of the company's mission. He gathers his team together for wine and cheese parties from time to time, bringing them up to date on contract bids. There are few secrets here; everyone gets involved.

The next few years should bring new business to Simulation Associates. The Nuclear Regulatory Commission has proposed requiring all nuclear power plants to install custom-built simulators within four years. According to a February issue of *Nuclear Marketing Report*, only 38 simulators currently serve the nation's 68 reactors; another 28 simulators are being constructed; eight more are being considered; and 13 nuclear power plants still have no plans at all.

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Once those simulators are built, there is always updating to be done. Says Lawrence, "An update or modification could be a $1 million job. We're of a size that if we get a major project—$2 million to $3 million a year—we're self-sustaining and growing. It's very easy for us to survive."

Yet Patel knows there may not be work in the nuclear power field forever. Already, he is applying his simulation techniques to fossil fuel plants. Potential applications are limitless. Patel keeps a little file of dreams, a folder filled with news clippings that tantalize his imagination: artificial intelligence, factory automation, plant process computers. Perhaps the chemical industry will be the next to require simulators, he suggests.

The frontier entices Lazo, the Newport News Shipbuilding official, as well. "We have explored some ideas together," he says. Lazo estimates that he and Patel have spent as much as 100 hours talking. "That's how important I think it is."

Patel says his company easily can do $3 million to $4 million in business a year, but to make it $50 million or more, "Somebody will have to take a risk." It takes considerable research and development to put a proposal together. While thankful for Lazo's alliance, he says, "Their support alone doesn't get you there."

Yet as an old-time friend and Surry associate says, "When Patel gets a problem, he doesn't like to let it go." He'll probably figure this one out, too. Says Patel: "I'm an optimist. I have a vision of where we want to go and a commitment to go there in spite of the roadblocks." ■

Suburban Building Boom

The nation's suburbs are increasingly populated by corporations today. Builders throughout the U. S. added more than 300 million square feet of space to office inventory each year from 1981 to 1985—most of it in the suburbs. In fact, the amount of suburban office space surpassed office space in central business districts for the first time in the early 1980s. But suburban office vacancy rates are currently nearly 20 percent, compared with 13 percent in central business districts. These high vacancy rates plus the rise of the service sector of the economy are expected to lure future business to the suburbs. ■

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