TOKYO KEIKI INC.

Financial Results Briefing for the Fiscal Year Ended March 31, 2019 (Fiscal 2018)

June 4, 2019

President **Tsuyoshi ANDO**

The forward-looking statements contained in this material reflect the management's assumptions based on currently available information as of the date of announcement. Future changes in business environment and other factors may therefore cause differences with the actual situation.

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Business Overview

Defense & Communications Equipment Business

Manufacture and sale of radar warning receivers, naval gyrocompasses, submarine inertial navigation systems, inertial sensors, and microwave devices

Marine Systems Business

Manufacture, sale, and services for marine gyrocompasses, marine autopilots, electronic chart display and information systems (ECDIS), radars, and other nautical instruments, and for satellite communications equipment, radios, and other marine communications equipment

Hydraulics and Pneumatics Business

Manufacture and sale of hydraulic solenoid valves, pumps, motors, and hydraulic systems

Fluid Measurement Equipment Business

-Manufacture and sale of ultrasonic flowmeters and microwave level gauges used in water supply facilities and agricultural water

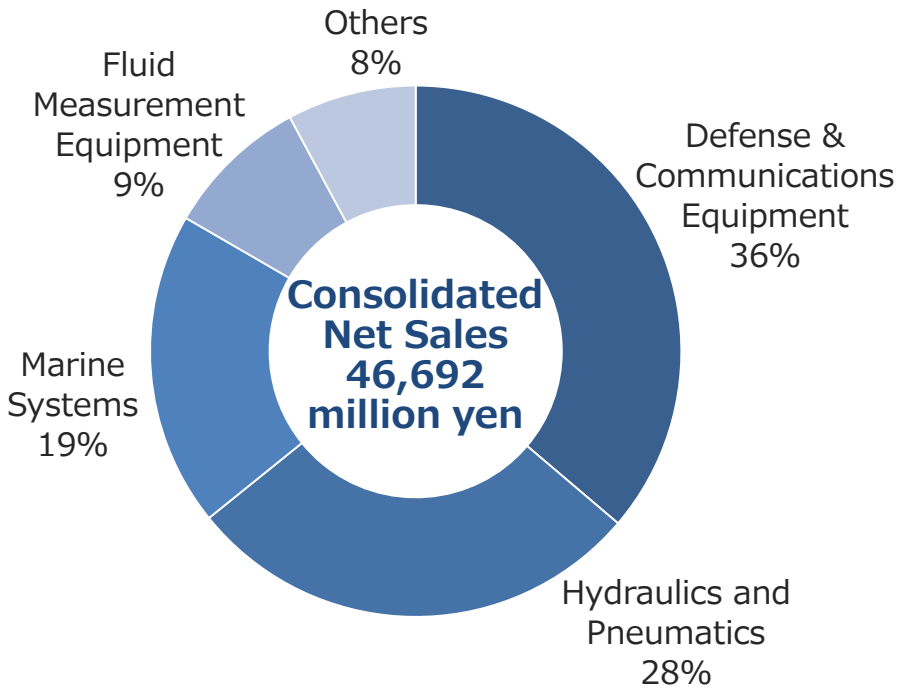
-Manufacture, sale and maintenance services for gas-based fire extinguishing systems

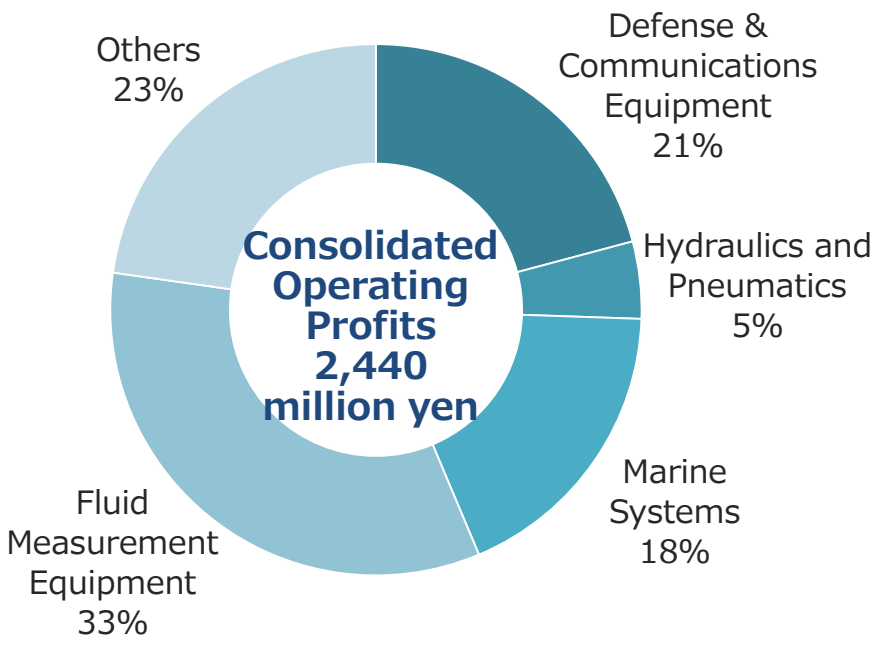
Others

-Railway Maintenance

-Printing Inspection Equipment

Net sales and operating profits for Fiscal 2018



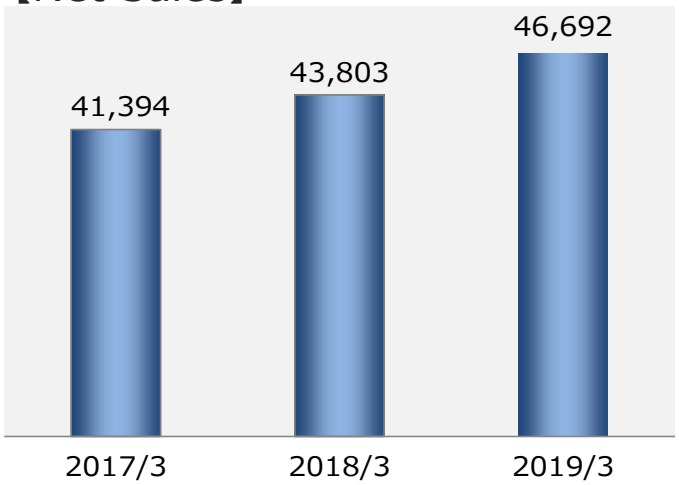


Financial Results Summary for Fiscal 2018

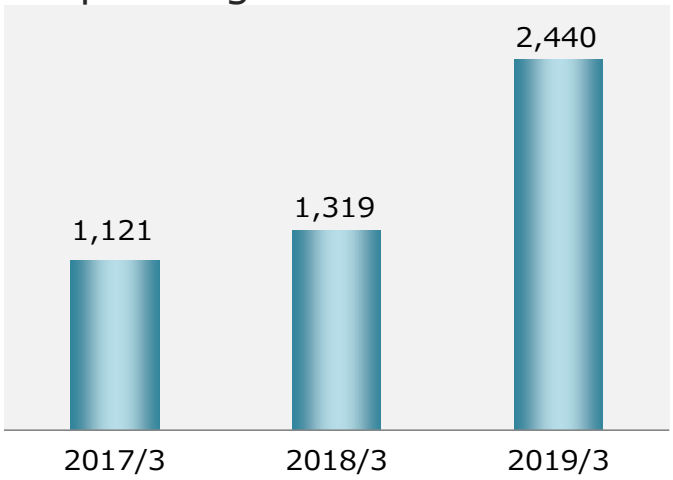
- Higher net sales in all business segments, including Other Businesses.
- Strong public-sector performance in Defense & Communications Equipment Business and Fluid Measurement Equipment Business; Other Businesses also performed well.

Changes in Consolidated Profit & Loss

【Net Sales】 (Million yen)



【Operating Profit】 (Million yen)

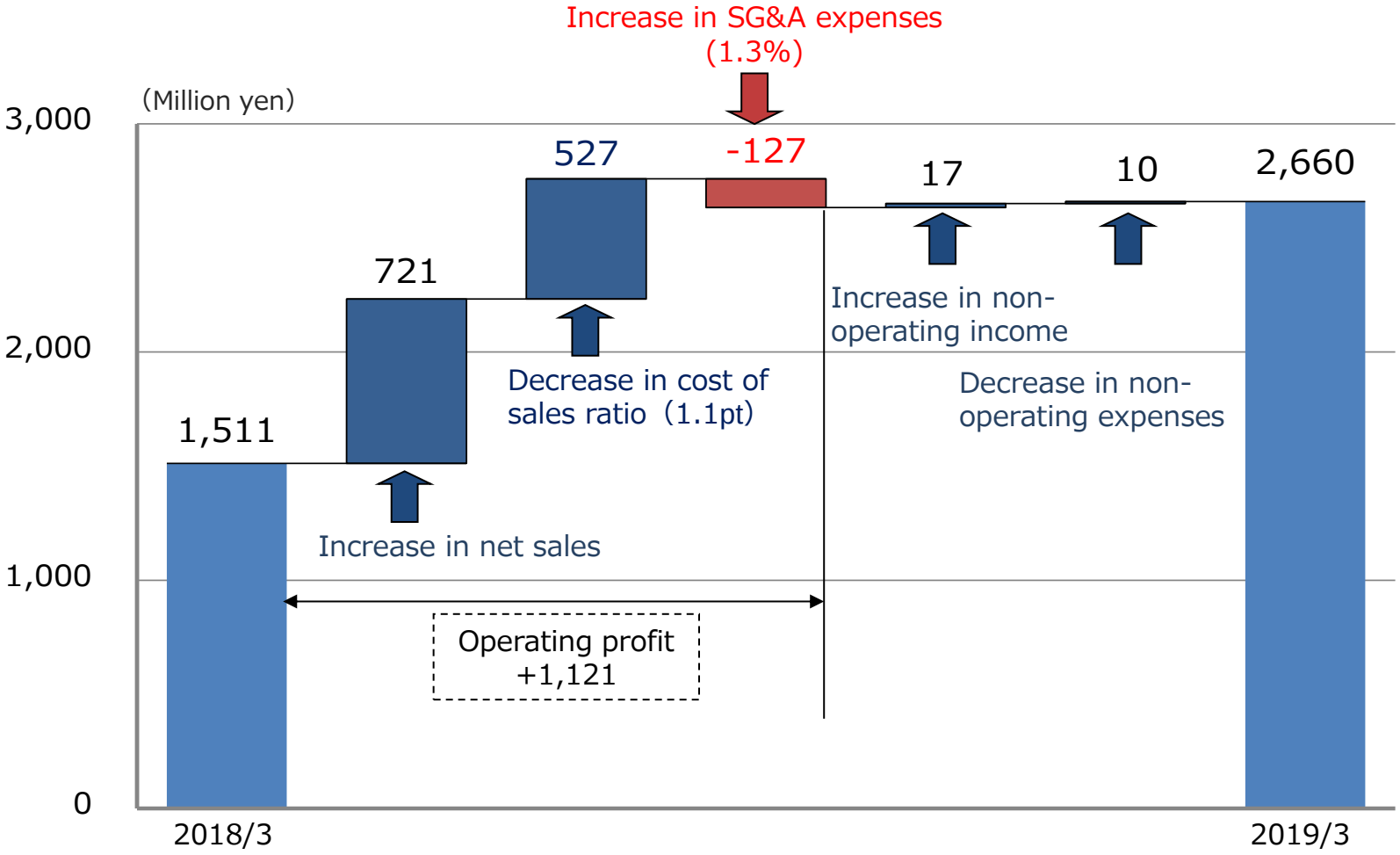


(Million yen)	2017/3	2018/3	2019/3	Amount of change	Rate of change
Net sales	41,394	43,803	46,692	2,889	6.6%
Operating profit	1,121	1,319	2,440	1,121	85.1%
Ordinary Profit	1,252	1,511	2,660	1,148	76.0%
Net Profit*	709	1,120	1,936	816	72.8%

* “Net profit” represents “Profit attributable to owners of parent”.

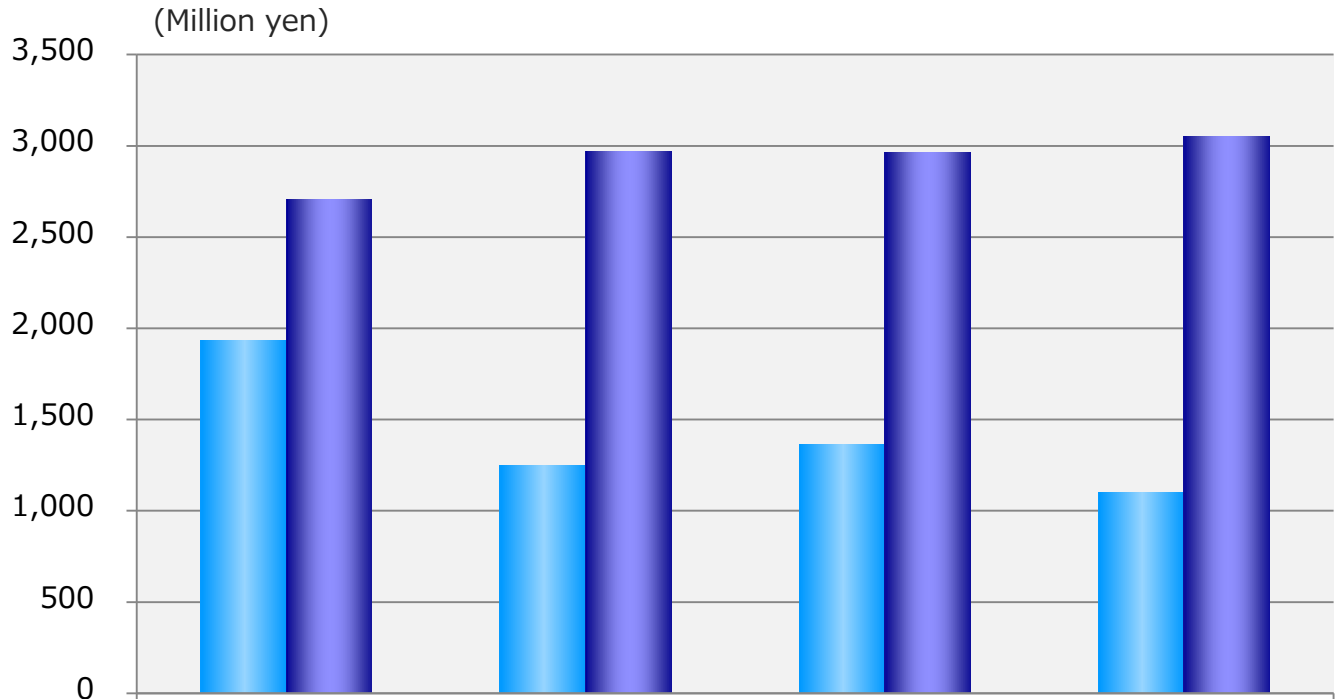
- Net sales (consolidated) up 6.6%:
  All business segments, including Other Businesses, posted increases.
- Profits (consolidated): Refer to next slide.

Analysis of changes in consolidated profit and loss
(Factors causing fluctuations in consolidated ordinary profit)



- Significant increase in operating profits. Factors include large increase in sales coupled with recovery in cost of sales ratio, which offset increase in SG&A expenses.

Capital investment, R&D



	2016/3	2017/3	2018/3	2019/3
Capital investment	1,934	1,246	1,363	1,102
R&D	2,707	2,969	2,962	3,052

- R&D expenses remain high. This is due to increased R&D spending for future business growth in the Fluid Measurement Equipment Business and Defense & Communications Equipment Business

Consolidated balance sheets (Main accounting items only)

(Assets)

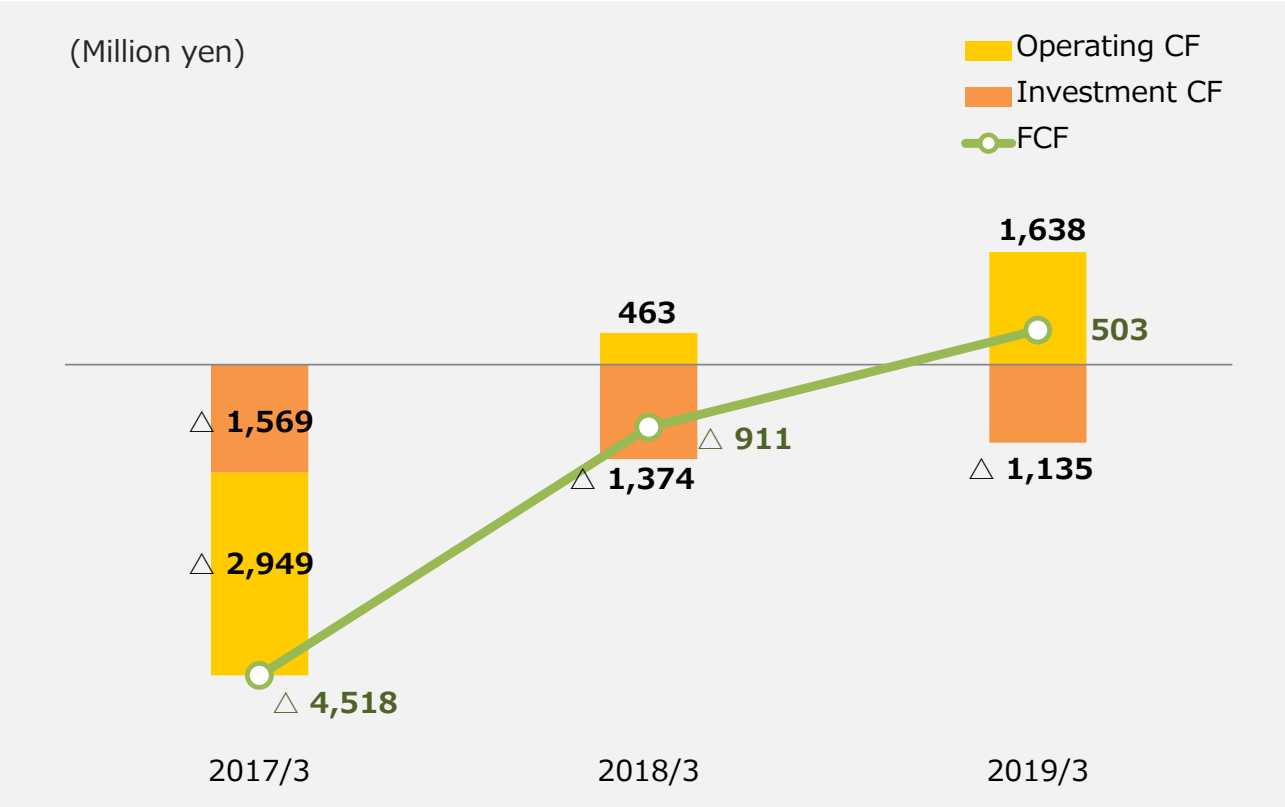
(Million yen)	As of Mar 31, 2018	As of Mar 31, 2019	Amount of change
Current assets	**45,273**	**46,124**	**851**
Cash and deposits	9,828	9,397	△431
Notes and accounts receivable	18,198	19,039	841
Inventories	16,504	16,990	486
Accounts receivable	151	76	△75
Other	594	624	29
Non-current assets	**12,772**	**12,224**	**△548**
Tangible assets	7,524	7,246	△278
Intangible assets	1	0	△1
Investment securities	3,857	3,401	△455
Deferred tax assets	777	950	173
Total assets	**58,045**	**58,349**	**304**

(Liabilities and net assets)

(Million yen)	As of Mar 31, 2018	As of Mar 31, 2019	Amount of change
Current liabilities	**20,580**	**22,289**	**1,709**
Notes and accounts payable	7,467	7,027	△440
Short-term loans payable	8,815	10,757	1,942
Provision for bonuses	1,110	1,121	11
Non-current liabilities	**9,041**	**6,579**	**△2,462**
Long-term loans payable	7,397	4,954	△2,443
Net defined benefit liability	649	721	72
Total liabilities	**29,620**	**28,868**	**△753**
Shareholders' equity	**26,617**	**28,137**	**1,520**
Retained earnings	19,923	21,528	1,605
Total net assets	**28,425**	**29,481**	**1,056**
Total liabilities and net assets	**58,045**	**58,349**	**304**

- Inventories up by 500 million yen. However, the increase in stocking for the public-sector market slowed because of headway made by the Defense & Communications Equipment Business in delivering mass produced radar warning receivers.
- 500 million yen decrease in combined long & short-term loans payable, reflecting repayments of long-term loans.

Changes in consolidated cash flows
(Operating CF/ Investment CF/ FCF)



*Free Cash Flows (FCF): Computed simply by adding cash flows from operating activities and cash flows from investing activities.

- Operating CF rose to 1.64 billion yen. Notes and accounts receivable increased (800 million yen), while payables decreased (400 million yen). On the other hand, the growth in inventories slowed (500 million yen increase compared to last year's increase of 2.5 billion), and there were increases in profit before income taxes (2.7 million yen) and depreciation (1.3 billion yen).
- FCF turned positive for first time in three fiscal periods.

Changes in major indicators

	2015/3	2016/3	2017/3	2018/3	2019/3
E P S (Yen) (Earnings per share)	27.64	15.05	8.54	67.61	117.19
B P S (Yen) (Book-value per share)	323.21	314.11	324.81	1,695.16	1,764.15
Equity ratio (%)	52.5	51.3	51.6	48.3	49.8
R O E (%) (Return on equity)	9.1	4.7	2.7	4.1	6.8
ROA (%) (Return on assets)	6.2	3.9	2.4	2.7	4.6

*Note: The Company has implemented consolidation of common shares at a rate of 1 share for every 5 shares effective October 1, 2017.

- Equity ratio:
  Although net assets increased by 300 million yen, equity increased by 1 billion yen, causing the ratio to rise by 1.5 points YoY.
- Return on equity (ROE):
  Improvement by 2.7 percentage points compared to the previous fiscal year;
  Average of 5.5% for the last five years.

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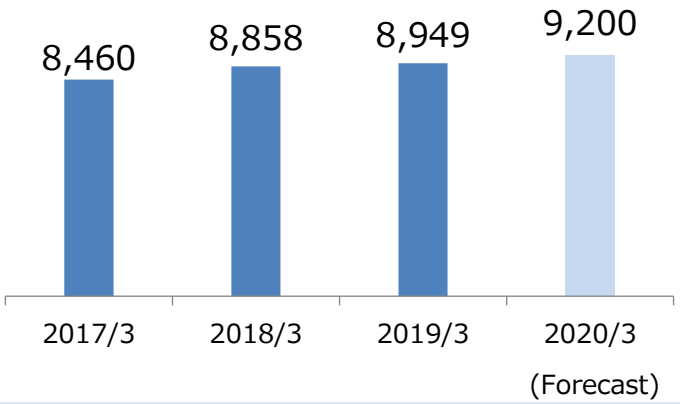
Status of orders received and order backlog

(Million yen)	Amount of orders received for Fiscal 2018			Amount of order backlog at the end of Fiscal 2018		
	Amount	Composition ratio	Change from Fiscal 2017	Amount	Composition ratio	Change from Fiscal 2017
Marine Systems	9,026	18.8%	5.2%	2,813	10.0%	2.8%
Hydraulics and Pneumatics	13,516	28.1%	3.6%	3,271	11.6%	16.1%
Fluid Measurement Equipment	4,101	8.5%	21.6%	715	2.5%	0.0%
Defense & communications Equipment	18,382	38.2%	11.6%	20,861	74.0%	7.6%
Reported segment total	**45,025**	**93.5%**	**8.6%**	**27,660**	**98.1%**	**7.8%**
Others	3,109	6.5%	13.3%	535	1.9%	△51.1%
Adjustment	1	0.0%	55.2%	0	0.0%	0.0%
Total	**48,135**	**100.0%**	**8.9%**	**28,195**	**100.0%**	**5.4%**

- Fluid Measurement Equipment Business: Significant YoY increase, reflecting a high level of orders for crisis management water-level gauges.
- The Defense & Communications Equipment Business: The backlog remains high, although the segment continues to deliver large orders.
- Other Businesses: Cleared much of the backlog after delivering overseas orders for rail inspection cars.

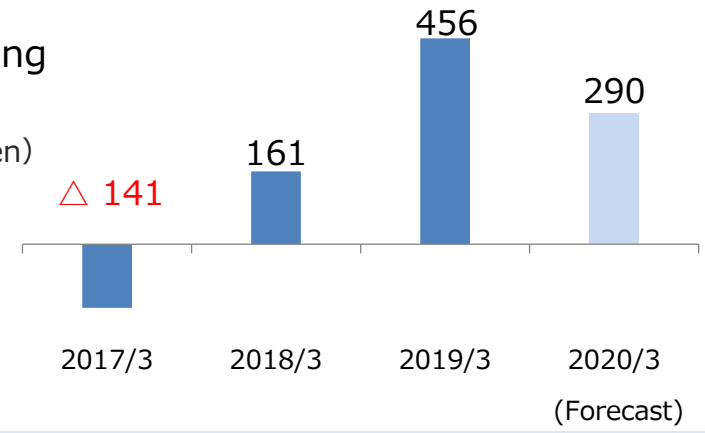
2-1. Marine Systems Business

【Net Sales】
(Million yen)



Difference from Fiscal 2017: 92M (1.0%)

【Operating Profit】
(Million yen)



Difference from Fiscal 2017: 294M (182.4%)

Fiscal 2018 Progress

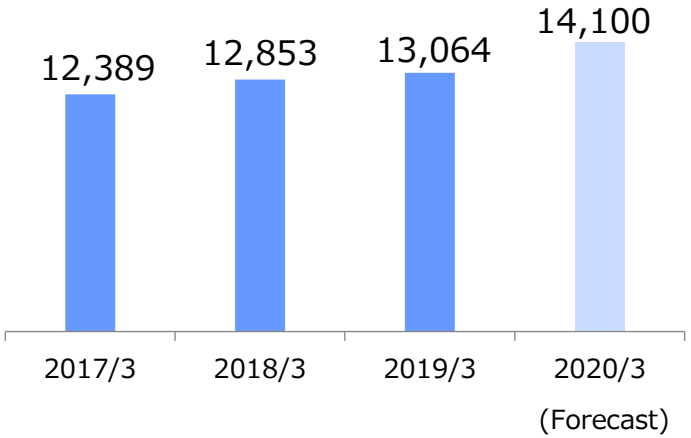
- Overseas, there were strong sales in new shipbuilding for Asian clients and in OEM marine gyrocompasses for European clients.
- Changes in product mix resulted in higher operating profits, but business remains tough.

Future measures

- Reduce costs of top products (marine autopilots and gyrocompasses) and other products to ensure profit.
- In the existing vessel market, expand efforts to promote changeover to sustainable and energy-efficient equipment (e.g., ACE and digital course recorders). Promote changeover to ECDIS.
- Expand marketing efforts in China by introducing medium-sized marine autopilots into Chinese costal/fishing vessels market ASAP.

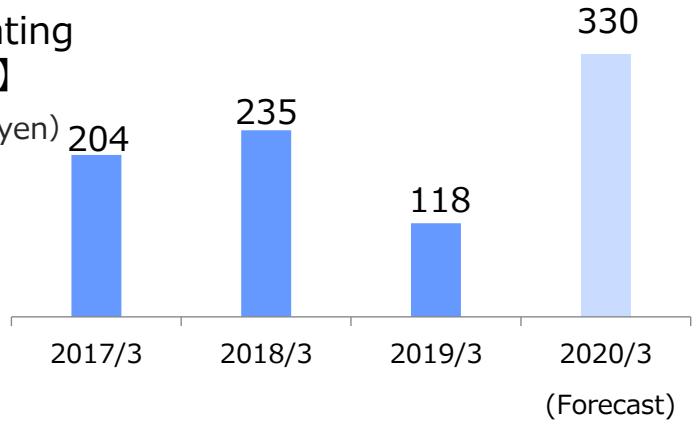
2-2. Hydraulics and Pneumatics Business

【Net Sales】
(Million yen)



Difference from Fiscal 2017: 211M (1.6%)

【Operating Profit】
(Million yen)



Difference from Fiscal 2017: △118M (△50%)

Fiscal 2018 Progress

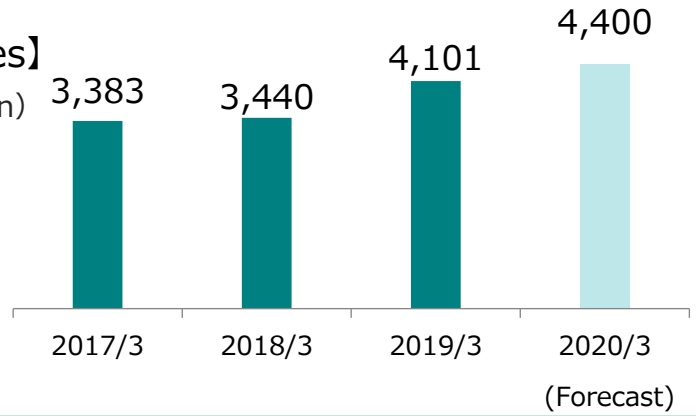
- In China (the key overseas market), demand for molding machinery fell.
- In Japan, there was brisk performance in construction machinery, machine tools, and hydraulic systems

Future measures

- Construction machinery: Continue cultivating new leads in Japan, as well as in China—where market development is accelerating.
- Molding machinery for domestic and overseas markets: Market direct-drive pump control systems and medium/small solenoid directional valves to manufacturers of molding machinery
- Hydraulic systems: Maintain focus on high-pressure gas equipment.

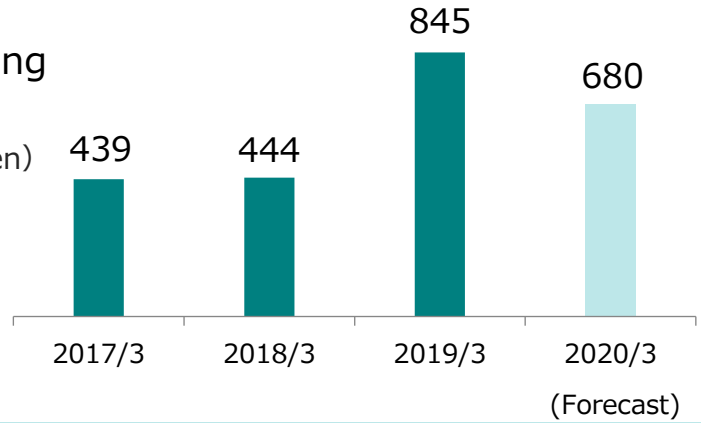
2-3. Fluid Measurement Equipment Business

【Net Sales】
(Million yen)



Difference from Fiscal 2017: 662M (19.2%)

【Operating Profit】
(Million yen)



Difference from Fiscal 2017: 401M (90.4%)

*In this period, the Disaster Prevention Equipment Business was transferred from Other Businesses to the Fluid Measurement Equipment Business and started being managed as the "fire-extinguishing systems market." The above graph reflects these changes.

Fiscal 2018 Progress

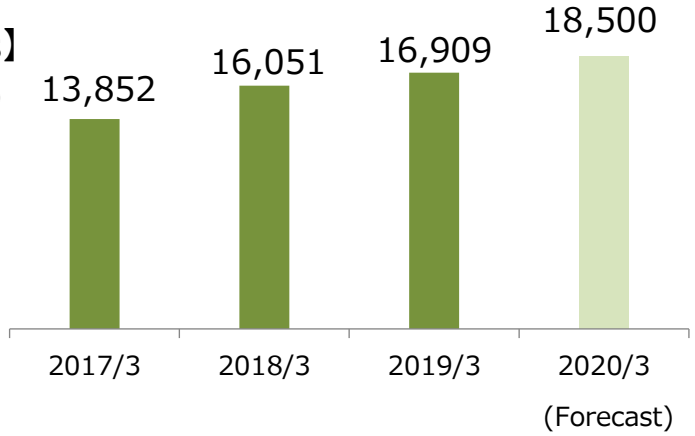
- Segment results were favorable. The fire-extinguishing systems market saw brisk performance, while in the public-sector market, orders for MD-10 (a newly launched crisis management water-level gauge for riverine disaster prevention) vastly exceeded expectations.

Future measures

- Public-sector market: Promote disaster-prevention products, enhance precision of (add value to) ultrasonic flowmeters, acquire prime contract orders for large-scale projects.
- Private sector and overseas markets: Promote sales of microwave level gauges to oil and chemical plants, advocate OEM supply.
- Fire-extinguishing systems market: Accelerate efforts to develop application in facilities handling dangerous materials (as a second application to multistory parking garages)

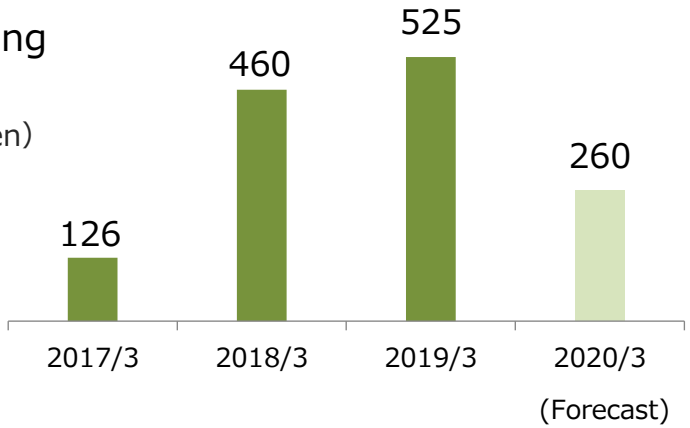
2-4. Defense & Communications Equipment Business

【Net Sales】
(Million yen)



Difference from Fiscal 2017: 858M (5.3%)

【Operating Profit】
(Million yen)



Difference from Fiscal 2017: 66M (14.3%)

Public-sector market

Fiscal 2018 Progress

- Defense: Mass production and shipments of radar warning receivers for the F-15 fighter.
- Maritime Traffic: Increase number of AIS base station systems and radars for the Japan Coast Guard.

Future measures

- Defense: Aim for record sales results underpinned by sales to F-15 AIS test equipment for F-15 AIS depot support.
- Maritime Traffic: Promote sales of new models of solid-state radar for overseas VTS operators and system integrators.

2-4. Defense & Communications Equipment Business

Private-sector market

Fiscal 2018 Progress

<inertial sensor and applied equipment>

- Mass production and shipments of automatic steering assistance devices for agricultural vehicles (for rice planter machinery).
- Strong sales in new model road roughness profilometer and analysis systems for expressway construction.

<Communication & control equipment>

- Delayed mass production/shipment of microwave amplifiers for semiconductor production equipment.

Future measures

<inertial sensor and applied equipment>

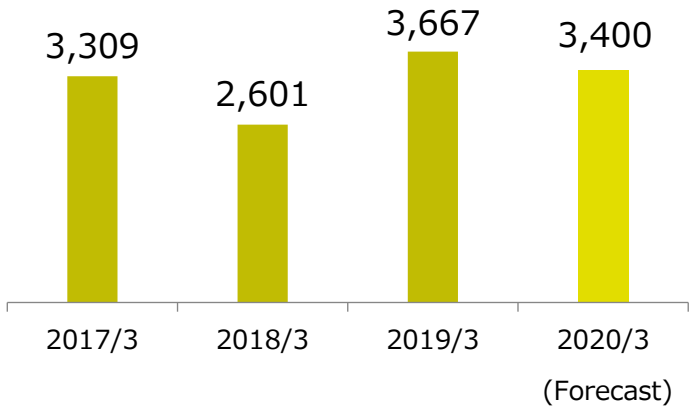
- Expand applications of automatic steering assistance devices for agricultural vehicles, and develop products aimed at tractors.

<Communication & control equipment>

- Microwave amplifiers for semiconductor production equipment: Focus on model upgrades and other models.
- Develop electromagnetic energy applications, such as microwave heaters.

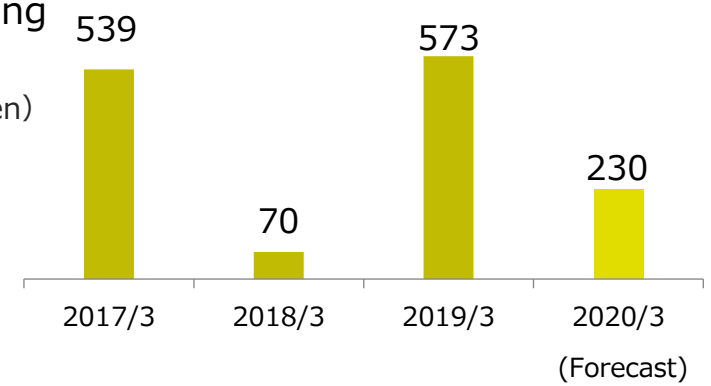
2-5. Others (Railway Maintenance/Printing Inspection Equipment)

【Net Sales】
(Million yen)



Difference from Fiscal 2017: 1,066M (41.0%)

【Operating Profit】
(Million yen)



Difference from Fiscal 2017: 503M (718.3%)

*In this period, the Disaster Prevention Equipment Business was transferred from Other Businesses to the Fluid Measurement Equipment Business and started being managed as the "fire-extinguishing systems market." The above graph reflects these changes.

Fiscal 2018 Progress

- Railway Maintenance Business: Delivered first overseas order for rail inspection cars, equipment sales were strong.
- Printing Inspection Equipment Business: Strong performance underpinned by market introduction of new model (P-CAP V6).

Future measures

- Railway Maintenance Business: Develop ideas for new strategic products as follow-on to rail inspection cars, and then introduce those products into the market.
- Printing Inspection Equipment Business: Strive to increase market share.

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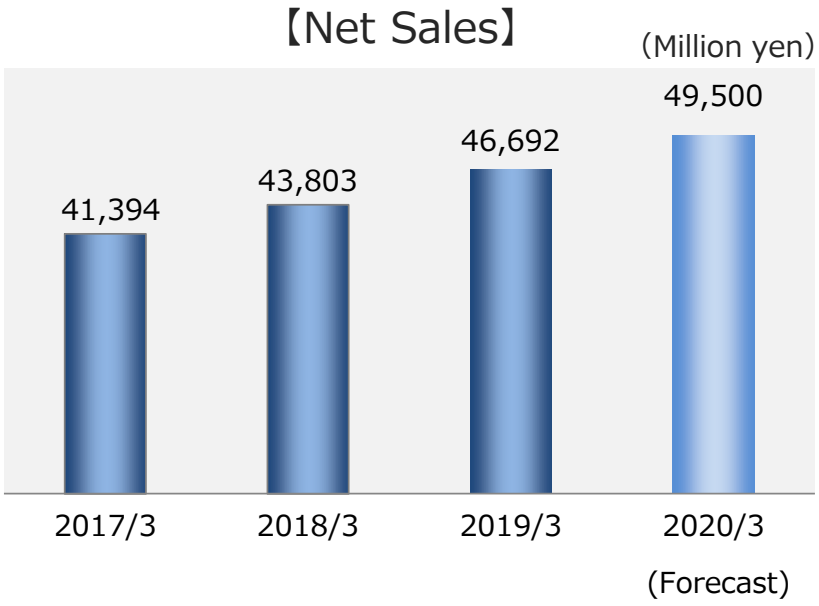
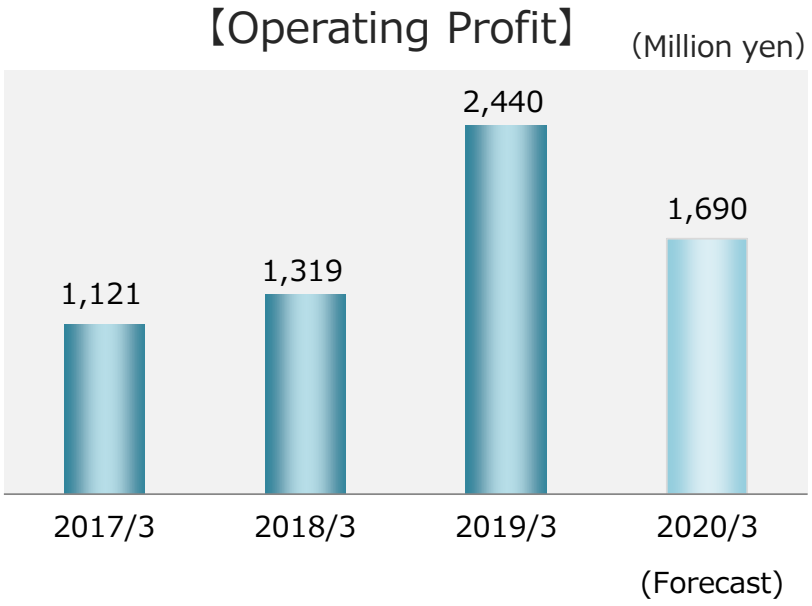
Net sales and operating profit forecast



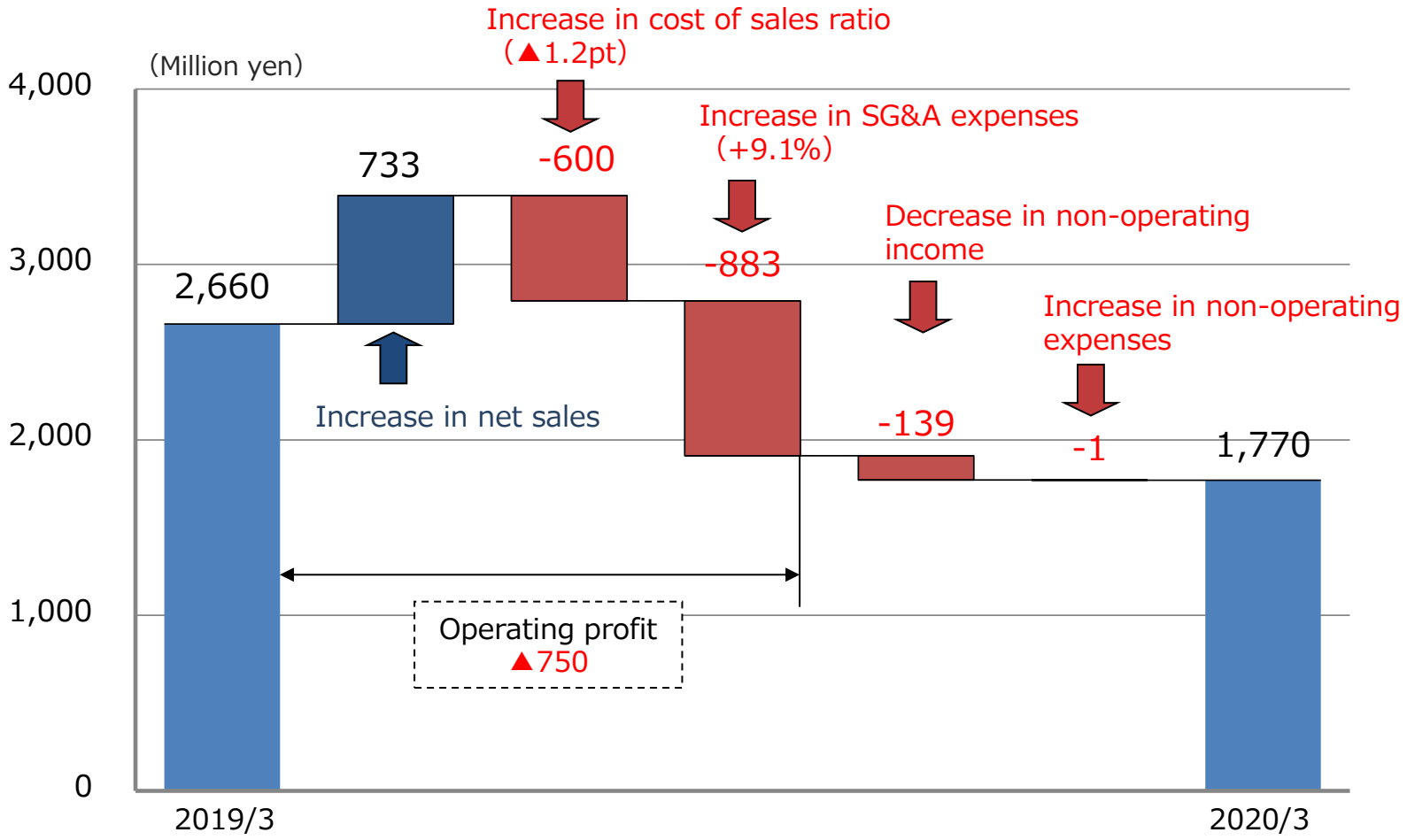


(Million yen)	2017/3	2018/3	2019/3	2020/3 (Forecast)	Amount of change	Rate of change
Net sales	41,394	43,803	46,692	49,500	2,808	6.0%
Operating profit	1,121	1,319	2,440	1,690	△750	△30.7%
Ordinary Profit	1,252	1,511	2,660	1,770	△890	△33.5%
Net Profit*	709	1,120	1,936	1,320	△616	△31.8%

* “Net profit” represents “Profit attributable to owners of parent”.

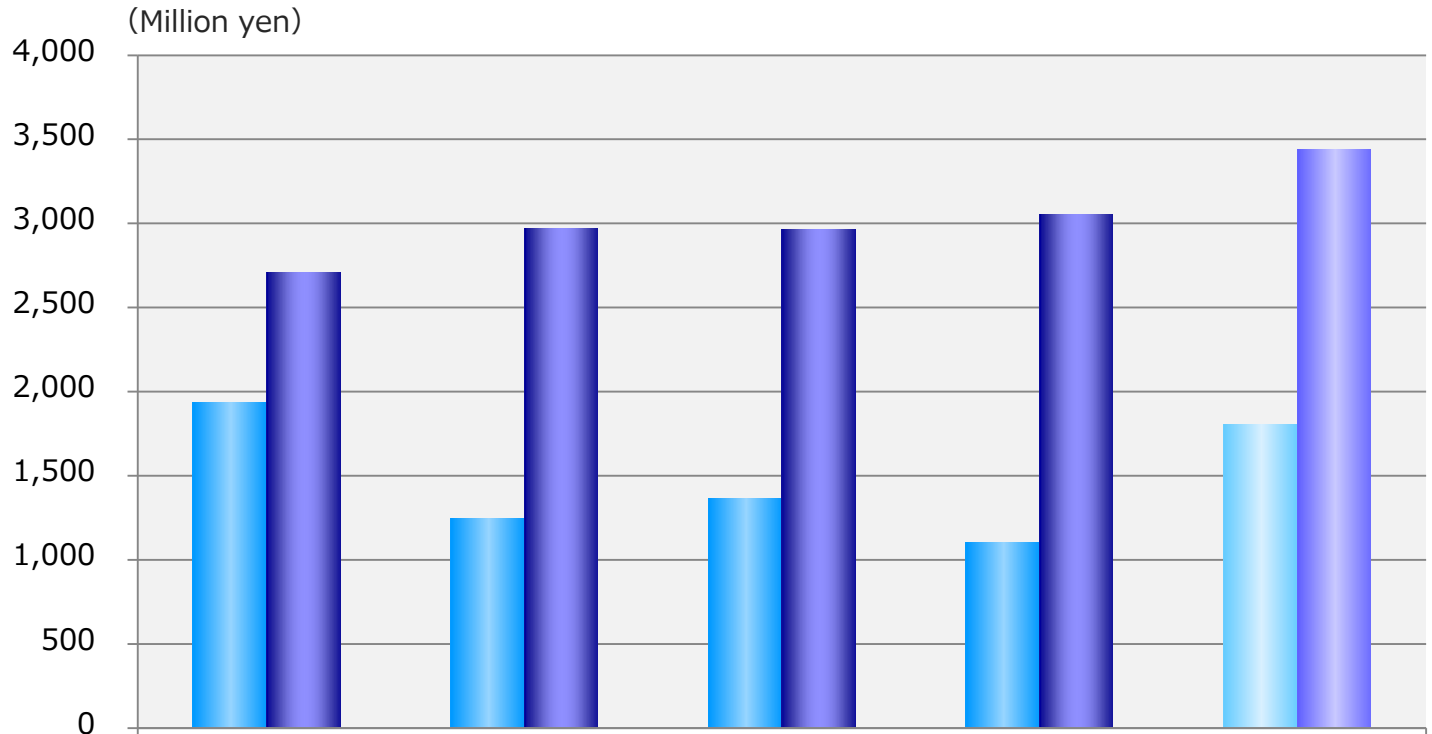
- Increase in net sales (consolidated) for the four business segments.
- Profits (consolidated): Refer to next slide.

Analysis of changes in consolidated profit and loss
(Factors causing fluctuations in consolidated ordinary profits)



- Sales will increase. However, operating profits will decrease due to poorer cost of sales ratio (following changes in product mix) and higher SG&A expenses—particularly higher R&D spending for future growth (e.g., business expansion).

Capital investment, R&D expense forecast



	2016/3	2017/3	2018/3	2019/3	2020/3 (Forecast)
Capital investment	1,934	1,246	1,363	1,102	1,803
R&D	2,707	2,969	2,962	3,052	3,437

Profit returns to shareholders

[Basic policy]
Implement stable returns to shareholders while maintaining balance with financial capacity.

Regarding the use of internal reserves
Allocate investments aimed at “new technology research” “new product development,” “productivity improvement,” “overseas base expansion,” “human resource development,” “organizational capacity building,” “management resource enhancement,” etc., which serve as the sources for profitability (earning power), in order to achieve sustainable growth and improve medium-to-long-term corporate value, while taking capital efficiency into account.

Dividend for the last five years and forecast for Fiscal 2019

	2015/3	2016/3	2017/3	2018/3	2019/3	2019/3 (Forecast)
Annual dividend per share (yen)	4.50	5.00 (Common, 4 + Commemorative, 1)	4.00	20.00	25.00	25.00
Payout ratio (consolidated) (%)	16.3	33.2	46.8	29.6	21.3	31.2
Total return ratio (consolidated) (%)	19.9	39.8	46.8	37.1	25.6	—

*From Fiscal 2017 (2018/3) onward, dividend amounts are those after consolidation of shares.
(Dividend amount before consolidation of shares is 1/5 of amount shown.)

Status of recent acquisition of treasury shares

	Aug 2011	May 2014	May 2015	Nov 2015	Nov 2017	Feb 2019
Total number of reacquired shares (yen)	1,300,000	310,000	300,000	335,000	58,000	76,800
Acquisition cost (million yen)	165	84	84	84	85	85

*November 2017 and February 2019 show the numbers after consolidation of shares.

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Medium-term Management Policy

Basic policies and growth strategies

(1) Expand business areas
(2) Promote globalization
(3) Sustainably Strengthen existing business

Goals

Through growth strategies based on the three basic policies, as the market leader,
- Improve and innovate technologies and skills to maintain edge over other companies,
- Continue to create proprietary, high-value-added products that are indispensable in the current generation and to society,
- Contribute to safety and preservation of the environment,
- Maintain annual growth in income and profits in the short-run,
- Dramatically improve profits and cash flow by heightening our earning capacity in the medium to long term, and
- Strive to meet the demands and expectations of the diverse range of our stakeholders.

Principles of making plans

-Due to rapid changes in the external environment, the term of implementation will be changed as needed.
-The 3-year Medium-term Business Plan will be reviewed every year (rolling plan).

Basic growth strategies

*Shown in parentheses are business segments.

New markets

Market development strategy (capture top share in niche markets)

Innovate to satisfy customers

- Cultivate overseas railway markets (Others)
- Promote overseas sales of high-pressure piston pumps for construction machinery (Hydraulics and Pneumatics)
- Small/medium marine autopilots (Marine Systems)
- Disaster-prevention equipment (Fluid Measurement Equipment)

(2) Promote globalization

Create new ventures

Integrate market development and product development strategies

- Microwave amplifiers for semiconductor production equipment (Defense & Communications Equipment)
- Automated agriculture devices (Defense & Communications Equipment)
- High-pressure equipment: Devices for hydrogen stations (Hydraulics and Pneumatics)

(1) Expand business areas

Existing markets

(3) Sustainably Strengthen existing business

Existing leading niche businesses: Shore up dominant position and increase earning power

- Streamline workflows through company-wide *kaizen*
- Promote IoT-driven smart manufacturing
- Develop human resources
- Improve market share

Product development strategy ("top-of-the-niche" strategy)

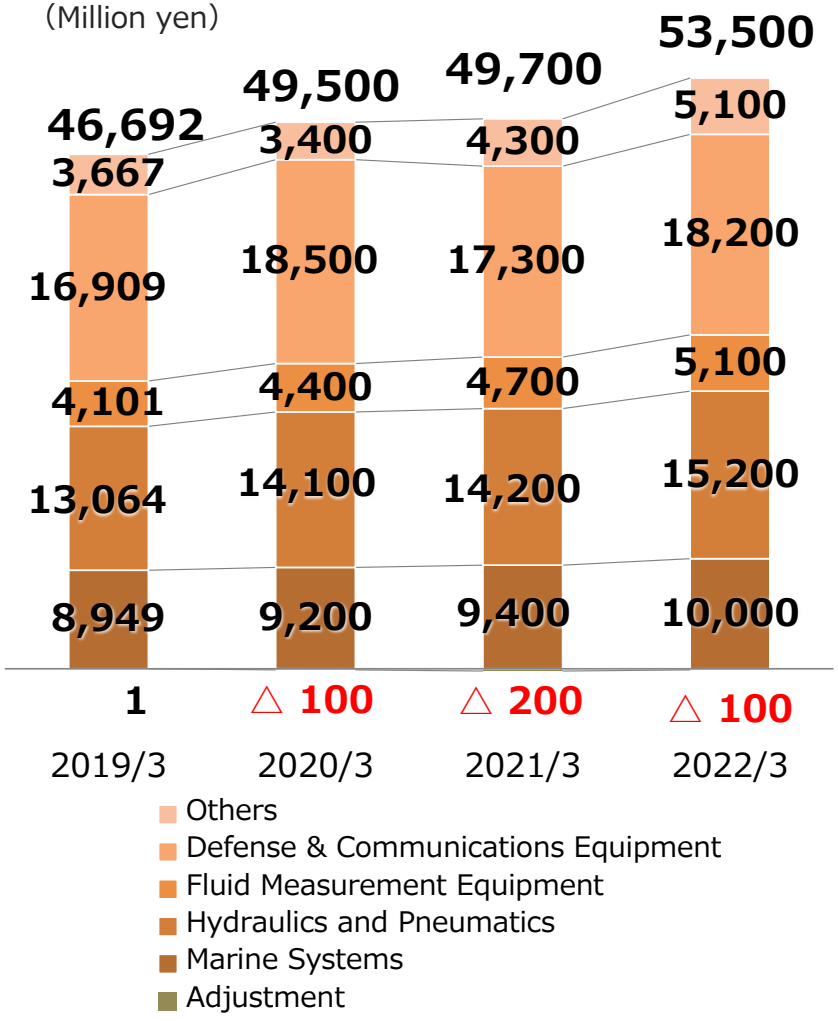
Accelerate development through "Open & Close" strategy

- Electronic chart tables / automated navigation systems (Marine Systems)
- High-pressure vane pumps (Hydraulics and Pneumatics
- High-precision ultrasonic flowmeters (Fluid Measurement Equipment)

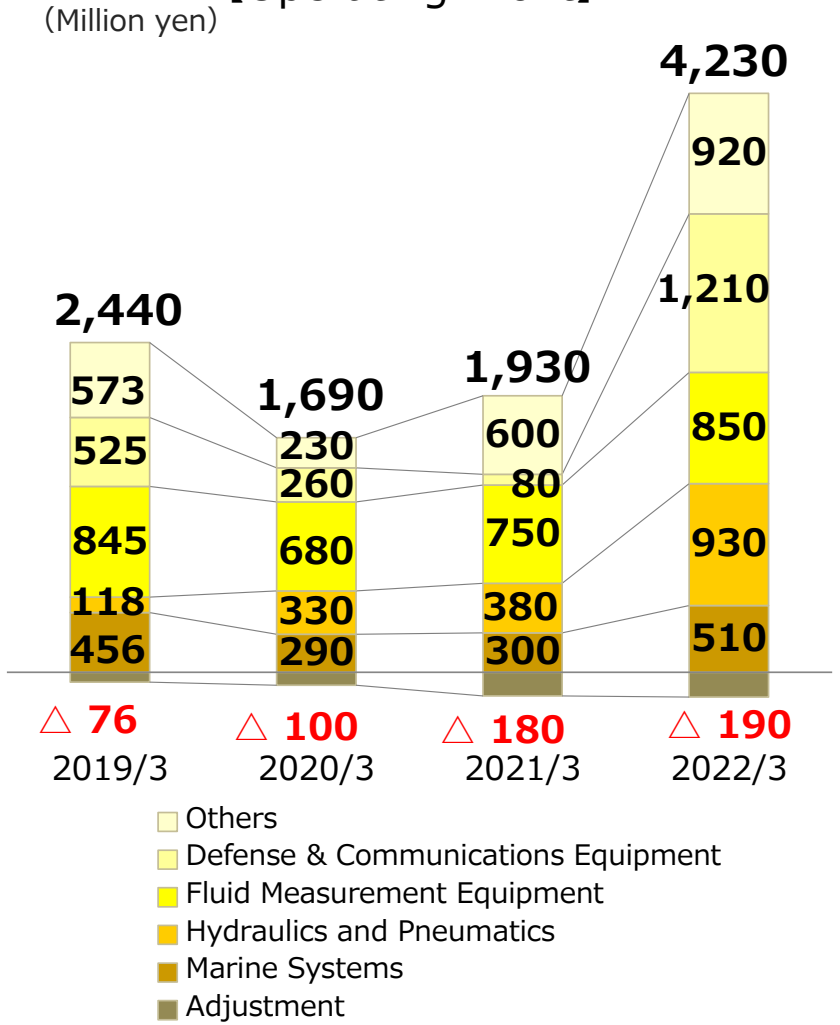
Existing products | New products

Three-year Business Plan starting from Fiscal 2019 (2020/3)

【Net Sales】



【Operating Profit】



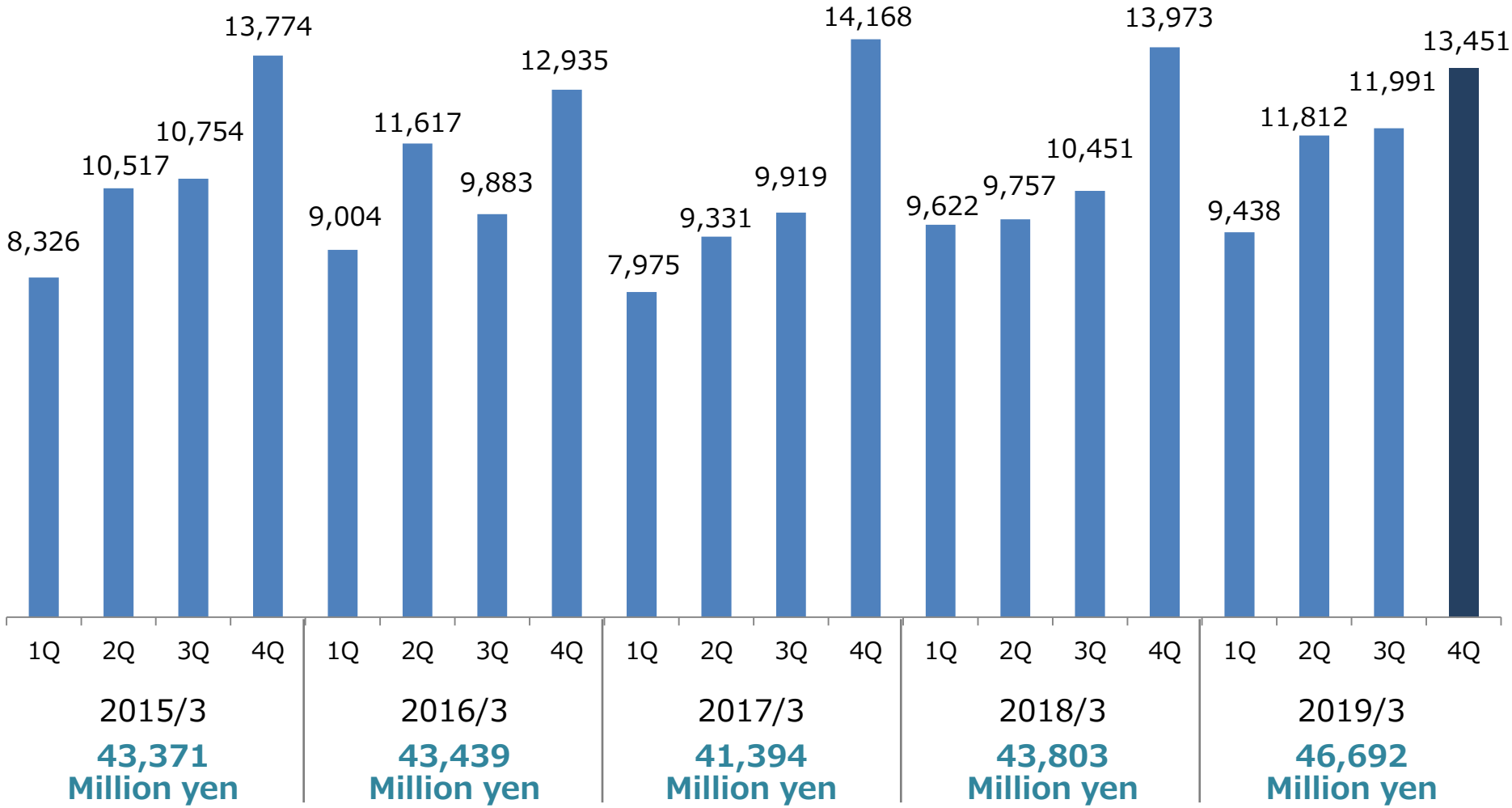
Highest consolidated net sales to date is 68,178 million yen (Fiscal 1991).

References

- **Quarterly changes in net sales and operating profits**
- **Changes in net sales and operating profits by segment**

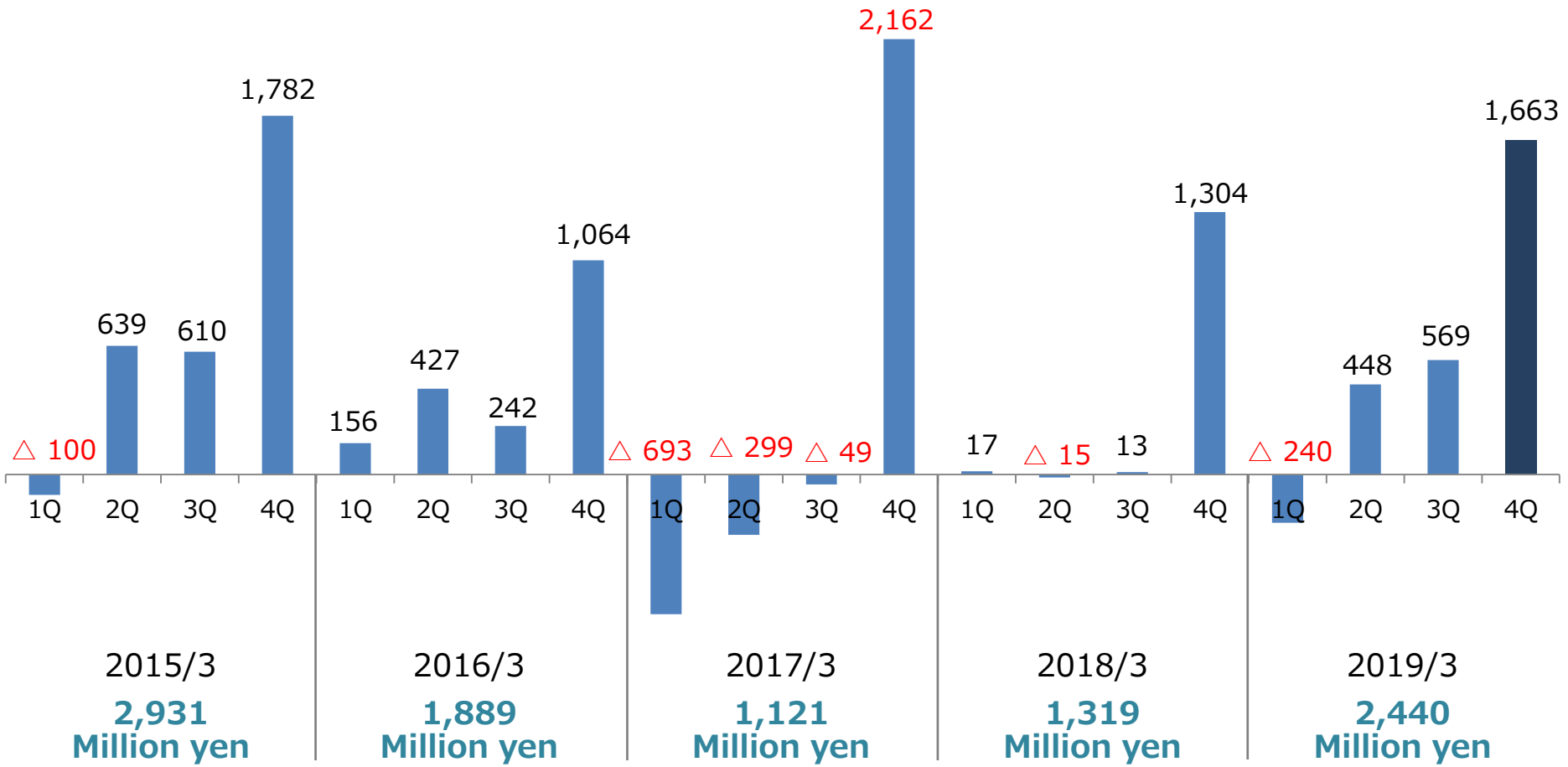
Quarterly changes in net sales

(Million yen)



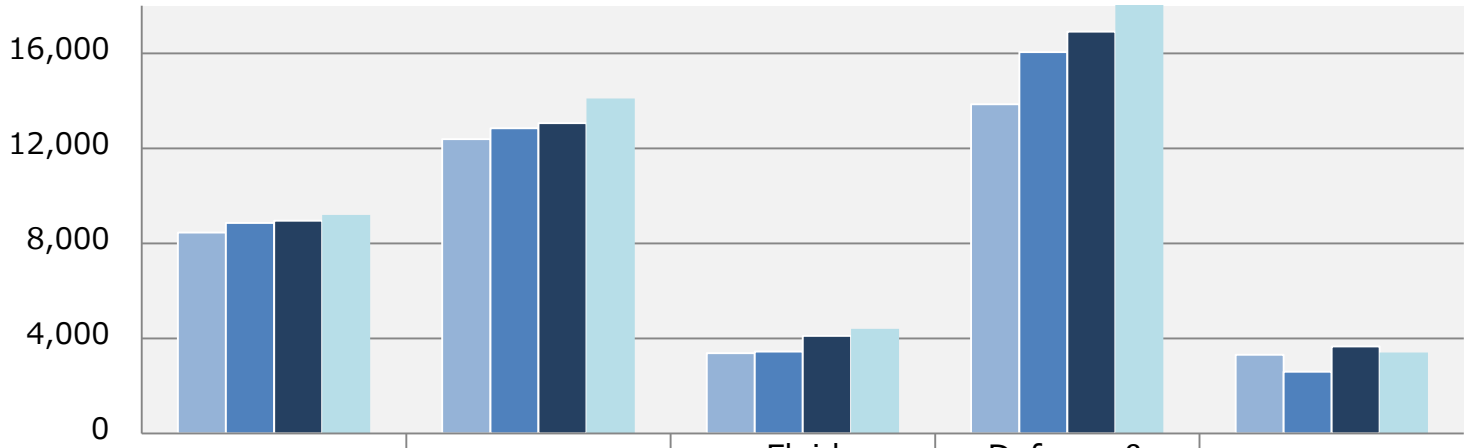
Quarterly changes in operating profits

(Million yen)



Changes in net sales by segment

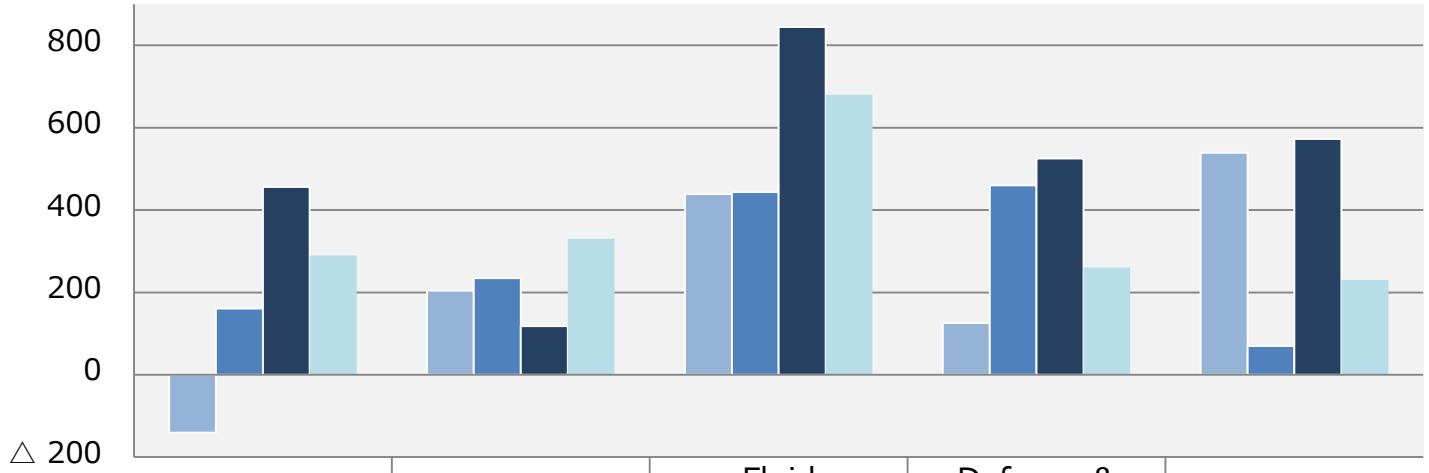
(Million yen)



	Marine Systems	Hydraulics and Pneumatics	Fluid Measurement Equipment	Defense & Communications Equipment	Others
2017/3	8,460	12,389	3,383	13,852	3,309
2018/3	8,858	12,853	3,440	16,051	2,601
2019/3	8,949	13,064	4,101	16,909	3,667
2020/3 (Forecast)	9,200	14,100	4,400	18,500	3,400

Changes in operating profits by segment

(Million yen)



	Marine Systems	Hydraulics and Pneumatics	Fluid Measurement Equipment	Defense & Communications Equipment	Others
2017/3	△ 141	204	439	126	539
2018/3	161	235	444	460	70
2019/3	456	118	845	525	573
2020/3 (Forecast)	290	330	680	260	230

*Operating profits before adjustment

TOKYO KEIKI, INC.
Glossary of terms used in the Financial Results Briefing Materials

Marine Systems Business		
	Term	Description
1	Gyrocompass	A gyrocompass applies the mutual effects of gravity, the earth's rotation and the characteristics of the "gyroscope". Its key features are: (1) indication of true north (magnetic compasses show magnetic north), (2) capability to serially output heading signals to other equipment, (3) capability to be positioned anywhere, (4) resistance to hull magnetism and other disturbances. As the critical "sensitive element" gyro rotor rotates continuously at high speeds for long periods, regular maintenance is recommended and in cases of severe wear due to cumulative operating time, replacement (overhaul) of the gyro rotor may be required. Periodic maintenance services are an integral part of our Marine Systems business.
2	Marine autopilot (automatic steering device for ships)	The autopilot receives signals from heading sensors such as gyrocompasses and uses them to automatically control the rudder to efficiently navigate towards the preset direction. The Autopilot PR-9000 Series, a key product of our company, boasts a large color LCD display as well as repeater and various navigational data displays that reduce the burden on crews and contribute to safer navigation. The PR-9000 features improved system independence and incorporates functions that strengthen operational monitoring of equipment to improve overall safety and reliability. In addition, the autopilot's route control function (ACE) automatically plots the route toward the next destination by adjusting only the heading to that destination from the current position and factors in estimated disturbances (tidal activity), departure from route, etc. to provide optimal control of the rudder in guiding the vessel on the newly designated route. This reduces departure from routes, shortens voyage, reduces unnecessary steering, and reduces the load of nautical operations, thereby contributing to safety and energy conservation. The ACE function can now be added to the autopilot of existing ships by using the course control unit.
3	Electronic chart display and information system (ECDIS)	The electronic chart and display information system, or "ECDIS", has functions for displaying the electronic navigational chart (ENC, electronic information needed for navigation safety, such as on position, course, speed, etc., in addition to the information contained in traditional nautical charts) and the ship's current position on the same screen and also superimposes other information (radar, planned routes, etc.) as well. Starting July 2012, its use has gradually become mandatory.

	Term	Description
4	Electronic chart table	The electronic chart table is a large, horizontal multi-touch screen for nautical navigation, which multiple users can operate and view. Unlike conventional ECDISs, this device (which is sometimes called a “planning station”) comes with features that streamline and optimize nautical navigation and planning. For example, users can add handwritten notes and link the device with a weather prediction system. The device can also be connected to a high speed network, enabling efficient and accurate ship-to-ship or ship-to-land communication. Thus, the electronic chart table provides a greater range of possibilities than ECDIS with capabilities to satisfy sophisticated nautical needs.
5	Fiber optic gyroscope (FOG)	A fiber optic gyroscope detects mechanical revolutions using optical interference. A coiled optical fiber is used for the sensor. Two beams from a laser are injected into the optical fiber but in opposite directions. Due to the Sagnac effect, the beam travelling against the rotation experiences a slightly shorter path delay than the other beam. The resulting differential phase shift is measured through interferometry, thus translating one component of the angular velocity into a shift of the interference pattern which is measured photometrically. Our FOG products are used in attitude and heading reference systems for patrol helicopters and attitude-sensing systems for tunnel excavation. We are currently pursuing the commercialization of FOG compasses for merchant ships. Unlike mechanical gyros, a key feature of the FOG is the absence of moving parts, leading to its high reliability. For applications requiring higher resolution than what FOG can provide, we also offer ring laser gyros that are used in the inertial measurement systems of naval vessels and submarines, applications that require high accuracy and reliability.
6	Digital course recorder	A course recorder is a device that automatically records the ship’s heading and rudder angle information over time. Conventional course recorders are mechanical devices that continuously pen records on a rolled record sheet. The digital course recorder does not use pens or record sheets but instead records and stores the ship’s heading and rudder angle information in memory which reduces running costs and contributes to the environment. The digital course recorder’s large LCD display also allows handwritten input to provide operability similar to the traditional way of note taking on record paper.

Hydraulics and Pneumatics Business		
	Term	Description
7	Direct drive pump control systems	This direct drive pump control system improves energy efficiency and economizes power consumption by optimally controlling the rotation of the servomotor that drives the hydraulic pump. The system maintains pump delivery pressures and flow rates at optimum levels by controlling the torque and speed of the servomotor, resulting in significant energy savings in the hydraulic systems of injection molding and other machinery.
8	Monitor and controller (for construction machinery)	The monitor and controller responds to joystick command signals of hydraulic excavators and other construction machinery to control proportional solenoid valves and display the operational status of equipment. We offer CAN*-compatible controllers, monitors (displays), and sensors for construction machinery. Multiple devices can be linked, allowing real-time communication of information necessary for controlling the machinery. *CAN (Controller Area Network) is reliable network technology developed for the automotive industry.
9	DAPDNA	The *dynamically reconfigurable processor* “DAPDNA” integrates a unique high-performance RISC core digital application processor (DAP) and a distributed network architecture (DNA) matrix of processing elements (PE) in a single chip. DAPDNA switches PE functional parameters and PE inter-connections (configurations) within a single clock cycle. High speed hardware processing and software flexibility are both achieved with DAPDNA’s parallel operation involving hundreds of computing units and dynamic configuration switching. DAPDNA is incorporated in our company’s printing inspection systems as well as in multi-function printers of major manufacturers and this semiconductor device demonstrates outstanding results, particularly in high-performance image processing.
10	RFID	Radio Frequency Identification (RFID) allows exchange of information through short-range wireless communication using electromagnetic fields and radio waves from RF tags embedded with ID information. Contactless IC cards used for fare cards (Suica, PASMO, etc.) and e-money cards (Edy, etc.) are a type of RFID. Our RFID products have been used mainly for building exit/entry control, but they are now being used as part of keyless entry systems for construction machineries.

Fluid Measurement Equipment Business		
	Term	Description
11	Ultrasonic flowmeters	An ultrasonic flowmeter measures flow rate (flow velocity × cross-sectional area) inside pipes using transmission signals and reflection signals generated by directing ultrasonic signals through fluids (liquids and gases) flowing in the pipes. Flow rate is determined by multiplying the cross-sectional area of the pipe by the flow velocity that is calculated from the difference in the transit times of the ultrasonic signals propagated with and opposite to the flow. Tokyo Keiki pioneered development of the world's first ultrasonic flowmeter for general industrial use in 1963.
12	Microwave level gauges	The Tokyo Keiki microwave level gauge utilizes radar technology to measure the level of a liquid surface. Radio waves are propagated between the gauge's antenna and the target surface and the propagation time is converted into measurement of the level of the liquid surface. A key characteristic of the gauge is its ability to carry out non-contact measurement of liquids and other fluids. Our latest high-frequency microwave level gauge utilizes 26 GHz and its narrowed beam width provides reliable and highly accurate measurement of fluid level even in tanks that are compact (small diameter) or tanks that incorporate agitators and other intricate structural components. Recently, the product has been used as non-contact water-level gauges for managing the risk of flooding from rivers
13	Halon 1301 fire-extinguishing systems	Gas-based fire extinguishing systems are used in various applications, from large open spaces such as multistory parking garages to specific pieces of equipment such as printing machines. Among the different types of gas-based extinguishing systems, halogenated (Halon 1301) extinguishing systems offer advantages that include low volume of gas discharge that prevents suffocation, long-term storage stability, no polluting residue, and superior electrical insulating properties that make them safe for use around electronic devices. These features make these systems ideal for use in areas where people enter, such as mechanical parking structures as well as computer server rooms, communication equipment rooms, and facilities for manufacturing dangerous materials. Although Halon is considered to be an ideal fire extinguishing agent, as a CFC compound, production of new Halon ceased in January 1994. Use of the existing supply of Halon however is not prohibited and new Halon 1301 fire extinguishing systems have been approved for critical applications. The recycling and reuse of Halon 1301 is strictly controlled and through its website, the Fire and Disaster Management Agency encourages the recycling of Halon 1301 in order to prevent its release into the atmosphere by careless disposal and to preserve the environment.

Defense and Communications Equipment Business		
	Term	Description
14	Radar warning receivers (countermeasure system, ESM system)	Radar warning receivers are incorporated in military and other aircraft to warn aircrews of threats from other aircraft, marine vessels and/or surface anti-aircraft systems by detecting the radio emissions transmitted by their radar systems. The radar warning receivers determine and indicate the type of radio emission, its direction, and whether your aircraft has been acquired ("locked on"). The proprietary radar warning receivers as well as ESM (Electronic Support Measures) systems developed and provided by Tokyo Keiki can detect position as well as enable specific analysis of RF signals. The systems are mainly designed for aircraft such as fighters, helicopters and cargo aircraft.
15	Inertial navigation systems	Inertial navigation systems incorporate built-in sensors (Inertial Measurement Unit (IMU), etc.) to provide information such as on position and speed that are critical for the navigation of submarines, missiles and aircraft without dependence on any external signals.
16	Helicopter video relay systems	The helicopter video relay system incorporates GPS, inertial sensors, accelerometers, and magnetic azimuth sensors that constantly monitor the aircraft's position and attitude/heading to provide accurate and stable transmission of live video broadcast feeds from helicopters in flight to ground-based or mobile-based stations.
17	F-15	The F-15 fighter was the third fighter jet put into service by the Japan Air Self-Defense Force (JASDF). Tokyo Keiki has provided equipment such as radar warning receivers, air data computers, radar indicators/signal processors, attitude and heading reference systems, and multi-functional color displays for this aircraft. With the obsolescence of the F-15's early version avionics, the JASDF is currently upgrading the avionics and we are supplying new radar warning receivers as part of this upgrade. In addition some of the aircraft are being modified with our ESM systems to enhance their capabilities.
18	Vessel traffic services (VTS) system	Vessel traffic services (VTS) are services implemented by a competent authority and are designed to improve the safety and efficiency of vessel traffic and protect the environment. In Japan VTS services are carried out by the Japan Coast Guard. VTS systems support VTS operators by providing situational awareness and communication and decision support tools including radar images that show vessel position and software that alerts VTS operators when dangerous maritime traffic situations are predicted from data analysis.

	Term	Description
19	Solid–state radars	Solid-state radars are pulse-compression radars using solid-state devices, which replace conventional magnetrons (electron tubes). As high voltage circuits are not used, these solid-state radars consume less power, are smaller in size and compared with magnetron radars, radiate less spurious radio emissions. With such advantages, these radars help address increasing social demands related to the maintenance and improvement of the environment and promotion of wireless communications. The solid-state radars provided to the Japan Coast Guard for VTS (Vessel Traffic Services) have significantly improved detection performance and resolution and boast excellent compliance with the increasingly stringent requirements pertaining to “Radio Regulations Concerning Permissible Values for Spurious Emission Intensity of Radio Equipment”.
21	ISM Band	ISM (industrial, scientific and medical) bands refer to frequency bands that are reserved specifically for industrial, scientific and medical purposes but not communications. ISM bands are utilized, for example, by microwave heaters (microwave ovens, etc.) and plasma generators for semiconductor manufacturing equipment.
22	Straight line assistance for agricultural vehicles (AG-GEAR series)	The AG-GEAR series features automatic steering assistance devices for agricultural vehicles that use a global navigation satellite system (GNSS) to track the location of the vehicle and to steer it along a straight pre-set path. The device frees the driver from the need to constantly control the steering wheel, thus reducing the burden of working long hours on the farm. Stable forward motion is achieved with ease with the driver needing only to check the vehicle’s status. An accelerometer and gyroscope correct fluctuations in acceleration and orientation, ensuring the vehicle is driven correctly even on inclines. Real-time kinematic (RTK) positioning is also available as an option. An RTK station installed next to the target field will correct GPS errors and maintain the vehicle on its forward path to within 3 cm accuracy.
23	Satellite communications antenna stabilizer	Conventional satellite news-gathering (SNG) systems, or news broadcast systems using communication satellites, can only transmit radio waves toward communications satellites when broadcast vehicles are at a full stop due to the difficulty in accurately directing the antenna toward the target satellite if the vehicle is in motion. Our mobile satellite communications antenna stabilizer incorporates proprietary microwave and inertial sensor technologies in combination with mechanical control to solve this problem and enable automatic and precision control of the antenna even from a moving vehicle. It is currently being used not only for broadcasting, but also for satellite communications with vessels.

Others		
	Term	Description
24	Ultrasonic Flaw Detector	An ultrasonic flaw detector is a type of non-destructive inspection device that enables detection of defects inside of a target object by using ultrasonic technology. This device consists of pulse generator, probe, receiver and display. Ultrasonic waves are propagated into the target object and characteristics of the waves reflected from defects within the object are processed to enable determination of their location and size. This technology is employed by our group for rail maintenance in a variety of products such as rail inspection cars and portable flaw detectors.
25	Switch Profile Gauge	A railroad switch (turnout) is a mechanical installation that enables railway trains to be guided from one track to another and consists of several components such as tongue rails, lead rails, crossings and guard rails. Our switch inspection device (SPG series) provides important measurements (e.g., wear values and distortion) that are critical to switch maintenance management and the device can also save these measurements as digitalized data. The mechanization of these previously manually accomplished tasks greatly boosts efficiency and labor savings.
26	DataDepot™ System	The 'DataDepot™ System' is a non-contact and high speed communication system which is developed specifically for railway use. Chainage information and locational information on structures (bridges, level crossings, stations, tunnels, etc.) are recorded to memory tags (DataDepot™) that are affixed to railway sleepers. Rail maintenance rolling stock identifies its running location by reading this information with an antenna mounted beneath the car body. This information is also utilized to record abnormal sections of rail as detected by rail inspection systems as well as for automatic control of rolling stock equipment. Features of the memory tag include no-battery, long-life, completely sealed construction, and excellent environmental resistance. The system also incorporates spread spectrum technology for superior noise immunity. In addition, use of the system is permitted without a license under Japanese Radio Law. Because location accuracy is higher compared with GPS and available even inside tunnels, this system has been adopted by many railway companies as well as recently for commercial trains.

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