

New Toyota-GM Plant Is U.S. Model for Japanese Management

Novel union contract allows for cooperation, not confrontation, in the "constant search for improvement"

Fremont, California
THIS small city in the San Francisco Bay area is the site of what has been hailed as the most significant labor-management experiment in the history of U.S. automobile manufacturing.

Gleaming against a backdrop of the coastal Hamilton Range, surrounded by carefully manicured grounds and immaculate parking lots, the bustling New United Motors Manufacturing Inc. (NUMMI) is the flagship proving ground for applying Japanese management systems to American workers.

NUMMI represents a marriage between the world's two largest automakers: Toyota and General Motors. The assembly plant, which opened 20 months ago, represents Toyota's first exercise in building cars in the United States. And it is the United Auto Workers' first experiment with a novel contract that eliminates many of the traditional work rules and stresses cooperation rather than confrontation with management.

The NUMMI operation is built in a rehabilitated plant that had been closed by GM in 1982. Toyota contributed \$150 million for the start-up; GM threw in \$20 million plus the old plant. With 2500 workers on two shifts, the plant is coming close to its aim of producing 940 Chevrolet Novas a day. Actually Toyota Corollas with a Chevrolet nameplate, they bear little resemblance to the old Novas. In September, the plant will start producing the Toyota FX, a sporty Corolla, as well.

The management is essentially in the hands of the Japanese, who are responsible for production and sourcing. The Americans handle the marketing. President is Tatsuhiro Toyoda, a member of the founding family. The highest ranking American is Robert Hendry, general manager for general affairs.

The smooth-running NUMMI operation now makes the old Fremont plant seem like a bad dream. A thorn in GM's side for years, it was a highly developed example of everything that could be wrong with American management. Absenteeism was raging at about 20%. The union had about 800 grievances pending. Quality and productivity

were abysmal. Drug and alcohol abuse were rampant. Fights would break out on the floor. Labor-management relations there, says local UAW head Tony DeJesus, meant "constant preparation and training as to how to fight with each other."

The parties are now in a three-way marriage and the honeymoon is not yet over. The big question is whether it will last. But there seems no doubt that the NUMMI setup makes for a far more productive and harmonious organization than Fremont has yet seen. Absenteeism is down to about 3% and grievances are at a minimum. NUMMI has cleverly eliminated incentives for workers to go out and get drunk by offering lunchtime pay for those who stay in the plant.

Members of the press have been clamoring for entrée since the plant started operation. Several dozen were allowed in for a press day on 20 May, the second since the plant opened. Labor Secretary William E. Brock was there, fresh from scolding the Teamsters at their annual convention. He had nothing but praise for the UAW, assert-

ing that "we have seen the most dramatic change for the better in terms of trust in the last 5 years than we have seen in the last 50."

Indeed, a brief tour of the clean, neat, and new facility could provide pictures for a patriotic textbook, with men and women, young and old, of many races, all looking happy, alert, and intelligent as they strove to make NUMMI work. Many participate in the optional morning calisthenics, and can throw around a few words in Japanese, including the phrase meaning "no problem." The one word everyone knows is *kaizen*, which means the constant search for improvement. In the old days, the management stance was "we want the product out of the door, whether it's good, bad or indifferent," says one union official. "Today, the watchword is quality, quality, quality."

NUMMI likes to do things the *bakayoke* way, which means foolproof. This started with the employee selection procedure. It mailed out applications to the 5000 people who had been laid off the old GM plant and received over 3000 back. Each applicant was put through a specially designed selection procedure including oral and written tests and simulation assembly work. Applicants were also assigned to put together little cars with blocks, and one applicant was instructed, without using hands, to tell the other how to do it. Applicants were also asked whether they considered working for NUMMI a "right" or a "privilege." The correct answer did not come hard to the many who had not seen a paycheck since 1982.

NUMMI thus accumulated a highly expe-



Team spirit: Meeting cubicle on NUMMI factory floor has cheery charts.

rienced (and older than average) hourly work force of 2200, 85% of whom are former GM workers, who, in accordance with the UAW agreement, were given preference.

The NUMMI plant has nothing noteworthy in the way of high technology, with the exception of its modern Japanese stamping plant, which is on the premises. What distinguishes it is the Toyota production system, which means its management. It is in essence a Japanese plant with American workers. Toyota, in line with what has become the common pattern, has flown several hundred managers and union people to Japan for indoctrination at NUMMI's sister plant Takaoka in Toyota City, where they experienced the system in its pure form. Five of NUMMI's eight general managers are Japanese, in addition to the president and vice president. Japanese trainers are also being continually ferried back and forth.

NUMMI is said to embody the best of both worlds, and to a large extent this appears to be true. Gone are the intricate hierarchical management structure and management-union antagonism that characterize the American system. Gone are the racism, sexism (women do not have assembly line jobs in Japan), and authoritarianism that make for the great homogeneity of the Japanese work force.

Egalitarianism appears to reign. The cafeteria and the parking lots have no areas designated management only. In the offices, all the walls have come down and employees are free to enter. Hendry and the Japanese vice president sit cheek by jowl in a large room full of desks. (Toyoda has his own office.)

There are only about four levels of management. The workers are organized into teams of seven or eight apiece, headed by a team leader. Three or four teams each form a group, headed by a foreman, now known as group leader. Teams meet regularly—on schedules of their own making—for problem-solving sessions (“kaizen”). The “standardized work” sheets that outline the tasks are subject to continuous revision, not by engineers as in most American plants, but by the workers themselves. No detail is too small if it can be systematically incorporated to improve efficiency or quality. The floor of the plant even has little diagrams showing the most efficient route for picking up a part and taking it to the line.

Workers are all cross-trained as they are in Japan, a practice that would not be possible under traditional union work rules. Instead of 200 or more job categories for hourly workers, there are three: general maintenance, tool and die, and assembly line. Workers in each team are trained for the



On the line: Workers assembling Toyota Corollas with Chevy nameplates. Cord running overhead can be pulled by anyone to stop the line.

jobs held by the other members, so they can switch jobs from morning to afternoon, or even every 2 hours. There are two beginning salary levels: \$11.29 for unskilled and \$15.05 for skilled, with annual bonuses. Team leaders make 50 cents more per hour but there are no “pay-for-knowledge” differentials for additional training, as there are in American plants.

One of the much touted innovations is the *andon*, the system that enables any worker to stop the assembly line if there is a problem. Still resisted by some foremen, this system has great significance because, says Hendry, if someone shuts down the line “that person now has control over the company.” If a worker pulls the cord a gentle chime rings out and the team leader hastens to the spot. If the problem is not corrected immediately the line will stop in 60 seconds. Unlike most American plants, where maintenance is conducted between shifts and repairs are made when a machine breaks down, workers are trained in minor repairs and are supposed to continuously monitor and immediately correct any malfunction. This is an aspect of *jidoka*—which has to do with building quality in.

The Toyota system places great emphasis on solving problems at the lowest possible level. There’s “hardly any management here at all,” exulted UAW vice president Owen Bieber at the press day. Indeed, management seemed scarcely in evidence. Toyoda was the only one wearing a suit; Hendry and public relations director Tom Klipstine, the only other salaried employees in evidence,

were both attired in the pale blue company shirt. (Uniforms are not required on the line.)

One of the systems that is of keen interest to American managers is the “just-in-time” or *kanban* system of dealing with suppliers. This is a particularly Japanese system since it makes the best use of their rarest commodity, which is space. In Japan the arrival of supplies is timed to the minute; one auto expert says that a Japanese assembly plant can operate with two-thirds of the space taken by an American one, principally because of savings in inventory space. At NUMMI, a modified system is in place, since it takes up to 2 weeks for supplies to come from Japan and several days from Detroit. *Kanban* entails a whole new relationship with suppliers, who in America are accustomed to being dropped cold if prices or quality are found wanting. The Japanese cultivate long-term relationships with their suppliers, who are regarded as an extended part of the “family.” *Kanban* requires finely tuned estimates of need and relies on a high level of trust and continuous communication and information between manufacturer and supplier.

Trust is big at NUMMI. Lester Myers, a union representative and veteran of 24 years at GM, says the greatest improvement is “communication. . . . Before, we didn’t have any.” Management has “made you feel good about yourself.” The union used to make fruitless requests for such amenities as recreation facilities and microwave ovens. NUMMI has backed up its rhetoric about

mutual trust by fulfilling these desires and more.

There is no question that everyone is working very hard at NUMMI. Klipstine said he bought a pile of books on Japanese management when he was assigned to the new company. What he has found out is that "Japanese management means keeping you so busy at what you're doing that you don't have time to read all the books on Japanese management style."

The company declines to give out any figures on productivity, but according to one auto expert, if 2200 workers are turning out 900 cars a year, that means about 22 man hours to make a car, which compares very favorably with the usual American output. According to Hendry "we don't look at productivity in terms of targets." As he explains it, traditional American management sets hourly output goals first, and hires or lays off depending on the goals. At NUMMI, the quality and harmony of the work force comes first, and output naturally flows from that. It is the difference between managing the product and managing the people. Since NUMMI employees are cross-trained, fluctuations in manpower needs can be met flexibly, and it is not necessary to hire an extra few hundred people to fill gaps as they arise.

Although "quality circles" are generally perceived as one of the basic elements of Japanese management, NUMMI does not yet have any. Hendry says that will come. The company recently took the first step toward quality circles by instituting a suggestion program in which worker ideas will be filtered up through teams and then to a centralized suggestion group. There will be monetary rewards but that aspect of the program is downplayed: in Japan, there is an aversion to giving special recognition to individuals, since it is recognized that no achievement is possible without the full participation of the group.

Hendry, asked how his experience at the plant had changed his way of operating, said the job "makes you much more patient." Patience is a quality that must be widely cultivated at NUMMI given the huge amount of time people spend in meetings—team meetings, group meetings, union-management meetings, and management meetings. Although workers are sometimes required to come in on Saturdays, they probably spend less time working because of all the time they spend in meetings. But they are working harder. Says Myers: "Anything that's going to keep this company going I'm willing to do."

NUMMI officials as well as union representatives are reluctant to rock the boat by identifying any problems on the horizon.

Some workers have formed a "People's Caucus" that has reportedly complained that the work pace is too fast, but both union and management officials express the belief that the basic system is sound and that the only problems are those of adjustment. According to union leader DeJesus, "the big-

gest problems right now are with people understanding the system." He says the union people have no problem embracing the Japanese system because "they are doing what they have wanted to do for years."

DeJesus also says the ground-up problem-solving is taking a burden off union griev-

The Japanese Infiltration

The Japanese in the last few years have moved rapidly to set up auto manufacturing plants on American soil. Suppliers are following suit, and there are already at least 40 Japanese supplier firms now in operation in this country. At the same time, Americans are seeking to benefit by their expertise through the establishment of various new corporate entities. Some examples:

■ Georgetown, Kentucky: Toyota is setting up another, all-Toyota-owned, assembly plant, to open in 1988, for manufacture of the upscale Camry. Toyota has not yet recognized the UAW, but the favorable experience at NUMMI may influence the company's decision on whether to have a unionized plant.

■ Smyrna, Tennessee: Nissan Corp., Japan's second largest automaker, has opened a \$250-million truck plant. Billed as the largest private enterprise ever in Tennessee, it employs 3000. Nineteen thousand people applied for the jobs, so presumably the plant is getting the cream of the Tennessee work force. So far the plant has withstood UAW efforts to organize it. Marvin Runyon, the United States president of Nissan, has said, "We think we have to be union-free in order to have the type of communication with our employees that we must have in order for us to build a quality product." The plant is run by Japanese, and 270 American team leaders have been trained at Nissan's Kyushu factory.

■ Marysville, Ohio: Honda of America Manufacturing, Inc., which already has American-based plants producing motorbike engines and lawn mowers, is now producing American-made cars. The 3000 workers are called "associates." The Japanese management has publicly adopted an open-minded stance about unionization but the UAW has so far failed to gain entry. Local press coverage quotes a Honda worker as saying, "They are trying to change your values so that the job will be the first thing in your mind in the morning and the last thing at night."

■ Flat Rock, Michigan: Mazda Motor Co., which is 25% owned by Ford, has a plant under construction on the site of the old Michigan Casting Center, and the first car will roll off the line in September 1987. The union contract, now under negotiation, will permit workers to accept 15% lower starting salaries, to be made up in increments over 3 years. A UAW spokesman says: "In my years at Ford I have never seen the cooperative dealings with management as I have seen with the Japanese at Mazda."

■ Bloomington/Normal, Illinois: Chrysler Motors and Mitsubishi Motors Corp., which has been making Chrysler cars in Japan for the past 16 years, have just broken ground for a joint production plant to open in 1988. Chrysler announced the agreement last year shortly after its president, Lee A. Iacocca, withdrew an antitrust suit against the NUMMI operation. The New Diamond-Star Motor Corp. will manufacture an "all-new, state-of-the-art sporty subcompact" engineered by Mitsubishi. Whether or not to unionize will be decided after the work force is on board. The plant, established with \$300 million apiece from the two companies, will employ a work force of 2900, with annual production of 180,000 cars.

■ Nashville, Tennessee: Ground was broken on 8 April for GM's new Saturn plant, which is heralded as an example of "leapfrogging" the Japanese in both technology and management. It aims to manufacture 450,000 cars a year in a \$3.5-billion manufacturing complex including a contiguous stamping plant. GM likes to present this as a "joint venture so to speak between UAW and GM" according to spokesperson Judy Merriott. Under a UAW-Saturn "memorandum of agreement" workers will be cross-trained and organized in "work units" headed by "advisers." The agreement is a "living document" which can be changed at any time, says Merriott. As "full partners" in the venture, union people are represented on the "strategic action committee" and are to participate in all decisions. ■ C.H.

ance procedures. "We were always defending people who didn't give a damn"—usually those with alcohol or drug problems. Now, he says, "we made it clear we won't be babysitting you any more. You're responsible for your actions." DeJesus says the union meets much more often with management than it used to—indeed, management crossed the street to visit the union hall for the first time in 1984.

The Japanese way of thinking has clearly affected the way officials at NUMMI look at things. Says DeJesus: "Toyota recognizes that human nature is human nature." Says Hendry: working at NUMMI "makes you focus on trying to learn more about human nature and what makes people tick."

The role of communication and information in this type of setup can scarcely be overemphasized. Workers have much more access to management—as symbolized by the no-walls offices—and are given much more information on such management concerns as production goals. This kind of openness goes against the grain of traditional American managers. Vladimir Pucik of the University of Michigan says that in the United States, "information is power. In Japan it's a resource."

GM intends to learn as much as possible from NUMMI. It has set up a technical liaison office in Fremont responsible for channeling information to headquarters. Sixteen GM managers are now being rotated through the plant. The production system has been videotaped from end to end, and training films have been made of numerous specific operations. According to Joseph Spielman, director of manufacturing engineering for the Chevrolet-Pontiac-Canada (CPC) division, 1500 GM people from 50 different plants and representatives from 40 local unions have been given tours of the plant.

The design of a new GM assembly plant now being built in Kansas City, Kansas, has been influenced by NUMMI, says Spielman. This is reflected in everything from the plans for the flow of materials to the "progressive" new agreement with the UAW. GM's CPC plant in Van Nuys, California, the only other auto assembly plant left in that state, may provide the most telling proving ground for the transfer of NUMMI ideas to an existing operation. Plant manager Ernest Schaefer says that his plant has been much impressed by the NUMMI operation and that a new union contract closely resembling the NUMMI agreement was ratified in May. Conversion to the team concept will be a "long slow process" requiring much training, says Schaefer, but it is "necessary down the line." The state of California is providing \$20 million for retraining.



Tatsuro Toyota: NUMMI president has MBA from New York University.

It has become clear that quality and productivity are not susceptible to technological fixes, but depend on management—as has been vividly illustrated by the problems GM has been having with its new, highly automated and robotized \$600-million assembly plant in the Hamtramck district of Detroit. Critics say that such problems arise from Americans' tendency to see technology as a quick fix and as a substitute for workers. The Japanese treat robots and other automation as complementary to the workers, and their assembly line setups reflect the integration of man and technology. Americans are still learning that technical solutions alone turn out not to be solutions. Says Daniel Luria of Ann Arbor's Industrial Technology Institute, "the future lies in learning how to manage people and manage plants as well as the Japanese do. . . . Progress in human relations must match progress in technology."

But Japanese management systems depend on physical plant design and production techniques as well as revised human relationships. Thus, the extent to which lessons from Japanese management systems can be transferred to existing American plants is a big question. Given that old and—until recently—highly successful habits are hard to break, it may be that genuine change is only possible in plants that start from the ground up.

It is hard to tell from talking to auto officials just how deeply they have grasped the new ideas. Certainly, their public rhetoric has changed, now abounding with talk of "people programs," "integrating technology

systems with people systems," "people-type training," and the realities of "human nature." But NUMMI executive vice president Kan Higashi told the *Wall Street Journal*, in a bit of forthrightness uncharacteristic of the Japanese, that he was "afraid that the GM upper management doesn't understand the basic concept."

One of the commonly cited dangers is often referred to as "cherry-picking"—adopting selected elements of Japanese practice such as just-in-time stocking without recognition that all the elements are interdependent within the total concept. As Michael Flynn of the Industrial Technology Institute puts it, American managers "have been trying to model trees and haven't stepped back to look at the whole forest."

The partial approach has been exemplified in the widespread introduction of "quality of work life" programs into American industry since the mid-1970's, some of which include quality circles, which are aimed at bringing more worker participation to decision-making and problem-solving. Although these have brought improvements in some cases, there is much debate over their worth. To all appearances, it took nothing less than the arrival of the Japanese to get managers into seriously rethinking about how best to handle "people."

As has often been noted, the Japanese are exporting, in highly developed form, ideas the seeds of which were sown by Americans—particularly statistician W. Edwards Deming, who after World War II tried to sell American manufacturers on an integrated statistical approach to quality involving cooperation between management and workers. Rebuffed in this country, he lectured widely in Japan, where he is now a minor national hero. So now these ideas—which at root are simply the universal tenets of good management—have returned in a form that is uniquely Japanese.

The NUMMI experiment is occurring against a radically shifting background involving globalization of production, product diversification, much increased sourcing from foreign countries, and complex new corporate interrelationships, hybrids, and mutants. As recently as 1980 the visionaries of the auto world predicted that automakers would be consolidating and that the world would end up with about six major manufacturers, all making "world cars." Actually, the opposite has happened. High technology and automation have facilitated growing differentiation. And the Japanese have demonstrated that efficiency does not necessarily depend on economies of scale.

In this rapidly changing picture, Japanese-American ventures stand as a delicate cultural and economic experiment of crucial sig-

nificance for both parties. Japan has pretty much saturated its domestic market, and expansion onto foreign soil has become imperative. The Americans, for their part, have lost their complacency about dominating the big car market, as foreign brands have moved from filling small-car demands to occupying luxury niches as well.

It has taken a series of shocks to bring the U.S. auto industry to the beginnings of some humility. As one GM official candidly acknowledged at the sixth annual United States-Japan Automotive Industry Conference held at the University of Michigan in April, "We're not accustomed to learning from other people."

It has taken a series of shocks to bring the beginnings of humility to U.S. automakers. Quality has improved, but, as one GM official said: "We're not accustomed to learning from other people."

The situation has improved dramatically since 1979, a nightmarish year for the American auto industry as sales dropped, plants closed, and the public turned in droves to Japanese offerings. But speakers at the Ann Arbor meeting warned that talk of a "comeback" is premature. Michael Porter of the Harvard Business School said that U.S. producers have been enjoying the benefits of import restraints and sales growth while still failing to cultivate a competitive advantage. Production costs are still too high; high volume is no longer a definitive advantage; the Japanese have seized the advantage in applying new technology to cars, and they are way ahead of the United States in developing global strategies. Although U.S. motor executives claim they want to "leapfrog" Japan in automaking, Porter said this country is still playing catch-up, not leapfrog. "U.S. firms are operating better but are imitating rather than innovating."

While joint ventures are seen as a mutually beneficial strategy, Vladimir Pucik of the University of Michigan Graduate School of Business Administration remarked that they may be a symptom rather than a solution, being "very often a desperate attempt by American companies to find a way out of their competitive disadvantage." The Japanese, he said, have a big advantage in that they know how to do business in English, while the Japanese language, and the consciousness underlying it, remains a largely impenetrable mystery to Americans.

According to Michael Flynn, the U.S.-based ventures are giving the Japanese obvious advantages, but so far, "it's not clear we've been very successful in learning much" in return. Although GM has been sending hordes of people through the NUMMI plant, Flynn points out that it will be a long time before many people with hands-on experience in a Japanese-run plant will be let loose in American plants.

The competitive situation promises to get a good deal rougher for Americans. By 1990 it is estimated that between 1.3 and 1.5 million Japanese cars will be built yearly in the United States (the total U.S. market is about 11 million). Imports (most of them Japanese)

accounted for 26.8% of the market in early 1986, and many experts agree that half of all cars sold in the United States by 1995 will be imports or U.S.-built foreign cars.

The matter of suppliers is one that promises turbulence in the future. NUMMI, for example, imports half its steel, as well as major parts, including engines and transmissions, from Japan and only 30% of the dollar value of NUMMI cars is U.S.-generated. The UAW is disturbed that American plants are increasingly resorting to "outsourcing," and there are fears that the traditional U.S. supplier base is crumbling.

Observers of the scene believe that top U.S. management has begun to understand the nature of the challenge, but the new awareness will take a long time to infiltrate corporate consciousness, particularly at the level of plant management. Even with unequivocal examples of the fruits of Japanese industriousness, there has been a tendency to rationalize such accomplishments by attributing them to indulgent treatment by the Japanese government, unfair trade advantages, and their "low-cost positions" in the market. Porter dismissed these "myths," asserting that "Japanese producer competitiveness today is the result of strategy, implementation ability, and a superb pool of human and technical resources." GM's Herb Telshaw, director of Suzuki Affairs, put it more sharply. The Japanese, he said, "are just plain smarter than we are." ■

CONSTANCE HOLDEN

Briefing:

House Backs Translation of Japanese Journals

Legislation providing \$1 million for the translation of Japanese scientific and technical journals into English has been passed by the House of Representatives. The House action follows passage of similar legislation in the Senate last December. Final congressional approval is expected.

Under the legislation, translations of selected Japanese journals would begin next October, the start of the new fiscal year. The translations are to be distributed to government agencies, universities, and to private research institutions.

Just how soon the translations become available under the Japanese Technical Literature Act of 1986 will depend on how quickly the Commerce Department moves to implement the program. Congress, however, is mandating that Commerce compile an annual report describing significant Japanese technical developments and an annual directory of repositories for Japanese technical literature in the United States.

In endorsing the bill, Representative Manuel Lujan, Jr. (R-NM), ranking minority member of the House Science and Technology Committee, said on 23 June, "This legislation gives us a basic competitive tool we have been neglecting—access to Japanese technical literature." A 1981 survey, he noted, disclosed that 75% of Japan's scientific and technical journals are not available in English and other Western languages.

Despite bipartisan support for the legislation in both houses of Congress, the Reagan Administration has opposed the legislation. To dispel that opposition, Senate and House conferees are expected to report out a bill that gives the Administration the discretion to fund the translation effort by shifting funds from other programs, rather than by increasing the Commerce Department's overall budget. And while the legislation also calls for Commerce to maintain a presence in Japan to monitor technical activities, the House and Senate are not insisting on additions to Commerce's delegation there.

Although aides to Senator Max S. Baucus (D-MT) and Representative Norman Y. Mineta (D-CA)—the respective sponsors of S. 1073 and H.R. 3831—concede that the \$1-million program is small, it may be the forerunner of a larger effort. The Senate Democratic Policy Committee is preparing legislation that would cover not only Japanese journals, but also technical literature in other key industrial nations. ■

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