**Sources of Strength**

**Motion Control Technology, Ability to Develop Applications and Technologies**

The compact and lightweight Precision Reduction Gear RV, which boasts excellent durability and high positioning accuracy, serves as the source of Nabtesco’s competitiveness. The high product performance is supported by the competencies the company has accumulated in responding to customer needs.

**Relations of Trust with Customers**

Nabtesco launched its first precision reduction gears on the market in 1986, and since then its global market share of precision reduction gears for industrial robots has grown to about 60%. Although the basic patents possessed by the company for the products expired in 2006, the high market share has been maintained as a result of conducting business with the greatest importance placed on customer satisfaction and building relations of trust with our customers.

**Stable Supply System**

In anticipation of a high demand for precision reduction gears, Nabtesco has increased the production capacity of its domestic plants and has launched new production sites in China to ensure the stability of its supply system. We have also been implementing measures for increasingly higher quality and faster delivery on a continual basis, and are able to make flexible responses to changes in demand, which adds another competitive edge to Nabtesco.

**Business Environment (Opportunities and Risks)**

According to the forecast made by the International Federation of Robotics, in the medium term, the global market of industrial robots (including small-, medium-, and large-sized robots) will grow at the annual rate of 15%. In particular, demand for small robots has recently increased in accordance with rising needs for automation around the world. This is in addition to the demand for medium to large robots, which has been robust for years. In light of the fact that the growth rate of the market for small robots is relatively high with demand beginning to increase, the annual growth rate of the market for medium and large robots is expected to be 6%. By region, the growth rate will be around 25% in China, where the need for unmanned, automated operations has seen a remarkable increase. Other than industrial robots, demand for machine tools is increasing both in Japan and overseas. Also, modularized products are in high demand particularly in Europe and China. We expect it will help promote the sales of our new-type actuators which integrates precision reduction gears and servomotors.
Gear Head Type “RD Series”
This is a gear head product based on the Precision Reduction Gear RV with the emphasis on ease of use. The product is easily installed on servomotors and features airtight grease sealing.

Measures for Medium- to Long-Term Growth
For the medium- to long-term growth of the company, we will further deepen relations of trust with our existing customers by responding to any new needs they have. At the same time, we will strive to find new customers, work for higher quality and faster delivery so that we will not miss any opportunities that come as a result of the increased demand for industrial robots. Moreover, we are enhancing our production capacity at our manufacturing facilities in Japan and building a new production base in China for the maintenance and improvement of our stable supply system. This is done to prepare for increasing demand on a medium- to long-term basis. Furthermore, in the fields other than industrial robots, we are going to utilize our long-established technological expertise to promote the sales of new products and to develop new markets.

Major customers
FANUC, YASKAWA Electric, Kawasaki Heavy Industries, KUKA Roboter, ABB Robotics and others

Production base (as of the end of December 2015)
Tsu City, Mie Prefecture, Japan / Jiangsu Prefecture, China

Market share
Joints of industrial robots: Approx. 60% global market share
Machine tools ATC (Automatic Tool Changer): Approx. 60% domestic market share

History of business development
In 1976, Teijin Seiki began selling reduction gear-equipped hydraulic motors for use in construction machineries. Subsequently, following the maturation of this market, the company began to focus its attention on industrial robots, which would provide a new growth market where the company could make use of its unique reduction gear technology. The company then proceeded with the development of reduction gears for robot joints and began selling precision reduction gears for industrial robots in 1986. We now have a 60% share of the world precision reduction gear market and our products are widely used in a range of fields in addition to industrial robots. In 2014, we achieved a cumulative production of 5 million units in the business. In 2015, we commenced building a new production base for precision reduction gears in China, which now offers the world’s largest industrial robot market. This base will start production at the beginning of 2016.

1986 Commenced launch of the Precision Reduction Gear RV Series.
1991 Built the Tsu Plant for the manufacture of precision reduction gears.
2014 Total cumulative production of precision reduction gears reached 5 million units.
2015 Began the construction of a production base in China (to start production in early 2016).
Growth Strategy by Business

New Energy Equipment Business

The renewable energy business is expected to demonstrate a long-term growth due to rising needs to secure energy sources and combat climate change. Leveraging our accumulated technologies and know-how in product development, we will strive to achieve sustainable growth.

Corporate Officer, General Manager, New Energy Business Development Division  
Toshiharu Hibino

Sources of Strength

(Drive units for wind turbines)
We have developed drive units for wind turbines based on our technology in precision reduction gears for industrial robots. The drive units are highly resistant to severe natural conditions, including low and high temperatures, and brine damage. In addition, as one of their strengths, they provide low-backlash performance, yet are compact and lightweight. Indeed, they embody the product development capabilities we have accumulated in the Precision Reduction Gear Business.

(Solar tracking equipment)
Making use of the high-precision, high-rigidity and high-efficiency precision reduction gear technology we have developed in the industrial robot field, we provide solar tracking equipment that resists exogenous impacts, consumes a minimum amount of electricity and is maintenance-free. These features lead to a lower lifecycle cost.

Business Environment (Opportunities and Risks)

(Drive units for wind turbines)
The main players of the wind turbines market are companies engaged in the heavy electric machinery industry, who deal with entire electric systems, as well as companies specializing in and leading the market in a highly competitive manner. In this market of technologically advanced products, we have a track record of supplying products to the main players. In Europe, demand for wind power generation equipment will expand due to the accelerated installation of offshore wind turbines, while in the United States and China, governments are fostering renewable energy promotion measures. Accordingly, we expect that we will be able to achieve steady growth in the business.

However, elimination and consolidation of wind turbine manufacturers, change in competition environment due to rising of manufacturers in emerging country and intensification of competition will pose risks for us.

(Solar tracking equipment)
The commercial operation of solar thermal power plants expected to fully begin in the middle of the 2020s, and there is also potential demand for special-purpose solar thermal power generation facilities at mines in Africa, South America and other regions. We are making efforts to grasp the sales opportunities provided by such demand.

On the other hand, we are preparing against possible risks that the use of renewable
energy will be discouraged due to a markdown of crude oil prices and that the number of orders we may receive will decrease due to the delayed launch of the precursory projects.

**Measures for Medium- to Long-Term Growth**

**(Drive units for wind turbines)**

For the wind power generation business, we will conduct marketing activities by making use of our technological strengths and sales network to find new customers and promote our sales.

**(Solar tracking equipment)**

As for solar tracking equipment, since its market has not yet established, we will continue our efforts to obtain new orders and expand the market mainly by using our product development ability and existing production facilities.

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**Major customers**

Drive units for wind turbines: Mitsubishi Heavy Industries, Hitachi and others  
Solar tracking equipment: Cobra Thermosolar Plants (Spain)

**Production bases (as of the end of December 2015)**

Drive units for wind turbines: Tarui-cho, Fuwa-gun, Gifu Prefecture, Japan  
Solar tracking equipment: Tsu City, Mie Prefecture, Japan

**History of business development**

To help meet expanding demand for renewable energy around the globe, Nabtesco began to develop products for the market. We carried out the first shipment of our Yaw drive units for wind turbines to an overseas leading wind turbine manufacturer in 2005, achieving a cumulative shipment of 10,000 units in 2008. Moreover, we began activities in the solar thermal power generation field in 2012 and secured an order for our solar tracking equipment for use in Concentrated Solar Power plants. Subsequently in 2013, we integrated the solar tracking equipment and drive units for wind turbines businesses into the New Energy Business Development Division. We will contribute to fostering the use of renewable energy through this business.

2005 Made the first shipment of Yaw drive units for wind turbines to an overseas leading wind turbine manufacturer.  
2012 Received the first order for solar tracking equipment for use at Concentrated Solar Power plants.  
2013 Launched the New Energy Business Development Division by integrating the solar tracking equipment and the drive units for the wind turbines businesses.
Sources of Strength

Since receiving the first order for our air brake equipment from the former Japanese Ministry of Railways in 1925, we have been accumulating technologies through the provision of highly reliable brake systems, and have contributed to, for example, space-saving by developing brake units comprising multiple brake mechanisms. Railroad vehicle equipment, making the foundation of social infrastructure, needs to be highly reliable and safe. We have long been working to increase customer satisfaction and build relations of trust with our customers. This is our strength and derives our ability to provide customers with MRO (maintenance, repair and overhaul) services continuously.

Business Environment (Opportunities and Risks)

In the Japanese market, we expect that demand will continue to be stable mainly due to the need to replace old railroad vehicles with newer models. In China, demand in the high speed train market is expected to stabilize as the market matures, while demand in the subway train market will continue to expand due to the need to improve convenience in people’s daily lives and for mitigation of environmental pollution. If a technology development of high-speed trains progresses in China, however, it will pose a risk to us. In Europe, we expect that demand will continue to grow steadily, while in the Southeast Asian market, Japanese railroad vehicle manufacturers will bolster their activities to obtain more orders, which will provide us with new business opportunities.

Market Size of Railroad Industry (by Region)

We will contribute to building safer and more convenient railroad transportation through provision of highly reliable brake control and door operating systems. These are the core components of railroad vehicles that require high safety. We will also pursue sustainable growth by proactively conducting business not only in Japan but also in overseas railroad vehicle markets.

Managing Executive Officer, President, Railroad Products Company

Yukihiro Imuta

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Market Size of Railroad Industry (by Region)
Measures for Medium- to Long-Term Growth

In order to conduct business in an effective and efficient manner in highly promising markets identified around the world, we will expand our business system in an all-encompassing manner, fostering the optimization of our development, procurement and production activities in the three regions of Japan, China and Europe. Particularly in Europe, which provides the world’s largest railroad market, we will work to obtain new orders through our local bases, aiming to expand the business in the region during the period of the next Medium-term Management Plan.

We will also promote sales of products targeting subway trains in China by making use of our local sales network as well as results and technologies accumulated in Japan. We will also continue focusing on increasing further customer satisfaction and expand the MRO business both in Japan and China based on our relations of trust with our customers. Moreover, in the second-hand vehicle market in Southeast Asia, we will continue our efforts to secure more orders in the MRO business.

FACT SHEET

Major customers
Japan Railway URI companies, private railway companies, Kawasaki Heavy Industries, Hitachi, Ltd., railway related companies in China and others

Production bases (as of the end of December 2015)
Kobe City, Hyogo Prefecture, Japan / Jiangsu Prefecture, China / Torino, Italy

Market share

<table>
<thead>
<tr>
<th>Product Line</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake systems</td>
<td>Approx. 50% domestic market share</td>
</tr>
<tr>
<td>Door opening systems</td>
<td>Approx. 70% domestic market share</td>
</tr>
</tbody>
</table>

History of business development

In 1925, we received an order for its air brake systems from the Ministry of Railways, and this marked the beginning of our Railroad Vehicle Equipment Business.

In the 1960s, Shinkansen bullet trains began running in time for the Olympic Games in Tokyo, and the urban railway networks were increasingly improved for transportation at higher speeds and in greater quantity. In response, we developed highly reliable automatic train control systems to ensure safety even during high-speed operations, as well as electric command air brake systems. We continued to expand the business as subway systems were successively constructed to mitigate traffic congestion in urban areas.

We also changed our business model from the development of hardware products to making proposals to individual customers in order to expand our business.

In and after the 2000s, we expanded our market share in Chinese and Taiwanese high speed train and subway businesses. Further, in 2013, we acquired an Italian railroad vehicle door manufacturer (presently Nabtesco Oclap S.r.l) to spearhead business in Europe and around the globe.

1925  Received the first order for air brake equipment from the former Japanese Ministry of Railways.
1998  Relocated and opened the Kobe Plant for the manufacture of railroad vehicle equipment.
2011  Established Jiangsu Nabtesco KTK Railroad Products Co., Ltd.
2013  Acquired OCLAP, an Italian railroad equipment manufacturer, and established Nabtesco Oclap S.r.l. Received an order for pneumatic door systems for train cars under the Intercity Express Programme (IEP) implemented in the United Kingdom.
2014  Became the first Japanese company to be certified as a global supplier of doors for train driving cabs and cars by Bombardier Transportation.
2015  Received an order for passenger doors for the Rennes subway line in France from Siemens AG.

Brake Operating Units for Railroad Vehicles

This system is configured as a unit with a brake operating device that plays the core role in the electric commanding air brake system and the air brake valves that provide the brake cylinder pressure output for service and emergency braking.

Door Operators for Railroad Vehicles

Offering a tremendous variety of door operating units, our product lineups comprises door operators that meet the demands of a wide diversity of applications from high-speed trains including the Shinkansen to commuter trains and ultra-low-floor light rail vehicles (LRTs).
Growth Strategy by Business

Nabtesco, as Japan’s top air brake system manufacturer for commercial vehicles, contributes to safe and environmentally sound transportation systems. We continue to further enhance our competitiveness by entering the global market with leveraged production bases in Japan, Europe and Asia, as well as expanded product lines.

Tomoyuki Horiguchi
President, Nabtesco Automotive Corporation

Sources of Strength

The technologies and brand power developed to meet demand for high quality products by Japanese automakers are Nabtesco’s strengths. Nabtesco became the first company to develop an air dryer in Japan, and our air dryers, which are highly safe and environment-friendly, are now one of the best known products in our Commercial Vehicle Equipment Business. We conduct business globally by making use of our production bases outside of Japan, and that is also a source of our strength.

Business Environment (Opportunities and Risks)

In Japan, the volume of freight movement is increasing, driven by the government’s economic measures and growing e-commerce business. In addition, the environmental law enforced ten years ago stimulated a replacement cycle for trucks. This cycle has supported and will likely support the continuous and steady demand for new trucks. In emerging countries, the demand is anticipated to grow by around 5% annually over the medium-term. Nonetheless, in ASEAN market where Japanese truck manufacturers hold a large share, the price competition between European automakers and those of emerging countries is intensifying and considered a risk that can affect the Group.

Measures for Medium- to Long-Term Growth

By creating added value and enhancing the quality management system for higher competitiveness, we will continuously seek to increase customer satisfaction, thereby maintaining our share in the Japanese market. Also, we will make more use of our bases in Japan and overseas, and foster local procurement with an eye to securing all opportunities provided by robust demand in the highly promising ASEAN market, while also receiving more orders in India through proactive marketing activities.

Furthermore, through acquisition of European compressor makers, we aim to not only achieve early commercialization of a high value-added system by combining an air dryer and compressor, both of which are our most popular products, but also generate sales synergy as we build stronger customer relationships in Europe.

Main Products

Air Dryers for Commercial Vehicles

This product removes any water or oil in the compressed air to increase the durability and reliability of air control systems. It is used by major Japanese heavy-duty truck manufacturers.
**Fact Sheet**

**Major customers**
Hino Motors, Mitsubishi Fuso Truck and Bus, Isuzu Motors, UD Trucks, Nissan Motor and others

**Production bases (as of the end of June 2015)**
Murayama City, Yamagata Prefecture, Japan / Samutprakarn, Thailand / Haryana, India / Saxony, Germany

**Market share**
Wedge brake chambers for commercial vehicles: Chambers: Approx. 70% domestic market share
Air dryers for commercial vehicles: Approx. 85% domestic market share

**History of business development**
Nippon Air Brake became the first company to manufacture and sell automobile oil brakes in Japan in 1933. Subsequently, it also succeeded in producing commercial vehicle air brake systems in Japan and continued to develop safety-related technologies and peripheral devices, further expanding its business in line with the development of the automobile industry.

In 1972, the company became the first to succeed in the development of air dryers for commercial vehicles in Japan. The air dryers contributed to solving various problems, such as the rusting and freezing-up of valves, by removing water contained in air brake systems.

We established a new production base in Thailand in 2004 and spun off the growing Commercial Vehicle Equipment Business from Nabtesco Corporation, founding Nabtesco Automotive Corporation in 2009. Then, in 2013, we established Minda Nabtesco Private Limited in India as a joint venture to conduct business in the local truck market. We are thus further expanding our target market for this business.

- **1933** Became the first company to manufacture and sell oil brakes for commercial vehicles in Japan.
- **1937** Began manufacturing and selling air brake systems for commercial vehicles for the first time in Japan.
- **1972** Became the first company to succeed in developing air dryers for commercial vehicles in Japan.
- **1991** Opened the Yamagata Plant for the manufacture of commercial vehicle equipment.
- **2004** Established a joint venture to manufacture and sell automobile components (Nabtesco Automotive Products (Thailand) Co., Ltd).
- **2009** Began operations as Nabtesco Automotive Corporation.
- **2013** Established a joint venture to manufacture and sell commercial vehicle equipment in India (Minda Nabtesco Automotive Private Limited).
- **2016** Acquired a German air compressor maker and founded “Nabtesco ITG GmbH.”

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**Wedge Brake Chambers for Commercial Vehicles**
This product is mounted on the wheels of heavy-duty trucks; it uses air pressure to push the piston to apply the brakes.

**Hydraulic Clutch Master Cylinders for Passenger Vehicles**
This product converts the clutch force from the clutch pedal of manual-transmission vehicles into hydraulic pressure and transmits the pressure to the clutch system. It is supplied to automotive manufacturers nationwide.

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WEB
Commercial Vehicle Equipment
Growth Strategy by Business

Marine Vessel Equipment Business

By upgrading and expanding product lines compatible with an electronically controlled diesel engine that contributes to lowering of environmental load, in addition to service support systems, we plan to assure we incorporate demand.

We are preparing to meet anticipated demand by expanding the product lines and service support for marine vessel engine control systems and electronically controlled diesel engines, which contribute to lowering environmental impacts.

Managing Executive Officer, President, Marine Control Systems Company

Taizo Tsuri

Sources of Strength

We are developing products to create new value, environmentally conscious products. In addition to conventional products, we have included new product in our product lines corresponding electronic engines for large-sized marine vessels in response to the enhancement of environmental regulations. This provides us with strength in the market. Moreover, we are implementing a substantial around-the-clock service support system, making use of our bases in Japan, Singapore, the Netherlands, China and South Korea.

Business Environment (Opportunities and Risks)

The mainstream of engines for large marine vessels has been rapidly shifting to electronic products at a pace that has exceeded our expectations, and in our strategy for the business, we will focus on obtaining more orders as demand for electronic engine control devices increases. Although the Marine Vessel Equipment Business is cyclic and has a risk to be affected by economic changes, we believe expansion of the MRO business will bring stability to the business.

Global Production of 2-stroke Diesel Engines for Marine Vessels

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>1,600</td>
<td>1,800</td>
<td>2,000</td>
<td>2,200</td>
</tr>
</tbody>
</table>

Source: Nabtesco estimates

Main Engine Remote Control System (M-800-V)

This system enables the remote control of the diesel engine in a vessel from the ship’s bridge and/or control room, and has functions for outputting commands to control the engine speed (rpm) and for monitoring the engine status. Equipped with advanced network functions and a liquid crystal touch panel display, the system provides excellent operability and expandability.
We will respond flexibly to market needs and create new products to help customers solve their problems, focusing on demand for electronic devices. In addition, we will put the three-polar (Japan, China and South Korea) production system on track to make further improvements in QCD (quality, cost and delivery). Moreover, we will expand our service network to build up a system to provide services with additionally higher quality, thereby making proposals and satisfying customers’ potential needs for preventive equipment maintenance service.

**Measure for Medium- to Long-Term Growth**

**FACT SHEET**

**Major customers**
Kawasaki Heavy Industries, Mitsui Engineering & Shipbuilding, Mitsubishi Heavy Industries, Hitachi Zosen, Hyundai Heavy Industries (South Korea), Doosan Engine (South Korea), Shanghai Waigaoqiao Shipbuilding (China), Hudong Heavy Machinery (China), MAN Diesel (Denmark) and others

**Production bases (as of the end of December 2015)**
Kobe City, Hyogo Prefecture, Japan / Shanghai, China / Busan, South Korea

**Market share**
2-stroke main engine control systems: Approx.60% domestic market share  (Approx.40% world market share)

**History of business development**
Since it developed the pneumatic valve in 1943, NABCO had been improving its pneumatic control technology for industrial use, and manufactured remote control equipment consisting of a range of valves, such as starting air pipe control valves, to be used in diesel engines for power generators and marine vessels, as well as gas compressors for freezers.

Subsequently, NABCO had built the foundation for meeting the standards that had been set by the ship classification societies of each country, and developed a pneumatic remote control system for ship engines ahead of others in Japan in 1963. Within only eleven years following the end of the war, Japanese shipbuilders had ascended to the level of the world’s top producers in terms of the number of new ships built and further expanded their business, driven by increased international trade. Also, in response to accelerated automation of devices of marine vessels, NABCO had dramatically boosted its market share for pneumatic remote control system used in large marine vessel engines in Japan.

Around 1975, as needs for advanced control systems using electronic technologies began to increase, NABCO decided to develop mechatronics technologies as well. In 1983, it developed a microcomputer-based main engine remote control system, which was later standardized. In 1987 the company launched a microcomputer-based electronic governor and established the position as a top engine control system manufacturer.

In addition, aiming to enhance service by making proposals to customers on preventive maintenance, we are expanding our service network through establishing bases in the Netherlands and Singapore.

- **1950** Delivered gas compressors for freezers of marine vessels.
- **1963** Commenced manufacture and sales of marine vessel engine control equipment.
- **1983** Developed and commences sales of microcomputer controllers.
- **1986** Commenced sales of M-800-X, a mass production model of microcomputer controllers.
- **1987** Developed and commenced sales of microcomputer-based electronic governors.
- **1995** Established Nabmic B.V. in Netherlands.
- **1998** Established Nabtesco Marine Service Pte., Ltd. in Singapore.
- **2000** Established Nabtesco Marinetec Co., Ltd. in South Korea.
- **2008** Commenced manufacture and sales of hydraulic control valves for electronic controlled engines.
- **2013** Established production facilities (Nabtesco Marine Machinery [Shanghai] Co., Ltd.) in China.
- **2014** Decided to participate in the R&D network of Maritime Innovation Japan Corporation.
- **2016** Total cumulative delivery of marine vessel electronic governor systems reached 7,000 units.

**WEB**
Marine Vessel Equipment

**Electronically Controlled**
**High-Speed Hydraulic Valves**
Each Electronically Controlled diesel engine cylinder is equipped with one electronically controlled high-speed hydraulic valve, which electronically controls the timing and amount of fuel injection and the timing at which the exhaust valve opens and closes. The valve contributes to higher fuel economy and is attracting much attention as an environmentally friendly component.

**Electronically Controlled**
**Diesel GAP Sensors**
Sensors monitor the behavior of engine fuel injection pumps and exhaust valves. The sensor gives an alarm when an abnormality is detected, thereby increasing the reliability of electronic diesel engine control systems.
Growth Strategy by Business

We will pursue innovation in production, technologies and after-sale services to achieve growth and also to contribute to the development of Japanese aircraft industry and our local communities while working to take advantage of the long-term growth of the civil aircraft market to win more business opportunities.

Nobutaka Osada
Deputy Chief Executive Officer, President, Aerospace Company and in charge of Production Innovation

Sources of Strength

Motion Control Technology and Technological Development Ability
We have long accumulated know-how and technologies by meeting the needs of customers in both private and national defense sectors, which are sources of strength for Nabtesco. We have developed the world’s highest-level production technologies and expertise in the aircraft market, which prioritizes safety, and using these technologies, we are developing a flight control actuation system (FCAS) that minimize possible risks.

Relations of Trust with Customers
We have been providing the world’s aircraft manufacturers with the best solutions for nearly 40 years, always taking the viewpoint of customers and a proactive attitude. The close relations of trust we have built with customers provides us with the strength to establish ourselves as the world’s first-class supplier of FCAS.

Manufacturing System
We have been continuously taking measures to attain higher quality and productivity at two plants—one in Japan and the other in the United States.

Forecast for passenger aircraft demand

[Graph showing forecast for passenger aircraft demand]

Source: Japan Aircraft Development Corporation

Flight Control Actuation System

Nabtesco is the leading Japanese manufacturer of this system, which controls the aircraft’s attitude. This system is used to move the surface such as the ailerons on the main wings and elevators on the tail surface. Nabtesco has a solid reputation as a global leader in the commercial aircraft market.
In the private sector, the number of operating airplanes will double over the next twenty years. The budget for national defense will be at a stable level, although it might slightly increase. On the other hand, risks exist caused by stagnant growth of the world economy and political changes.

Measures for Medium- to Long-Term Growth

By communicating closely with customers based on our relations of trust, we will analyze their “needs and wants” and propose highly competitive and high-quality solutions by concentrating our resources appropriately. We will also improve our technological development ability to substantially shorten the lead time for new product development and expand the capacity of our manufacturing facilities in Japan and the United States to launch new programs in and after 2017, thereby steadily grasping the business opportunities provided by increased demand in the aircraft market.

Moreover, we will undertake actions while considering the provision of value across the value chain, and enhance measures in the after-sale market, while keeping the importance of achieving “profitable growth” in mind.

## Business Environment (Opportunities and Risks)

In the private sector, the number of operating airplanes will double over the next twenty years. The budget for national defense will be at a stable level, although it might slightly increase. On the other hand, risks exist caused by stagnant growth of the world economy and political changes.

## Measures for Medium- to Long-Term Growth

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## FACT SHEET

### Major customers
- Boeing (United States)
- Mitsubishi Aircraft Corporation
- Kawasaki Heavy Industries
- Mitsubishi Heavy Industries
- IHI
- the Japanese Ministry of Defense
- airline companies and others

### Production bases (as of the end of December 2015)
- Tarui-cho, Fuwa-gun, Gifu Prefecture, Japan
- State of Washington, the United States

### Market share
- FCAS: Approx.100% Market share for domestically-produced aircraft

### History of business development

The history of our Aircraft Equipment Business dates back to the period during the war, when we began manufacturing landing gear for airplanes. After the end of the war, we introduced overseas technologies and adopted a range of element technologies. We also acquired the know-how necessary for the design, development, and production of aircraft equipment.

We subsequently worked to enter the overseas civil aircraft market, and began dealing with Boeing in 1976. In 1990 we secured a contract to supply flight control actuators (FCAs) to Boeing for use in the B777, thereby receiving the world’s first order for FCA systems for use in civil aircraft. This success helped us to improve our position in the global market and also promote a growth afterward.

In 2014 and 2016, we were awarded Boeing Supplier of the Year Awards, acclaimed for our performance improvement of QCDS (Quality, Cost, Delivery and Service). We have continued to steadily receive orders and supply FCAS and services for various airplanes and expand the business.

### 1944
- Commenced production in Japan for airplanes in the national defense field.

### 1976
- Established Teijin Seiki America, Inc. (presently Nabtesco Aerospace, Inc.) in the State of Washington.

### 1977
- Received orders for spoiler actuators for the B767 and for aileron actuators for the B757.

### 1990
- Received an order for FCAS for the B777.

### 2006
- Received an order for high-voltage electric power distribution unit for the B787.
- Received an order for aileron actuators/spoiler actuators for the B747-8.

### 2008
- Received an order for the FCAS for the MRJ (Mitsubishi Regional Jet).

### 2012
- Total cumulative delivery of FCAS for the B777 reached 1,000 units.

### 2013
- Received an order for spoiler actuators for the ‘737MAX, the latest model in the B737 family.

### 2014
- Received 2013 Boeing Supplier of the Year Award.

### 2015
- Received an order for FCAS for the B777X, the B777 next-generation model.

### 2016
- Received 2015 Boeing Supplier of the Year Award.
Growth Strategy by Business

Hydraulic Equipment Business

We retooled our production system in response to the rapid deceleration of the Chinese market. In the future we will enhance measures for hydraulic systems based on the product lines expanded through the acquisition, identify potential customer needs, and add new values to our products to achieve growth again.

Managing Executive Officer, President, Power Control Company
Hiroaki Sakai

Sources of Strength

Nabtesco’s traveling units “GM Series” for crawlers, which integrate a hydraulic motor, a reduction gear, a parking brake and other components in one unit, feature excellence in durability and reliability in addition to great power generation efficiently, while remaining compact. Since the start of mass production in 1977, the GM series, one of the major products, have been highly appraised by customers, helping us to enhance the Nabtesco brand. With the improvement of machine processing technologies, the the Tarui Plant has achieved a high level of automation during the manufacturing process, which contributes to the continuous generation of competitiveness.

Business Environment (Opportunities and Risks)

Demand for construction machinery has been stagnant in China, which is the greatest market for it although the demand recovery can be expected in a medium-term. Within the construction machinery market, a new trend towards value creation, such as the incorporation of hybrid systems and ICT, will also help us find new business growth opportunities. Nonetheless, if the economic recoveries in emerging countries including China are delayed, infrastructure demand, the main usage of construction machinery will continue to shrink. The longer it takes us to realize the synergy effect with Hyest Corporation, which was acquired in 2015, there is a higher chance of failing to meet the predefined targets on time.

Measures for Medium- to Long-Term Growth

In the Hydraulic Equipment Business, we will make a series of production system reforms and cut down fixed costs associated with impairment losses at the Shanghai plant in China to balance the revenue and the expenditure for the year ending December 2016. Also, based on the product lines expanded through the acquisition of Hyest Corporation, we will foster a shift from selling components to cross-selling of hydraulic equipment and further proposals of hydraulic systems that correspond to customers’ potential needs and generate greater

Unit Sales of Hydraulic Construction Machinery in China (incl. Foreign Capital and State Companies)

Source: China Construction Machinery Association
added value. To react to risks caused by changes in demand in the major markets, we will develop new markets where we can fully utilize our strengths, while optimizing the production at our bases in Japan, China and Thailand, and thereby building a system that enables flexible response to changes in demand in the construction machinery market.

Growth Matrix of Hydraulic Equipment Business of Nabtesco

- **[Market Development]**
  - Develop new applications other than excavators for a wide range of product lines (e.g., Cranes (traveling, swing and winch units, etc.))

- **[Diversification]**
  - Challenge for one of the diversified hydraulic machinery manufacturer through further development of application and hydraulic systems

- **[Market Penetration]**
  - Enhance flexible response to demand fluctuation
  - Lead-time reduction and automatic manufacturing
  - Improve cost competitiveness through maximizing utilization of overseas bases and promoting "local production for local consumption"

- **[Product Development]**
  - Expand product lineups for package deal and hydraulic systems
  - Expansion of product lineups through M&A

Amplification of Product Lineups for Excavators through M&A

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<tr>
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<th>Mini Excavators</th>
<th>Medium- to Large-Sized Excavators</th>
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<td>Nabtesco</td>
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<td>Hyest Corp.</td>
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Major customers

- Komatsu, Kobelco Construction Machinery, Hitachi Construction Machinery, Sumitomo Construction Machinery, Kubota, YANMAR, Volvo, JCB, Sany, Xugong Excavator, Liu Gong and others

Production bases (as of the end of December 2015)

- Tarui-cho, Fuxa-gun, Gifu Prefecture, Japan / Shanghai, China / Chonburi, Thailand

Market share

- Traveling units for hydraulic excavators: Approx. 30% global market share

History of business development

Both Teijin Seiki and NABCO began conducting such business back in the 1930s, offering a range of products, not only for construction machines and special vehicles, but also for general industrial equipment. The company also developed small, multiple-spool control valves for use in road sweepers produced in Japan, and these valves have been developed into our present control valve products.

Teijin Seiki began conducting business by establishing the Tarui Plant in 1961. Its hydraulic motors were not highly competitive despite being core products, and the company worked to develop a new product independently. The traveling units “GM Series” that was thus developed provided the four functions necessary for the driving unit of hydraulic excavators (i.e. hydraulic motor, reduction gear, valve and parking brake functions), and was also compact enough relative to the width of an excavator crawler shoe. The company then successfully commenced mass production of this innovative product. Further, the reduction gear technology developed for hydraulic motors led to the development of Precision Reduction Gear RV to control the joints of industrial robots.

Subsequently, we established a production base in China in 1996 and another in Thailand in 2008, and have resulted in fostering overseas business expansion and increasing our global market share in the business of traveling units for hydraulic excavators to 30%. In 2015, we acquired Hyest Corporation, the hydraulic equipment division of TOSHIBA MACHINE, with a view to further expanding our product lines and developing new hydraulic systems.

- 1937 Manufactured hydraulic pumps for airplanes in the national defense field.
- 1949 Commenced manufacture and sales of hydraulic equipment.
- 1961 Opened the Tarui Plant for the manufacture of hydraulic equipment and start the Hydraulic Equipment Business.
- 1970 Opened the Nishi Kobe Plant (presently Seishin Plant) for the manufacture of hydraulic and pneumatic equipment.
- 1977 Commenced mass production of the “GM-series” traveling units. By using the reduction gears technology, developed the Precision Reduction Gear RV series for use in industrial robots.
- 1996 Established a joint venture named Shanghai Teijin Seiki Co., Ltd. (presently Shanghai Plant).
- 2008 Established Nabtesco Power Control Co., Ltd. in Thailand.
- 2015 Acquired Hyest Corporation, the Hydraulic Equipment Business division of TOSHIBA MACHINE CO., LTD.
- 2016 Fully Absorbed Hyest Corporation

Control Valve for Mini Excavators

This product is a sectional type multi-control valve developed specially for mini excavators, and is ideal for various needs such as action control of excavators. The series is popular for its compact size, versatility, and wide ranging product lines. It has captured a large share in Japan.
Growth Strategy by Business

The “Pedestrian Flow Solution” is a business concept designed to provide people with safety, security and comfort in transportation and in their living spaces. Under the concept and the brands of NABCO and GILGEN, we will expand our businesses in Japan and also overseas markets, primarily in Europe, North America and China.

Managing Executive Officer, President, Accessibility Innovations Company
Koji Kaminaka

Sources of Strength

Global Business Development
Since the first releasing Japan’s first domestically produced automatic doors on the market in 1956, we have been engaged in the Automatic Door Business, and with roughly 50% and 20% shares in the domestic and global markets respectively, are now among the top market players. “NABCO” and “GILGEN” are two of our brands providing automatic door products in the four core markets: Japan, Europe, North America, and China, are the essential sources of our strength.

On a global scale, we conduct the value chain business focusing on automatic doors for buildings. We provide customers with a range of products and solutions, including installation, maintenance and management services in an integrated manner, which is also a source of strength for us. We are the only company in the world who sell automatic doors and platform doors in all of the four aforementioned markets, and thus occupy a unique position in the industry.

Broad Product Lines with Focus on Automatic Doors
We offer a wide spectrum of products to meet our customer needs as one of the world’s top automatic door brands. We focus on automatic doors used for buildings but also special purposes and industrial use.

Sales and Installation Network
We have sales, installation and maintenance services supporting systems that covers all regions across Japan and helps us to maintain high market share. Similarly, we have world-class shares in major overseas markets sustained by our well established network of sales, installation, and maintenance.

Business Environment (Opportunities and Risks)

In the European market, the stagnant economy in Southern Europe causes sluggish demand for automatic door products; however, the demand in the Swiss market is forecasted to remain steady. In the short-term the global market for automatic door products is expected to remain stable supported by the favourable U.S. economy and the strong domestic demand driven by upcoming Tokyo 2020 Olympics and Paralympic Games. In the long-term, the declining birth rate and aging of Japanese population will increase the risk of domestic market shrinkage. In response, in order to offset these risks and secure consistent profitability, we will increase the business scale through acquisition of domestic
We will expand the size of our business through M&A and organic growth. In the mature markets, we will take advantage of our large market shares to provide a range of products including general-purpose automatic and custom-made doors and offer a variety of solutions from installation and maintenance to management services with an eye to enhancing profitability and customer satisfaction.

**Measures for Medium- to Long-Term Growth**

We will expand the size of our business through M&A and organic growth. In the mature markets, we will take advantage of our large market shares to provide a range of products including general-purpose automatic and custom-made doors and offer a variety of solutions from installation and maintenance to management services with an eye to enhancing profitability and customer satisfaction.

- **Major customers**
  - Automatic doors for buildings: Leading construction companies, sash manufacturers, commercial facilities, hospitals, public organizations, industrial facilities (factories) and so forth
  - Platform doors: Railway companies in each country

- **Production bases (as of the end of December 2015)**
  - Kobe City, Hyogo Prefecture, Japan / State of Wisconsin, the United States / Bern, Switzerland / Beijing, China

- **Market share**
  - Automatic doors for buildings: Approx.50% domestic market share, Approx.20% world market share
  - Platform screen doors: Approx.95% domestic market share (cumulative)

- **History of business development**
  - NABCO, which is one of the former companies of Nabtesco, worked to launch a new business in addition to supplying transportation vehicle equipment, including brake systems for railroad vehicles and automobile oil brakes. In 1953, the company began manufacturing and selling automatic door systems for railroad vehicles and buildings. Then in 1956, it produced the first automatic door in Japan ahead of all others. The Olympic Games held in Tokyo caused an explosive increase in new building construction mainly in the city center, and skyscrapers were built one after the other, which also boosted the use of automatic doors. By establishing a sales network across Japan as well as a careful service system, the company established a robust market position in the country by the early 1960s. Subsequently, started by the export of products to Hong Kong, it proactively expanded its business to overseas markets and gained a foothold in the U.S. market in the 1990s. In 2011, we acquired Gilgen Door Systems AG (KABA Group) to enter the European market on a full scale and have been operating the business under multiple global brand names. Building the brand of "NABCO" and "GILGEN", we are establishing the top-class position predominating the four largest markets (Japan, North America, Europe and China) in terms of automatic door and platform door businesses.
  - 1956 Became the first company to manufacture automatic doors in Japan.
  - 1957 Established Osaka Door Engines (presently NABCO DOOR).
  - 1992 Acquired LANSON, an automatic door manufacturer in the United States (presently NABCO Entrances).
  - 1995 Established CSCEC-NABCO Auto Door Co., Ltd. in China (presently NABCO Auto Door (Beijing) Co., Ltd.
  - 2011 Acquired the Automatic Door Business Division from Kaba Group of Switzerland and established Gilgen Door Systems AG.
  - Building tetrapolar-system (Japan, North America, Europe and China) for automatic door and platform door businesses.
  - 2012 Full acquisition of NABCO DOOR as the result of stock swap
  - 2013 Total cumulative production of NABCO automatic doors reached two million units.

- **WEB**
  - Automatic Doors and Platform Doors

And overseas distribution companies, and through expansion to markets in North America with its continuously growing population and South-East Asia whose social infrastructure is gradually maturing.

**FACT SHEET**

**Automatic Platform Doors**

Automatic platform doors are now used worldwide to ensure passenger safety at railway stations. Demand for these doors is fast expanding over the world. Nabtesco has over 20% share of the global market and is successfully operating in European, Asian and Japanese markets.

**Platform Screen Doors**

Platform screen doors help ensure passenger safety on platforms. These doors also contribute to higher air conditioning efficiency, and enable unmanned operation of new transportation systems.
Nabtesco’s strengths include technological capabilities, which enabled us to become the world’s first successful developer of a rotary packaging machine. The machine integrated a stream of involved steps in packaging into one line with a control technology that enabled high-speed, reliable, stable, and airtight packaging. The finely-tuned response abilities of onsite employees who support application of the technologies can also be considered as one of our competitive advantages.

Relations of Trust with Customers
We have earned trust from food manufacturers for our compact packaging machines, which provide high performance, require only limited space, and even seal packages with high air tightness to ensure the safety of food products contained therein.

Business Environment (Opportunities and Risks)
Japan has seen increased demand for prepared meals for consumption by individuals at home, and demand for food packaging in pouches from manufacturers of private brand has been robust. Also, in North America, foods packed in pouches are gradually being accepted in place of cans as the preferred form of preserved foods. Moreover, in China and other emerging economies, people are increasingly focusing on the safety and hygienic quality of food products, and the demand for our packaging machines that enable high-precision processing are on the rise. However, risks associated with foreign exchange rates are also increasing as the export of these machines expands leading to greater changes in conditions with regard to competition and business results.

To respond to sophisticated customer needs, we will foster the development of next-generation high-speed packaging machines and the enhancement of our service system. We will also proactively expand our business outside Japan, targeting potential customers in overseas markets.

Sources of Strength

Advanced Technologies and Abilities of Onsite Employees

Relations of Trust with Customers

Business Environment (Opportunities and Risks)
Measures for Medium- to Long-Term Growth

We will strengthen our bases and official distributors outside of Japan to promote sales mainly in Europe, the United States and China. Also in line with the sophistication of customer needs, we will maintain and increase a competitive edge through the development of next generation high-speed machinery and enhancement of services in Japan and overseas.

FACT SHEET

Major customers
Sugar and salt manufacturers, food and beverage manufacturers, detergent manufacturers, pet food manufacturers in Europe, beverage manufacturers in North America, food manufacturers in China and others

Production bases (as of the end of December 2015)
Iwakuni City, Yamaguchi Prefecture, Japan / Dalian, China

Market share
Packaging machines for retort pouch foods: Approx.85% domestic market share

History of business development
In line with Japan’s economic growth, requirements for automation and energy conservation began to increase. In 1964, we started developing an automatic packaging machine, and thus entering the packaging machine market. In the middle of the 1960s, automatic packaging machines were rapidly adopted by sugar and salt manufacturers as well as by confectionery companies. In the 1970s, requirements for automatic food processing machines increased among frozen food manufacturers due to the spread of so-called fast food and the growth of the restaurant industry. In response, we began developing automatic food machines and became the first company to develop a curry cubes packaging machine in Japan. We also succeeded in developing a vacuum packaging machine.

Further, in 1994 we began supplying packaging machines for spout bags, and in 2011, established a production base in Dalian, China. Additionally, in 2013 we established a local corporation for sales promotion and service provision in the United States. We are thus favorably expanding the business.

1964 Developed an automatic packaging machine and started the packaging machines business (as the former Teijin Seiki).
1970 Delivered Japan’s first retort pouch curry packaging machine (as the former Teijin Seiki).
1976 Began delivering vacuum packaging machines (as the former Teijin Seiki).
1994 Began delivering spout bag packaging machines (as the former Teijin Seiki).
2011 Established a subsidiary in Dalian, China (Dalian Toyo Jidoki).
2013 Established a local distribution company for packaging machines [TOYO JIDOKI AMERICA CORPORATION].

High-Speed Automatic Filler/Sealer
This ten-process rotary filler/sealer can be used to pack a range of foods, including not only liquids but also products containing both liquid and solid substances. Moreover, this machine allows the filling and sealing of two bags at the same time, which means that it has the production capacity equivalent to that of two conventional machines, while requiring the floor space and support equipment for one machine. Further, a range of test equipment can be mounted on the machine. The filler/sealer also supports deaeration using steam.

WEB
Packaging Machines