

# I. Reinforcement of Global “Quality” Management

## Group-Wide Emphasis on Improving Quality

The business activities of the Toyota Industries Group have globalized rapidly in recent years. Given our management philosophy of “Quality First”, we attempt to devote our utmost efforts to the reinforcement of our global quality management systems to achieve uniformly high standards of quality in production in every area of the world in which we operate.

In June 2000, Toyota Industries acquired BT Industries, one of the world’s largest manufacturers of warehouse truck, as a subsidiary. BT Industries combined with Toyota Material Handling Company (a division of Toyota Industries Corporation), to form the Toyota Material Handling Group (TMHG). TMHG now does business in 80 countries throughout the world, producing 183,000 forklifts annually, and employs a total workforce of 15,000. In May 2004, in Toyota Industries’ first collaborative development project with BT Industries, we began to develop a forklift truck designed specifically for the European market.

In January 2006, the resulting new model was launched on the European market under the Toyota, BT and CESAB (a BT Industries subsidiary) brands. The next few pages will focus on the globalization of the materials handling equipment business, which is exemplified by this joint development project, and report on the current situation in quality management, as well as future challenges that will need to be addressed.



### Toyota Material Handling Company

The division of Toyota Industries Corporation responsible for the materials handling equipment business. In 2001, Toyota Motor Corporation’s industrial equipment sales division was transferred to Toyota Industries and added to the existing development and production divisions, thereby integrating manufacturing and sales operations. Toyota Material Handling Company is the world’s market leader in forklift sales.



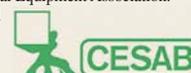
### BT Industries

A world leader in the manufacturer of warehouse truck for indoor use based in Sweden. BT Industries had a long history as a world leader in the forklift industry, even before becoming a subsidiary of Toyota Industries in 2000.



### CESAB

The Italian subsidiary of BT Industries, Cesab is one of Italy’s top manufacturers of industrial equipment, with a history spanning 64 years. The company’s president is a former Chairman of the European Industrial Equipment Association. Cesab specialises in the design and manufacture of electric forklifts.



## Italy, the Home of Design

Joint Development in Europe of New Forklift Model for Europe

### Drawing Effectively and Efficiently on the Resources of the Whole Toyota Industries Group

In May 2004, Toyota Industries and Cesab, BT Industries' Italian subsidiary, began the joint development of an electric three-wheel rear-drive forklift designed specifically for the European market. The aim of this project was to make effective use of the development resources of the two companies by building systems for joint development, rather than having the companies each develop different models for the same market. It was decided to base the development project at Cesab's facilities in Italy. Our goal was to take advantage of the global nature of the Toyota Material Handling Group, which has business premises located throughout the world, thereby enabling us to offer products that directly reflect the specific needs of users in each regional market. As a pioneer of this concept, it was decided that the development of a new model for sale in Europe should be carried out in Europe.

The electric three-wheel rear-drive forklift is a light-duty truck, suited to small-scale, indoor operations. It is very compact and has a small turning circle for handling relatively light cargos over short periods of time. Although not a major seller in Japan, demand for this kind of forklift is particularly high in Europe. As it is used primarily for light duties, this type of forklift must be easy to operate, even by inexperienced operators.

To satisfy these requirements, the joint Japanese and Italian development team set out to enhance the basic functions, such as driving, loading and steering, while at the same time developing an ease of maneuverability that would allow operators to become accustomed to its operation from the very first time they board it. It was also important to project an image of "compactness" and "ease of handling", even for novice operators. Another requirement was to maintain consistency with the the respective existing models of three brands that it was to be sold under—Toyota, BT and Cesab—including external appearance and operating system design. It was decided, therefore, to take advantage of the unique design strengths that Cesab has cultivated in Italy, the home of design.

### Fusion of the Contrasting Development Styles of Japan and Italy

When development began, the thing that most surprised the Japanese members of the development team was the speed with which the Italians worked. As soon as the plan for the basic performance and external design had been completed, the Italians immediately started to work on building a prototype. There were times when Italian development style (which emphasized speed) conflicted with the Japanese development (*monozukuri*) style (which emphasized through consideration at a slower pace). While the

Italian members of the team considered numerous aspects of the design and production simultaneously, the Japanese members of the team considered each aspect independently before "building up" the design. In a fusion of these contrasting styles of "creation", the project steadily moved forward and the resulting design was graceful and streamlined and functional as well.

### Creating a Workplace Dedicated to Maintaining Quality

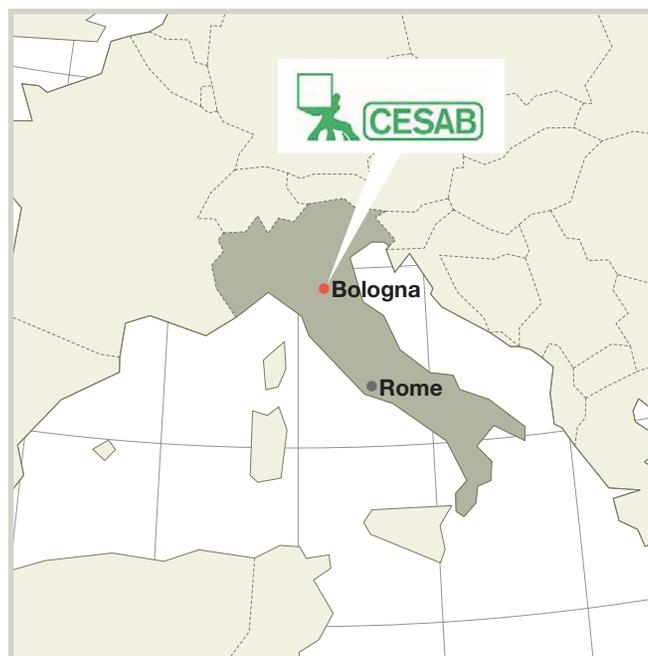
Forging Mutual Understanding in the Pursuit of Process Management, Quality Management and Quality Improvement Activities

### Meeting the High Quality Standards of TMHG

Cesab is one of Italy's leading forklift manufacturers, with a workforce of 500 and an annual output of about 6,900 vehicles in fiscal year 2006. Enthusiastic about the introduction of new technologies, its firmly-established reputation for the manufacture of electric forklifts with an emphasis on quality was well-known to Toyota Industries even before the acquisition of BT Industries. Its TG (toll-gate) System, in which quality is checked at critical points along the manufacturing line, called toll-gates, is an example of Cesab's unique quality management system.

Since the acquisition of BT Industries also made Cesab a part of the Toyota Industries Group, Cesab has enthusiastically embraced the quality management know-how of Toyota Industries. Cesab has sent engineers from its manufacturing division to Japan to learn about the Toyota Production System (TPS), pursued the *mieruka*\*

\* *Mieruka*: Bringing an issue out into the open and putting it into a form that all related parties can clearly see and comprehend.

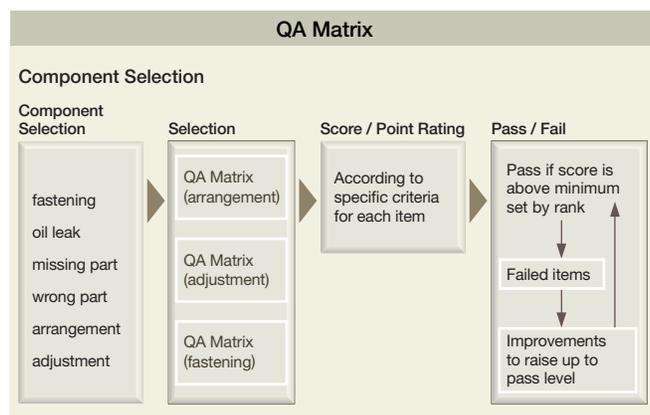


concept and voluntarily created *kaizen* case study maps and a *Kaizen* Room. Because Cesab has implemented these techniques and improved its manufacturing processes, Toyota and Cesab can prioritize making improvements in the dual areas of design and production process planning.

In terms of design, for example, the Japanese engineers were closely involved in the design drawing stages for the frame structure, and the reliability and durability testing of hydraulics and electronic components. In terms of production process planning, Toyota's engineers used a method called the QA Matrix\* to check Cesab's plans, verifying the necessary checkpoints. In this way, we were assured that Cesab met the extremely high standards expected by the Toyota Material Handling Group.

Drawing on their own system of production planning, Cesab, meanwhile, started to develop concepts for production preparation from the design stage and was able to solve potential problems in the production stage from the product design stage.

\* QA (Quality Assurance) Matrix: Potential defect events at each process phase are organised into a table or matrix and analysed for their correlation to the 4M (man, machine, material and method) elements.



## Promoting Mutual Understanding of the Common Foundation of Toyotaism

The engineers from Toyota and Cesab possessed a wealth of experience in the development of forklifts, so there were no concerns in that regard. There were significant differences, however, between their preparation of development frameworks and work processes. A major challenge at the beginning of the project, therefore, was for the engineers to find a common foundation from which they could come to understand each other and work towards quality improvements.

This cross-cultural communication challenge was greatly facilitated by the Toyota principle of *genchi-genbutsu*, which means actually going to see for oneself the situation at the workplace, no matter what the problem. This "Toyotaism" went a long way to bridging the gap between the engineers at each of Toyota and Cesab.

The Toyota staff travelled to Cesab's manufacturing plants to actually check the products themselves, providing comprehensive support and working with the Cesab staff until the products were

acceptable to the entire team. The Cesab engineers involved in the inspection process were in turn invited to Japan for education, in Toyota's methodology and processes. This concept of *genchi-genbutsu* was a major factor in the successful collaboration between our two companies.

## Cooperation with Local Parts Manufacturers

Improving Quality and Protecting the Environment

### Meeting the High Quality Standards of TMHG

Northern Italy, where Cesab's manufacturing operations are based, has a long established manufacturing industry. It also has a broad support base of parts manufacturers, whose quality and technological capabilities are held in high regard in Italy and other countries. By selecting parts suppliers that excel in quality, price and delivery times, Cesab strives to improve quality and reduce costs.

During the development process for the new forklift model, component prices were checked to verify whether they would be reasonable in Italy and from a global perspective. As part of this process, the development team conducted simulations, including using drawings to determine how much parts would cost if they were to be procured in Japan as opposed to Italy. In this way, the production team was able to procure components at appropriate price levels.

Cesab obtained ISO 14001 (the international standard for environmental management systems) certification in May 2006. Cesab also requires its parts suppliers to prohibit, reduce and monitor the use of substances of environmental concern in their products and manufacturing processes.

## Development based on Integrated Manufacturing and Marketing Processes

Utilizing the Unique Characteristics of Each Brand across the European Market

### Integrating Manufacturing and Marketing to Ensure Customers of Each Brand are Satisfied

By making the integration of manufacturing and marketing processes a key element of the development project, the new model meets the needs of the respective customers of our three different brands. The new forklift will be launched under the three brands throughout the European market. The Toyota brand will cover the whole of Europe, Cesab will supply the Italian market, and BT will supply the rest of Europe, excluding Italy. Although they share a common platform, the development team canvassed the views of the respective marketing divisions of the three companies and created designs for

each brand that inherited their respective brand images. Forklifts marketed under the Toyota brand also have an added extra, not included in the other two brands—a unique safety system called the “SAS Function”.

Toyota Industrial Equipment Europe, a subsidiary of Toyota Industries that has overall control of forklift sales in Europe, conducted workshops at the major sales centres of each brand to establish a target market for the new model in terms of priority regions, target customer groups, sales prices and other factors. It then drew up marketing plans based on the responses received.

Because Cesab had not previously supplied products for the Toyota brand, there were many aspects in which obtaining a mutual understanding of each other’s systems was a major challenge, including in the areas of sales, logistics and services, and in particular in after-sales service. To deal with this problem, the Toyota team produced documentation that presented the work flow which was used as a sounding board to find out the views of the Cesab team, and from this, a work collaboration flow was born.

This development based on the integration of manufacturing and marketing resulted in the birth of a new model that meets the needs of the respective customers of all three brands, and in the creation of efficient marketing systems. As a result, since its launch in January 2006, the new model has been very favourably received by many customers and dealers. Annual sales of 2,500 units—far in excess of initial projections—are now anticipated by us, and work is underway which is expected to increase production capacity.

## Making the Most of the Fruits of Joint Development

Promoting Creative Collaboration to Achieve a Common Platform for the Next-Generation Model

### Importance of Showing Mutual Respect

This joint Japan-Italy development project was our first attempt at making effective use of development resources by developing a common platform for the basic elements of a new model, while also offering extensive differentiation between the Toyota, BT and Cesab brands. It was therefore necessary to spend a great deal of time setting up the best development environment, unity of intentions and sharing of information. As the differing approaches to production held by different regions and companies fused together, however, a process of creative collaboration was successfully forged. Rather than each of the three companies developing their own new model, the same result was achieved using far less resources. It also proved the remarkable effectiveness of using a European base, which has daily access to the needs of customers and trends in the market, to develop a new model specifically for the European market.

One of TMHG’s slogans is “respect”. This development project showed clearly the importance of an attitude of respect (a willingness



to learn from others) for each other’s experience, opinions and sensibilities.

### Maximizing the Integrated Strengths of the Group

The Toyota Industries Group has many subsidiaries that possess superior products and technologies that should be shared with the world.

For example, the Raymond Corporation, the American subsidiary of BT Industries, has been a pioneer in the development of products and technology that promote ergonomics and operator health and safety. In fiscal year 2006, in the forklift sector, BT Raymond developed a new mast for standup reach trucks that keeps the operator’s neck at a comfortable angle during operation. We believed that this new design is a major improvement in visibility and safety and reduces operator fatigue. In the development of the BT Reflex, as well, a new tilting cabin was developed in which the entire driver cab tilts back automatically as the forks are raised, reducing neck strain for the operator.

BT Industries has established a high standard of technology and expertise in the area of sales and service, and offers its customers professional services to minimize the downtime of their products after they are sold. One example of these services is the introduction of IT support, in which BT engineers use hand-held terminals to provide speedy support to customers in real time.

These are just a few examples of the outstanding products, technologies and services offered within the Toyota Industries Group, across the entire spectrum of our business, from development to sales. By sharing them across the entire group on a global scale, we expect the group to become even stronger. We believe that the key to such an endeavour will be active communication that transcends the barriers of culture and language between countries and companies.

The success of the Japan-Italy joint development project can be said to have provided the cornerstone for future large-scale collaborative developments. Through international joint projects such as this, the Toyota Industries Group will continue to strive to maximize the strength of the group by promoting creative collaborations on the basis of mutual respect.