Aftermarket

NTN provides various products for industrial machinery and automotive maintenance needs. In industrial aftermarket applications, we provide bearings for general machinery and bearings used to repair equipment used in industries such as mining, paper, steel, cement, and food manufacturing. In automotive aftermarket applications, we satisfy customer needs with a product lineup of repair parts (auto parts) composed of bearings and peripheral components.

In addition to delivering products, we also provide technical services such as by holding the “NTN Aftermarket Academy” to help customers learn about bearings through lectures and practical training, and by holding technical workshops at customers’ manufacturing sites using technical service units. Also, we support customers improving productivity and ensuring stable operation of their facilities, for example, by providing the NTN PORTABLE VIBROSCOPE, which makes daily maintenance of production facilities easier.

| Business environment

One of the issues in our aftermarket business is that our brand recognition is lower in some overseas regions than in Japan. Compared to our competitors, we have actually not been able to secure our superiority not only in supplying individual products, but also in terms of overall capabilities including provision of peripheral components and after-sales service. The challenge for us is how to increase our share of products dealt by overseas distributors, which sell competitors’ brand as well, unlike the Japanese distributors which handle our products exclusively. To that end, it is necessary to enhance the overall attractiveness of our products and improve the value of the NTN brand by strengthening our service & support programs, improving product quality as well as packaging quality, and reinforcing countermeasures against counterfeit products. In addition, in order to increase competitiveness in overseas markets, it is extremely important to establish a system for prompt delivery of top-selling products.

Until last year, demand was high and we lost sales opportunities due to insufficiencies in our supply capacity. However, as global demand declined sharply due to the spread of new coronavirus infections, we will focus on maintaining inventory of top-selling products that are necessary for a prompt delivery system in this fiscal year so that we can avoid losing sales opportunities when the economy becomes stronger again. Additionally, an increasing influx of low-priced products produced in emerging countries is one of the threats. We are promoting strategies to secure advantages, such as identifying the needs of each market and using different brands appropriately.

| Achieve OUR VISION

Transform from a “Manufacturing Company” into a “Company that Delivers Value to Customers through Products and Services.”

The business environment such as the development of AI, IoT, and other digital technologies, environmental issues, and demographic shifts has been changing continually and companies are required to be flexible in accommodating new market needs to ensure sustained growth. In the aftermarket business of bearings, suppliers are faced with new expectations in addition to traditional requirements, including high quality products, broad product lineup and prompt delivery. The role of suppliers, particularly those in the equipment aftermarket business for steel, paper and other industries, is gradually changing from a bearing supplier into a provider of comprehensive maintenance services for equipment and peripheral components.

In order for the Company to achieve the best customer satisfaction in the aftermarket, besides surveying the needs of distributors and end-users and offering bearing repair services, we will further enhance our brand value by proposing a new business model that provides services such as measuring the characteristics of each sales region and the price range, which we will strive to increase profits from regions and products where sales are expected to continue to grow in the future. For example, bearing units, one of our main products for the aftermarket, have lower market shares in the U.S. than in other sales regions, so we will strengthen product strategies for each region and work to increase the market share.

| Initiatives to improve profitability

**Focus on core products and profitable products in aftermarket**

We assume that our global share is approximately 10% in the aftermarket, but that number differs according to region and product. By strategically introducing products that match the characteristics of each sales region and the price range of each market, we will strive to increase profits from regions and products where sales are expected to continue to grow in the future.

**Establishing a system for the post-coronavirus world**

Establishing a prompt delivery structure for the aftermarket business

Products for the aftermarket, which contribute to the stable operation of customers’ facilities and improvements in their productivity, must be delivered at the timing required by customers. In order to realize just-in-time supply, we will organize inventories of best-selling products and establish a structure for prompt delivery. In this way, we will work to establish a system that can provide stable supply even when demand fluctuates.

Creating a business model with future potential

By using devices such as the NTN PORTABLE VIBROSCOPE, which enables measurement of equipment vibrations, detection of bearing abnormalities, and estimation of damaged areas and can be used by simply installing the device on facilities, we will not only sell bearings, but also expand MRO business, which covers maintenance, to create a business model with future potential. In addition, while assessing the situation, we will provide technical services in a way that is different from the previous one, such as aggressively utilizing on-line technical workshops in Japan and overseas that we carry out from a perspective of preventing the spread of the new coronavirus, even after the pandemic has ended.

| Business Strategies

**Business Strategies**

- **Business environment**
  - High-branding power and presence of European and U.S. competitors in the overseas aftermarket business
  - Expansion of needs for service & solution business and increase in sales that customers expect from suppliers
  - Commoditization of bearings, especially general-purpose products, and the intake of low-priced products due to the globalization of the market
  - Sophistication of counterfeit bearings

- **NTN’s Strengths**
  - Networks of major domestic and overseas distributors, and strong partnership with major distributors
  - Broad product lineup
  - Experience and know-how in supplying products for MRO in the global market
  - MRO: Maintenance, Repair, and Overhaul
  - Sales network that covers global markets
  - Awareness and technological capabilities
  - Providing detailed technical services

| Operating income margin

<table>
<thead>
<tr>
<th>Sales (Bill. yen)</th>
<th>Operating income (Bill. yen)</th>
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<tbody>
<tr>
<td>2016</td>
<td>109.4 billion yen</td>
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**NTN Report Aftermarket**

Eiichi Ukai

| Initiatives for the NTN revitalization

- Strengthening systems and organizations
- Strengthening service & support
- Achieving OUR VISION

| Percentage of total sales

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**Results for the fiscal year ended March 31, 2020 and forecast for the fiscal year ending March 31, 2021**

In the fiscal year ended March 31, 2020, net sales fell to 109.4 billion yen, down from the previous fiscal year. This was due to a year-on-year decline in sales from both the industrial machinery aftermarket and automotive aftermarket in Japan, the Americas, and Europe as a result of the sluggish economy. In addition, in the fourth quarter, demand declined and sales activities were restricted in some regions due to the spread of the new coronavirus. Operating income was 12.7 billion yen due to the significant impact of a decline in demand, despite efforts to reduce variable costs and fixed costs such as personnel costs and expenses.

For the fiscal year ending March 31, 2021, net sales was 19.6 billion yen and operating income was 800 million yen in the first quarter. Although we cannot foresee the impact of the spread of the new coronavirus, we expect the net annual sales to be 91 billion yen.

**Establishing a system for the post-coronavirus world**

Establishing a prompt delivery structure for the aftermarket business

Products for the aftermarket, which contribute to the stable operation of customers’ facilities and improvements in their productivity, must be delivered at the timing required by customers. In order to realize just-in-time supply, we will organize inventories of best-selling products and establish a structure for prompt delivery. In this way, we will work to establish a system that can provide stable supply even when demand fluctuates.

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By using devices such as the NTN PORTABLE VIBROSCOPE, which enables measurement of equipment vibrations, detection of bearing abnormalities, and estimation of damaged areas and can be used by simply installing the device on facilities, we will not only sell bearings, but also expand MRO business, which covers maintenance, to create a business model with future potential. In addition, while assessing the situation, we will provide technical services in a way that is different from the previous one, such as aggressively utilizing on-line technical workshops in Japan and overseas that we carry out from a perspective of preventing the spread of the new coronavirus, even after the pandemic has ended.

**NTN PORTABLE VIBROSCOPE**

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We are responding to the demands of our customers for long operating life, improved loading capacity, and higher speed, all of which are required by all types of industrial machinery, with the world’s highest standard new-generation bearings, ULTAGE Series. In addition, through constant R&D efforts, we will launch bearings with even lower torque, more compactness and lighter weight to the marketplace, enabling environmental impact reduction in a variety of industrial machinery fields.

Looking ahead to the next generation, we will promote modularizations and intelligence by deepening bearing technologies and integrating sensors and precision equipment technologies. In addition to developing high-value-added products, we will develop new products and services by utilizing the abnormality detection technology, condition monitoring system (CMS), and AI. Specifically, we launched sales of the Wind Doctor™ condition monitoring system for wind turbine and i-WRIST™, a Wrist Joint Module that contributes to automation and labor saving at manufacturing sites. By providing these products and services, we will contribute to the development of industry and the creation of a sustainable society.

### Business environment

A recent trend is that, in addition to customers of construction machinery, agricultural machinery, and machine tools, which are the foundation of the industrial machinery business, demand from social infrastructure customers such as rolling stock and wind power generation has increased against the backdrop of changes in social structure and increased environmental awareness, and we have been promoting the establishment of technology and production systems. In the future, the business environment surrounding industrial machinery is expected to change dramatically due to the progress of IoT and the development of AI technologies. Based on this understanding, we are developing condition monitoring services for predictive maintenance that apply IoT and sensing technologies to address issues shared by customers, such as saving energy, stable long-term operation, and reduced lifetime costs. For wind turbines customers, we have already proposed the Wind Doctor™ condition monitoring system for wind turbine, which has been evaluated favorably, and we have begun offering concrete suggestions for other industries, such as construction machinery, machine tools, and rolling stock.

### Our Vision

NTN will become a company that customers in the industrial machinery market rely on most for its exceptional technological competence.

The industrial machinery market is comprised of a variety of industries, and bearings are used in a wide range of machinery. We supply bearings with a wide range of sizes, from miniature sizes of several millimeters in outer diameter used in electronic machinery to ultra-large sizes of several meters used in wind turbines and large mining equipment. In addition, products used in aircraft and high-speed railways require extremely high reliability because the stoppage of machinery affects human lives. We have accumulated product and manufacturing technologies for many years, and we utilize these technologies to respond to a variety of market needs. In recent years, the external environment has been constantly changing due to factors such as increasing awareness of the global environment issue and changes in population dynamics, and changes in the industrial structure can also be seen as a result of a rapid progress in IT-related technologies including IoT and AI. Under these circumstances, we will utilize digital technology based on bearing technology in the industrial machinery business, thereby continuing to be an indispensable company in the industry, and will support the development of the world industry.

### Initiatives for the NTN revitalization

- **For core sectors (construction machinery, agricultural machinery, and machine tools):**
  - Reliability to develop high-speed, high-rigidity and high-precision products
  - Ability to respond to new needs in fields and parts for which we have not entered the market
  - Strong relationships with manufacturers with the top shares in the industries

- **For our growth sectors (gearbox, rolling stock, aerospace, and wind turbines):**
  - Ability to develop products tailored to customer needs
  - Experience in doing business with major customers around the world
  - Ability to produce products of the sizes that other companies cannot respond to

### Changes in market environment

- Rising needs for autonomous machinery operations and sensing technologies
- Competition in development of high-value-added products
- Impact of policies, trade issues, and the global economy, etc. on demand
- Intensified competition due to the influx of low-priced products

### Results for the fiscal year ended March 31, 2020 and forecast for the fiscal year ending March 31, 2021

Net sales was 105.1 billion yen due to the following factors: decreased sales in main industries such as construction machinery, agricultural machinery, machine tools, and reduction gears following a decline in demand caused by the impact of the US-China trade friction; and the impact of customer shutdowns and supply chain turbulence following the spread of the new coronavirus in the fourth quarter and onward. Consequently, we posted operating loss of 2 billion yen despite reduced variable costs and a decrease in fixed cost such as personnel costs and expenses.

For the first quarter of the fiscal year ending March 31, 2021, net sales was 22.6 billion yen and operating loss was 900 million yen. Although we cannot foresee the impact of spread of the new coronavirus, the full-year net sales is expected to be 93.5 billion yen.

### Initiatives to improve profitability

**Selection of industries**

We propose better solutions to customers through synergies between industrial machinery business and aftermarket business and establish profitable business models. In addition, by strengthening profit control of each project, we will identify any unprofitable business and work to improve profitability of our entire business. We will also distinguish between “businesses we will focus on” and “businesses we will withdraw from” according to the regions and industries, and select industry sectors in order to optimize the profitability of the entire business.

**Reducing cost through optimal procurement of materials and parts**

As an initiative to improve profitability other than selling prices, we will actively utilize materials from China and India. At the same time, we will implement centralized purchasing of materials and components at an appropriate price, regardless of local procurement, and strive to improve profitability by reducing costs through procurement at the most appropriate locations with the aim of distributing materials and parts to manufacturing sites that need them.

### Establishing a system for the post-coronavirus world

**Acquire highly profitable businesses by developing high performance products such as bearings with IoT sensors**

In addition to bearing sensing technologies we have accumulated over many years, we have also developed a “Sensor Integrated Bearing Unit” for machine tool spindles, which can prevent seizure through advanced condition monitoring using the industry’s first high-precision sensor. In the future, in addition to advanced condition monitoring and control technologies, we will develop and propose a high-performance product that meets the needs of customers, such as bearings with sensors that enable manufacturing sites to be unmanned and achieve labor-saving by utilizing IoT and AI.

**Establishing a fabless system in the new field of materials (i-WRIST™, Wind Doctor™)**

With regard to Wrist Joint Module “i-WRIST™” and Condition Monitoring System (CMS) for wind turbines (Wind Doctor™), we will flexibly expand our new business domains through a fabless system in which we do not own these manufacturing plants and conduct outsourced production.
Business environment

In the automotive industry, due to the impact of the new coronavirus, automotive production is seeing a significant decline globally in 2020, and it may take several years for the industry to recover to the level before the new coronavirus. Even in this environment, the electrification of vehicles, among four future trends referred to as “CASE”**, is steadily progressing, and we believe that how to transform the risks associated with major changes into growth opportunities will affect the company’s rise and fall. In the case of EV shifts, there is a risk that the transmission, which uses many bearings, will be replaced by a reduction gear with a simple structure, resulting in a decline in demand. In the future, the transition from ownership to sharing may result in a decrease in the number of vehicles in the market, and commoditization of vehicles as a tool may lead to intensified price competition.

On the other hand, markets related to EV-specific quietness, low vibration, and high-speed rotation as well as markets related to sensor technologies and abnormality detection functions (CMS, etc.) which are indispensable for autonomous driving are expected to grow. In addition, the needs to increase durability of components and demands for aftermarket components are expected to grow as car sharing increases the operating rate of vehicles. We recognize that the ever-changing automotive industry is now in a situation where suppliers face both the chance of breakthroughs and the risk of shakeout.

Our work in the automotive segment includes developing more advanced bearings, hub bearings and drivetrains to create higher added value. We are also combining these core products with core technologies to develop module products. To prepare for the coming era of electrification of automobiles and autonomous driving, we have released “Electric Motor and Actuators” composed of ball screws, motors and controllers. We are working on expanding their range of applications and proposing them to customers. Through collaboration with our partners, we are expanding these products globally while breaking away from self-sufficiency in order to meet the existing needs of the automotive market, such as low fuel consumption and increased ride comfort, as well as the rapidly increasing demand for electrification.

| Business Strategies | Automotive market |

**OUR VISION** As an indispensable presence for the automotive market, NTN will become a company that offers products and services for vehicles all over the world.

The rise of electrified vehicles throughout the world’s automotive markets calls for functional automotive components with different characteristics or more rigorous performance requirements than are required for conventional internal combustion engine vehicles. We will accommodate these needs by offering differentiated technical expertise and lineups of advanced products providing features such as size/weight reduction, higher speed rotation, lower torques and less noise/vibrations in order to secure a competitive advantage over our competitors.

Another major wave, Ride Sharing and Maas**, is based on the absolute reliability of the driving system responsible for driving, turning, and stopping vehicles. Carmakers are shifting the focus and resource of their development work from the tangible (vehicle performance) to the intangible (services), creating an expanding range of areas in which NTN can contribute to vehicle safety, reliability and comfort. By capturing these dynamic changes in the business environment as opportunities, we will provide values that exceed customer expectations through product development and advanced technical services that are ahead of market needs. By doing so, we aim to become the leading manufacturer in the drivetrain component segment essential to the automotive market.

** Results for the fiscal year ended March 31, 2020 and forecast for the fiscal year ending March 31, 2021

In the midst of a global downturn in automotive sales, net sales declined to 437.0 billion yen in the fiscal year ended March 31, 2020 due to a significant drop in demand associated with the shutdown of automotive production in China and other regions as a result of the spread of the new coronavirus from the fourth quarter. We posted operating loss of 3.7 billion yen, which was largely attributable to a shrinking sales volume caused by a sharp drop in demand along with decline in selling prices, and we were unable to offset the negative impact through cost reduction initiatives. In the first quarter of the fiscal year ending March 31, 2021, net sales was 49.7 billion yen and operating loss was 9.6 billion yen. Although we cannot foresee the impact of the spread of the new coronavirus, the full-year net sales is expected to be 355.5 billion yen.

** Initiatives to improve profitability without relying on scale

The impact of the new coronavirus has greatly reduced the amount of automotive production and we expect that recovery to the level before the new coronavirus will occur at a moderate pace and take several years. In the automotive business, we will move forward with transformations to an earnings structure that does not rely on scale so that we can generate profits even in an environment in which the car production scale does not recover. In the future, we will endeavor to secure profits by further promoting the development of higher-value-added and higher-performance products such as size and weight reduction, higher rotation, lower torque and lower vibration in response to electrification as well as to promote optimization of scale by restructuring and withdrawing from low profit businesses.

In addition, we will strive to reduce manufacturing costs by promoting local procurement and optimal procurement. At the same time, we will work to reduce fixed costs by strengthening collaboration with alliance partners, so that we can improve in profitability.

** Establishing a system for the post-coronavirus world

For hub bearings and drivetrains with the world’s No. 1 and No. 2 market shares, respectively, we will concentrate resources on areas where we can leverage our strengths in technology and product functions based on our accumulated technology and global reduction experience, thereby ensuring that our competitiveness will improve. Meanwhile, for low-profit part numbers, we will drastically improve profitability by promoting further cost reductions, requesting price increases, and withdrawing from the market.

In order to respond to the accelerating changes in the market structure for EVs and electric motors, we will promote the mass production and commercialization of electric module product by combining bearing and ball screws technologies and motor electronic control technologies. We will also work to swiftly expand our business in new areas.

* Mobility as a Service: A new concept of “Mobility” in which traffic is shared through the use of information and communications technology, and transportation by all means of transport other than private cars is widely connected as a single service

** CASE – Connected, Autonomous, Shared, Electric
Business Strategies | Research & Development

NTN's basic approach to research and development
We are committed to realizing a low-carbon society by contributing to energy saving of all machinery through the development of core technologies and new products. We are also actively developing natural energy-related products that can contribute to an energy circulation society by applying core technologies that we have cultivated into new areas. As a new initiative, we are also focusing on R&D by utilizing external collaboration to support regenerative medicine and drug discovery that will lead to early detection and treatment in a society where birthrate is decreasing and the population is aging.

Executive Officer, CTO, Chief Technical Officer
Masaki Egami

R&D trends and results
Supporting CASE automobiles
A hub bearing is a unit product that supports the rotation of tires, and NTN has the largest market share of hub bearings in the global market. NTN has developed hub bearings with multi-functions for Connected, Autonomous, Shared and Electric (CASE) automobiles.

These are the world’s first high-performance module products adapted to next-generation automobiles, such as eHUB which combines a hub bearing with a motor generator, and sHUB which integrates a mechanism that adjusts the steering angle of the tires into a hub bearing. The products will contribute to safer and more comfortable driving of future CASE automobiles, by improving fuel efficiency, automated driving, etc.

In addition to Low Friction Hub Bearing III, which aims to achieve low fuel consumption (reduces rotational friction by 62% compared to a conventional product), we have successfully received orders for mass production of ULTAGE Tapered Roller Bearings and Ultra-low Friction Sealed Bearings for transmissions, and are contributing to solving issues in the automotive field.

Strengthening systems for future growth and transformation of business category
In April 2020, we established the New Business Search and Development Department within the New Product and Business Strategic Planning Headquarters in order to accelerate the development of new products and promote transformation of the business category for the next generation. The module and system products are not developed individually by the existing engineering divisions, but are instead developed and commercialized by the New Business Search and Development Department through a totally integrated process.

Specifically, we will transfer the development of eHUB and sHUB supporting CASE applications, as well as i-WRISTTM in the robotics field from our R&D centers, to conduct R&D to meet market needs in new areas.

Technological advancement through external collaboration
NTN Next Generation Research Alliance Laboratory: Shift from “Products” to “Services”
In September 2017, NTN Next Generation Research Alliance Laboratory was established in the Graduate School of Engineering at the National University Corporation, Osaka University with the aim of creating new business and accelerating technical innovation. In April 2020, the laboratory moved to the second step.

In the first step, we conducted research to develop superiority in core products, such as sensor-integrated bearings supporting machine tools that utilize the IoT, and motors and control technologies combined with eHUB and sHUB, as well as research to predict the residual life of bearings by using AI. The results were transferred to the Company. As our aim to be a "company that delivers value to customers through products and services," in the second step, we will shift to research that emphasizes "services." Specifically, we will focus on upgrading the condition monitoring system and CAE technology using AI.

While sharing the results with the research and engineering divisions in NTN, we will build new core competencies related to the utilization of AI technology and implement them in society.

Efforts to develop and commercialize cell chips: Contribute to improving quality of life
In collaboration with Osaka University, we are working to create an artificial three-dimensional structure using iP-derived cells by applying our precision positioning technology and the microscopic coating technology we have cultivated through repair devices. We have found that the coating of high viscosity solutions containing iP-derived cells onto the chips, which has not been achieved so far, can be achieved with our microscopic coating technology.

In modern societies where human longevity is increasing, there is a need to speed up and streamline the processes of drug discovery, and to reduce the invasiveness and duration of disease assessment. Therefore, we are promoting research and development using cell chips to observe cell responses and changes, and we intend to contribute to early detection and treatment, which will become increasingly important in the future.

Services solutions (Value creating)
In 2012, we launched a condition monitoring system (CMS) “Wind Doctor™” to detect abnormal signs of large wind turbines at an early stage. This system is one of the services that utilize the IoT to provide operational status information, and we have received a lot of orders for this system.

The system acquires vibration data for mechanical components, such as bearings and gears, by a highly dust-resistant and water-proof data collection device and conducts diagnostics using the remote monitoring and analysis software provided by us. Many power generation companies praise the system for its extensive analytical functions, and the number of subscribers has exceeded 200, winning the top market share in Japan. Furthermore, we are working to roll out this system on a global scale.

In the future, the development of offshore wind turbine generators is greatly anticipated in Japan as well, and CMSs are becoming increasingly important in offshore areas where maintenance is very difficult. Therefore, we will actively propose monitoring services using this system and contribute to improving the operation rate of wind turbines.

Use of CAE Solution Technologies
In October 2018, we established the CAE R&D Center to accelerate the use of CAE in our R&D and design activities. In addition to optimizing product designs and enhancing structural analysis, we eliminate rework in development by simulating prototypes and various experiments, leading to more efficient R&D and faster development within the Group.

In addition, we have developed new common calculation tools that can be used in the three regions including Japan, Europe, and the Americas, and have realized our own global design system. By providing reliable technical proposals based on logical data in a timely manner, we will contribute to speeding up the development process of our customers.
Building a change-resilient “Monozukuri” system that NTN aims for

In recent years, we have been facing a rapidly changing and unpredictable business environment, including large-scale natural disasters and the cessation of global economic activities due to the new coronavirus (COVID-19).

At the same time, business conditions are rapidly changing, including customer needs, and the speed of processes from product planning, including marketing, to prototyping and mass production will be the key to improving customer satisfaction in the future.

Under these circumstances, we will strengthen the linkage between the innovation process of product planning and development and the supply chain process of marketing, production, and sales, with the aim of establishing a “Monozukuri” system that is resilient to changes.

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<td><strong>Organizational change of the Procurement Headquarters</strong></td>
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In order to strengthen global procurement and centralized purchasing and accelerate Variable Cost Reformation through centralized management led by the head office, the Procurement Headquarters was reorganized into 3 departments: the Global Procurement Supervising Department, the Japan Region Procurement Department, and the Procurement Logistics Administration Department.

We will establish regional headquarters in North America, Europe, China, and ASEAN and build an NTN global procurement network, thereby promoting local procurement in optimal locations with global suppliers. In doing so, we will endeavor to ensure stable procurement and reduce costs.

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<th>Production</th>
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<td><strong>Promotion of Monozukuri Paradigm Shift “PRODUCTION REFORM”</strong></td>
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We are promoting digitalization with the aim of realizing “Monozukuri” that determines our competitiveness. The pillar of our policy is to eliminate waste by connecting information, and to prepare for a reduction in the working population through robotization, automation, and intelligence technology.

Until now, we have pursued partial optimization (streamlining by process). In order to apply digital technology more effectively, we will introduce the overall optimization (streamlining of the entire supply chain) method to achieve more streamlined production.

We will promote streamlining with the goal of reducing production lead times and improving inventory turnover and productivity. We are aiming to create a Monozukuri system through digitalization and streamlining.

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<th>Quality</th>
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<td><strong>Basic approach to quality promotion</strong></td>
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NTN’s Basic Quality Policy specifies all the basic principles that shape our manufacturing approach. We use it to work on maintaining and improving product quality throughout the world, working toward quality that satisfies all our customers.

Our products are used in many applications around us, providing daily support. They are also found in equipment where lives are at stake, such as aircraft, railroad, automobile, and medical equipment, and therefore, require extreme precision and durability.

Every single employee understands the importance of quality and works earnestly toward Quality to earn our customer’s trust.

*Applicable quality*  
One quality should immediately respond to the change in customer requirements.  
*On-time delivery*  
We have to aim quality competition  
*Quality must be taken in every stage of process*  
Quality should benefit our company

**Quality slogan**  
Quality paves the way for our future

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<th>TOPICS</th>
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<td><strong>New Wakayama Works</strong></td>
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In October 2019, we completed the construction of a new base in Wakayama Prefecture that produces radial bearings, our core products. The factory building has been constructed with a motif of “Monozukuri” that NTN aims for, and in order to commence mass production will be the key to improving customer satisfaction in the future.

As of June 2020, the installation of new grinding and assembly facilities has been completed, and installation of new grinding and assembly facilities has begun in order to commence mass production in October. Over the next five years, we will completely transfer the facilities from the Kongo Works and restructure the production of radial bearings centered on this new plant.

**Specializing in high-performance, high-value-added products**

With the rapid progress of EVs and electrification in the automotive market in recent years, the market for high-performance, high-value-added products such as quietness, low vibration and high-speed rotation is expected to expand with regard to radial bearings used in motors and driving parts. At the New Wakayama Works, which serves as the mother plant of high-performance products, we will adapt the latest heat treatment facilities, FA facilities, inspection instruments, and IT, as well as the latest technologies, including miniaturized and multisite facilities based on the manufacturing practices of the Kongo Works in order to offer a wide variety of products from small lots. Through these measures, we will work on new products that meet the needs of the market, halve the prototype delivery time, and shorten the production lead time to one-third of the previous one, thereby promptly supplying high-quality products to the world. At the same time, the Wakayama Works is aggressively pursuing energy conservation and environmental impact reduction, aiming to become the mother plant of NTN Smart Factory.

*“NAMESEKA Factory” that the New Wakayama Works aims for*

**To realize production that is highly flexible and responsive to customer needs and changes in demand**

**To enhance efficiency of manual work by using robots and IT**

**To reduce in-process inventories and shorten lead time through the “Automatic Transportation System” and “Production Reform”**

**To advance quality control by using IoT/AI**