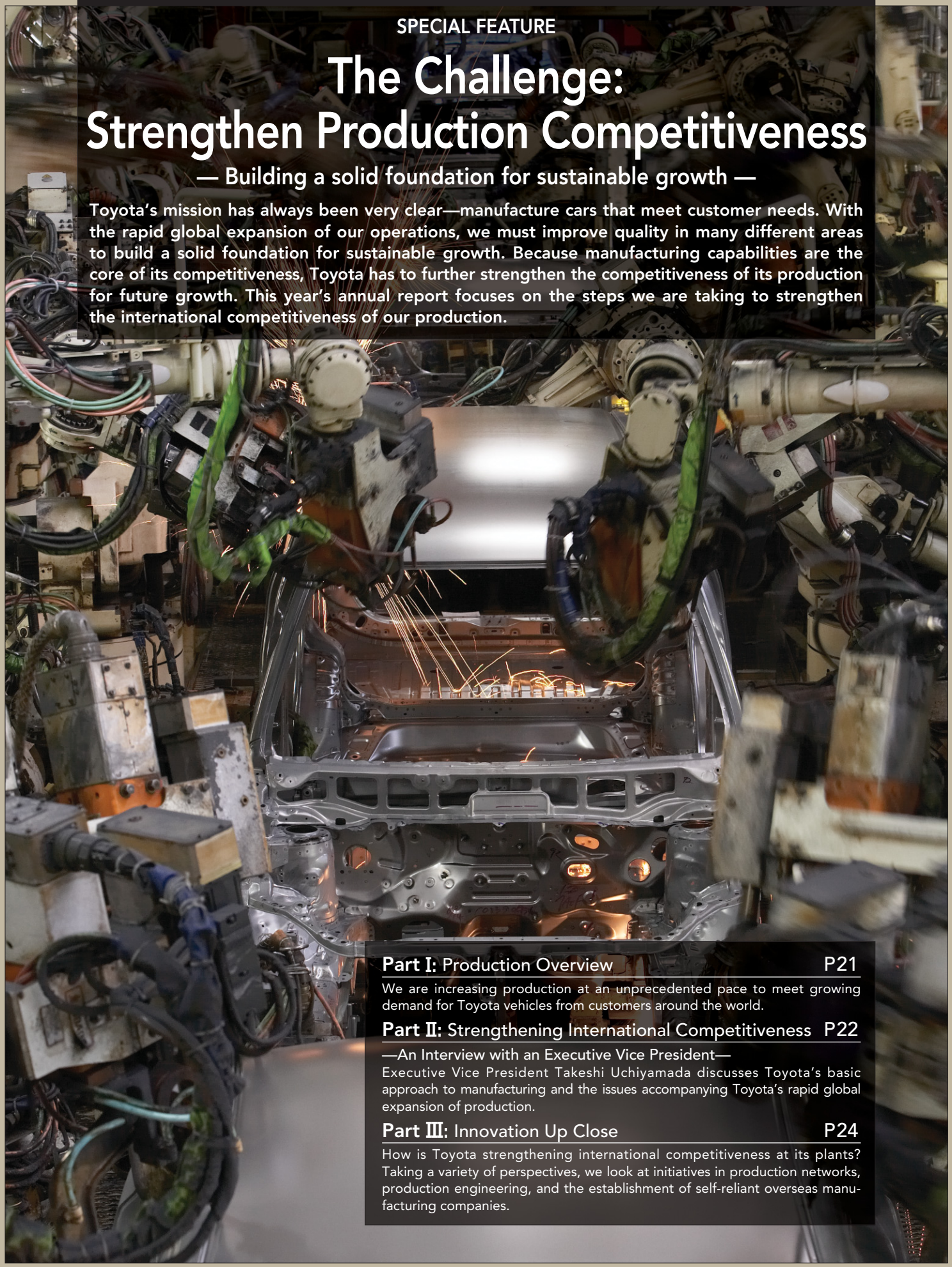
SPECIAL FEATURE

The Challenge: Strengthen Production Competitiveness

— Building a solid foundation for sustainable growth —

Toyota's mission has always been very clear—manufacture cars that meet customer needs. With the rapid global expansion of our operations, we must improve quality in many different areas to build a solid foundation for sustainable growth. Because manufacturing capabilities are the core of its competitiveness, Toyota has to further strengthen the competitiveness of its production for future growth. This year's annual report focuses on the steps we are taking to strengthen the international competitiveness of our production.



Part I: Production Overview

Toyota's vehicle sales worldwide have increased steadily in recent years. To keep pace, Toyota's vehicle production, particularly overseas, has grown significantly each year. We are further increasing production capacity and innovating production engineering technologies to deliver Toyota vehicles to more customers around the world.

Continuing Rapid Expansion of Vehicle Production Worldwide

In the past several years, consolidated vehicle production has grown at a sharp pace, increasing by between 500,000 and 600,000 vehicles each year. In the last five years, Toyota met rapidly growing demand by ramping up production in regions across the world and building new plants—increasing production capacity by 2.87 million vehicles. As a result, we manufactured vehicles or components at 52 companies in 26 countries and regions as of June 30, 2007. We will continue the crucial task of expanding our production capacity to improve our ability to supply products because increasing demand will likely persist worldwide.

In 2006, Toyota started up plants with a combined production capacity of 400,000 vehicles in Texas, the United States, and in Guangzhou, China. In addition, we raised the production capacities of our plants in France and Thailand. In 2007, our third plant in Thailand and our third plant in Tianjin, China, started operations. Also, Camry production began at the North American plant of Fuji Heavy Industries Ltd. Other facilities slated to come on line include a plant in Russia at the end of 2007, a second plant in Canada in 2008, and another plant in the United States, in Mississippi, around 2010.

Innovating to Further Cultivate Global Operations: The Role of Production

Automotive markets worldwide have grown continuously and are expected to continue to grow, especially in emerging markets and North America. Toyota has catered to global demand by localizing production. To advance localization, we have overcome a range of challenges, such as improving capital investment efficiency, maintaining uniform quality worldwide, and accelerating human resources development. However, among auto manufacturers competition for survival in global markets will likely get stronger. We have entered an age in which only the truly competitive will prevail.

As an automaker, manufacturing lies at the core of our competitiveness. By continuing to innovate production engineering technologies, which underpin manufacturing, and strengthening international competitiveness, Toyota will sustain dynamic growth. At the same time, we will build cars that satisfy customers around the world.

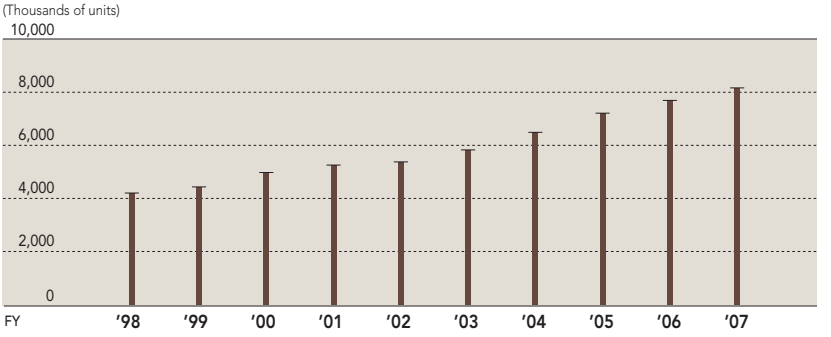
In the following section, Takeshi Uchiyamada, Executive Vice President responsible for production, explains Toyota's basic approach to manufacturing and the challenges that our production-related divisions face. In the third section, we report on specific steps we are taking to innovate automotive production.

Expansion of Overseas Production Capacity: Results and Plans

	2006	2007		2008	Around 2010
North America	Texas 200,000 vehicles	SIA* 100,000 vehicles	Mexico +20,000 vehicles	Canada second plant 150,000 vehicles	Mississippi 150,000 vehicles
Europe	France +30,000 vehicles	Russia 20,000 vehicles			
China	Guangzhou 200,000 vehicles	Tianjin third plant 200,000 vehicles			
Asia and Other Regions	Thailand +90,000 vehicles	Thailand third plant 100,000 vehicles	South Africa +90,000 vehicles		

Note: Production capacity is as of June 2007.
* SIA: Subaru of Indiana Automotive, Inc., the North American plant of Fuji Heavy Industries Ltd.

Consolidated Vehicle Production



Note: Fiscal years ended March 31

Part II: Strengthening International Competitiveness
— An Interview with an Executive Vice President —

We believe it is vital for our production sites to continuously evolve. Fortunately, Toyota has not only the strength in depth of its engineering team but also the many opportunities the divisions have to innovate production engineering technologies based on the "Toyota Production System."

Takeshi Uchiyamada,
Executive Vice President, Production

Toyota must continually strengthen the competitiveness of its production-related divisions to supply high-quality cars to customers worldwide in a timely, cost-efficient, and stable manner. In the following interview, Takeshi Uchiyamada, Executive Vice President with overall responsibility for production, talks about the challenges Toyota's production-related divisions face as operations expand globally and how they are overcoming them.

Q First, would you explain Toyota's basic approach to manufacturing?

A Our basic philosophy is to "build vehicles where demand is found" while relentlessly innovating production engineering.

Toyota is strengthening its production in line with two overall strategies. First, we build vehicles where the demand is found. By manufacturing in regions where demand exists, we shorten lead time from order to production while creating local employment and contributing to the development of local economies. Second, we pursue innovation in production engineering technologies and systems to achieve efficient production while ensuring uniform quality worldwide. Toyota now has production bases around the world as a result of this strategy. Widespread operations have two significant advantages; they steadily supply Toyota vehicles to various markets and they hedge against demand fluctuation risks.

We seek *kaizen* and *kaikaku*. *Kaizen* means continuous pursuit of incremental improvements. *Kaikaku* means revolutionizing for benefits on a bigger scale. Together, these two approaches help us to continuously and dramatically strengthen our competitiveness.

Q What kind of challenges does the rapid global expansion of Toyota's operations present to the production-related divisions?

A The main challenges are catering to fluctuating global demand, innovating production engineering technologies, and establishing self-reliant overseas manufacturing companies.

Overseas production has almost doubled in the past five years, with consolidated overseas annual production now at 3.08 million vehicles. In its long history, Toyota has never experienced such rapid expansion.

Given the speed of change, I think our production-related divisions face three main challenges. First, we have to improve our ability to respond to fluctuations in global demand. Second, we need to innovate production engineering technologies to significantly improve the efficiency and quality of plants around the world. Finally, our overseas manufacturing companies must become more self-reliant.

Q Regarding the first issue, responding to global demand fluctuations, what steps is Toyota taking?

A We are developing a "global link production system" that enables us to respond rapidly and flexibly to changes in demand.

It would be easy if demand in various regions was always stable, allowing all of our plants to maintain the rate of operation at a high level. But reality proved different. Driven by regional,

timing, and product-related factors, demand changes quickly and causes differences among the rate of operation at each plant.

For example, we often have an overseas plant that cannot keep up with demand and a plant in Japan with spare capacity. Neglecting such imbalances leads to losing opportunities and lowers the overall rate of operation. To remedy the situation, the plant in Japan may take part of the production on behalf of the overseas plant. This is only possible if plants have flexible production lines that can handle multiple models. A "global link production system" will enable us to limit investments needed to increase the production capacity of overseas plants. The "global link production system," focused on improving flexibility, is becoming an important way of dealing with global demand fluctuations. (Please see Part III: Innovation Up Close for further information on the "global link production system.")

Q What measures is Toyota taking in production engineering technologies innovation?

A We are stepping up the development of production engineering to improve efficiency and quality.

Since its establishment, the Company has followed a manufacturing philosophy that is reflected in the "Toyota Production System." Guided by this philosophy, we aim to provide customers with better, more affordable products more quickly by innovating production engineering. I think this mind-set is one of Toyota's greatest assets. We look to incorporate ideas, equipment, and manufacturing methods that allow us to efficiently make high-quality products with easy maintenance and reduced environmental burden. Toyota aims to dramatically outperform previous benchmarks through technological innovation—not just improvements of 10% or 20% but of 50% or even more. (Please see Part III: Innovation Up Close for further information on production engineering technologies innovation.)

Q Would you explain the third challenge the production-related divisions are facing: promoting the self-reliance of overseas manufacturing companies?

A We intend to accelerate human resources development.

We have started up production lines for vehicles and components at 16 new overseas plants in the past five years in response to the recent rapid increase in vehicle demand. And, more plants are on the way. These new overseas plants must be self-reliant so that they can be fully competitive, even without support from Japan.

The most important factor in realizing self-reliance is the prompt cultivation of individuals to support the local production activities. At Toyota, we have already achieved significant successes through the introduction of systems and programs for human resources development. However, we need to pick up the pace of such initiatives as we move forward. Toyota will commit significant resources to training personnel in Japan and overseas based on the philosophy that "making products means making people." (Please see Part III: Innovation Up Close for further information on promoting the self-reliance of overseas manufacturing companies.)

Q What advantages does Toyota have that will enable it to continue production innovation?

A Our advantages are the depth of our engineering team and the many opportunities that we have to innovate production engineering technologies.

We believe it is vital for our production sites to continuously evolve. Production-related divisions have recently been very busy starting up new plants and changing over production lines due to the rapid growth of operations around the world. But, at the same time, this has given us many opportunities to introduce new production engineering technologies. In other words, our continued strong growth has spurred production engineering technologies innovation.

In addition, Toyota has divisions specializing in production engineering that are independent from production divisions. I do not think that any other automaker devotes the amount of resources to production engineering that we do. Our numerous production engineers bring formidable collective expertise to problem solving on issues that arise while developing production. Fortunately, Toyota has not only the strength in depth of its engineering team but also the many opportunities the divisions have to innovate production engineering technologies based on the "Toyota Production System."

Part Ⅲ: Innovation Up Close

At Toyota, we are building production networks that can respond flexibly to demand fluctuations across global markets. We are also developing production engineering technologies that will lead to groundbreaking improvements in production efficiency. In addition, we are moving forward with a broad list of measures to strengthen the international competitiveness of production, including stepping up the pace of personnel training to increase the self-reliance of overseas manufacturing companies. In this section, we take a look at some of the specific challenges Toyota is tackling.

Meeting Demand Fluctuations

Expanding Production and Demand Fluctuation Risk:

Demand for Toyota vehicles is growing rapidly in many regions around the world. We would lose sales opportunities if the production and supply capabilities of our plants are unable to keep up. However, only focusing capital investment on meeting demand in each region increases the risk of declining business performance when changes in demand leave surplus production capacity. Therefore, Toyota must anticipate and respond flexibly and swiftly to changes in regional demand to maintain international competitiveness.

Offsetting Demand Fluctuations through the "Global Link Production System":

Toyota is introducing the "global link production system" to enable flexible responses to global demand shifts. Simply put, plants with low operating rates will take on part of the production of plants with high operating rates. We aim to raise our overall production capacity utilization and production capacity by establishing a mutually supportive global system based on monitoring demand trends and the operating status of plants in regions worldwide.

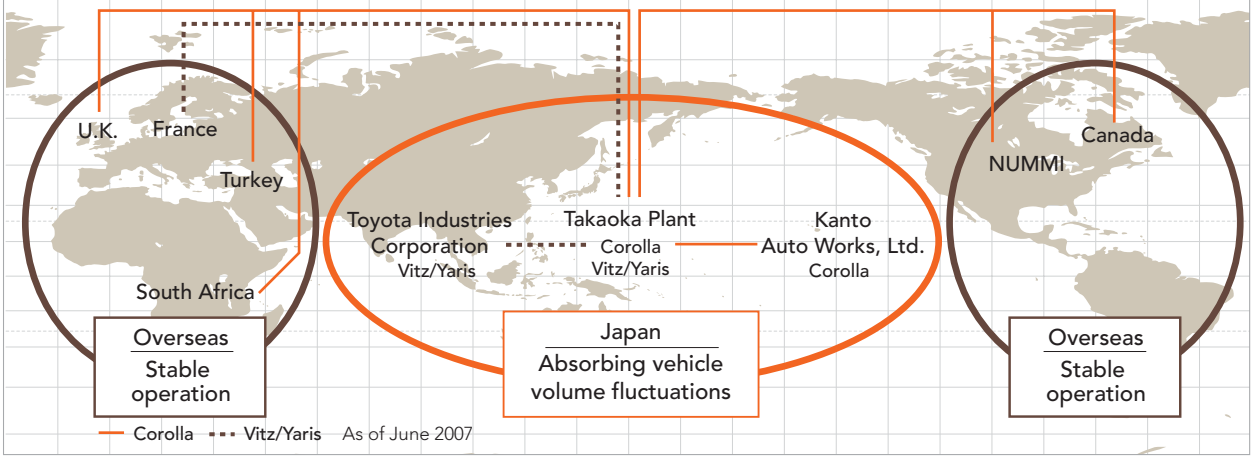
We are working to ensure that each plant fully realizes its potential production capacity and increases its flexibility to enable diverse model mix production through the "global link production system." This system will give us the advantage of flexible production capacity around the world and will center on our core global models: the Corolla, Camry, Yaris (Vitz in Japan), and IMV* series.

* IMV: An abbreviation of Innovative International Multipurpose Vehicle, which refers to SUVs, pickup trucks, and other multipurpose vehicles that Toyota develops and produces overseas for markets worldwide.

Transforming the Role of Link Production:

Link production is not new to Toyota. Since Toyota's early days, mother plants in Japan have ensured initial quality and stable supply by undertaking joint production when new overseas plants start

An Example of a Global Link Production System: Link Production of the Corolla and Vitz/Yaris



France plant (TMMF)

up production. The geographical coverage and complexity of such supporting relationships have increased with our growing international operations. Today, the role of Toyota's link production has gone beyond domestic mother plants simply backing up the production of overseas plants. Link production is becoming a way of channeling our collective strength to cater to global demand. Link production, which continues to evolve, ensures future supply stability while hedging risks related to demand fluctuations.

Growing beyond Japan-Centered Support:

The foundation of Toyota's link production lies in the relationship between mother plants and new overseas plants. As plants in Japan increase their ability to manufacture a wide variety of models, they are able to stabilize the operations of overseas plants by flexibly and quickly supporting their production needs. For example, our Takaoka plant in Japan supports increasing overseas demand for the Yaris (Vitz in Japan) through its connection with our plant in France (TMMF).

Moreover, link production exclusively among overseas plants has recently begun in earnest. We have established mutually supportive links among plants in Thailand, Indonesia, South Africa, and Argentina under the IMV project, which seeks to build an optimized production and supply system. Link production among overseas plants is clear evidence of the steady evolution of Toyota's global production networks.

Aiming for the Largest Benefits from the Smallest Links:

So far, we have presented link production as an example of how we are responding to the risk of demand fluctuations. However, recklessly increasing link production among plants could lower the efficiency of investment and production. Toyota is mindful of that risk and will build a "global link production system" that is carefully calibrated to achieve the maximum efficiency.

Therefore, in addition to forging links, we will have to draw out the full potential of each manufacturing company in order to raise its production capacity and operating rate. And, production engineering technologies innovation will become more important than ever as a means of enabling plants worldwide to realize flexible and lean operations.

Avoiding Sales Losses through Link Production

Toyota prepares production plans based on medium-to-long-term demand projections. However, changes in macroeconomic factors, such as the fluctuations of crude oil prices or currency exchange rates, can very quickly affect demand for automobiles. Our production engineering and production divisions are expanding the "global link production system" to reduce sales losses due to such demand fluctuations. Our mission is to construct a "global link production system" that maximizes vehicle output and earnings while getting the most out of existing resources and working hard to curb new investment.

Without a doubt, link production is making a significant contribution to Toyota's progress. Demand for small, fuel-efficient models, such as the Corolla and Yaris, has increased rapidly around the world, spurred by recent hikes in crude oil prices. Thanks to an effectively functioning "global link production system," we have maintained a timely supply of these vehicles and avoided losing sales opportunities.

Norifumi Miura
Project General Manager
Strategic Planning Group
Global Strategic Production
Planning Division

Yaris

Production line of Hilux VIGO, IMV series

Innovating Next-Generation Production Engineering Technologies

Innovation Challenges:

Toyota's multifaceted production engineering technologies innovation has three main challenges:

- **Increasing the flexibility of production lines,**
- **Developing simple and streamlined production methods and equipment, and**
- **Ensuring high quality through production processes.**

Our production-related divisions must tackle these perennial challenges to maintain global competitiveness. We must be able to adjust to changing production needs while constantly setting new targets and working toward them through production engineering technologies innovation. Finding new solutions is particularly important today, with operations expanding rapidly worldwide and a series of new manufacturing companies coming on stream.

Real Production Efficiency:

In theory, a production line continually manufacturing a large volume of the same model would achieve the highest production efficiency. However, even though such a rigid production line is very efficient when operating at full capacity, if sales of the model decline the line's operating rate would be down. And, it would not be easy to change the production line over to another model.

On the other hand, a single production line with the flexibility to build several models simultaneously improves a plant's ability to adapt to a range of different production needs. Such production lines make it easier to adjust production plans to sales trends. They also maintain high plant capacity utilization because changing or adding models requires minimal time and labor.

Global Body Line Innovation:

Toyota has developed production lines that can manufacture multiple models more efficiently amid diversifying demand and shortened delivery times in the world's automotive markets. The Global Body Line (GBL) is an example of these efforts.

Toyota has been introducing its groundbreaking body-welding line, GBL, at plants in Japan and overseas since 1996. As a result, GBL is now the mainstay body-welding line in operations worldwide. Typically, between 4,000 and 5,000 spot welds and a variety of processes are needed to assemble the body of a car from roughly 300 stamped parts. At this stage, accuracy is critical. Because a car's body is critical to vehicle design, riding comfort, and driving performance, welding processes must have assembly accuracy within one millimeter of product drawings. To achieve the required accuracy in body assembly, devices called jigs hold stamped parts in position to be welded together. GBL significantly improves production efficiency through an innovative jig mechanism. Not only that, GBL adapts easily to large or small production volumes.

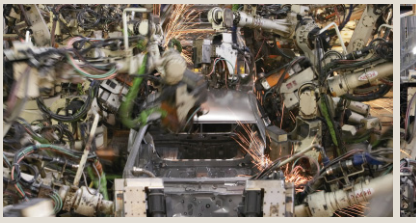
GBL's predecessor, the Flexible Body Line system, positioned jigs on the outside of the car body and circulated jig pallets. As a result, a production

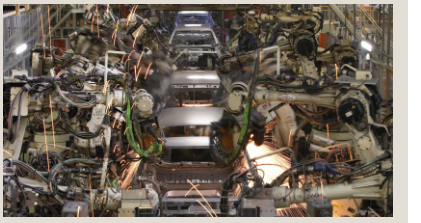
Evolving GBL

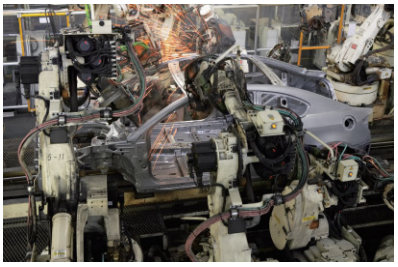
In 1985, Toyota developed the Flexible Body Line (FBL), which radically reduced jig replacement work arising from model changeovers and allowed the mixed production of four or five models. In 1996, pursuing a revolutionary new concept, we developed the Global Body Line (GBL) that added to the merits of FBL the ability to handle an even more flexible mix of models. We introduced GBL in almost all of our plants because it can adapt to a range of production volumes—from high-volume production lines at plants in Japan, North America, and Europe to low-volume production lines at plants in such countries as Vietnam and the Philippines.

The introduction of GBL has drastically increased the efficiency of body-welding processes. Compared with FBL, GBL has reduced costs for model changeover and addition by 70% while cutting initial investment costs, floor space, maintenance costs, and CO_2 emissions in half. In addition, GBL can produce up to eight models simultaneously. Aiming to further evolve GBL, we are developing a next-generation body-welding line at our Takaoka plant.

Akitoshi Ichino
General Manager
Project Planning Department
Body Assembly Engineering Division







GBL, the innovative body-welding line

line with a monthly output of 20,000 vehicles needed 50 jigs and jig conveyors. GBL, on the other hand, innovatively positions jigs on the inside of the car body and only requires one jig, drastically reducing capital investment. Another major advantage of GBL is that we can introduce it at plants with small production volumes. GBL enables easy access for welding from the outside by placing the jig inside the car body. This radically improves the workability of the manual welding process and parts setting that are used by some smaller plants.

Length of Production Lines Halved by the Set Parts System:

Innovation in production engineering technologies is also transforming assembly processes for attaching interior and exterior parts and power train components, such as engines, to painted car bodies. One example of production innovation on assembly lines in recent years is the Set Parts System (SPS).

On assembly lines, operators set thousands of parts to each car body on a conveyor. It is important to create conditions that are easy to work in, as manual operation plays such a central role in those processes. SPS is innovative because it does away with the assembly lines' parts racks and greatly improves operators' work environment and efficiency. Traditionally, the interior and exterior parts assembled to car bodies were kept on racks alongside the production lines. This meant that operators had to go over to the racks and select a part each time they needed one. Under SPS, we moved the assembly parts to a separate area, put all of the parts needed for each vehicle in work boxes in advance, and placed the boxes with the vehicles on the assembly line.

As a result, operators no longer have to go all the way over to parts racks to choose and collect parts. Instead, they can concentrate on assembly. Furthermore, by getting rid of parts racks, SPS has shortened production lines by more than half while substantially improving operational efficiency and production lead times. We are constantly evolving such production systems and introducing them at plants worldwide.

Simplified and Slim Production Equipment:

One of Toyota's basic approaches to manufacturing is to look for straightforward manufacturing methods that use simplified and slim production equipment. Such methods benefit many different aspects of our operations, including production efficiency, space efficiency, initial investment, quality, ease of maintenance, new plant start-ups, human resources development, and workplace environments.

If production equipment becomes smaller, it needs less space and the transportation distance between equipment is shortened. This reduces the overall length of production lines and production lead times. Additionally, slim production equipment enables the use of smaller plants, which dramatically improves production and investment efficiency. Moreover, simplified equipment means less complex

Production line without parts racks thanks to SPS

manufacturing, making learning new skills and maintenance easier, thereby improving quality. This strategy is not difficult to explain, but putting it into practice requires considerable technological innovation. And in such efforts to simplify, we have set the bar high for ourselves.

Original Ideas:

We think out of the box to develop easy-to-use and slim production equipment. One example is the injection molding machines that make bumpers and other plastic parts. Based on previous thinking and production methods, molding dies had to be very large because several thousands of tons of pressure were applied when plastic was injected into molding dies. Maintenance was also challenging; operators had to wear safety ropes and climb the machines to maintain them.

Approaching the problem from a different angle, we saw that by greatly reducing the pressure used to inject the plastic we would be able to downsize the molding dies. Of course, to realize that idea we had to overcome a large number of technical hurdles. As a result of those efforts, today we have reduced the volume of bumper plastic injection molding machines by half, the volume of stamping dies by two-thirds, and die clamping force by three-fourths.

Clearly, such innovations in production engineering technologies are realizing enormous benefits. They not only strengthen the competitiveness of existing plants but also accelerate Toyota's global development by significantly reducing the labor and cost needed to start up new plants. Traditionally, it took nearly three months for production lines at overseas plants to become fully operational after start-up. Now, it takes about three weeks. In addition, initial costs for the construction of new plants have been cut roughly in half.

Quality Assurance Systems:
Improving quality is a major focus of our production-related divisions' technology innovation efforts. Quality is Toyota's lifeline. The number one reason customers choose Toyota vehicles is for their high quality. We are moving forward with strong efforts to maintain product quality as the structure and performance of vehicles become increasingly complex and advanced and as overseas production increases rapidly.

To ensure high quality, it is important to examine designs meticulously to develop manufacturing processes and equipment that meet the required quality standards. Accordingly, Toyota's production engineering experts are involved from the early stages of design and prototype development to create designs that enable easy quality assurance and manufacturing. Under this system, the advice those experts provide helps employees from various production-related divisions understand the quality standards they have to meet and reflect them in production processes and equipment.

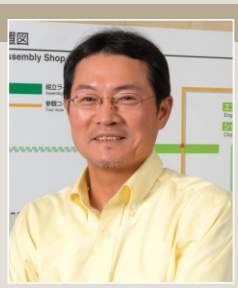
Built-in Quality:
We have long believed in building quality into products in the production process. By this we mean that, rather than inspectors ensuring quality, each operator and piece of equipment ensures quality so that defective products are never passed on to the next process. Therefore, operators can stop the production line to avoid forwarding defective products on to the next process if they discover a defect or something unusual. We are strict about ensuring quality on the spot and then sending the product to the next process as opposed to making a lot of defective products and then repairing them.

A recent initiative is the stepped-up introduction of in-line measurement. This involves continuously measuring the precision of products in respective processes and controlling process trends based on statistics derived from the accumulated data. We can anticipate defective parts and always keep production equipment in operating status by monitoring product-precision trends that are approaching threshold values. In addition to helping us anticipate the occurrence of defective parts, understanding trend figures enables us to deal with single items rather than lot units if a defect arises. This initiative is a typical example

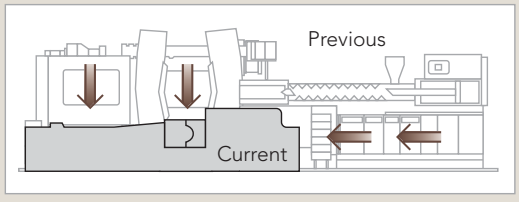
Simpler, Streamlined Production Equipment

How far can production equipment be streamlined and simplified? Toyota's in-house development and innovation of original production engineering is constantly testing established ideas and preconceptions. For example, our production robots can operate in small spaces that people cannot get into, allowing us to drastically shorten assembly lines. Changing over to robots has also enabled the development of a conveyor system that is less than one-tenth of the weight and length of the previous system, which weighed tens of tons and was several dozen meters long. In addition, we have fundamentally reviewed the processes of such processing machines as stamping machines, molding presses, and casting machines to create significantly simplified and downsized equipment that suits part sizes.

No longer limited to production engineering, streamlining and simplification are becoming a theme in the innovation of production control systems. For example, we are changing "Andon" from letters to graphic symbols. Coupled with simpler, slimmer equipment, such innovations enable anyone anywhere to use and maintain equipment and systems—making a major contribution to our current efforts to rapidly develop operations globally.



Hisanori Nakamura
General Manager
Production Process Engineering
Innovation Division



Downsized injection molding machine for bumpers

Andon

In-line measurement process

of how we build quality in production processes.

Advancing the Self-Reliance of Overseas Manufacturing Companies

Self-Reliance Promotion:

Toyota is establishing self-reliant overseas operations to maintain a timely, lower-cost, and stabler supply of quality cars around the world. Overseas production is on the brink of surpassing domestic vehicle production. Therefore, we are moving from the traditional system whereby mother plants in Japan provided comprehensive support to new overseas plants toward a network of global collaborations.

In particular, we have focused efforts on prompt human resources development. We have implemented a variety of measures to ensure that locally employed personnel acquire skills and contribute to operations as soon as possible. We are also pursuing innovations to make it easier for new plants to start up and become independent. In production engineering, those innovations include efforts on a worldwide scale to simplify and standardize production equipment and systems. In addition, we are implementing a variety of other support programs designed to help overseas manufacturing companies become self-reliant.

Controlling Processes through In-Line Measurement

In addition to rejecting defective parts, a distinctive feature of in-line measurement is that it enables process control to stop the occurrence of defective parts in the first place. Previously, we measured the precision of vehicle bodies, an assembly line end item. Now, we can build in high quality at each stage of the process by also measuring the precision of the vehicle at several points along the way.

In addition, by monitoring trend figures in daily production, we can quickly see which process is developing an irregularity. We can then prevent the occurrence of defective parts by making adjustments before the process reaches its threshold value. Also, if a defect occurs, we can use the accumulated data from upstream and downstream processes to analyze and identify the cause of the problem. Currently, we are introducing the in-line measurement system at overseas plants in stages.

Tetsuaki Yoshikawa
General Manager
Engineering Service Department
Tsutsumi Plant Body Manufacturing Division

In-line measurement

In-line measurement (measurement using infrared laser)

Personnel Training at GPC:

Before locally employed personnel begin working on production lines, they undergo rigorous skills training. Toyota has inculcated the standard works that form the foundation of the "Toyota Production System" at its plants around the world. Personnel must acquire skills to follow those standard works correctly. We established the Global Production Center (GPC) in July 2003 to improve the efficiency and speed of such skills acquisition. GPC is located in the Motomachi plant in Japan. Here, skilled technical personnel from plants in Japan develop and use teaching methods that incorporate technical training devices as well as manuals that include animation and other visual aids. GPC has cut the time required for skills acquisition by more than half thanks to the use of standardized intensive training methods.

More than 10,000 personnel have graduated from GPC in the four years since its establishment. In addition to Japan, we are developing GPCs in North America, the United States; Europe, the United Kingdom; and Asia-Oceania, Thailand. These new facilities are implementing parallel, large-scale skills-training efforts around the world. This marks a transition from the previous phase in which Japanese trainers taught overseas personnel to a new phase in which local trainers pass on their skills to local personnel as well as personnel from other countries.

Shop-Based Support System:

Toyota undertakes shop-based activities to improve specific production processes in order to standardize and disseminate constantly evolving production engineering and techniques around the world. Until now, mother plants in Japan have mainly shouldered technical support for overseas plants. However, problems with this approach have emerged with the introduction of new technologies and the increasing production of models sold only in local markets.

To rectify this, we created a system that staff members of each shop from domestic plants and production engineering departments use to identify the best-practice or global best processes. This system cross-sectionally links the staff at stamping shops, paint shops, and other shops. Grouped by shop, staff members gather and share information on transferring technology to overseas plants and on human resources development as well as consider concrete ways of achieving these tasks.

Overview of Shop-Based Activities Advancing activities for separate production-process shops

	Stamping-based activities	Painting-based activities	Assembly-based activities	.....
Motomachi Plant	Stamping staff	Painting staff	Assembly staff	
Takaoka Plant	Stamping staff	Painting staff	Assembly staff	
Tsutsumi Plant	Stamping staff	Painting staff	Assembly staff	
⋮	⋮	⋮	⋮	
Production Engineering	Stamping staff	Painting staff	Assembly staff	

The support provided to overseas plants lost uniformity because mother plants in Japan have long traditions and have evolved their own unique manufacturing styles. Therefore, we prepared basic plant requirements, which summarize the common elements of plants' approaches, as a standardized tool to help overseas manufacturing companies learn and become self-reliant. Such initiatives are forming a major part of Toyota's efforts to further the self-reliance of overseas manufacturing companies.

Global Human Resources Development:

Toyota's human resources development aimed at increasing the self-reliance of overseas manufacturing companies goes beyond skills training of key production personnel. Worldwide, we are also introducing a broad spectrum of programs for the medium-to-long-term training of production-related personnel.

For example, "Pro-Win" Professional-Will Interact Needs is a three-year program for developing professionals in production-related divisions. In addition, we implement personnel exchange programs that account for more than 250 trainees each year. The "OT-Clab" Overseas Trainee-Culture and Business initiative develops future production managers by sending young employees from Japan to overseas production bases as trainees. In the opposite direction, employees from overseas manufacturing companies come to Japan for a limited period under the "ICT" Intra-Company Transferee program.

Progress toward Self-Reliance:

The multifaceted initiatives that we pursued to increase the self-reliance of overseas manufacturing companies are steadily showing results. One example is the production of the Camry

Global Production Centers Overseas

In March 2006, the European Global Production Center (E-GPC) was established at Toyota's U.K. plant as a branch of the Global Production Center (GPC) in Japan. At E-GPC, our job is to develop trainers that will work in the production-related divisions of Toyota's European plants. I went to GPC to learn how to become a trainer in February 2004. Using that experience, I now teach trainers in Europe.

E-GPC serves plants in the United Kingdom, France, Turkey, Poland, Portugal, the Czech Republic, South Africa, and Russia. Although certain difficulties arise because trainees come from countries with different languages, customs, and cultures, that makes my job even more rewarding. On average, trainees come here for one week. Then, they return to their plants and use the know-how and skills gained at E-GPC to train their team members. In addition, we plan to have trainers come from plants around Europe to teach at E-GPC.

Richard Finchett
Senior Manager
European Global Production Center

at the Kentucky plant. For a previous model change, the mother plant, Tsutsumi, sent more than 1,000 support personnel per month to Kentucky. Also, we had to shut down the production line for almost a month. Last year's changeover to the new model Camry was a big improvement. The mother plant, Tsutsumi, did not send any support personnel, and the shutdown period was cut in half.

Additionally, we regard the recent start-ups of new plants in Texas and Mexico as models for establishing self-reliant North American manufacturing companies that do not need mother plants in Japan. Both plants achieved trouble-free start-ups through local support from their respective mother plants in Kentucky and Indiana. We plan to replicate these successes at other overseas operations to increase the number of self-reliant manufacturing companies.

Toyota Hosts Global Production Strategy Summit

In April 2006, senior managers from manufacturing companies around the world gathered in Japan for Toyota's first Global Production Strategy Summit. At the summit, we presented our goal of increasing the self-reliance of production operations and asked participants to formulate plans to achieve that goal. Following that, we hosted a second summit in November 2006. At this summit, senior managers from manufacturing companies around the world debated issues and measures for achieving greater self-reliance based on the proposals from overseas manufacturing companies. From this, they issued the Five-Year Plan for Self-Reliance as a road map for measures going forward.

Further, in April 2007 managers debated more detailed measures for achieving self-reliance at a summit held in the United States for companies that coordinate manufacturing in respective regions. We plan to convene such summits regularly to encourage further brainstorming among the managers of respective companies and build momentum in the drive toward self-reliance.

Keiichi Kanda
General Manager
Operation Management Department
Global Strategic Production Planning Division

We believe that measures to strengthen the international competitiveness of production will become an even more important factor in maintaining our advantage in markets worldwide. Toyota will continue the timely supply of cars that customers love around the world through a combination of the basic manufacturing approach reflected in the "Toyota Production System," the constant innovation of production engineering technologies, and the passion that our members around the world invest in vehicle manufacturing.