NIPPON SIGNAL
REPORT 2022



NIPPON SIGNAL GROUP PHILOSOPHY

Our Mission

Our Mission

We help realize a more secure and comfortable society through superior technologies that provide safety and reliability.

Our Vision

Our Vision

We strive to become a global company by pursuing world-leading technologies with ingenuity and passion to inspire our customers' *Kando*.*

* *Kando* is a Japanese word that describes the sense of awe and the emotion you feel when experiencing something beautiful and amazing for the first time. It is the moment when your expectations are exceeded – you feel *Kando*.

Our Values

Our Values

1. Emphasize "safety and reliability" above all. ... *Mono-zukuri* (Manufacturing)
2. Strive to improve customer value by taking the customer's perspective. ... *Koto-zukuri* (Business)
3. Take on challenges for your own growth. ... *Hito-zukuri* (Education)
4. Preserve the environment and contribute to the development of local communities. ... *Machi-zukuri* (CSR)
5. Have dreams and share them. ... *Michi-zukuri* (Creation of the future)

Our Code of Conduct

Our Code of Conduct: Six Commitments

1. Working for Customers' *Kando*
2. Fair Corporate Activities
3. Proper Information Disclosure and Communication with Society
4. Respect for Human Rights and Creation of a Good Working Environment
5. Environmental Protection and Proactive Social Contribution Activities
6. Proper Management of Company Assets and Information



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Editorial Policy

Nippon Signal Group publishes Nippon Signal reports for its customers, shareholders, investors, and other stakeholders, to provide comprehensive updates on the Group's management strategy, business activities, performance results, and financial and non-financial information.
In preparing these reports, the International Integrated Reporting Framework of the International Integrated Reporting Council and the Guidance for Collaborative Value Creation released by the Japanese Ministry of Economy, Trade and Industry were referenced, and we aim to ensure ease of understanding with regard to our business model, value creation, and ESG (environmental, social and governance) initiatives that form their basis.
In the NIPPON SIGNAL REPORT 2022, we have created content focused on the relationship between our business activities and the Sustainable Development Goals (SDGs) relevant to us, in order for more people to better understand our enhancement of corporate value by means of social contribution through products and services that we promote.

Note on Forward-Looking Statements

Nippon Signal Report contains statements on the future plans, forecasts, and prospects of Nippon Signal Group. They reflect the predictions made by us and are based on the information available at the time this report was published. Please note that they may differ from the actual results due to the progress and circumstances surrounding future business activities.

Nippon Signal's Main Business Domains

From railways to transportation, stations to towns, and Japan to the world.

Nippon Signal Group strives to pursue outstanding technology for "safety and reliability," while expanding our business locations.
As a company supplying a wide range of solutions to support safety and comfort, we contribute to the evolution of infrastructure.

O&M

① Remote monitoring systems



Cloud-based systems to collect, accumulate, and analyze information on railway facilities, areas along train lines, and services using ground IoT networks and onboard imaging systems.

② Waterproof point machines



We strengthened the waterproof function of simplified waterproof railway point machine by improving the cover. This has enabled steady operation even when the upper part of a point machine is under water.

Labor Savings

③ Bus Rapid Transit (BRT)*1



We provide systems to allow bus traffic in both directions to share a single lane in East Japan Railway Company's self-driving BRT verification tests.

④ Light Rail Transit (LRT)*2



Next generation tram system that operates along newly created travel spaces.

⑤ Wireless train control systems



Train control systems using wireless communication, to reduce system lifecycle cost.

Automatic Operation

⑥ Automatic operation (cars)



A system that connects signal information with cars using 5G to assist smooth preliminary decelerations and starting preparations.

⑦ Automatic operation (conventional line trains)



We are developing an automatic train detector that allows safe and stable transportation on conventional lines, with the aim of realizing GoA2.5*3 by the end of fiscal year ending March 31, 2025.

Safety at Railway Crossings

⑧ Level crossing gates



Devices that prevent cars and pedestrians from entering the crossing.

Robotics

⑨ Automatic floor cleaning robots



These robots clean floors unattended, accurately detecting peripheral obstacles using lasers and ultrasound sensors.

⑩ Multiple handling vehicle*4



Humanoid robots for work at height aimed at eliminating heavy-lifting work from railway maintenance operations and improving its efficiency.

Safety on Platforms

⑪ Platform safety monitoring systems via image analysis



A system to detect hazard on station platforms using image processing devices attached to existing surveillance cameras.

⑫ Platform screen doors



We ensure safety and security on platforms, with a wide range of Platform screen doors to fit various types of stations and vehicles.

Transit Safety

⑬ Traffic lights



Controlling traffic lights using control devices, to display red, green or yellow signals to drivers and pedestrians.

⑭ Pedestrian supporting applications



We support people with visual impairment and senior citizens to cross roads safely using a smartphone.

⑮ Automatic passenger gates



We participate in verification tests for facial recognition passenger gates, which is a step toward future applications of ticketless passenger gates.

Transit Safety

⑯ Multilingual ticket vending machines



We provide clear and user-friendly multilingual automatic ticket vending machines and information display systems for stations.

⑰ Parking lot management systems



We provide a range of devices and solutions, including the PARK-LOC® system and network-linked payment machines.

⑱ Security gates



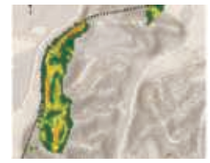
We provide total security environments that are people-friendly, from entry and exit systems for people and vehicles, to office security.

⑲ Automatic X-ray baggage checking equipment



This world's first checking equipment adopting a compact X-ray source, precisely and speedily detects the presence of dangerous items.

⑳ Slope failure prediction technologies



Systemization of "location" prediction for slope failure, to protect transportation infrastructure from torrential rain.

Works of Group Companies

㉑ Nursing care robots



Users can step on this equipment from the back, a novel riding style, to enjoy free mobility.

㉒ Magnetic resonance imaging units



Producing leading-edge medical devices that use magnetic force to capture cross-sectional images of a living body to support high-precision diagnoses.

㉓ PET/MRI



Producing leading-edge medical devices that detect microscopic lesions with high clarity using advanced digital technology.

㉔ Solar power generation



Contributing to accelerating the spread of clean energy by installing solar power generation systems on building rooftops.

*1. BRT stands for Bus Rapid Transit System.
*2. LRT stands for Light Rail Transit System.
*3. GoA2.5 is a grade of automated train operation in which an attendant, who is not an operator, is present in the cab of the first car.
*4. Developed jointly with West Japan Railway Company and Man-Machine Synergy Effectors, Inc.



History of Innovation

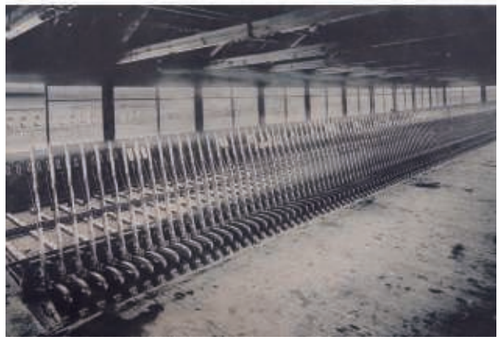
Pursuit of New Pinnacles of Safety, Accuracy, Comfort, Speed and Volume

The history of Nippon Signal is also the history of a continuous pursuit of innovation, and the history of the evolution of Japan's transportation infrastructure. Commitment to further innovation is the unchanging DNA of Nippon Signal Group that has been passed down from our founding until today.

Value provided by Nippon Signal

1928-1950s | 1960s-1980s | 1990s-2010s | 2011~

Foundation of Nippon Signal and Modernization of Railway Signals



The Railway Nationalization Act, promulgated in 1906, nationalized major thoroughfares throughout Japan, and transportation demand saw a sharp spike thereafter. Nippon Signal Co., Ltd. was established in December 1928 via a merger of three companies, and was tasked with modernizing and realizing domestic production of railway signals. (The photograph shows a mechanical interlocking system delivered to Kyoto Station in 1914. Mimura Factory postcard from the Railway Museum collection)

1929 A technical collaboration agreement with General Railway Signal Company of the United States is concluded with the aim of achieving domestic production of world-leading signal equipment.

1931 Made-in-Japan traffic signal equipment is produced and installed at the Nihonbashi, Gofukubashi, and Sakurabashi intersections.

1958 Production of parking meters commences.





Evolution of Electronics Technologies and Start of New, Forward-Looking Businesses



The opening of the Tokaido Shinkansen marked the beginning of a new era, and Nippon Signal's electronics technologies proceeded to evolve in the Automatic Train Control (ATC) and Centralized Traffic Control (CTC) systems used for the Shinkansen. We contributed to the development of Japan's transportation infrastructure by creating various new products geared toward the needs projected to arise in the future as post-Shinkansen businesses are developed.

1963 Production of Pasca 205 miniature commercial calculator commences.

1964 ATC and CTC systems produced by Nippon Signal are adopted for use on the segment of the Tokaido Shinkansen Line connecting Tokyo Station and Shin-Osaka Station.

1970 Production of PARK-LOC® system commences.

1972 Production of Japan's first comprehensive automated ticket gate system commences and this system is installed for use on the segment of the Sapporo Municipal Subway connecting Kita-Nijuyo-Jo Station and Makomanai Station.



1984 An automatic boarding control system for aircraft is developed.

Technological Progress and Network Business Development



The transition from analog technologies to digital technologies and from hardware to software enable Nippon Signal to acquire technologies for realizing high-speed processing of massive quantities of data. With these technologies, we contribute to the dense, on-time operation, and complex interoperable equipment of railways, to support the mobility of 40 million people living and working in the Tokyo metropolitan area.

1998 Production of the Eco Scan® microelectromechanical system optical scanner commences.

2003 The Visionary Business Center is established to facilitate the creation of new products and new businesses.



Eco Scan®, microelectromechanical system optical scanner

2007 Mutual use of common IC cards (Suica and PASMO) commences, and Nippon Signal performs upgrades to all automatic passenger gates.

2009 The Overseas Division is established to boost competitiveness in overseas markets.

2009 Order-taking and manufacturing of platform doors commence on a full scale.

Acceleration of Global Expansion and Start of New Long-Term Management Plan



Leveraging the technological prowess it cultivated in Japan, Nippon Signal accelerates global expansion efforts centered on Asian and other emerging countries. In these efforts, we focus on the development of systems compatible with the Mobility as a Service (MaaS) revolution and new digital transformation.

2011 The SPARCS (Simple-structure and high-Performance ATC by Radio Communication System), the first wireless train control system in the world, is developed and put into use on the Beijing Subway Line 15.

2017 The ANSHIN* Center is established to provide IoT platform base functions.

2017 SPARCS is installed on the Delhi Metro Line 8 (Magenta Line).

2018 The CLINABO® automatic floor cleaning robot is developed.

2019 Nippon Signal participates in verification tests and projects related to the provision of signal information to self-driving vehicles.

2020 Set a self-driving verification section on the Kashii Line, Kyushu Railway Company.



CLINABO® automatic floor cleaning robot

* "ANSHIN" stands for 'Anzen and Shinrai,' which means 'Safety and Reliability' in Japanese. We also define "ANSHIN" as 'Advanced Nippon Signal High-level Intelligence Network.'

Major events especially in the railway industry

1928-1950s

- Opening of the section of the Tokyo Underground Railway between Asakusa and Shimbashi
- Opening of the section of the Osaka Municipal Subway between Namba and Tennoji
- Establishment of the Teito Rapid Transit Authority (TRTA)
- Opening of the Kanmon submarine tunnel, the world's first undersea tunnel
- Establishment of Japanese National Railways (JNR) (a railway business transferred from the Ministry of Transport)
- Electrification of the Senzan Line is completed, and operation commences

1960s-1980s

- Tokyo Monorail commences operation
- The Tokaido Shinkansen Line commences operation
- The Sanyo Shinkansen Line commences operation
- Modernization of power is completed for JNR main lines (total abolition of steam locomotives)
- The Tohoku Shinkansen and Joetsu Shinkansen Lines commence operation
- Privatization and division of JNR into each JR company
- Opening of the Seikan tunnel (Seikan ferry services are abolished, and the Tsugaru-Kaikyo Line commences operation)

1990s-2010s

- Birth of the Tokaido Shinkansen "Nozomi"
- The Yamagata Shinkansen (a mini-shinkansen running on converted narrow-gauge railway lines) commences operation
- Driverless trains commence operation on the Tokyo Waterfront New Transit Waterfront Line (Yurikamome)
- The Nagano Shinkansen (from Takasaki to Nagano; later part of the Hokuriku Shinkansen) commences operation
- Okinawa Urban Monorail, the first railway in Okinawa since the end of the Second World War, commences operation
- The Kyushu Shinkansen (from Yatsushiro to Kagoshima Chuo Station) commences operation
- Toyama Light Rail commences operation
- Taiwan High Speed Rail commences operation

2011~

- The Kyushu Shinkansen (Kagoshima route) commences operation on all sections
- Cruise Train "Seven Stars in Kyushu" commences operation
- 50th anniversary of the opening of the Tokaido Shinkansen
- The Hokuriku Shinkansen (Kanazawa extension) commences operation
- The Hokkaido Shinkansen commences operation
- Okinawa Urban Monorail extension commences operation
- Takanawa Gateway Station on JR Yamanote Line opens

Value Creation Process

Nippon Signal is engaged in new value creation to contribute to "solving social issues" and "advancing infrastructure," through value chains founded on "safety and reliability," while keeping an eye on global environmental changes.
We aim to achieve sustained growth by accelerating the process of development and real-world implementation of products that are suited to the market needs, carrying out business structure reforms, and strengthening our business foundation.

Group Philosophy

Our Mission | **Our Vision** | **Our Values** | **Our Code of Conduct: Six Commitments**

INPUT

Financial capital

Shareholders' equity **76.8** billion JPY

Interest-bearing debts **11.7** billion JPY

Manufactured capital

Capital investment **2.5** billion JPY

Intellectual capital

R&D expenses **2.6** billion JPY

Human capital

Number of employees **3,009**

Human capital investments (non-consolidated) **83** million JPY

Social and relationship capital

Nippon Signal operation coverage

30 countries and regions

Business Activities



Growth Strategy

Long-Term and Medium-Term Management Plans ➡P11

Strengthening the Foundation Underpinning Sustained Growth

ESG Initiatives ➡P33

OUTPUT Business Domains


Railway Signal Systems


Smart Mobility Systems


Automatic Fare Collection (AFC) Systems (Station Network Systems)


Smart City Systems

OUTCOME Value provided to society

We help realize a more secure and comfortable society through superior technologies that provide safety and reliability.

Contribution to the SDGs



➡P29



To Our Stakeholders

Supporting the infrastructure evolution with safe and comfortable solutions and aiming for transformation toward the Next Stage



Hidehiko Tsukamoto
President and Chief Executive Officer

COVID-19 has transformed our lives and society and has had an enormous impact on almost all industries, including the transport industry. Although the situation remains uncertain, the evolution of digital technologies has made it possible to do things that could not have been done before. Taking these recent changes as an opportunity, the Nippon Signal Group formulated a new Medium-Term Management Plan, "Next Stage 24," for the steady pursuit of our path toward the future. Based on our management strategies of "collaborative value creation with customers after COVID-19 pandemic," "expansion of international business and improvement of profitability," "enhanced design prowess and manufacturing prowess in the era of software first," and "promotion of ESG (environmental, social and governance) Management for sustained value creation," we will achieve sustainable growth and development and the enhancement of corporate value after the COVID-19 era.
As values change with major progression of the times, we will take maximum advantage of the strengths we have cultivated to date, actively incorporate change to make safety, reliability and comfort the engines of our growth, and strive for further evolution to next-generation transport infrastructure.

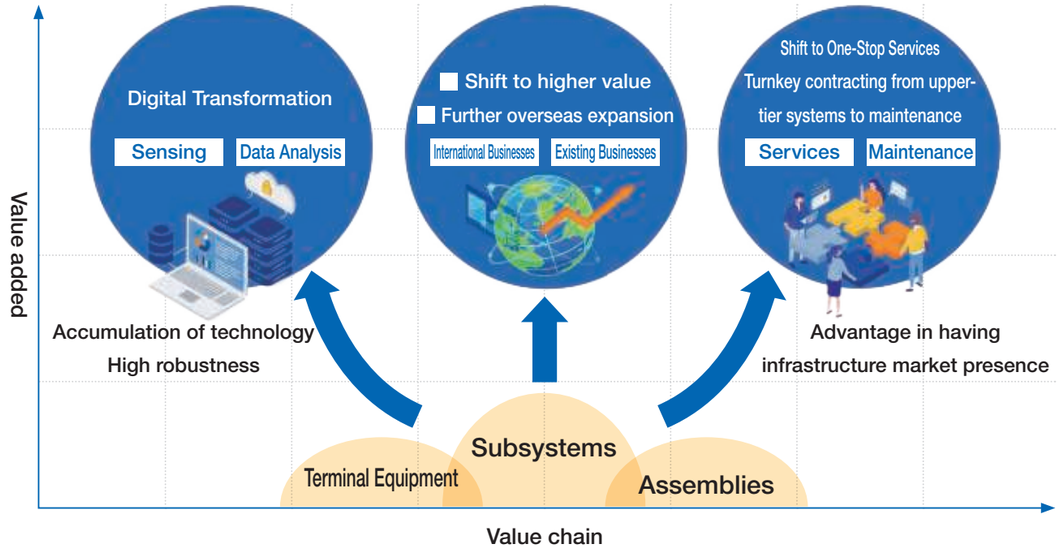
Review of FY2021 and the Previous Medium-Term Management Plan (FY2019–FY2021)

While there is still no sign of when the COVID-19 pandemic will come to an end, as progress is made in vaccine roll-outs and the development of therapeutic drugs, initiatives aimed at both the prevention of the virus's spread and social and economic activity are picking up pace. On the other hand, the protracted pandemic has brought forward the economic slowdown caused by the low birth rate and aging population by more than a decade. The service revenue of public transport operators has plummeted, and, as well as shifting away from the "aggressive" strategies in anticipation of inbound tourism prior to the Tokyo Olympic and Paralympic Games toward "maintenance" strategies due to the pandemic, they have started to place more emphasis on investments in non-transport businesses.
In addition to COVID-19, we are now also facing clashes and disputes between nations, such as Russia's invasion of Ukraine and the intensification of the confrontation between the United States and China. Due to these circumstances, there are concerns about rising prices of energy, food, and other commodities, a slowdown in global economic growth, and protracted difficulties in procuring parts such as semiconductor chips due to turmoil in supply chains. As social issues, including environmental problems, emerge, there has been a major surge of new trends, such as net carbon zero and the growing importance of sustainability-focused management. In particular, the protraction of procurement lead times of semiconductor chips and other materials and the sharp rises in material prices caused by increases in global demand are having a significant impact on manufacturing. The Nippon Signal Group will strive to minimize the impact of these trends by promoting design changes and group purchasing.
In our Long-Term Management Plan, "Vision-2028 Evolution 100," and its first-stage Medium-Term Management Plan (FY2019-21), which began in April 2019, recognizing that we are facing a period of great change in which the disruptive innovations born out of technological progress are creating a situation in which conventional industries that cannot adapt will be doomed to extinction, we have sought to respond swiftly to digitalization and to transform our business with the aim of achieving our vision for the Nippon Signal Group. Waving the banners of DX and AI, we have developed new products, such as automated driving systems for trains and automobiles, CBM*, and various kinds of robots, and proceeded with demonstration trials. Even during the pandemic, to ensure we could continue our business while prioritizing the safety of our employees, we have continued and strengthened our various infection prevention measures, such as the promotion and expansion of remote work.
In terms of our numerical targets declared in the previous Medium-Term Management Plan, although we promoted the deployment of products and services that would support structural reforms, such as the reduction of fixed costs by each public transport operator, the curtailment of investment by our customers due to the pandemic and difficulties in procuring semiconductor chips and other parts have had a significant impact, and unfortunately, we were unable to achieve the final-year targets for net sales or profits. The development of new products and creation of new businesses in response to environmental changes has fallen behind, and in our new Medium-Term Management Plan, as well as strengthening our development capabilities, we will accelerate the real-world implementation of products that we have developed to date.

*CBM: Short for Condition Based Maintenance. A preventative maintenance approach in which the condition of equipment is constantly monitored and maintenance is only carried out when deemed necessary.

To Our Stakeholders

Stages of the Nippon Signal Group's Value Chain Vision



2021 Medium-Term Management Plan Performance Targets and Results

	2021 Medium-Term Management Plan Target	Results (FY2021)
Net sales	120.0 billion JPY	85.0 billion JPY
Operating margin	10%	6.3%
ROE	9% or more	5.3%
Equity ratio	50-60%	64.7%

New Medium-Term Management Plan (FY2022–FY2024) "Next Stage 24"

In April 2022, a new Medium-Term Management Plan, the second stage in the Group's Long-Term Management Plan toward its 100th anniversary, will commence. The concept of the new medium-term plan is "Next Stage 24 - Toward the next stage for Nippon Signal Group." The goal of this concept is to make full use of digital and AI technologies and deliver sophisticated solutions in response to new social and economic activities and lifestyles that were born of the pandemic and are already starting to take root, as a corporate group that provides social infrastructure, and in so doing create safe, reliable transport infrastructure and a sustainable society. Putting into practice the Group's philosophy of "help realize a more secure and comfortable society through superior technologies that provide safety and reliability," we hope to help people live safe, secure, and comfortable lives even during the pandemic and bring life back to normal.

In the "Next Stage 24" plan, based on our Group philosophy, which represents our unchanging values and foundation, as well as the immediate changes in the environment, we have set three priority measures, namely "(1) Collaborative value creation with customers after COVID-19 pandemic," "(2) Expansion of international business and improvement of profitability," and "(3) Enhanced design prowess and manufacturing prowess in the era of software first," and we will promote ESG Management for sustained value creation.

Priority Measure (1): Collaborative value creation with customers after COVID-19 pandemic

For expansion of the solutions business that supports customers' structural reforms, we will pursue labor-saving developments such as automated driving of trains and automobiles, cashless services, CBM, station platform monitoring systems, and robots, and accelerate their implementation in the real world with the aim of full-scale commercialization.

Priority Measure (2): Expansion of international business and improvement of profitability

In addition to enhancing profitability through business development rooted in megacities, from the performance of projects to ongoing business development through maintenance, extended projects and market development, we will strive to set up local operations in overseas markets and strengthen our global capabilities.

Priority Measure (3): Enhanced design prowess and manufacturing prowess in the era of software first

In addition to strengthening our product development in response to environmental changes and the establishment of group-wide design and production frameworks, we will aim for optimization of QCD through efforts such as the improvement of productivity through the promotion of standardization and in-house manufacture and capital spending.

[Promotion of ESG (environmental, social and governance) Management for sustained value creation]

We will aim to enhance corporate value through means such as the reduction of greenhouse gas emissions aimed at decarbonization, participation in the Task Force on Climate-related Financial Disclosures (TCFD), the promotion of diversity as a driver of value creation, and the promotion of sustainability throughout all our business activities.

Background to Formulation of Plan

(Changing external environment)

Changes in business environment

- Decline in movements and non-resident population due to pandemic, customers' structural reforms
- Transformation and diversification of work styles and lifestyles
- Rapid advances in digitalization
- [Japan] Population decline, aging population with low birth rate
- [Overseas] Population increases and urbanization
- Shift to decarbonized society at a global level

(Unchanging values)

Nippon Signal Group Philosophy



To Our Stakeholders



Basic Policy and Priority Strategies of "Next Stage 24"Performance

Basic Policy

[Supporting the Next Stage of Infrastructure]
Real-world implementation of transport innovation through digital technologies and acceleration of establishment of local operations overseas

Numerical Targets

FY2024
Net sales: 130.0 billion JPY
ROE 10%

Environmental Goals

Greenhouse gas emissions:
50% reduction (2030)
Net zero (2050)

Priority Strategies

1 **Collaborative value creation with customers after COVID-19 pandemic - Product transformation with DX**
- Expand solutions business and develop products to support customers' structural reforms
- Be thoroughly customer-oriented and strengthen marketing and proposal capabilities

2 **Expansion of international business and improvement of profitability - Sustainable, long-term business development**
- Business development rooted in megacities, promotion of location strategies
- Streamline and strengthen global capabilities

3 **Enhanced design prowess and manufacturing prowess in the era of software first - Manufacturing reform to support business transformation**
- QCD optimization from design process, strengthening of Group capabilities and in-house production
- Strengthening of development capabilities and establishment of design and production frameworks adapted to DX

Sustained Value Creation

Sustained value creation for the future - Promotion of ESG Management and improvement of corporate value
E: Participation in TCFD, promotion of decarbonization
S: Promotion of diversity, health management, and sustainability
G: Sustainable reinforcement of corporate governance and compliance

Re-organization of Group company functions, DX, human resources development, introduction of next-generation core systems

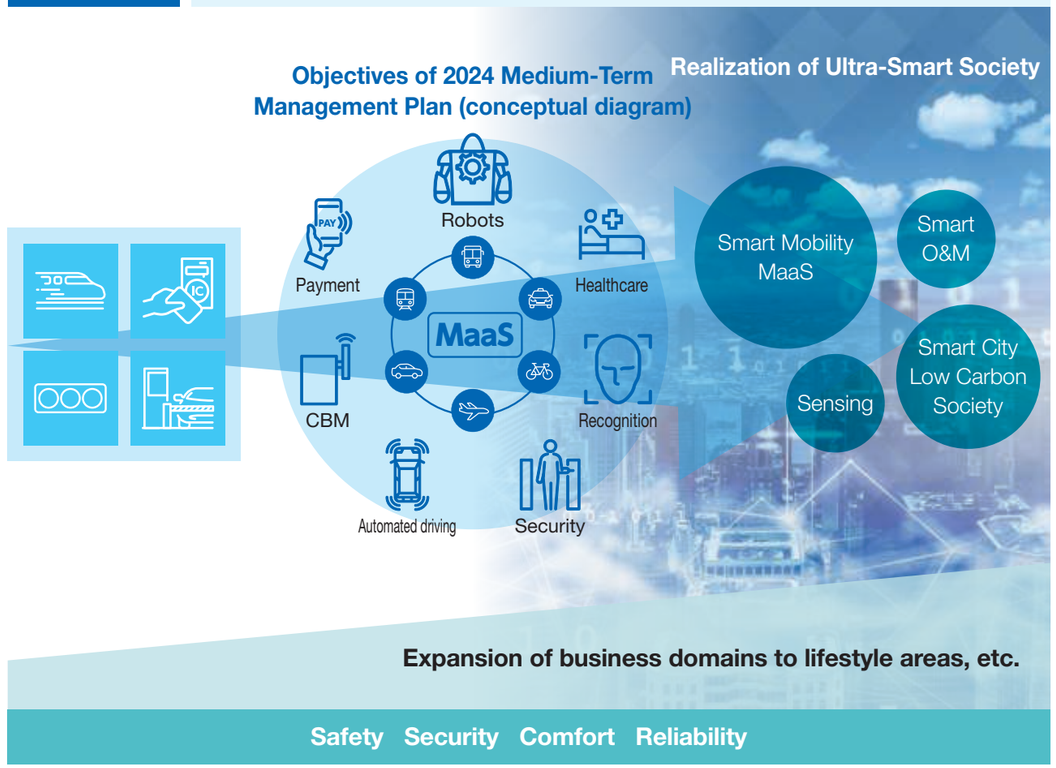
Toward the 100th Anniversary

In our Long-Term Management Plan, under the concept of "supporting the evolution of infrastructure safely and comfortably," we declared our goal to "become a respected corporate group as an infrastructure provider in the Digital era."
The history of the Nippon Signal Group is also the history of a continuous pursuit of innovation, which has continued to support the evolution of Japan's transportation infrastructure. Solving social issues is now and always has been the main focus of the Nippon Signal Group, and our commitment to further innovation is the unchanging DNA of the Group that has been passed down from our founding until today.
Pursuing safety and reliability in all our business activities to support the infrastructure evolution lies at the heart of our company. It will increase the Group's competitive advantage and contribute to the realization of a sustainable and resilient society. Continuing to engage in solutions to social issues in Japan and overseas and fulfilling our roles and responsibilities is the *raison d'etre* of the Nippon Signal Group and the wellspring of our corporate value. We will accept with grave sincerity the hopes of all our stakeholders, including our customers, shareholders and investors, business partners, employees, and local communities, and continue our quest to generate innovation and new value to respond to those hopes with outcomes that exceed their expectations.

Nippon Signal Group's Vision

100 years since the foundation
Supporting the evolution of infrastructure safely and comfortably

Our Will
Become a respected corporate group as an infrastructure provider in the Digital era





A Company that Contributes to Infrastructure

150 Years of Railroad Service and Nippon Signal

In December 2022, Japan will mark the 150th anniversary of the opening of its first railway between Shimbashi and Yokohama. Here, we present the 150 years of the railways, which have a smaller impact on the environment, are suited to mass transportation, offer outstanding punctuality and safety, and have supported society as transportation infrastructure, alongside the history of Nippon Signal.

Major events related to Japan's railways

Meiji Era

1872 Japan's first railway opens between Shimbashi and Yokohama
1877 Railway Bureau is established in the Ministry of Public Works (later the Ministry of Transport)
1881 Nippon Railway (Japan's first private railway company) is established
1889 Tokaido Line is completed (between Shimbashi and Kobe)
1895 Kyoto Electric Railway (Japan's first electric tram) opens
1903 Tokyo Electric Railway opens between Shimbashi and Shinagawa (Tokyo's first intra-city train)
1906 Railway Nationalization Act (law that brought Japan's major railways under national control) is promulgated

Taisho Era

1914 Construction of Tokyo Station is completed
1926 Automatic entry ticket vending machines are installed at Tokyo and Ueno Stations

Showa Era

1927 Tokyo Underground Railway between Asakusa and Ueno opens (Japan's first subway)
1928 Nippon Signal is established
1930 Super Express "Tsubame" begins operating between Tokyo and Kobe
1931 Joetsu Line is completed with opening of Shimizu Tunnel

Showa Era

{1941 - Aug. 15, 1945: Pacific War}
1949 Enforcement Law for the Japanese National Railways Law is promulgated, Japanese National Railways (JNR) is established, and Ministry of Transport is established
1956 Electrification of Tokaido Main Line is completed
1958 JNR's first Centralized Traffic Control (CTC) system is adopted on Ito Line
1959 Groundbreaking ceremony for the Tokaido Shinkansen (bullet train)
1963 This prompts progress in adoption of Automatic Train Stop (ATS) devices
1964 Tokyo Monorail opens between Haneda and Hamamatsucho
Tokaido Shinkansen opens between Tokyo and Shin-Osaka, with Automatic Train Control (ATC) and CTC systems adopted for use on entire line
1965 Midori-no-Madoguchi (JNR ticket offices) are established
1966 Adoption of ATS is completed on all JNR lines
1971 Sapporo Municipal Subway Namboku Line (between Makomanai and Kita-Nijuyo-Jo) opens
1972 Sanyo Shinkansen (between Shin-Osaka and Okayama) opens

Showa Era

1981 Kobe New Transit (first new transit system and world's first fully automated, driverless transport system) opens
1982 The Tohoku Shinkansen opens (between Omiya and Morioka)
1984 Sanriku Railway (first third-sector railway) opens
1985 Magnetic prepaid card, "Orange Card," is launched
1987 JNR is privatized and divided into seven JR companies

Heisei Era

1990 Six-door cars appear on the Yamanote Line with aim of shortening boarding and alighting times
1991 East Japan Railway Company (JR East) launches first stored-fare magnetic card, "iO-CARD"
1992 Tokaido Shinkansen "Nozomi" commences operation
1996 "Surutto KANSAI," prepaid fare system mutually accepted on the multiple private railways in the Kansai region, is launched
1997 Test runs commence on the Yamanashi Maglev Test Line
Hokuriku Shinkansen opens
2000 "Passnet" card system used jointly by 17 railways in the Kanto region is launched
2001 JR East launches "Suica" IC-card fare system
2003 Okinawa Urban Monorail (between Shuri and Naha Airport) opens

Heisei Era

2004 Kyushu Shinkansen (between Shin-Yatsushiro and Kagoshima Chuo) opens
2007 Taiwan High Speed Rail opens (first export of Japan's Shinkansen system to another country)
Common IC-card fare system, "PASMO" launches in the greater Tokyo metropolitan area (mutual use with Suica commences simultaneously)
2011 Great East Japan Earthquake strikes (many railway lines in the Tohoku region were damaged, and, due to planned power outages, railways in the greater Tokyo metropolitan area conducted planned service cancellations and reductions of services)
2016 Hokkaido Shinkansen opens (between Shin-Hakodate-Hokuto and Shin-Aomori)
2017 Sanyo Shinkansen starts using pattern-control ATC system

Reiwa Era

2020 Verification tests on the first automated operation on conventional railway lines commence on the Kyushu Railway Company (JR Kyushu) Kashii Line
2022 150th anniversary of Japan's first railway between Shimbashi and Yokohama

History of Nippon Signal

Tasked with promoting the domestic production of railway signals

After the opening of the first railway between Shimbashi and Yokohama in 1872, the adoption of railway signal technology became one of Japan's highest priorities for the development of its railways. One person who worked hard on the adoption of those technologies was Amane Mimura, the man who would later lay the foundations of Nippon Signal. In 1896, Mimura traveled to the United States and Europe as a representative of Nippon Railway (Japan's first private railway company) and brought home with him the latest in railway signal technology and safety devices. He subsequently established Mimura Factory, a manufacturer of railway signaling equipment. In 1928, Mimura Factory merged with Shiota Factory and Railway Signal Corporation to form Nippon Signal Co., Ltd., which was tasked with promoting the domestic production of railway signals.



Electric semaphore signal

Protecting the safety of ever faster, denser railway traffic

From the post-war reconstruction to the period of rapid economic growth, Japan's railways grew and developed at a steady pace, but on the flip side, there were numerous serious accidents, and the railways were being called on to implement reliable safety measures. Using railway signal technology that incorporated the latest in electronic technologies, Nippon Signal continued to protect the safety of increasingly fast, dense railway traffic. Nippon Signal developed Japanese National Railways' first Centralized Traffic Control (CTC) system, which was adopted on the JNR Ito Line in 1958. For the Tokaido Shinkansen, which began operating in 1964, Nippon Signal was tasked with designing CTC, Automatic Train Control (ATC), and relay interlocking devices, supporting the realization of the super express train of dreams that astonished the world.



Centralized Traffic Control device and display panel (Ito Line)

Expansion of AFC systems achieves comfortable, convenient travel

In the 1960s, with the influx of people from regional areas, stations in the cities were experiencing increasingly intense morning and evening rushes. To alleviate crowding during commuting times, the railway operators proceeded to adopt systems for the automation of station services (ticketing, ticket inspection, fare adjustment), such as automatic passenger gates and automatic ticket vending machines. Nippon Signal delivered a full-scale Station Network System managed across all stations and lines on the Sapporo Municipal Subway, which was established in 1971 in time for the 1972 Sapporo Winter Olympics. Subsequently, we have contributed to the automation of station services all over Japan, while meeting the needs of the times, such as the transition to IC cards for ticketing, conversion to barrier-free equipment, and introduction of multilingual services to machines.



Scene of production at Utsunomiya Plant

The challenge of further evolution to next-generation transportation infrastructure

From the second half of the 20th century into the 21st century, the railways have unceasingly adopted cutting-edge technologies and have continued to evolve into safer, faster, and more comfortable modes of travel. However, for Japan's railways to survive and grow as transportation infrastructure into the future, they will need to overcome changes in the social structure, such as population decline and labor shortages caused by the low birth rate and aging population. Nippon Signal is promoting a variety of projects that look ahead to the future of the railways. They include an automated operation system for conventional lines that have level crossings, which accounts for the majority of Japan's railways, a remote monitoring system that reduces the personnel required by adopting IoT technology for railway equipment operation and maintenance, and robots that work in tandem with humans on maintenance work.



Kashii Line automated operation verification testing

AFC (Automated Fare Collection)

Automated Fare Collection (AFC) Business
50th Anniversary of AFC (Station Network Systems)
– Always supporting station services of the new era –

It is 50 years since we began working on Japan's first full-scale station network system. Nippon Signal has contributed to the automation of station services (ticketing, ticket inspection, fare adjustment) with the use of high value added equipment and systems that are always equipped with the latest technologies.

1969 — Creation

Leads the adoption of AFC systems at Japan's railway stations

Nippon Signal was one of the first to research and develop automatic passenger gates in the late 1960s. In 1966, we concluded a technology alliance with an American company, Advance Data System (ADS), and in 1969, we sold four automatic passenger gates to Tokyo Monorail Co., Ltd. At the end of 1971, we delivered Japan's first full-scale AFC system (automatic passenger gates, automatic ticket vending machines, and fare adjustment machines) that automated and managed all station services across the entire line at all stations of the Sapporo Municipal Subway, which was built to coincide with Japan's first Winter Olympics.



Automatic passenger gates (first-generation model, Sapporo City Transportation Bureau)

1970s — Development

Promotion of transition to micro-electronics and software in automatic passenger gates and ticket vending machines

Nippon Signal continued its challenge of developing even more sophisticated AFC systems with the themes of higher performance, simplification, and lower costs. In 1978, we developed the S-Model ticket vending machine, our first software-driven model. Over the next 10 or so years, we launched the SX-2, which accepted paper currency, the completely software-driven SX-3, the SX-4, which had a prepaid processing function, and the SX-5, which featured high processing capacity due to the installation of a 32-bit CPU, and comfortable operability with a slanted customer-facing surface. In passenger gates as well, while promoting the transition to micro-electronics (ME) and software, we have continued to develop increasingly sophisticated models to meet station service needs. They include a ticket gate for intermediate gates (passenger gates connecting different lines belonging to the same company), and a ticket gate that could accept and return multiple tickets simultaneously for the Shinkansen, which requires a function for handling multiple tickets (basic fare ticket, express ticket, reserved seat ticket, etc.).



Automatic passenger gate (Tokyo Monorail)

2000s — Evolution

Accommodating the transition to magnetic cards and IC cards for fares

In 2000, with the launch of Passnet, a card that allowed passengers to ride the trains of the 17 major railway companies in the Kanto region with a single card, the popularization of magnetic cards began. Then, in 2007, simultaneously with the birth of "PASMO," a common IC fare card accepted by the major private railways, subways and buses in the greater Tokyo metropolitan area, mutual use of PASMO and the East Japan Railway Company's IC fare card, "Suica," began, heralding the arrival of the IC fare card age that we know today. Throughout those years, Nippon Signal has developed state-of-the-art automatic passenger gates, fare adjustment machines, and automatic ticket vending machines to accommodate the transition to magnetic cards and IC cards. We have made proposals to the railway operators in each region, based on the concepts of their respective lines. For the Toei Subway Oedo Line, preempting the objectives of the barrier-free legislation that came into force in 2006, we delivered AFC systems that enabled all people, including the elderly and people with disabilities, to use the stations in comfort.



Ceremony to launch mutual use of IC fare cards

2010s — Present Leap

Expansion of business while pursuing even more advanced functions

Today, Nippon Signal's AFC business contributes to more efficient and smarter station services through automatic passenger gates, ticket vending machines, and fare adjustment machines that emphasize not only safety and ease of use, but also ease of maintenance and reduction of environmental impact. We have also developed multilingual ticket vending machines in response to the increase in overseas visitors to Japan, and in 2014, we delivered automatic passenger gates that are able to read both QR codes and IC cards for the Okinawa Urban Monorail, which was the first railway in Japan to adopt QR-code tickets. In these and other ways, we are quick to incorporate the latest trends into station services of the future. Our AFC systems, which have a track record stretching back some 50 years, offering reliable quality and advanced functions, have been well received overseas as well. They have been adopted by railways in emerging Asian markets such as the Chennai Metro in India and the Dhaka high-speed railway in Bangladesh.

Automatic passenger gate at Chennai Metro

Interview

Toward the 200th and 300th Anniversaries of the Railways

When I look back over the 150 years of Japan's railways, I gain a renewed sense of the important role that the railways have played in contributing to Japan's growth and development. At the same time, I also recognize anew the great significance of the mission that was assigned to Nippon Signal in its participation in railway-related businesses. Today, to overcome the changes in the business environment, such as population decline caused by the low birthrate and aging population, and strive for the revitalization of Japanese industry, the railways will need to make a dramatic transformation. Under these circumstances, while properly identifying "that which we must not change" (basic philosophy of safety first) that we have cultivated until now and "that which we must change" toward the future, Nippon Signal will continue to create innovation in railway signals and AFC systems. Thoroughly addressing the business challenges of the railway operators and the needs of the people who use the railways, we will create new products and new business models to suit the market environments in and after the COVID-19 era and the DX age, and contribute to the Next Stage of Japan's railways.



Deputy Chief Executive Officer
Takeshi Fujiwara

Feature

Growth Strategy of the Company

Focus 1 | Traffic Control Dedicated Wireless Network System (Police MVNO*)

Digital transformation (DX) of Traffic Signal Systems

More than 40 years have already passed since starting the establishment of traffic control systems, and there are now some 210,000 traffic lights operating around the country. Around 70,000 of those are connected to traffic control centers, and for the majority of those connected lights, communications are via analog lines. For this reason, without alternative modes, a lack of progress in considering cost reductions has become an issue.
Nippon Signal began development of wireless network equipment exclusively for traffic control and network systems in 2016 with the aim of reducing communications costs and realizing stable operation of traffic light systems through the conversion from analog to digital lines. In the same year, we established a committee for the verification testing, study and research of traffic control systems using mobile networks. Traffic signal manufacturers and telecommunications carriers were invited to join this committee, as well as the National Police Agency, which is the government agency with jurisdiction, and the police headquarters of the various prefectures as observers. The committee took about three years to conduct wide-ranging verifications of matters such as security and communication stability. From October 2020, we began providing services as a wireless network system MVNO operator exclusively for traffic control.

*MVNO: Short for Mobile Virtual Network Operator.
An enterprise that operates its own mobile communications service by leasing networks from a mobile network operator (MNO), without being allocated radio waves (not operating base stations).

Redundancy and security ensured for stable service provision

Traffic lights systems must constantly provide stable operations and continuous operations at times of disaster. Nippon Signal's Police MVNO has the following three features, providing safe and secure service.

(1) Stable operation by switching between two lines

In wireless communications, communication can sometimes be disrupted by external impacts. Nippon Signal's Police MVNO plays an important role in transmitting the traffic lights system's control information, and as such, frequent disruptions of communication would be unacceptable. By connecting simultaneously with two communications carriers, we are able to switch between the two lines, depending on the line connection status, thus preventing disruption of communications.

(2) Establishment of BCP through data center redundancy

Traffic signal systems are required to provide information continuously even at times of disaster. Data centers that integrate the lines have been set up in two locations, Tokyo and Osaka. In the event of a large-scale disaster, switching between the two data centers will enable information provision to continue uninterrupted.

(3) Security

In a study commenced in 2016, we obtained the cooperation of the prefectural police department and firmed up our security policy. Data is encrypted at each stage, between wireless network sectors by the communication carriers and between the wireless communication devices and the control center. In addition, the security of the networks between the traffic control center and the traffic lights, etc. has been ensured by forming closed networks for the exclusive use of the police.

Contributing to the reduction of customers' fixed costs

Making this service a subscription model has lowered the barriers against adopting the service for customers, resulting in its adoption by a wide range of customers.

(1) One-stop service provision

As the MVNO operator, Nippon Signal provides one-stop services, from the various administrative procedures and installation of the equipment to maintenance services once the service is up and running. This makes it easier to convert from the conventional analog dedicated line services (scheduled to end in 2024).

(2) Reduction of communications costs

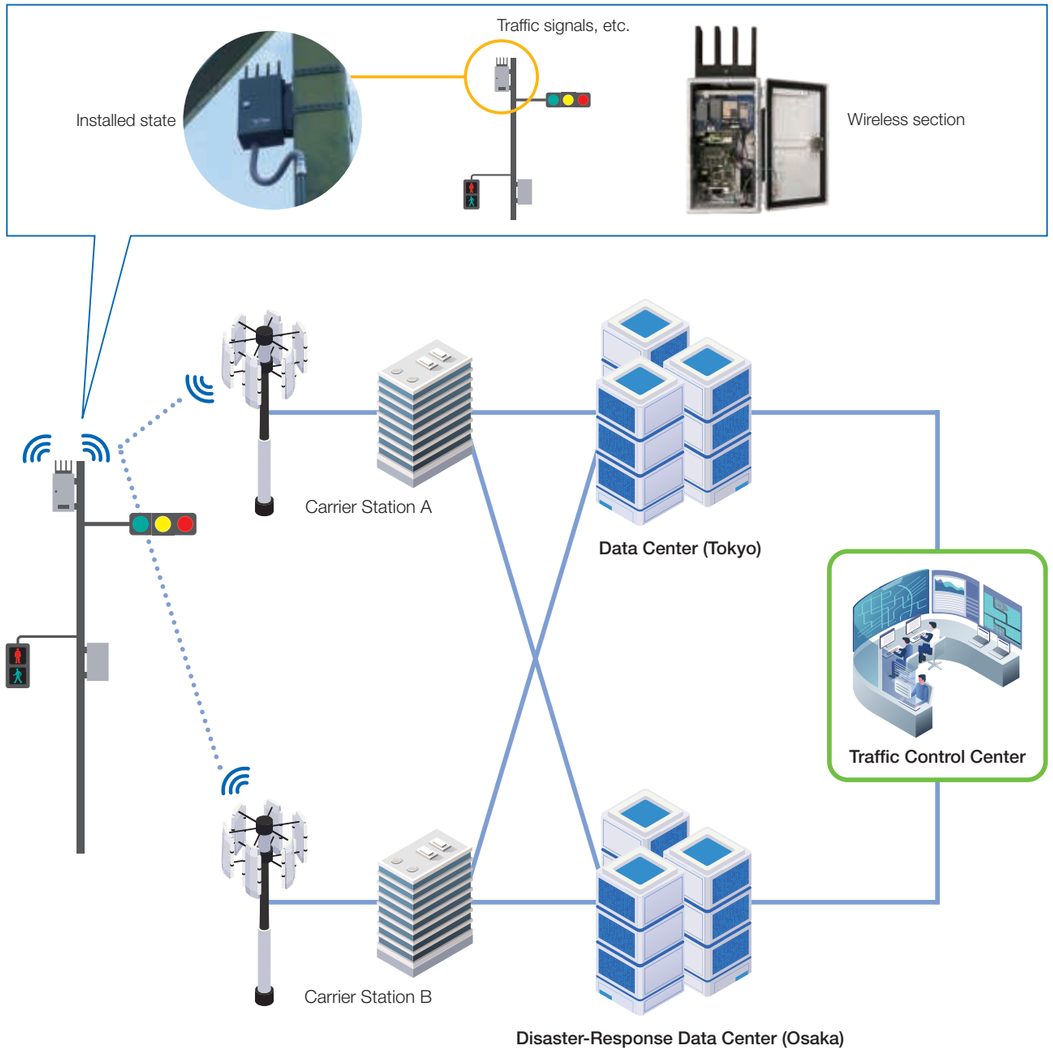
Conventional analog dedicated-line services were charged by distance, so the installation of private lines over long distances resulted in high fees. Because our service is wireless, it is not affected by distance, enabling us to provide services for lower, fixed fees.

(3) Reduction of various costs

Because of the elimination of distance-based fees, the central traffic control systems that were needed for analog dedicated-line services can be simplified (modem-less terminal devices, elimination of sub-centers). Also, with the simplification of the equipment, running costs, such as air-conditioning costs and maintenance costs required to maintain the equipment, have also been reduced.

We concluded contracts for about 100 lines in FY2020 and about 800 lines in FY2021, and we expect the cumulative total to exceed 2,000 lines in FY2022. Looking ahead, as well as contributing to fixed cost reductions with our wireless traffic control private network system, we will expand the provision of our services to transport infrastructure that requires redundancy and security beyond the police, with the aim of building communications platforms that will contribute to society with highly safe and secure technologies.

Wireless Traffic Control Private Network System



Feature: **Growth Strategy of the Company**

Focus 2 | Robotics

Humans and Robots Working Together to Solve Social Issues and Support the Smart City Systems of the Future

Robots are being adopted in a variety of industries to eliminate labor shortages caused by the low birthrate and aging population. In the Smart City Systems project, which aims to create a sustainable future with the use of information and communications technology (ICT), solving social issues with robots is a key theme. Under these circumstances, Nippon Signal has taken on the challenge of creating value in the robotics domain with the concept of "humans and robots working together."

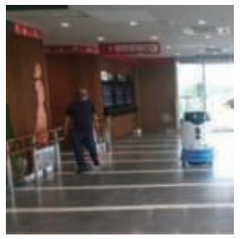
"Self-driving robots" evolving into a presence that provides a wide variety of services

Nippon Signal has been delivering CLINABO® automatic floor cleaning robots since 2018 to help alleviate labor shortages in cleaning operations. CLINABO® is a self-driving robot that employs Nippon Signal's core technology. It memorizes the patterns of cleaning routes that it has been taught and uses proprietary sensor technology, image analysis technology, and SLAM*1 technology to identify obstacles accurately and conduct cleaning operations safely and smoothly.
Nippon Signal has two product lines—CLINABO®, a mopping-type cleaning robot suited to tiles and waxed floor materials, and one for CLINABO CL02, a dust-collection-type cleaning robot for carpet and wooden floors, which respond to market needs for commercial cleaning robots.
CLINABO CL02 is equipped with reliable autonomous driving features, cleaning ability, and comfortable operation. It also features high value added functions that are a step toward the next generation of cleaning operations, including remote operation via a tablet and cleaning on multiple levels of a building by linking the device to the elevator. In addition to the enhancement of functions, we have also distinguished our company from the competition in terms of support services, from pre-adoption setup support and lectures on how to use the robot to operational support once it is in service. CLINABO® and CLINABO CL02 have already been put into service at railway stations, large warehouses, and office buildings, where they are helping to alleviate labor shortages. Our self-driving technology is being extended into areas other than cleaning robots, such as the joint development of a security robot with a major security company.
In its engagement in the robotics domain, Nippon Signal is working to build new business models. We will also promote the broadening of our customer base by providing different formats for use beyond conventional equipment sales, such as subscription, leasing, and rental.
Leveraging the SLAM technology platform that we had established by FY2021, we are looking ahead several years with plans to develop a service robot that will operate in a wide variety of modes, including sentry duties, cleaning, security, and patrols and inspections. We will propose our service robots, which will have been further evolved and available in an expanded line-up, as infrastructure that supports urban life of the future, targeting large-scale redevelopment projects that are being progressed as "super cities"*2.

*1 Simultaneous Localization and Mapping: Technology that simultaneously self-estimates location and maps the environment, which is essential to self-driving and automated operation.
*2 Concept that aims for the advance realization of "total future cities," leveraging cutting-edge information technologies such as artificial intelligence (AI) and big data, with local governments and businesses working together with the national government.

Automatic cleaning robots



Multiple handling vehicle that supports a move away from heavy-lifting work

In anticipation of a shortage of workers, tasks requiring a great deal of physical labor, the elimination of hazardous tasks, and efficiency improvement have become challenges on the ground in maintenance operations in the railway business. Nippon Signal has been collaborating with West Japan Railway Company and Man-Machine Synergy Effectors, Inc. since FY2021 on the Multiple handling vehicle that will support work at height and the conveyance of heavy objects in railway works.
Railway maintenance requires atypical work (work that requires different methods and flexible responses adapted to the circumstances) depending on the state of the tracks and equipment. This makes it difficult to assign such duties to robots, which are usually developed to handle certain specific tasks. Nippon Signal's Multiple handling vehicle accommodates such atypical work by realizing "human-robot collaboration" with force feedback control technology. The human operating the robot remotely receives force feedback (the sensation felt when the robot touches an object is fed back to the operator's hand) from the robot's arm, allowing the work to be performed safely and accurately.
In March 2022, a prototype "two-armed model," which uses two arms to perform delicate tasks, was completed, and we will proceed with commercial production in FY2022.
We expect the Multiple handling vehicle to be adapted to a wide range of areas that require the securing of worker safety and flexible on-site response to different situations. Nippon Signal will extend the expertise in Multiple handling vehicle that it has established in railway maintenance into new areas in the future, including disaster recovery work and special work such as in nuclear power stations.

Based on our fundamental "fail-safe*3" philosophy, we will merge the core technologies that we have cultivated to date, including sensors, image analysis, and mechatronics, with state-of-the-art robotics, and contribute to the realization of a future society in which humans and robots work together. Partnering with companies for whom business innovation with robots is a management challenge, such as railways, building maintenance firms, developers, and construction companies, we will aim for the mutual growth of our businesses and the real-world implementation of robots.

*3 A philosophy of preventing accidents even in the event of equipment failure by always controlling equipment on the safe side


Conventional work at height (courtesy of West Japan Railway Company)

Multiple handling vehicle



Cutting down trees

Painting of overhead wire supports


Replacement of overhead wire components

Feature

Growth Strategy of the Company

Focus 3 | International Businesses Initiatives

Main Themes of Overseas Division

We develop businesses that have roots in regions, with a focus on existing markets, to contribute to the economic development of those regions. In addition, we strive for lasting, long-term business development while exploring new businesses in and after the COVID-19 era.

Concept Lasting, long-term business development rooted in megacities

Initiatives
1. Strengthening of global capabilities and risk management (point)
2. Expansion of maintenance business in key markets (line)
3. Continuous business development through close ties with customers (plane)

Global Network

As a leader of Japan's Railway Signal Systems industry, which is held in high regard worldwide, Nippon Signal began developing operations overseas with the supply of level crossing systems to the State Railway of Thailand in 1949. Today, we are engaged in a large number of projects in 30 countries and regions worldwide.
We supply the world with technologies that enhance the safety and reliability of railway infrastructure, such as the signal system adopted for Delhi Metro Line 8, which started fully unattended operation in 2020, and AFC (Station Network Systems) adopted in major cities including Chennai, Bangkok, and Jakarta.
Going forward, we will continue to actively develop operations overseas, leveraging the experience and technologies we have cultivated in Japan's transport infrastructure sector.

Interview Sustainable Growth of International Businesses — Next Stage to Global Markets —

With the acceleration of digital transformation (DX), which was anticipated even before the pandemic, innovative technologies have inevitably been developed, and work styles and businesses to suit this new era have emerged, one after another. In the Japanese market, we believe that there can be no growth for our company unless we can offer, in timely and appropriate ways, solutions to our customers' major challenges of reducing their fixed costs and restructuring their business portfolios.
Turning our gaze to the rest of the world, growing geopolitical risks are directly and indirectly affecting our global business. Under these circumstances, we must offer solutions to social issues in individual countries with a focus on transportation, while keeping our eyes open for opportunities and hedging our risks. Fortunately, demand for transportation infrastructure in individual countries has remained steady, and we will continue to ride that wave. Nippon Signal has delivered state-of-the-art transport systems to many countries over the past decade. The Next Stage plan calls for us to accommodate extended and newly established lines, and to continue to provide businesses that support customers closely by planting roots in the relevant countries and cities. I believe that it is important to promote technology transfers that will contribute to economic development, particularly in employment in the countries concerned, to build relationships that will be mutually beneficial for both Japan and those countries. To this end, we will conduct business activities in areas such as autonomous driving on railways and roads, CBM, security, and payment systems as our keywords for growth.



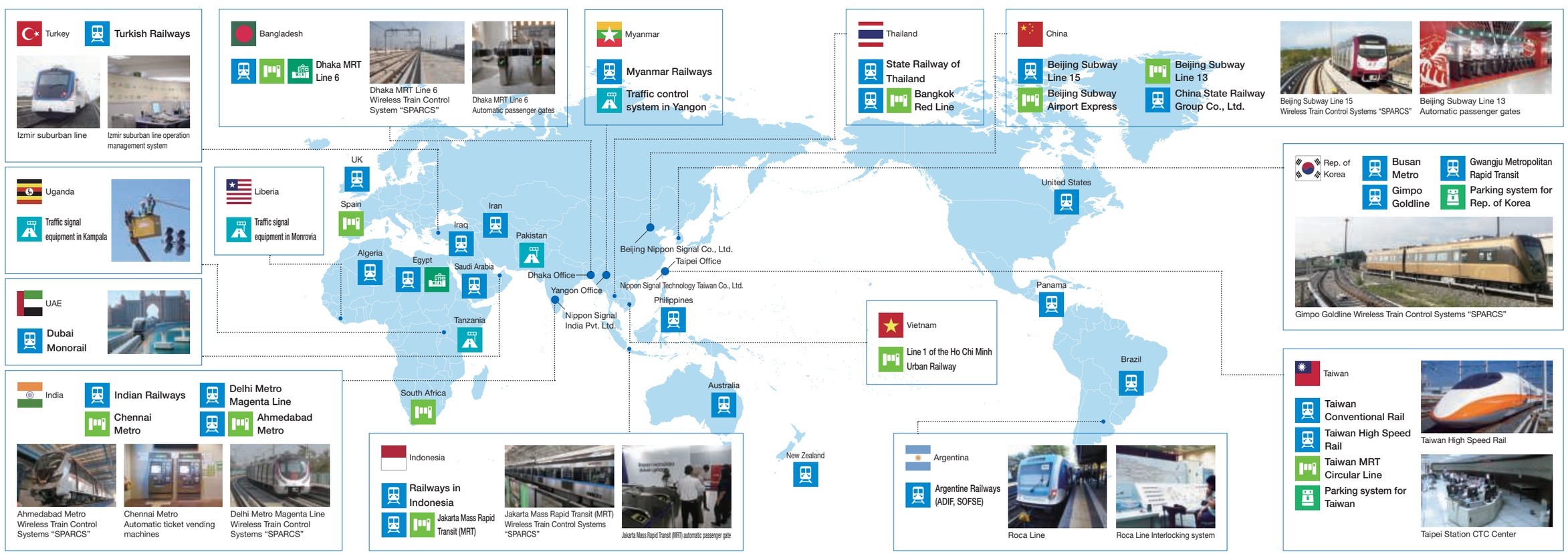
Director and Managing Executive Officer
Hideo Oshima

Nippon Signal operation coverage:

For many years, Nippon Signal has been a leader in Japan's Railway Signal Systems industry, which is held in high regard worldwide. Backed by such experience and technology, we are actively expanding overseas.

30 countries and regions

Railway Signal Systems | Automatic Fare Collection Systems | PSD | Smart Mobility Systems | Smart City Systems



Research and Development

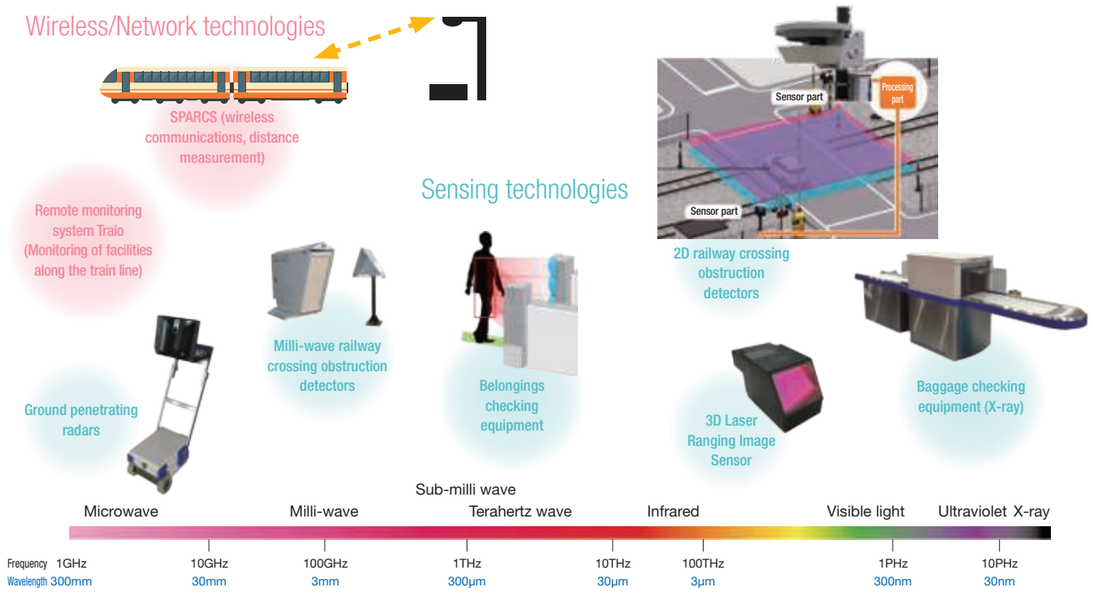
We will focus on the reduction of fixed costs for transportation infrastructure through digital transformation (DX), as well as on themes that lead to energy conservation and CO_2 reduction to create a decarbonized, recycling-oriented society, and accelerate the development of new solutions and products.

Basic Policy

Sensing, wireless, and network technologies that interweave electromagnetic waves, and image analysis using AI, have been positioned as shared foundational technologies for the Company. We will use them to create various new products for achieving ongoing business growth leading up to 2028 (our 100th anniversary) and contributing to the resolution of social issues.

❶ Sensing, Wireless, and Network Technologies

We are developing a range of new products based on the shared foundation of sensing, wireless, and network technologies that interweave electromagnetic waves.



❷ AI / Image Analysis Technologies

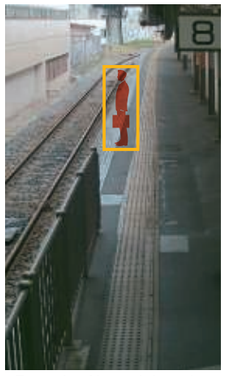
We are engaged in developing products including Station Platform Safety Monitoring Support Systems that utilize image analysis of video from cameras positioned in the station, and crew support systems that detect signs from obstruction warning signal device of level crossing obstructions based on image analysis of video from cameras positioned at the front of the train.

[Image Analysis Platform Monitoring Systems]

The system is capable of analyzing images of train station premises on behalf of station staff and keeping track of passenger behaviors. It supports accident prevention and initial responses to accidents by notifying station staff of hazardous situations, such as passengers walking on the edge of the platform or falling from the platform.

*The development of this system is partially supported by subsidies for railway technology development given by the Railway Bureau of the Ministry of Land, Infrastructure, Transport and Tourism of Japan.


Camera for image analysis


Example of hazard detection

❸ Supporting Inspections along the Railway with AI: Traio Onboard Units

The aging population with a low birth rate and the COVID-19 pandemic require the railway industry to establish a new framework for maintaining and managing facilities along the railway safely with reduced labor and costs. Given these circumstances, Nippon Signal is developing Traio*1, a system that monitors the state of facilities along the railway and achieves efficient and high-quality maintenance, combining accumulated know-how related to railway signal systems and IoT technologies.

The Company has recently developed Traio onboard units. This enables on-board inspections of facilities along the railway*2, which have been conducted by engineers on the ground. Images are captured by cameras that can collect images even during the night and by near-infrared lighting. AI extracts best shots from the pictures and makes pass/fail decisions on the facilities. With AI supporting the task of deciding on abnormality for facilities, which has been difficult to identify with sensors, onboard units achieve labor savings in maintenance operations.

West Japan Railway Company has decided to equip their train cars for total inspection with these units*3. We will continue to contribute to the resolution of issues associated with changes in the social environment and issues faced by companies engaged in the railway business, by providing new ways of monitoring railways and stations with the rollout of Traio to every railway facility.

*1 Traio is a word coined by combining "train" and "IoT."
*2 Facilities along the railway include suspension insulators, concrete poles, pull-off devices, hinged cantilevers, high-voltage cables, and watch towers.
*3 Nippon Signal developed part of the Traio system jointly with West Japan Railway Company.

[Onboard Systems for Train Cars for Total Inspection]

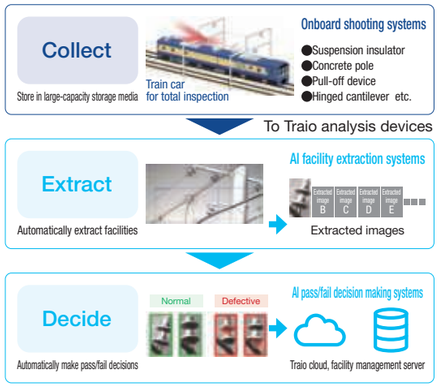

Train car for total inspection


Monitoring terminal

Photos of actual onboard equipment


Camera Lighting

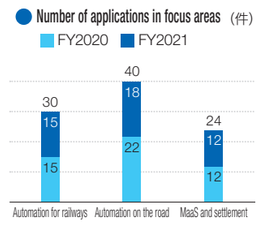




❹ Intellectual Property Initiatives

[Acquisition of Intellectual Property]

Nippon Signal promotes the acquisition of intellectual property linked with its business strategy to co-create value with customers in the era of new normal, with the aim of creating new businesses. Specifically, we are expanding our intellectual property, including patents, with a focus on such areas as automation for railways, automation on the road, and mobility as a service (MaaS) and settlement. We are also pressing ahead with the acquisition of intellectual property concerning the shared foundational technologies for our business (sensing, wireless, and network technologies and AI/image analysis technologies).



[Rewards for Employee Inventions]

Nippon Signal has established a system to reward inventions made by employees, in accordance with the provisions on employee inventions in the Patent Act. To increase the incentive toward employee inventions, bonuses are paid at the time of invention, at the time of patent registration, and when the invention contributes to profit.

Interview Future Research and Development

We are developing technologies that support next-generation transportation infrastructure, by linking the United Nations Sustainable Development Goals (SDGs), Japan's Society 5.0* initiatives (AI, IoT, robots/automation, response to declining population) in the country's science and technology policy, and CO_2 reduction. Specifically, we are focusing on technology-intensive solution development, which maintains existing functions, adopts simple structures, and achieves overall optimization by using IT. This is intended to help our customers' asset management. We will offer robust systems by combining sensing technologies that take advantage of features of different wavelengths, from low frequency waves, microwaves, and milli-waves to X-rays, with data processing that uses AI.

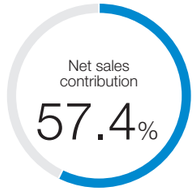
*A human-centered society that achieves both economic development and resolution of social issues by a system that highly integrates cyber space and physical space

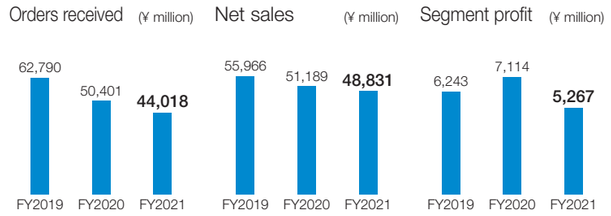

Director and Managing Executive Officer
Masayoshi Sakai

Business Overview At a Glance

Transportation Infrastructure









Railway Signal Systems

Main Areas of Business
- Automatic Train Control (ATC) devices
- Automatic Train Stop (ATS) devices
- Centralized Traffic Control (CTC) devices
- Electronic interlocking devices
- Level crossing protection devices
- Display devices
- Communication-Based Train Control Systems (SPARCS), etc.



Smart Mobility Systems

Main Areas of Business
- Traffic control systems
- Traffic lights control systems
- Traffic lights
- MVNO
- PICS, etc.

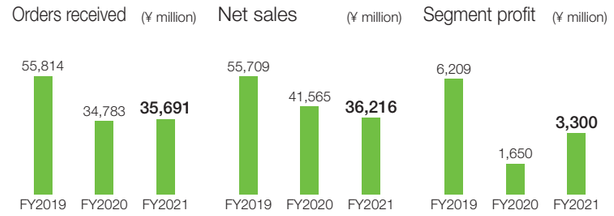
In Railway Signal Systems, in the Japanese market, while our products have been impacted by the supply shortages of semiconductor chips, we received orders and recorded sales related to various signal safety devices, including Automatic Train Control (ATC) systems and Centralized Traffic Control (CTC) devices, for railway operators.
We are also developing products related to fixed cost reductions by customers in anticipation of the end of the pandemic and to capital investments in reliability and safety, and we are rolling out our new Traio platform, which enables comprehensive monitoring of railway facilities, station service facilities, and facilities around stations, to railway operators throughout Japan.
Further, as an initiative related to the automation of train operation, in December 2020, we began verification testing of our high-performance Automatic Train Operation (ATO) system based on Automatic Train Stop (ATO) systems on some sections of Kyushu Railway Company's Kashii Line. As the results of this testing have been favorable, the system has been expanded to all sections of the Kashii Line. We will continue to develop products and services that will help our customers solve their management challenges, including the decline in the railway workforce.
In overseas markets, we received orders and recorded sales for railway signal safety devices and other products from India, Taiwan, and South Korea. Based on this track record of adoption of our systems, we have worked on marketing activities in response to infrastructure demand in various Asian countries.
In terms of upcoming initiatives, we will promote the creation of value addition to a range of devices, including signal safety devices, and develop products to address the current social issues of the declining workforce, natural disasters, and decarbonization.

For Smart Mobility Systems, particularly Road Traffic Safety Systems, we received orders and recorded sales for MVNO (network leasing services), traffic signal equipment, and other products. We also worked to expand sales of advanced PICS (pedestrian information communication systems), and took part in verification testing of an automated driving service using a cooperative vehicle-highway system that Nippon Signal itself developed.
In terms of upcoming initiatives, we will work on product development and commercialization aimed at the real-world implementation of KURU LINK (First/Last One Mile Service), where self-driving public transportation vehicles connect departure points and transport hubs, such as train stations, as well as transport hubs and destinations, and automated operation-related services that are based on coordination between infrastructure, such as traffic lights, and self-driving vehicles.

ICT Solutions









Automatic Fare Collection (AFC) Systems

Main Areas of Business
- Automatic passenger gates
- Automatic ticket vending machines
- Automatic fare adjustment machines
- Platform screen doors
- Gated parking lot management systems
- Centralized payment PARK-LOC® parking lot management systems, etc.



Smart City Systems

Main Areas of Business
- Security gates
- Automatic cleaning robots
- 3D Laser Ranging Image Sensor
- Ground penetrating detection radars
- OA devices (maintenance), etc.

In AFC, particularly Station Network Systems, the trend of customers to curb capital investment due to the impact of the COVID-19 pandemic continues in the Japanese market, but we received orders and recorded sales for various types of platform doors and passenger gates, as well as for the upgrading of ticket vending machines to accommodate the new 500-yen coin.
Also, looking ahead to the future, in the area of Station Network Systems, where DX is proceeding rapidly, we worked on the development of technologies such as digital ticketing, transition to EC, and transition to cloud-based systems and on new product proposals.
In overseas markets, we received orders and recorded sales for AFC systems and other products from Vietnam and Bangladesh.
In terms of upcoming initiatives, the business environment for cashless settlement systems and image processing are expanding in anticipation of full-scale development of MaaS. To respond to settlement systems in the new smart mobility society, we will bring new products into the market and create new businesses.

In Smart City Systems, particularly Security System Solutions, the effects on various products of the supply shortages of semiconductor chips continues to be felt, but we received orders and recorded sales for 3D sensors, ground penetrating detection radars, and other products from the manufacturers of Platform Screen Door, and for installation in construction and agricultural equipment.
In the robotics area, we are striving to expand sales of our automatic cleaning robots, which have a bacteria elimination function and can be linked up to elevators, and, together with our partner companies*, we pursued the joint development of Multiple handling vehicle, aimed at eliminating heavy-lifting labor and improving efficiency in railway maintenance.
In terms of upcoming initiatives, we will enhance security gate lineups and accommodate new technologies, such as facial recognition and contactless technologies. Moreover, we will work on the development of a wide variety of robots by leveraging the knowledge gained from cleaning robot development.

* West Japan Railway Company and Man-Machine Synergy Effectors, Inc.

NIPPON SIGNAL's SDGs Actions

Nippon Signal Group will balance social and corporate values through five types of *zukuri* (a Japanese word for creation) or business activities to achieve the United Nation's 17 Sustainable Development Goals (SDGs) to Transform Our World and the Group Philosophy.



Basic Policy on CSR

SDGs

Group Philosophy

We hope to realize a more secure and comfortable society for people around the world, and "Our Mission" in Nippon Signal Group Philosophy sets out the idea.

Details:➡ P44

Environmental Policy

SDGs

Group Philosophy

We provide eco-friendly products and services, and also reduce the environmental impact throughout the product life cycle, from product development to final disposal, to achieve a synergy between business activities and environmental protection efforts.

Details:➡ P37

Health Management

SDGs

Group Philosophy

Under the Health Declaration made on April 1, 2022, Nippon Signal has launched initiatives on health management designed to fulfill our social responsibility based on our corporate philosophy of "safety and reliability," and to continue to advance as a company with sustainable growth.

Details:➡ P41

Basic Policy on Information Security

SDGs

Group Philosophy

The Nippon Signal Group ("the Group") is engaged in group-wide information security initiatives under this Basic Policy, with the aims of protecting the information assets of the Group from accidents, disasters, criminal acts, and other threats, and of responding to the trust of our customers and society.

Details:➡ **https://www.signal.co.jp/environment/information_security/**

Basic Policy on Internal Control System

SDGs

Group Philosophy

(1) System to ensure that the execution of duties by Directors and employees complies with laws and regulations and the Articles of Incorporation
(2) System for the storage and management of information concerning the execution of duties by Directors
(3) Rules and other systems for management of risks of loss
(4) System to ensure that the execution of duties by Directors is conducted efficiently
(5) System to ensure appropriateness of business operations of the Group comprising the Company and its subsidiaries
(6) Matters regarding employees in cases where Audit & Supervisory Board Members request the assignment of employees to assist them in their duties and matters regarding the independence of such employees from the Directors
(7) System for Directors and employees to report to Audit & Supervisory Board Members and other systems regarding reports to Audit & Supervisory Board Members
(8) Policy on processing of expenses arising from the execution of duties by Audit & Supervisory Board Members
(9) Other systems to ensure that audits by Audit & Supervisory Board Members are conducted effectively

Details:➡ P49

Policy for Determining Remuneration, etc. for Individual Directors

SDGs

Group Philosophy

Directors' remuneration is decided under a remuneration scheme to provide Directors with healthy incentive to pursue medium-to-long-term improvements in corporate value while also accomplishing short-term performance targets. Remuneration for each Director is set at an appropriate level, based on their responsibilities.

Details:➡ P48

Basic Approach on Eliminating Anti-social Forces and Status of Establishment of Such Approach Group Philosophy

SDGs

Group Philosophy

From the perspective of practicing social justice, the Group will have no relationship with anti-social forces whatsoever in either direct or indirect ways. In the event that the Group is subjected to unreasonable demands from anti-social forces, we will categorically reject such unreasonable demands, in coordination with relevant administrative organizations such as the police and legal experts such as attorneys as necessary.

NIPPON SIGNAL's SDGs Actions

1. Social contributions and disaster relief through products and services

SDGs Group Philosophy

The issue of labor shortages due to a low birthrate and aging population is one that threatens the basis of many industries in Japan. In railways as well, there are expectations of solutions to social issues, including the decline in the working population to work on the railways, through the promotion of automation and mechanization of operations. Nippon Signal has developed unattended train operation devices (high-performance ATO (FS-ATO))* based on automatic train stop (ATS) systems and started verification tests on service lines of Kyushu Railway Company. The section of the verification test line was extended in March 2022. We have also developed Traio onboard units. This unit enables onboard inspections of facilities along the railway, which had previously been conducted by engineers on the ground.

*FS-ATO: High-performance automatic train operation (ATO) devices featuring reliability and fail-safe operation equivalent to a security device



2. Reduction of environmental impacts to create a decarbonized, recycling-oriented society

SDGs Group Philosophy

Asia and Africa, regions that have been growing, are forecast to see air pollution get worse and CO_2 emissions increase. Nippon Signal proposes building rail networks and transportation systems in the regions to reduce air pollution and environmental load of exhaust gases, thereby contributing to the resolution of global issues through the establishment of infrastructure.
We have received an order for a traffic signal system for Bangalore in India, which is experiencing chronic traffic congestion due to population growth. This system is scheduled to start operation in FY2022. SPARCS, our eco-friendly wireless train control system, can reduce CO_2 emissions by approximately 70%* per annum compared with conventional train control systems. The adoption of SPARCS has started with the realization of the world's first completely wireless train control system for Beijing Subway Line 15 in 2011, followed by expansion into other countries including India, Indonesia, and South Korea, as well as bulk orders in Japan for systems with automatic operation functions.



*Prerequisites
Line type: Conventional railway line, train wheels, double track; **Track length:** 7.5 km; **Stations:** 4 (1 machine room); **Number of carriages:** 6 (total number of carriages); **Intervals between transceivers:** 300 m (number of track circuits: 50T)

3. Transportation infrastructure development and disaster relief support

SDGs Group Philosophy

Nippon Signal is working to develop products that support transportation infrastructure that people can use at ease and comfort, while addressing issues for the future, such as an aging population with a low birth rate and labor shortages. As well as working to provide high quality, highly reliable products and systems, we contribute to durable transport infrastructure that reduces labor and costs, with train control systems using wireless communication, and O&M solutions utilizing IoT technology. Regarding disaster relief support, we are participating in BRT verification tests using sections on the JR Kesennuma Line and the JR Ofunato Line, which had been hit hard by the Great East Japan Earthquake.



4. Construction of platforms in which diverse employees are able to feel empowered in their work

SDGs Group Philosophy

In order to improve the work environment and eliminate human rights violations in our increasingly globalized corporate activities and supply chains, we provide compliance training on a regular basis.
Signalio Nanasato and Signalio Utsunomiya are our studio dormitories for unmarried employees that accommodate diverse individuals, where younger employees of diverse gender and nationalities live. We have secured an environment to help young employees fully demonstrate their ability with the dormitories having satellite office functions and training rooms. A corporate childcare facility Signalio Kids is attached to Signalio Utsunomiya so that employees can continue to work with peace of mind when they enter the stage of raising children in their life cycle. We have adopted free-address workspaces at our head office to invigorate communication between employees.



5. Support for high-quality education, cultural activities, and women in the workplace

SDGs Group Philosophy

Nippon Signal is a co-sponsor of the Pacific Music Festival (PMF), an international educational music festival for fostering young musicians, which was founded by Leonard Bernstein, a distinguished conductor and composer of the 20th century, to facilitate international and regional exchanges through high-quality culture and art. Nippon Signal also co-sponsors Bolero: Plaza of Children's Dreams, a project organized by Michie Koyama, a world-class pianist, to support recovery efforts from the Great East Japan Earthquake with a wish to help children find dreams and hopes for the future through real experience. We also provide female students with career development support and recognize that training our new employees and reskilling existing employees are important tasks for management.



6. Environmental preservation

SDGs Group Philosophy

Ever-increasing emissions of greenhouse gases (e.g., carbon dioxide, methane, chlorofluorocarbon) since the industrial revolution are having serious impacts on the global environment, such as extreme weather events and rising temperatures. Nippon Signal, a company that handles transportation infrastructure, is expected to conduct its business activities in an environmentally-friendly manner, and contribute through the popularization and maintenance of railways that are the means of transportation with low environmental load.
Nippon Signal is pushing forward initiatives that contribute to conservation of the global environment, such as the use of renewable energy and forestry conservation, with solar panels installed in its dormitories for unmarried employees--Signalio Nanasato and Signalio Utsunomiya. In addition, we have continually engaged in forestry activities with the Forest of Nippon Signal opened in Yaita City, Tochigi Prefecture.



7. Active global partnership

SDGs Group Philosophy

Nippon Signal operates projects in 30 countries and regions, and we contribute to the creation of infrastructure in countries across the globe, mainly in Asia, by providing train control systems, automatic fare collection systems, platform doors, and other products.
Achieving SDGs requires global partnerships with countries, corporations, citizens, and academic institutions across the globe. Nippon Signal actively networks with people in emerging countries, such as those in Asia and Africa, and facilitates the creation of business partners and talent development, in an effort to support the development of these countries.



8. Promotion of social welfare

SDGs Group Philosophy

Nippon Signal Group recognizes that it is a social infrastructure company and that it should be a group of people who can help save lives in the event of an unexpected accident or a disaster. Based on this idea, we have a scheme to encourage officers and employees of the Group in Japan to obtain lifesaving skill certifications issued by local fire authorities.
Nippon Signal continues to be a co-sponsor of the Gold Concert, a music contest for people with disabilities, giving Nippon Signal award certificates and commemorative gifts to grand prize winners. Furthermore, we collect anniversary donations around the date of the anniversary of our founding each year under a matching gift* scheme. We have made donations to many organizations including the Japanese Foundation for Cancer Research, Saitama Prefectural Children's Medical Center, Saitama Rehabilitation Center, and Saitama Adapted Sports Association.

*Matching gift is a system where the Company adds a certain contribution to the amount of donations made by employees and donates the sum.



E Environment

TCFD (Task Force on Climate-related Financial Disclosures)

Recognizing that climate change affects sustained growth, Nippon Signal declared its support of the Task Force on Climate-related Financial Disclosures (TCFD) on December 23, 2021. We will carry out the following initiatives in accordance with the TCFD recommendations.

Task Force on Climate-related Financial Disclosures (TCFD) was established by the Financial Stability Board (FSB) to discuss matters on climate-related disclosures. The Task Force recommends firms and other entities to grasp and disclose the risks and opportunities that climate change poses on their business.

Greenhouse Gas Emissions Reduction Plan

Nippon Signal will work on its own corporate initiative to reduce its greenhouse gas (GHG) emissions by 50% by 2030 and to achieve carbon neutrality by 2050.

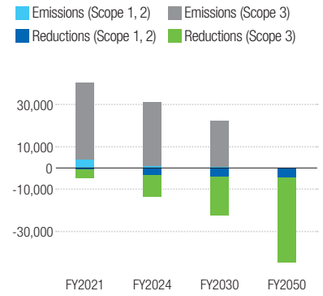
Our plants (manufacturing bases) will be 100% powered by green electricity in 2022. We will concurrently make efforts to reduce emissions from the use of products we have sold.

Scope 1: Direct GHG emissions of the company that occur from fuel combustion or industrial processes

Scope 2: Indirect GHG emissions associated with the use of electricity, heat, or steam supplied by electric power companies and other external sources

Scope 3: All indirect GHG emissions resulting from business activities that do not fall into Scope 1 or Scope 2

CO_2 reduction plan

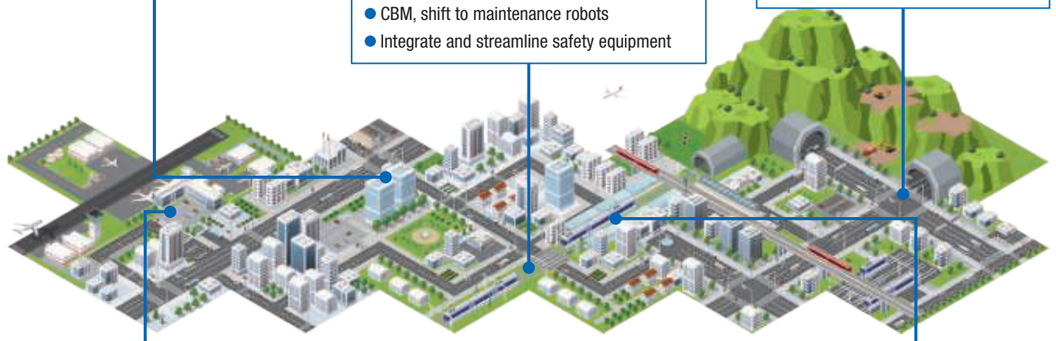


Initiatives for Environment Beneficial Products, R&D

Office
Save labor, automation
- Automatic cleaning robots
- Robot control
- Security

Railway
Streamline equipment, save labor on maintenance work
- Automatic operation
- CBTC (SPARCS, etc.)
- Upgrade the functions of on-site equipment (IoT, disaster prevention)
- CBM, shift to maintenance robots
- Integrate and streamline safety equipment

Road traffic safety
Automate operation, reduce environmental impact
- BRT, LRT
- MVNO, PICS
- I2X, vehicle-infrastructure coordination



Parking
Shift towards full automation and cashless payments
- Autonomous parking, car allocation
- Cloud-based management of vehicle numbers
- Remote monitoring, shift to cashless payments

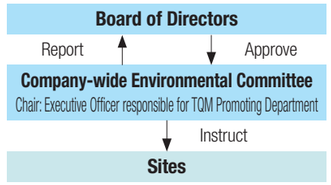
Nippon Signal's social responsibility
Consider decarbonization and respect for human rights in view of the whole product life cycle
- Procurement (green procurement, fair trade, etc.)
- Manufacturing (use of green energy)
- After-sales (recycling)

Station
Save labor, shift to cashless payments
- Payment, recognition
- Shift to thin client computing
- Platform monitoring, CBM

Disclosure in Accordance with TCFD Recommendations

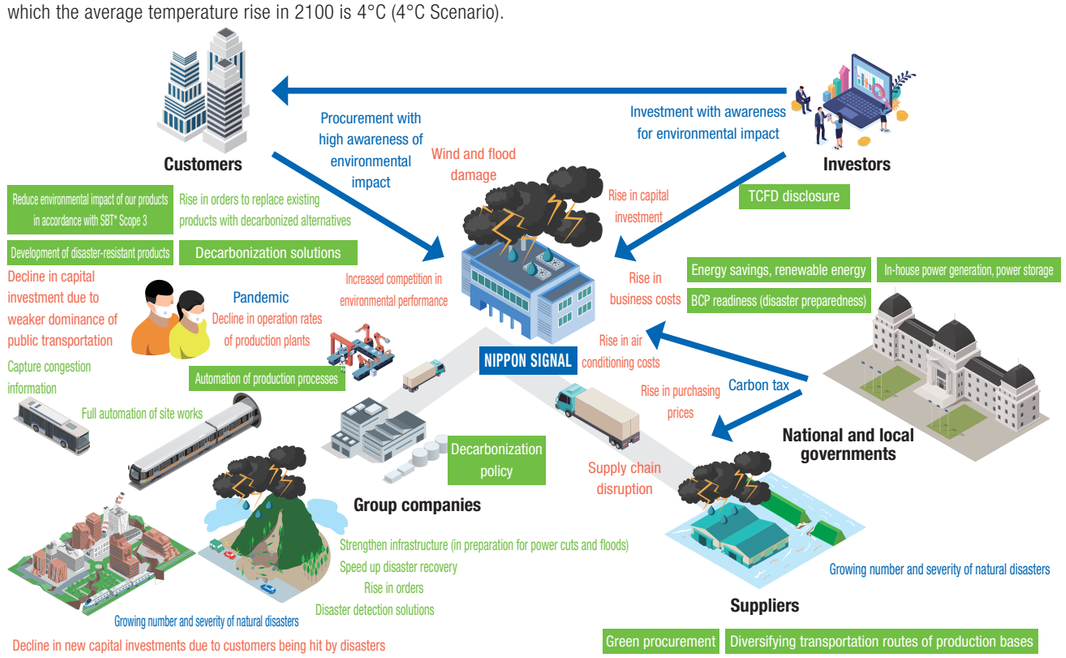
Governance

Nippon Signal regards the addressing of climate change as a significant sustainability challenge. Our Company-wide Environmental Committee, chaired by the Executive Officer responsible for TQM Promoting Department and involving heads of each site, manages the process in accordance with the targets and plans for each fiscal year. The Board of Directors provides supervision based on the reports on matters and progress.



Strategy (scenarios adopted)

In considering scenario analyses, we have consulted AR6 SSP1-2.6 and SSP5-8.5 of the Intergovernmental Panel on Climate Change (IPCC) and set two scenarios, namely, (1) a world in which the average temperature rise in 2100 is below 2°C (2°C Scenario), and (2) a world in which the average temperature rise in 2100 is 4°C (4°C Scenario).



*According to SBT (Science Based Targets: an international initiative to help companies set and achieve GHG emissions reduction targets towards the goal of holding the increase in global temperature to "below 2°C" above pre-industrial levels) classification

Risk management

At Nippon Signal, we sort out, evaluate, and manage climate-related risks listed below and deliberate their validity at the Company-wide Environmental Committee.

(1) Transition risks (policy and regulations, market, technology, users' behavioral changes)

(2) Physical risks (natural disasters, infectious diseases)

Indicators and targets (life cycle CO_2 emissions)

Nippon Signal will calculate its GHG emissions according to Scopes 1-3 of STB (Science Based Targets: an international initiative to help companies set and achieve GHG emissions reduction targets towards the goal of holding the increase in global temperature to "below 2°C" above pre-industrial levels) and work to reduce emissions. For Scope 3, we will measure emissions for each category and make efforts to reduce GHG emissions, particularly those related to the use and end-of-life treatment of our products, with activities starting in the early design stages.

Upstream	Company		Downstream
Scope 3	Scope 1	Scope 2	Scope 3
Raw materials, Employee commuting, Transportation and delivery	Fuel combustion	Use of electricity	Use of products, End-of-life treatment of products
Other: Capital goods, fuel and energy related activities not included in Scope 1 or 2, waste, business travel, leased assets			Other: Transportation and delivery, processing of sold products, leased assets, franchises, investments

E Environment

Strategy Based on Scenario Analyses

According to our analysis, the changes in society to keep the temperature rise below 2°C will bring about carbon taxation and other regulations, changes in market needs, and other changes, and will push up demand for Nippon Signal's decarbonization solutions. If the temperature increased by 3-4°C, there will be a rise in physical risks associated with severe disasters caused by climate change, and it may seriously affect our supply chain including our own offices and plants. Our analysis also suggests that there will be a rise in demand for disaster-resistant products.

2°C Scenario

Risks	Implications for Nippon Signal	Responses of Nippon Signal
Transition risks		
Carbon tax on suppliers, introduction of emissions trading system	● Rise in business costs (carbon tax, emissions trading) ● Rise in purchasing prices led by the transfer of costs of materials (iron), etc. to the prices	● Drive energy saving efforts and use of renewable energy (introducing energy-efficient equipment, purchase of non-fossil certificate) towards achieving GHG emissions reduction targets*1 (6th Stage Environmental Action Plan). ● Expand decarbonization policy to Group companies ● Present Green Procurement Guidelines including those in line with the Framework Convention on Climate Change and keep track of compliance
Rapid change in procurement and investment behaviors aimed at a decarbonized society	● Increased competition in environmental performance (products with greater environmental impact will lose competitive power) ● Failure to respond appropriately will lead to the loss of trust in society and business opportunities ● Additional costs arising from having to make environment-related capital investments ahead of schedule ● Rise in costs for adapting to circular economy	● Reduce environmental impact of Nippon Signal's main products in accordance with SBT Scope 3*2 ● Develop products and services that will help reduce GHG emissions ● Support TCFD and conduct scenario analyses, disclose information in accordance with the framework

*1. Long-term targets for GHG emissions reduction (SBT Scope 3) will be presented in the 6th Stage Environmental Action Plan.

*2. SBT, or Science Based Targets, are the GHG emissions reduction targets required under the Paris Agreement. Scope 3 covers indirect emissions.

4°C Scenario

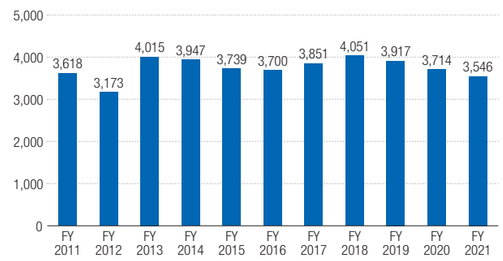
Risks	Implications for Nippon Signal	Responses of Nippon Signal
Physical risks		
Increased severity and sharp rise in the frequency of natural disasters	● Wind and flood damage to production bases ● Suspension of parts supply due to supply chain disruption ● Decline in new capital investments due to customers being hit by disasters ● Restriction on outdoor work due to extreme heat, rise in air conditioning costs	● Business continuity planning: disaster preparedness at production bases, manufacture of same product at multiple production bases, diversifying suppliers, securing means of transportation ● Secure in-house power generation and power storage capacity ● Develop disaster-resistant products (waterproof, etc.) ● Improve outdoor work environments (roofs, spot air conditioning, etc.)
Regional epidemic of infectious diseases	● Decline in operation rates of production plants including parts factories ● Reduction of production due to disruption in parts supply ● Decline in new capital investments due to weaker dominance of public transportation	● Automate production processes, utilize IT for business talks ● Secure parts and product inventory ● Develop products for use against infectious diseases (temperature check, traceability, etc.)

Opportunities

Opportunities	Implications for Nippon Signal	Responses of Nippon Signal
Expand sales of products and solutions that support customers' decarbonization efforts	● Rise in orders to replace existing products for the purpose of decarbonization ● Increased requests for proposals for decarbonization solutions	● Decarbonization plan consisting of design improvement and change of products (including discontinuing products) ● Develop solutions that will help reduce GHG emissions
Expand sales of products and solutions that support the strengthening of customers' infrastructure	● Rise in orders to replace existing products following customers' works to strengthen infrastructure ● Rise in orders for products for securing substitute power source in case of power failure and products to prepare for flooding ● Increased requests for proposals for solutions that enable speedy recovery from disasters	● Develop products that can stay functional during a disaster ● Develop products that contribute to speedy recovery from disasters
Expand sales of solutions that will help counter infectious diseases (new normal)	● Increased requests for proposals for solutions that enable capturing of congestion information and equalizing of the flow of people ● Increased requests for proposals for solutions that enable full automation of site works	● Develop and propose solutions to capture the flow of people and forecast congestion ● Develop and propose remote monitoring and operation solutions
Create and expand new businesses	● Increased requests for proposals for disaster detection solutions	● Development plan for technologies to detect disaster occurrence to infrastructure

Trends in Life Cycle CO_2 Emissions

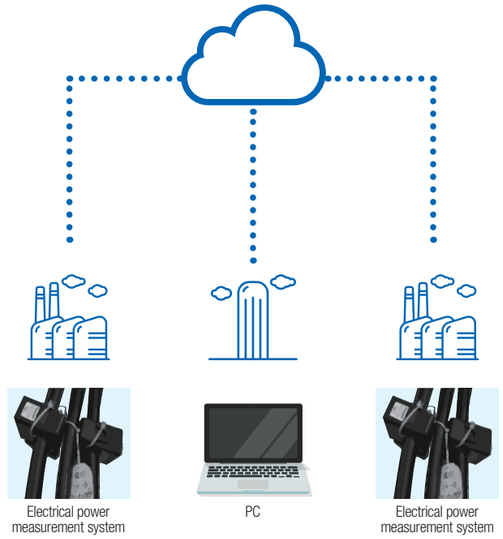
● Trends in Scope 1, 2 emissions



● Introducing electrical power measurement systems

Nippon Signal is driving energy saving efforts in its use of electricity, which accounts for 80% or more of GHG emissions in Scopes 1 and 2, along with the purchase of green power. Plan is underway to introduce a system that automatically measures electrical power consumption at Nippon Signal and its Group companies by use. This will not only help measure the "life cycle CO_2 emissions" of Nippon Signal's products but can also be used by our customers in their CO_2 emissions calculation and development of effective energy saving plans.

Overview of electrical power measurement system to be introduced



● Emissions from main Scope 3 categories and calculation method

We estimate CO_2 emissions from categories that are thought to account for a large portion of total emissions from our corporate activity. We plan to cover more categories and also review the calculation method to improve the accuracy of figures.

Environment and Quality (Sustainability)

E Environment

Environmental Management

Our environmental efforts represent the essence of our business activities.

● Environmental Philosophy
Nippon Signal promotes initiatives to protect and improve the environment in an effort to create a better world for everyone and build a more comfortable society through safe and reliable technology.

● Environmental Policy
We provide eco-friendly products and services, and also reduce the environmental impact throughout the product life cycle, from product development to final disposal, to achieve a synergy between business activities and environmental protection efforts.

1. **We consider the impact of our business activities on the environment, promoting efforts to conserve resources and energy, reduce waste, and recycle materials while curbing environmental pollution and improving our sustainable environmental management system.**
2. **We comply with laws, regulations, ordinances, and other agreements related to the environment. We also adhere to our own corporate control standards.**
3. **We strive to incorporate environmentally conscious technology from the design stage of new product development.**
4. **We establish specific goals and targets for protecting the environment within achievable technical and financial limits to realize the aims of this environmental policy, and conduct periodic reviews to ensure continued improvement.**
5. **We have created a document version of this environmental policy to ensure all employees are thoroughly aware of the policy for its implementation and maintenance and to share the policy with the public.**

In order to promote the fusion of environmental conservation activities and environmental management, Nippon Signal Group has been operating an Environmental Management System based on ISO 14001, through the Company-wide Environmental Committee, comprised of representatives from five production facilities and chaired by the Executive Officer responsible for TQM Promoting Department.
In the fiscal year ending March 31, 2023, four Group companies that engage in production joined the Company-wide Environmental Committee to accelerate decarbonization. In order to achieve the provision of eco-friendly products and services, we aim to reduce environmental impact from the developmental stage onward, make continual improvements based on the PDCA cycle, and be a sustainable growth company.

● Environmental Audit
We regularly implement internal and external audits to verify compliance with, and the effectiveness of, the Environmental Management Systems.

Internal audit: Regularly implemented audits based on audit guidelines
External audit: Annual audits by ISO certification institutions; no cases of nonconformance were found in the audit conducted in the fiscal year ended March 31, 2022.

● Environmental Risk Management
After identifying environmental risks posed by the business operations at specific sites, emergency response training is conducted regularly to help us avoid and mitigate risks.

● Environmental Compliance
Information on environmental laws and ordinances is managed and shared, and periodic checks are implemented to confirm compliance.
In the fiscal year ended March 31, 2022, there were no legal violations or accidents related to the environment.

Quality Management

We engage in business activities based on our Group Philosophy: "We help realize a more secure and comfortable society through superior technologies that provide safety and reliability." We determine priority matters and quality targets for each fiscal year, in accordance with our quality policy. We operate a quality management system based on ISO 9001, through our Company-wide QA Committee, chaired by the Executive Officer responsible for TQM Promoting Department. Each division and department engages in quality enhancement by establishing a quality management plan based on the priority matters and making efforts for continual improvement based on the PDCA cycle.

RQMS Management

RQMS (Railway Quality Management System; ISO/TS22163:2017) is a quality management system standard for the rail industry. It includes the requirements appropriate for the railway market, in addition to the requirements of ISO 9001:2015. Nippon Signal attained certification in the fiscal year ended March 31, 2020.
We passed the review in the fiscal year ended March 31, 2022 and the certification remains valid.

TCFD Declaration

We declared our support of the Task Force on Climate-related Financial Disclosures (TCFD) on December 23, 2021. Based on the TCFD recommendations, we will proceed with climate-related financial disclosures, including the publication of this report, as required.

Green Procurement Guidelines

Based on its environmental policy of providing eco-friendly products and services, Nippon Signal enacted the Green Procurement Guidelines in 2005. When purchasing commercially available electric and electronic components or items with designated specifications from manufacturers or suppliers, we select and preferentially procure raw materials and components that are friendly toward the environment while also taking into account quality, price, and delivery date.
In addition, we encourage suppliers to acquire certification for Environmental Management Systems, conduct green procurement, and manage and eliminate the use of regulated chemical substances from the perspective of supply chain management.

Environment & Quality Education and Awareness Raising

Nippon Signal conducts regular training for internal environmental and quality auditors to ensure appropriate environmental activities and improve quality management.
We encourage our employees to take the Certification Test for Environment Specialists (Eco Test)[*1] and acquire rank 3 or higher certification in the Quality Control Examination (QC Exam)[*2] with the aim of raising their awareness of, and helping them acquire knowledge on, the environment and quality. As of March 31, 2022, employees who have passed the Eco Test or acquired rank 3 or higher certification in the QC Exam both exceeded 70%.

*1 Eco Test: A test scheme organized by the Tokyo Chamber of Commerce and Industry through which people aim to acquire knowledge on environmental issues
*2 QC Exam: An examination scheme organized by the Japanese Standards Association through which knowledge on quality management is evaluated

● Environmental and Climate Change Education
With the understanding that all employees should proactively address environmental issues (especially climate change), we will implement level- and division/department-specific education programs.

Social Contribution to the Environment

● Green Energy Procurement
To promote the use of green energy in product manufacturing, Nippon Signal Group will introduce green power to its manufacturing facilities in the fiscal year ending March 31, 2023. We will continue to decarbonize our supply chain.

● Forestry Activities at the Forest of Nippon Signal
The Forest of Nippon Signal was established in Tochigi Prefecture in 2019, which houses our Utsunomiya Plant. We planted 2,700 mountain cherry trees (*Cerasus jamasakura*) in the first year of the forest's establishment. In spring 2022, additional 500 trees were planted to make up for the damage caused by deer. We thus continually engage in forestry activities.



● Global Environment Protection Activities
Each office (head office, branch offices, plants, affiliated companies, etc.) of the Nippon Signal Group carries out unique global environment protection activities.



Ageo Factory: Employees participated in volunteer work for Mitsumata Marsh nature protection (organized by Arakawa Upstream River Office, Kanto Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism).



Mitsumata Marsh is located on the border of Ageo City, Kawagoe City, and Kawajima Town in Saitama Prefecture. Aquatic plants and wetland plants flourish in the area, creating a habitat for a variety of wild birds and dragonflies.

E Environment

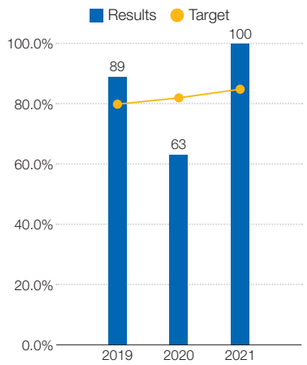
Environmental Performance

Since the fiscal year ended March 31, 2006, Nippon Signal Group has continued to formulate environmental action plans, based on which it has pursued reductions in environmental impacts. In the fiscal year ended March 31, 2022, we achieved the targets in the 5th Stage Environmental Action Plan and completed the Plan.
We are promoting the 6th Stage Environmental Action Plan from the fiscal year ending March 31, 2023.

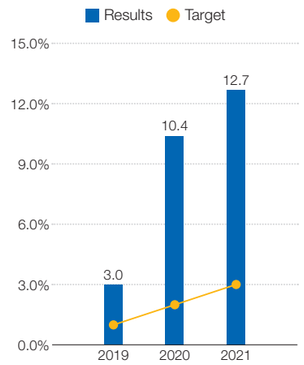
● **Targets and Results of the 5th Stage Environmental Action Plan (FY2019–FY2021)**

Environmental Targets	Indicators		Fiscal year ended March 31, 2020	Fiscal year ended March 31, 2021	Fiscal year ended March 31, 2022
1 Development of Eco- Friendly Products	Proportion of eco-label products (proportion to newly developed products)	Target	80%	82%	85%
		Results	89%	63%	100%
2 Global Warming Countermeasures	CO_2 emissions reduction: (reduction rate from average during the 4th Stage Environmental Action Plan for three sites)	Target	1% reduction	2% reduction	3% reduction
		Results	3.0% reduction	10.4% reduction	12.7% reduction
	Yamagata Nisshin Electronics Co., Ltd. (reduction rate from average during the 4th Stage Environmental Action Plan)	Target	1% reduction	2% reduction	3% reduction
		Results	18.1% reduction	11.7% reduction	14.5% reduction
	Nisshin Tokki Co., Ltd. (reduction rate from average during the 4th Stage Environmental Action Plan)	Target	1% reduction	2% reduction	2% reduction
		Results	15.8% reduction	10.6% reduction	19.3% reduction
3 Promotion of the 3 Rs	Reduction in industrial waste generated: (average reduction in emission units over five fiscal years)	Target	1% reduction	1% reduction	1% reduction
		Results	11.8% reduction	7.9% reduction	5.0% reduction

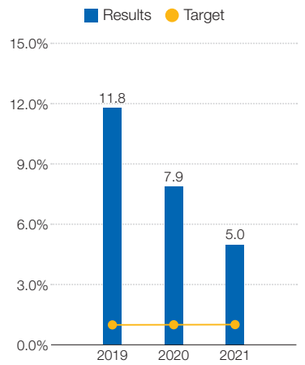
Development of Eco- Friendly Products



Global Warming Countermeasures (Three Sites)



Promotion of the 3 Rs



Targets of the 6th Stage Environmental Action Plan (FY2022–FY2024)

[Environmental Targets] (6th Stage Environmental Action Plan)
(1) Decarbonization of Business Activities
Energy use reduction rate **: 1% or more**
Green energy procurement rate **: 60% or more**
Target achievement rate in environmental activity plan at each division/department **: 100%**
(2) Reduction in and Sorting of Industrial Waste Generated
Reduction in industrial waste generated (reduction in emission units) **: 0.5% or more**
Industrial waste reduction and sorting activities target achievement rate at each division/department **: 100%**
(3) Decarbonization of Products
CO_2 emissions reduction in products and systems
(Activities aiming for 50% reduction by 2030)
(4) Environmental Awareness Building
Number of times regional environmental activities take place **: Four times or more a year at each office**
Environmental/SDGs education **: Four times or more a year**
(New employee education, managerial employee education (TCFD education), eco-friendly design education, education for employees in charge of promoting environmental initiatives)

Reduction of the Environmental Impact from Our Products

● **Nippon Signal's Original Eco-Label Products**
We rank products by our level of eco-friendliness. Products that meet our internal criteria are approved as eco-label products.

Designed with full consideration for the environment and approved for environmental labeling (type II*)

*Type II: Type of self-declared eco-labeling by a company (For details, refer to JIS Q 14021).

Examples of Eco-Label Products ❶

Smart City Systems

Developer: Koji Kuramochi



Facial recognition office gates



Electricity consumption:28% reduction
Weight:9% reduction
Number of components:9% reduction
Maintenance time:18% reduction
(Compared with the targets at the start of development)

Product Features

The security gates allow only people with permission into buildings and offices, preventing the entry of suspicious or unauthorized people. They support a variety of facial recognition systems, while achieving a design in harmony with the space.

Development Points

■ Improved design
- With a fewer number of components and lighter weight, the product blends in contemporary architectural design.
  Up to 50 people can walk through the gate every minute thanks to the recognition accuracy of the camera.

■ Reduction in electricity consumption
- Flap units are powered by direct drive instead of belt drive, which results in power saving.
  *If no one walks through the gate for a specified period of time, power to keep the motor running is cut off, reducing standby power consumption. When the sensor detects entry or exit, the motor starts running again to prevent unauthorized passage.

■ Improved maintainability
- The product has a built-in maintenance function, which makes maintenance tools (drivers, PCs, etc.) unnecessary and shortens maintenance time.

Examples of Eco-Label Products ❷

Railway Business

Lead developer: Tomoya Chikahisa



Local line signal systems

Electricity consumption: 96% reduction
Size: 97% reduction
Weight: 95% reduction
Number of components: 86% reduction
(Compared with conventional products)



[Developed product]
Central interlocking device/Terminal device
FS-PLC2
Height: 420 mm, Width: 385 mm, Depth: 360 mm



Product Features

We have developed a centralized interlocking device (using FS-PLC2) to update aging signal systems of local lines (lines in rural areas with few passengers), achieving simple and low-cost signal systems.

Development Points

■ Reduction in environmental impact and costs
- While conventional products require installation of new optical cables for interface between devices, this product allows reuse of existing metal cables.
- While conventional products require installation of interlocking devices at every station, this product's system centralizes the interlocking logic of each station of the train line.

S Society

Human Resource Strategies and Development

To achieve the Vision-2028 "Evolution 100" long-term management plan, Nippon Signal will develop human resources who reskill and continue to proactively grow, with the aim of making a foray into new businesses and fields as infrastructure evolves.

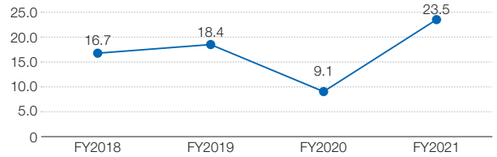
Basic Policy

Technology has evolved dramatically in accordance with social changes. As a result, work and lifestyles are changing as well. To keep pace with such changes in the business environment, we intend to support employees who are willing to learn proactively and further improve their skills.
Specifically, we will continue with the *Tetsuatsu* Program for first year employees, which equip them with business skills under a robust support system. In addition, we will strengthen our education system across the board in phases. Specific initiatives include strengthening of digital literacy to adapt to the era of digital transformation and development of leaders for the next generation.
To help employees balance work with personal life, we aim to be a workplace that offers flexible working arrangements for childcare and nursing care purposes. In particular, the number of male employees using flexible working hours for childcare has been increasing in recent years. In the current fiscal year, approximately 30 male employees, nearly twice as many as the previous fiscal year, are using the system, which indicates an increasing interest among men in taking part in childcare. By reviewing the systems that support work-life balance, we will work to create a work environment where each and every employee is empowered.

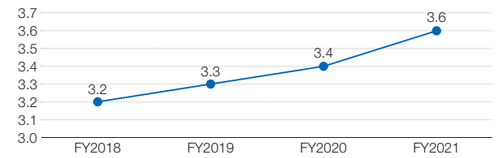
Active Promotion of Women to Managerial Positions

Since April 2021, Nippon Signal has been working on the creation of a workplace where all employees can fully demonstrate their abilities, based on the plan of action for general employers. To this end, we are building a work environment that helps employees balance work with childcare and supports working women.
As part of such initiatives, we aim to increase the percentage of women among managerial employees to 5% or more. We have actively nominated women to attend training for managerial candidates and steadily increased the share of women in managerial positions, thereby supporting female employees' career advancement.

● Share of women among new recruits (%)



● Share of women in managerial positions (%)



Health Management

In promoting health management, we have documented our policy for maintaining and enhancing employees' health in writing. To ensure company-wide implementation of the policy, we have formulated the Health Declaration by the top management.

Nippon Signal Group Health Declaration

Nippon Signal Group's philosophy is to help realize a more secure and comfortable society through superior technologies that provide safety and reliability. Employees and their families, who support the Group's activities, are irreplaceable assets, and it is most important that they are healthy and empowered.

The Company, employees, and the Health Insurance Society will join forces and take active measures to create an environment where each and every employee and their families are physically and mentally healthy at work and live happy lives.

Nippon Signal Group will press ahead with the creation of an environment where employees can actively maintain and enhance their health, and keep moving forward as a company that achieves sustainable growth.

Date of formulation: April 1, 2022
Hidehiko Tsukamoto,
President and Chief Executive Officer,
Nippon Signal Co., Ltd.

We will establish the Health Management Promotion Group in the Human Resources Department; work with each office, the Health Insurance Society, and Group companies; and invest in health across the Group based on the Group Philosophy, thereby maintaining and enhancing the health of all employees and their families.
We will promote the following activities and aim to establish a work environment where employees are physically and mentally healthy.

(1) Physical health
- In addition to existing initiatives concerning health checkups and health guidance, we will work to increase the consultation and participation rates by making it easier for employees to go through the checkups and receive health guidance.
- To encourage employees to exercise regularly, we will hold sports events and roll out an exercising campaign in collaboration with the Health Insurance Society.

(2) Mental health
- We will conduct stress checks, mental health seminars, etc. Measures will be taken for early detection and prevention of mental health issues, including follow-up on employees assessed as highly stressed.

(3) Future health
- We will hold seminars, etc. to increase health literacy.

Interview ## To Be a Corporate Group Where Human Resources Shine



Director and Managing Executive Officer
Masahiro Kubo

Nippon Signal intends to contribute to managerial reforms of railway business operators and other customers and be the first to commercialize new technologies and businesses that upgrade transportation infrastructure. Needless to say, the source of value creation we aim for is human resources. Our Values in the Group Philosophy include *Hito-zukuri* (education), and we are committed to develop human resources who take on challenges for their own growth. Our priorities for the fiscal year ending March 31, 2023 cover human resources initiatives, such as improvement of employee engagement and maximization of human capital value of the Group. We will work on these in addition to the acceleration of business growth, improvement of capital efficiency, business process reforms, IT infrastructure development, and decarbonization. We will take active measures that are conducive to HR system reforms, work style reforms, and health management and become a corporate group where diverse, empowered human resources work and grow.

Major Initiatives

● *Tetsuatsu* Program Activities

The *Tetsuatsu* Program, in place since 2019, was named after the proverb, "Strike while the iron is hot (*Tetsu ha atsui uchini ute*)." It is an education program for new employees, where they gain a variety of experiences and accelerate their growth curve by taking advantage of their ability to think flexibly and learn quickly.
To learn the fundamentals of our business processes and acquire correct knowledge and procedures, new employees are given guidance by an assistant manager. Each new employee is matched with a senior colleague ("buddy"), who teaches them the basics under the instruction of an assistant manager. The program aims to give the experience of developing new employees to everyone around them, including general managers, managers, assistant managers, and buddies; involve the entire organization in human resources development; and be close to new employees.
The specific objectives of the program are as follows:
1. Accelerate the growth curve of new employees by letting them gain a variety of experiences.
2. Build a system where the entire organization supports and develops new employees.
3. Improve the engagement of employees, including new employees.

As a milestone, a reporting session on the directions of the activities is held at the end of the fiscal year. We learn from the summary of each team's initiatives and improve the program for the next fiscal year.

Tetsuatsu 2021 Program

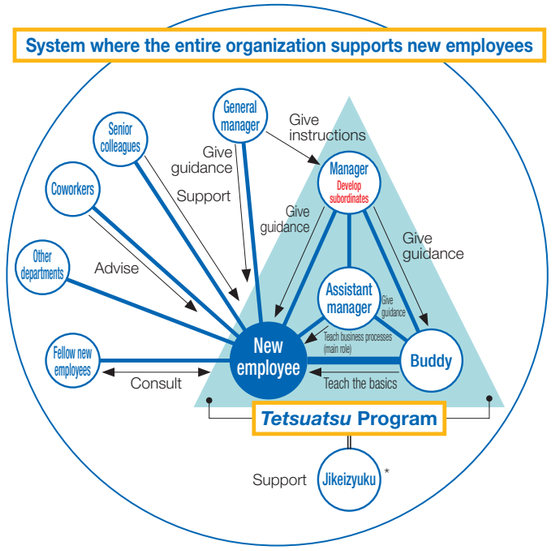
■ The program creates a system where everyone around new employees, including managers, general managers, senior colleagues, and coworkers, supports and develops them, on the basis of a trusting relationship between new employees and assistant managers and buddies.
➡The objective is to give everyone a shared experience of developing new employees and foster an organizational culture of human resources development.

Roles of managers:
Managers are responsible for developing subordinates. They develop staff who report to them, including new employees, buddies, and assistant managers.

Roles of assistant managers:
Assistant managers play a central role in teaching business processes. They give guidance to new employees with buddies, other senior colleagues, and other team members.

Roles of buddies:
Buddies teach the basics under the instruction of assistant managers. They take care of new employees beyond work settings.

[Our vision]
- Ensure that new employees learn the fundamentals of our business processes and acquire correct knowledge and procedures. They learn the basics of a manufacturing company.
- Build a system where the entire organization supports and develops new employees.



*Jikeizyuku: A training center that provides education to cultivate the Nippon Signal mindset, including education on corporate philosophy and history and professional education.

S Society

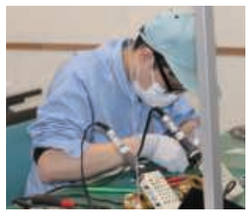
● National Skills Competition

Through participation in the National Skills Competition, we promote the creation of an organized and continuing educational base for "NS Meisters," personnel able to compete on a global stage and take charge of manufacturing for the future. We have been participating in the national competition each year since our first participation in 2016.
We participated in the electrical equipment assembly trade category. This category requires acquisition of broad knowledge and techniques in areas including electronic circuit design, circuit board design, program design, repair and measurement, etc. along with advanced soldering skills.




● NS Skills Contest

As part of our activities aimed at enhancing our technological capabilities in manufacturing, and nurturing engineers and supervisors who will be role models for others, we started holding an NS Skills Contest in 2013.
We use our own printed circuit boards and other parts, which are assembled, wired, and installed in contest tasks. We set new tasks every year, which also provides a development opportunity for staff in charge of designing.


● Japan Association of Corporate Executives Internship Program

We took part in the Japan Association of Corporate Executives Internship Program for the first time in 2017, and 2021 marked our fifth time.
Four students participated in the program. Through their experience and learning in a corporate setting, they sought to enhance their ability to understand given topics, ability to express their thoughts, discipline, and proactiveness; realize the importance of academic study; and develop themselves.
The theme was to understand the safety and reliability of manufacturing that supports transportation infrastructure. As in the previous fiscal year, all in-person programs were canceled, and the entire internship took place online, in order to prevent the spread of COVID-19. Focusing on "continuity (unwavering safety based on fail-safe technologies)" and "change (new products that facilitate digital transformation)," we offered interactive online training sessions as an opportunity to think about technologies and products needed in society after the COVID-19 pandemic.
One of the participants, who has a natural science background, commented, "The internship gave me an opportunity to consider how specifically I can contribute to society in the future."

● Developing Character and Integrity

In the fiscal year ended March 31, 2022, Nippon Signal organized a new liberal arts seminar focused on developing character and integrity.
The purpose of the seminar was to cultivate character and integrity and create a culture of learning across the Nippon Signal Group. To this end, the program encouraged participants to acquire the habit of identifying issues, doing their own research, and thinking for themselves, as well as to have interest in a wide variety of fields and revisit liberal arts as a necessary grounding for next-generation leaders.
Prominent and engaging speakers delivered lectures on timely topics in a wide range of fields in social sciences (politics, economics, diplomacy, etc.), humanities (history, culture, religion, etc.), and natural sciences (brain science, astronomy, etc.), which greatly inspired a large number of participants.



CSR (Social Contribution) Activities

As a company involved in the transportation infrastructure business, which is closely linked to the lives of the public, Nippon Signal Group is highly aware of the importance of coexisting with society and is thus inspired to conduct social contribution activities on a Groupwide basis.

Basic Policy on CSR Activities

We hope to realize a more secure and comfortable society for people around the world, and "Our Mission" in Nippon Signal Group Philosophy sets out the idea. Offering valuable products and services to society through superior technologies that provide safety and reliability and solving societal issues will create business opportunities, which will, in turn, increase corporate value.
Taking advantage of the characteristics of our transportation infrastructure business, we will strive to contribute to society consistently while appreciating our ties with stakeholders to help realize safe and comfortable lives for people in Japan and around the world. The maximum amount of expenditure for such activities is approximately 1% of our ordinary income and will be reviewed in accordance with the expansion of the business.

Major Initiatives

● NIPPON SIGNAL Global Challenge Scholarships

Nippon Signal supports the "from Saitama to the World" scholarships system operated by the Saitama Center for Global Students, which assists students from Japan study overseas, and has implemented the NIPPON SIGNAL Global Challenge Scholarships from the fiscal year ended March 31, 2020, for aspiring young people challenging themselves overseas. As the economy becomes more and more globalized, there is a pressing need to cultivate global human resources. These scholarships provide financial assistance for those engaged in study or other activities overseas, striving to develop their own potential and aspiring to contribute to the development of international society and the realization of a sustainable society.



● Matching Gift

We have collected anniversary donations on the date of the anniversary of our founding (February 16) each year since the fiscal year ended March 31, 1994, under a matching gift* scheme. In the fiscal year ended March 31, 2022, these donations were used to provide goods to patients hospitalized in the Saitama Prefectural Children's Medical Center, which provides high-quality medical services for children in an area where Nippon Signal used to have a factory. We also make annual donations to the Japanese Foundation for Cancer Research.
*Matching gift is a system where the Company adds a certain contribution to the amount of donations made by employees and donates the sum.



● Co-sponsoring Bolero: Plaza of Children's Dream

Bolero: Plaza of Children's Dream is a music event organized by Michie Koyama, a pianist from Sendai. The purpose of the event is to let children who experienced the Great East Japan Earthquake have dreams and hope. As part of *hito-zukuri* (education) and *michi-zukuri* (creation of the future), we co-sponsor Bolero: Plaza of Children's Dream.



G Corporate Governance

Corporate Governance

Nippon Signal Group (the Group) has been working to improve the transparency of its decision-making process and construct a corporate governance system that properly incorporates supervisory and check functions.

Basic Policy

The Group's basic policy in corporate governance is to conduct management that gives priority to all stakeholders and emphasizes making contributions to society.
To genuinely implement this basic policy, the Group will make ongoing management structural reforms that aim to strengthen corporate governance. The Group will also enhance the management structure so that it can respond flexibly and swiftly to changes in the environment surrounding management.

Basic Policy on Corporate Governance

Based on its corporate governance structure as a Company with Board of corporate Auditors, Nippon Signal (the Company) appoints Outside Directors who are sufficiently independent.
The Company has instituted an Executive Officer System to accelerate and improve the efficiency of managerial decision-making and to enable the flexible execution of business as well as the Group Business Planning Committee to enhance governance in the Group management. The Company currently has a total of nine Directors, three, or one-third, of whom are Outside Directors that have also been designated as independent directors as stipulated by Tokyo Stock Exchange, Inc. The Company has a total of four Audit & Supervisory Board Members, three of whom are Outside Audit & Supervisory Board Members that have also been designated as independent auditors as stipulated by Tokyo Stock Exchange, Inc. Of the Directors and Audit & Supervisory Board Members, six are outside officers, and three are female officers, ensuring the diversity of composition of the Board of Directors.
In order to enhance debate regarding the nomination of officers and their remuneration, and raise the objectivity and transparency of the decision-making process, the Nomination and Remuneration Advisory Committee was established as an advisory body to the Board of Directors. This committee is made up of a majority of Outside Directors that are designated as independent directors.
The Company has also established the Advisory Board, which is an advisory body for Representative Directors. This board consists of outside specialists with sophisticated and specialized knowledge on business management.
The decisions on significant matters regarding the Company are based on two procedures: a request for decision and a resolution by the Board of Directors.
These procedures are set out in the standards for reference formulated by the Board of Directors. The Board of Directors deliberates on matters requiring a resolution under laws, regulations or the Articles of Incorporation, and important matters related to business operation, including the formulation of short- and medium-term management plans. It also decides on matters stipulated under the Board of Directors regulations and the standards for reference. In addition, the Group Business Planning Committee carries out deliberation and reporting related to the execution of duties under short- and medium-term management plans of the Group companies.
Executive Officers make up the Committee of Directors, a venue for discussions and reports on the execution of duties based on short- and medium-term management plans. Executive Officers are also delegated authority for business execution.

Corporate Governance System at a Glance (As of June 24, 2022)

Organizational format	Company with Board of corporate Auditors
Number of Directors (including Outside Directors)	9 (3 Outside Directors)
Number of Audit & Supervisory Board Members (including Outside Audit & Supervisory Board Members)	4 (3 Outside Audit & Supervisory Board Members)
Term of Directors	1 year
Has Executive Officer System	Yes
Advisory body to the Board of Directors	Nomination and Remuneration Advisory Committee
Accounting Auditor	Grant Thornton Taiyo LLC

Evolution of Corporate Governance System

	2015	2016	2017	2018	2019	2020	2021
Reinforcement of supervisory function	Outside Directors increased to two			Outside Directors increased to three			
	Two Outside Audit & Supervisory Board Members				Outside Audit & Supervisory Board Members increased to three		
Clarification of management responsibility	Two-year terms for Directors		Terms of Directors shortened to one year				
Promotion of Board of Directors diversity	Female officers increased to two		Female officers increased to three				
Protection of management decision objectivity and transparency	Advisory Board established						
			Nomination and Remuneration Advisory Committee established				

Competence Required of Candidates for Director (Knowledge, Experience, and Capabilities)

The Group aims to remain to be a provider that supports infrastructure evolution with safe and trustworthy solutions. In order to lead sustainable business growth, the Company selects as candidates for Director those who possess strong acumen and experience as a corporate manager, deep insight into technological development surrounding the Company, capabilities to drive the expansion of business domains conducted on a global scale, and expert knowledge that contributes to corporate governance.
[Candidates for Director selected from within the Company]
The Company selects those who possess strong acumen for overall management, with knowledge of the business environment surrounding the Company and the industries it belongs to, understanding of the Company's strengths and issues through manufacturing, technological research and development, marketing, and sales activities, and experience in management administration such as accounting, legal affairs, and risk management.
[Candidates for Outside Director]
The Company selects those who can provide advice on management strategies and perform an effective supervisory function on management by drawing on advanced and specialized knowledge and experience in fields other than the Group's business domains, while appropriately ensuring well-rounded diversity. In addition, to fully incorporate views from objective and independent standpoints into corporate management, candidates for Outside Directors need to satisfy the requirements for independent directors/auditors as stipulated by Tokyo Stock Exchange, Inc. Furthermore, they account for one-third or more of all Director candidates and at least one of them need to have corporate management experience at another company.
Given the highly public nature of the Company's business working on transportation infrastructure, a deep understanding of our business is essential in making managerial decisions. We therefore consider that the appropriate proportion of Independent Outside Directors among members of the Board of Directors is around one-third.
The skills matrix of the Company's Board of Directors is as follows.

Knowledge, Experience, and Capabilities the Company's Directors Possess

Name	Corporate management	Finance and accounting	Risk management/ Legal affairs	Global experience	Technology/R&D	Manufacturing	Sales/Marketing
Hidehiko Tsukamoto	●		●	●	●	●	●
Takeshi Fujiwara	●			●		●	●
Hideo Oshima	●			●	●	●	●
Masahiro Kubo	●	●	●			●	●
Masayoshi Sakai	●				●	●	●
Kazuhiro Hirano							●
Yasuko Matsumoto Independent Outside			●				
Yuriko Inoue Independent Outside			●				
Yoshiyuki Murata Independent Outside	●		●	●	●		●

Note: The skills matrix above shows the Directors' expertise which the Company particularly expect them to exhibit.

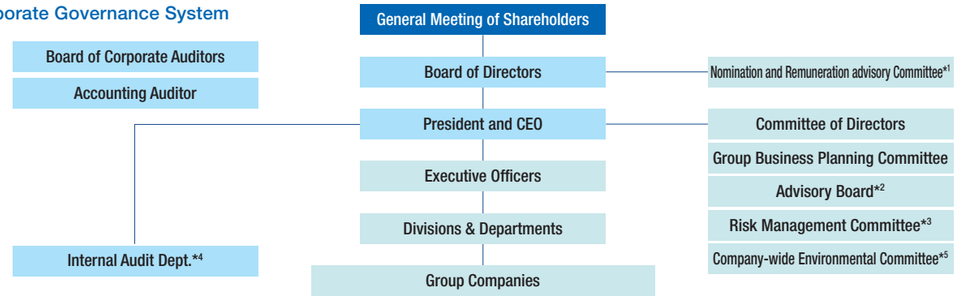
(Reference) Criteria for Independence of Outside Officers
The Company prescribes the following criteria for the independence of Outside Officers to objectively determine the independence of Outside Officers. If an Outside Officer falls under any of the following items, the Company determines that the Outside Officer is not sufficiently independent from the Company.
An Outside Officer designated as an Independent Officer as stipulated under Tokyo Stock Exchange, Inc. shall endeavor to maintain independence as prescribed in this Criteria until resignation. If the Outside Officer loses his/her independence, the Outside Officer shall notify the Company in advance (or as soon as possible after the event under unavoidable circumstances).

1. **A person who is, or has been in the past 10 years, a business executor(*1) or Non-executive Director (if the person is an Outside Audit & Supervisory Board Member) at the Group (i.e. the Company or its subsidiaries).**
2. **Any person (party) who has fallen under any of the following items (1) to (8) in the past three years.**
   (1) A party for whom the Group is a major business partner(*2) or a business executor of such party
   (2) A major business partner of the Group(*3) or a business executor of such partner
   (3) A consultant, accounting professional, or legal professional who has received a significant amount of money(*4) or other property from the Group other than officer remunerations (if a party who receives such property is a corporation, association, or any other entity, a party who belongs to the relevant entity)
   (4) A current major shareholder(*5) of the Group or a business executor of such shareholder
   (5) A business executor of a corporation that is a current major shareholder(*5) of the Group
   (6) A person who belongs to the appointed audit firm for the statutory audit of the Group
   (7) A business executor of an entity whose Outside Officer is also a business executor of the Group
   (8) A person, an officer or other business executor of a corporation, association, or any other entity who receives a large amount of donation or grant(*6) from the Group
3. **If a person who falls under 1. or 2. above is a key person(*7), close relatives (spouse, first or second degree relatives) of such person**
4. **A person who has assumed the office of Outside Officer for more than eight years in total**

(*1) A business executor refers to a person who executes the duties of a Director (excluding an Outside Director), Executive Officer, or employees, etc.
(*2) A party for whom the Group is a major business partner refers to a party who has business transactions with the Group, with total amount of sales in any of the fiscal year within the last three fiscal years exceeding 2% of the consolidated net sales of such business partner. Such business partner shall include its parent company and important subsidiaries if such business partner is a corporation.
(*3) A major business partner of the Group refers to a party with whom the Group has business transactions, with total amount of sales in any of the fiscal year within the last three fiscal years exceeding 2% of the consolidated net sales of the Group, or a party who has made a loan to the Group in the amount at 2% or more of the consolidated total assets of the Company at the end of the most recent fiscal year. Such business partner shall include its parent company and important subsidiaries if such business partner is a corporation.
(*4) A significant amount of money refers to the yearly average money exceeding 10 million yen over the three most recent fiscal years.
(*5) A major shareholder refers to a shareholder who holds, directly or indirectly, 10% or more of the total voting rights. Such major shareholder shall include its parent company or important subsidiaries if such major shareholder is a corporation.
(*6) A large amount of donation or grant refers to a yearly average amount exceeding 10 million yen over the three most recent fiscal years.
(*7) A key person refers to a Director, Corporate Officer, Executive Officer, business executor who serves as a General Manager or in a higher rank, or business executor who has authority equivalent to that of a General Manager or higher position.

G Corporate Governance

Corporate Governance System



*1 Nomination and Remuneration Advisory Committee: Serves as an advisory body to the Board of Directors; consists primarily of Outside Directors, who raise the transparency and objectivity of procedures regarding remuneration for officers or appointment of candidates for officers by participating in the decision process.
*2 Advisory Board: Serves as an advisory body to the Representative Directors; consists of outside experts with sophisticated and specialized knowledge on business management who provide advice and suggestions on business management from an elevated perspective.
*3 Risk Management Committee: Controls compliance risks and all other types of risks under the direction of the Board of Directors; chaired by the President and Chief Executive Officer.
*4 Internal Audit Department: Provides assistance with internal management control activities by auditing the management and operation processes; monitors all managerial activities — such as purchasing, sales, and accounting—to provide information based on the monitoring results as well as advice and suggestions on remediation and efficiency improvement.
*5 Company-wide Environmental Committee: Promotes constant improvement of the company-wide environmental management system; chaired by the Executive Officer responsible for TQM Promoting Department. Issues important for management activities are reported to the Board of Directors.

Reason for nomination as Outside Director and an outline of expected roles

Name	Grounds for Election	Concurrent Post(s)(as of June 24, 2022)	Number of Board of Directors Meetings Attended
Yasuko Matsumoto	Ms. Yasuko Matsumoto has a great deal of advanced knowledge and experience as a legal expert and provides advice and recommendations on legal compliance and adequacy from a professional point of view. The Company has appointed her as Outside Director in expectation that an effective supervisory function on its business administration will be demonstrated.	—	13 out of 13 meetings held (100%)
Yuriko Inoue	Ms. Yuriko Inoue has high level of professional knowledge and experience as an expert on intellectual property rights. The Company has appointed her as Outside Director in expectation that advice on its management and strategies including corporate law and data governance will be provided and an effective supervisory function on management will be demonstrated.	• Professor, Business Law Department, Graduate School of Law, Hitotsubashi University (Chair of Department) • Outside Director, Dai-ichi Life Holdings, Inc.	13 out of 13 meetings held (100%)
Yoshiyuki Murata	Mr. Yoshiyuki Murata has ample experience, an impressive track record, and knowledge as a business manager. The Company has appointed him as an Outside Director in expectation that these qualities will be applied within its business administration, and an effective supervisory function on management will be demonstrated.	• Director, Executive Vice President, Head of Technology Coordination Department, Head of Production Headquarters, Head of Research Headquarters, Daiwa House Industry Co., Ltd. • Outside Director, Fujita Corporation	9 out of 10 meetings held (90%)

* Mr. Yoshiyuki Murata attended 9 out of 10 Board of Directors meetings held after his assumption of office on June 25, 2021.

Reason for nomination as Outside Audit & Supervisory Board Member

Name	Grounds for Election	Concurrent Post(s)(as of June 24, 2022)	Number of Board of Directors Meetings and Board of corporate Auditors Meetings Attended
Mikio Shiokawa	Mr. Mikio Shiokawa possesses specialized knowledge and wide-ranging insight pertaining to global-perspective risk management. The Company has appointed him as an Outside Audit & Supervisory Board Member in expectation that meaningful advice and input will be offered regarding the globalization of its business and that this advice and input will be translated to advice on and audits of its business administration.	—	[Board of Directors meetings] 13 out of 13 meetings held (100%) [Board of corporate Auditors meetings] 13 out of 13 meetings held (100%)
Masayuki Tamagawa	Mr. Masayuki Tamagawa has accumulated substantial insight and experience pertaining to finance and accounting while also boasting an extensive career in government agencies and international organizations as a specialist in sophisticated and wide-ranging fields such as international finance. The Company has appointed him as an Outside Audit & Supervisory Board Member in expectation that his wealth of experience and impressive track record in international and domestic finance and taxation will be utilized to perform audits of and provide advice on its business administration.	• Managing Director, Kogakuin University • Specially-appointed Professor of Educational Development Center, Kogakuin University	[Board of Directors meetings] 13 out of 13 meetings held (100%) [Board of corporate Auditors meetings] 13 out of 13 meetings held (100%)
Naoko Shimura	Ms. Naoko Shimura possesses specialized knowledge and exceptional insight regarding corporate law and M&A activities as a legal specialist. The Company has appointed her as an Outside Audit & Supervisory Board Member in expectation that her wealth of experience, impressive track record, and extensive insight will be utilized to perform audits of and provide advice on its business administration from a legal perspective.	• Partner, Nishimura & Asahi • External Auditor, TABIKOBO Co. Ltd. • Outside Director, mixi, Inc. • Part-Time Lecturer of Business Law Department of Graduate School of Law, Hitotsubashi University	[Board of Directors meetings] 13 out of 13 meetings held (100%) [Board of corporate Auditors meetings] 13 out of 13 meetings held (100%)

Evaluation of the Board of Directors' Effectiveness

The Company takes steps to periodically verify that the Board of Directors is functioning effectively. Based on the findings of those verifications, an evaluation of the effectiveness of the Board of Directors is performed to identify issues and promote ongoing improvement activities. In February 2022, a survey was administered to, and responses received from, all Directors and Audit & Supervisory Board Members with regard to measures for enhancing the structure, operating procedures, and meeting discussions of the Board of Directors.
Through this process, it was determined that the Board of Directors was highly effective overall. This decision was prefaced on the assessment that the Board of Directors was sufficiently diverse and balanced, that it engaged in free and open discussion, and that it was appropriately exercising its supervisory function.
All officers selected "appropriate" or "mostly appropriate" for all questions in the survey. Improvements were recognized regarding the enhancement of discussions of remotely held Board of Directors meetings, which had been indicated as an issue through the previous evaluation.
As for the content (quality) and quantity of reference materials and securing of time for deliberation on important management strategies, the Company will work to enhance discussions at Board of Directors meetings by improving the quality of reference materials, narrowing the focus of discussions, and improving operational efficiency.

Training for Directors and Audit & Supervisory Board Members

The Company utilizes training by external organizations and holds biannual officer training sessions to help new Executive Officers acquire the necessary skills for exercising high levels of leadership and taking part in management.
In addition, officers are encouraged to actively take advantage of opportunities for further education, including inter-industry exchange forums and other external seminars.

Officer Remuneration

Director remuneration comprises fixed compensation as well as performance-linked compensation tied to both short-term performance and medium- to long-term performance. This scheme is employed to provide Directors with healthy incentive to pursue medium- to long-term improvements in corporate value while also accomplishing short-term performance targets. Performance-linked compensation is not paid to Outside Directors or Audit & Supervisory Board Members.
Fixed compensation is decided based on rank with consideration paid to the duties of given Directors, the highest level of employee remuneration, and the remuneration levels of other companies.

Matters on Performance-Linked Compensation, etc.

Performance-linked compensation is tied to both short-term performance and medium- to long-term performance, in order to provide Directors with healthy incentive to pursue medium- to long-term improvements in corporate value while also accomplishing short-term performance targets. A fixed amount is paid every month.
Compensation linked to medium- to long-term performance is decided each year on an individual basis based on the rate of accomplishment of targets set for each Director. Compensation linked to short-term performance is calculated by dividing the amount equivalent to 2.0%–2.5% of the ordinary income of a given fiscal year among all Directors and Executive Officers. Ordinary income has been selected as the performance indicator because the Group considers profitability as a medium- to long-term challenge and the Medium-Term Management Plan includes an ordinary income target.
With an eye on links to shareholder value (share prices), Directors, Audit & Supervisory Board Members (excluding Outside Audit & Supervisory Board Members), and Executive Officers spend fixed amounts from their monthly remuneration on treasury share purchase. They thus purchase treasury shares on a constant basis. Specifically, treasury shares are purchased through the officers shareholding association to avoid insider risks. The Group therefore does not have a stock compensation scheme at the moment.

Policy for Determining Remuneration, etc. for Individual Directors

(a) How the policy on determination of remuneration, etc. for individual Directors was set
To provide healthy incentive to pursue medium- to long-term improvements in corporate value while also accomplishing short-term performance targets, the Company consulted with the Nomination and Remuneration Advisory Committee about the policy for determining remuneration, etc. (hereinafter referred to as the "Policy") and respected the content of the report submitted by the committee. The Policy was adopted at the Board of Directors meeting held on June 23, 2017.
(b) Overview of the Policy
Director remuneration comprises fixed compensation based on rank as well as performance-linked compensation tied to both short-term performance and medium- to long-term performance. This scheme is employed to provide Directors with healthy incentive to pursue medium- to long-term improvements in corporate value while also accomplishing short-term performance targets. Remuneration for each Director is set at an appropriate level, based on their responsibilities.
(c) Reason for which the Board of Directors found remuneration, etc. for individual Directors for the fiscal year ended March 31, 2022 in line with the Policy
In making decisions on remuneration, etc. of individual Directors, the Nomination and Remuneration Advisory Committee deliberated on the original proposal from multilateral perspectives, including alignment with the Policy, and the Board of Directors respected the content of the report submitted by the committee when making its decision. The Board of Directors therefore found the decision in line with the Policy.

Matters on Delegation of Authority to Determine Remuneration, etc. for Individual Directors

In the fiscal year ended March 31, 2022, the Board of Directors decided at a meeting held on June 24, 2022 to delegate the authority to determine the amount of remuneration for individual Directors to President and Chief Executive Officer Hidehiko Tsukamoto. He has determined the specifics. The authorities to determine the amount of fixed compensation for each Director and to evaluate the achievement level of managerial goals to be reflected to performance-linked compensation have been delegated. These authorities have been delegated because the Representative Director is the appropriate person to evaluate the achievement level concerning managerial goals while overseeing the performance of the Company as a whole. To ensure appropriate exercise of authority by the Representative Director, the Board of Directors consults with the Nomination and Remuneration Advisory Committee about the original proposal and receives a report from the committee.

G Corporate Governance

Group Governance Structure

The Company dispatches Directors and Audit & Supervisory Board Members to Group companies to help elect their Representative Directors, as well as offer guidance and supervision. The Company's corresponding departments receive daily reports on the financial standing and how businesses are being run at individual subsidiaries.
The Group Business Planning Committee holds quarterly meetings, where it receives reports on the management, financial results, and risk management systems of the entire Group and offers the necessary guidance.

Major Initiatives

- Providing positive support, cultivating abilities and offering guidance for formulating strategies and improving management
- Understanding the financial standing and progress in management plans at the Group Business Planning Committee
- Conducting extraordinary audits when necessary

Internal Control System

The Company has put in place the Basic Policy on Internal Control System, which was formulated by the Board of Directors in May 2006. Based on this policy, the Company constantly works to revise its internal control system in an effort to construct a more appropriate and efficient system.

The operational status of the internal control system is as follows.

(1) Compliance Structure
(a) Nippon Signal Group Philosophy was established to ensure that all officers and employees share the mission and values of the Group and act accordingly. Managers responsible for promoting penetration of the Group Philosophy are deployed at each workplace, and the Company seeks to embed the philosophy through regular educational activities, including self-checks, etc.
(b) The Group has provided compliance education for all Group officers and employees, such as a read-through of the Compliance Manual and the implementation of self-checks.
(c) Compliance helpdesks for whistleblowing (compliance hotlines), including an external form of contact, have been set up in the Group's efforts to build up the compliance structure of the entire Group.
(2) Risk Management Structure
The Risk Management Committee, which is chaired by a Representative Director, holds regular meetings as stipulated by regulations. The Risk Management Committee debates from a group-wide perspective, on topics such as the state of and responses to semiconductor shortages, information security measures, etc. It met twice during the fiscal year ended March 31, 2022, and the matters discussed at the meetings were reported to the Board of Directors.
(3) Management of Group Companies
(a) The operations of subsidiaries are required to be reported at regular meetings of the Group Business Planning Committee. The committee held four meetings in the fiscal year ended March 31, 2022.
(b) The status of subsidiaries is also audited as appropriate through meetings of the Board of Directors of subsidiaries to which the Company has dispatched Directors or Audit & Supervisory Board Members.
(4) Execution of Duties by Directors
(a) The transparency of management is enhanced, with Outside Directors constituting one third of all Directors. In addition, the Company is endeavoring to strengthen the checking function of Audit & Supervisory Board Members regarding management decision-making, and enhance management transparency, with Outside Audit & Supervisory Board Members comprising three of the four Audit & Supervisory Board Members.
(b) The Board of Directors holds regular meetings on a monthly basis and extraordinary meetings when needed as stipulated by the Board of Directors regulations. The Board held 13 meetings in the fiscal year ended March 31, 2022.
(c) Meeting materials are distributed prior to each meeting, and the Company is working to ensure sufficient time for perusal before attendance.
(d) Highly independent Outside Directors attend meetings of the Board of Directors, and provide highly specialized advice on management from broad perspectives.
(e) The Nomination and Remuneration Advisory Committee met three times, and reports were submitted on the officer structure and officer remuneration, based on the Nomination and Remuneration Advisory Committee Regulations.
(f) The Advisory Board holds regular meetings, of which 11 took place in the fiscal year ended March 31, 2022.
(g) Information on the execution of duties by Directors is stored and managed appropriately, based on laws and ordinances and the Document Management Regulations.
(5) Execution of Duties by Audit & Supervisory Board Members
(a) The Board of corporate Auditors holds regular meetings on a monthly basis and may hold extraordinary meetings when needed as stipulated by the Regulations of the Board of corporate Auditors. The Board of corporate Auditors held 13 meetings in the fiscal year ended March 31, 2022, which were also attended by Outside Audit & Supervisory Board Members.
(b) One employee has been selected from the Internal Audit Department to provide assistance in the duties of Audit & Supervisory Board Members, and the employee has been providing assistance accordingly.

Dialogue with Shareholders and Investors

The Company avoids holding its General Meeting of Shareholders on dates on which many companies hold their meetings to make it easier for shareholders to take part in the General Meeting of Shareholders and to exercise their voting rights. Notices of convocation are distributed well in advance and are disclosed on Tokyo Stock Exchange, Inc.'s website and the Company's website before they are sent along with the English translation of proposals. In addition, the Company facilitates the exercise of voting rights through the creation of an environment that enables the electronic exercise of voting rights through the use of a platform for said purpose, as well as live streaming of the General Meeting of Shareholders.
The Company considers dialogue with shareholders and other investors to be one of the most important tasks for management. Accordingly, the Company has launched an investor relations section on its website to disclose information in a timely and appropriate manner. The Company organizes financial results briefings for institutional investors and posts the materials on its website, and creates other opportunities for constructive dialogue with investors in an effort to enhance its corporate value.

Cross-Shareholdings

The Company engages in cross-shareholdings when deemed necessary for purposes such as sustaining or enhancing business alliances or sales transactions, or maintaining financial transactions and other collaborative business relationships.

The Company recognizes that it is desirable to keep cross-shareholdings at a minimum from the perspective of maintaining and improving corporate value. Based on this recognition, the Board of Directors determines the rationality of individual holdings on an annual basis by evaluating the holding purpose, the associated gains or losses, transaction volumes, counterparty performance, and future relationships. Those cross-shareholdings that are deemed to lack meaningfulness will be sold.
Voting rights attached to cross-shareholdings will be exercised by voting in favor of proposals judged to contribute to corporate value and against those judged to detract. Discussions with the counterparty will be arranged as necessary to discuss proposals.
The Company currently does not have uniform standards for exercising voting rights due to the need for comprehensive decisions that take into account non-financial information pertaining to each company.
Should a company express its intent to sell shares of the Company's stock possessed as a cross-shareholding, the Company will respond appropriately and without implying that transactions will be curtailed or taking other steps to interfere with the sale.

Anti-Takeover Measures

To maintain and enhance both its corporate value and the common value of shareholders, the Company established measures against the acquisition of large quantities of its shares. These anti-takeover measures were approved by resolution at the Ordinary General Meeting of Shareholders in June 2010 and put into place thereafter. Following the expiration of these anti-takeover measures, resolutions to extend the period of the measures were approved at the Ordinary General Meetings of Shareholders held in June 2013, in June 2016, in June 2019, and in June 2022.

For details about the anti-takeover measures, please see the Company's website (Japanese only).
➡ **https://www.signal.co.jp/ir/shareholder/**

Risk Management Structure

The greatest risk to the Group is failing to maintain safety and reliability. To ensure that safety and reliability is always maintained, the Company has established several regulations that clearly define the boundaries of authority and responsibility. Group divisions work in line with these regulations as they take actions to control risks.
The Risk Management Committee, which is placed under the direct control of the President and Chief Executive Officer, is responsible for countering actions that would impede sound corporate management and addressing risks and compliance issues that threaten to damage corporate value or those that a division cannot handle on its own.
The Risk Management Committee instructs all Company divisions and Group companies to regularly identify, analyze, and evaluate risks. In addition, the Compliance Subcommittee has been formed to address serious risks that are expected to emerge in the medium- to long-term, thereby contributing to the systematic implementation of countermeasures.

Compliance Promotion Structure

Compliance promotion activities are advanced under the guidance of the Risk Management Committee, which is chaired by the President and Chief Executive Officer. In 2010, the Compliance Manual was created, and the Company began holding regular compliance training to spread and entrench compliance awareness.
In addition, the Company has set up compliance hotlines as compliance helpdesks for whistleblowing. In 2015, the Company added an outside lawyer as a contact point.

Business Continuity Planning

The Group works on transport infrastructure that is indispensable to society. In contributing to society, the Group understands that it has a responsibility to try to swiftly restore operations in the wake of a natural disaster, an act of terror, or any other calamity so that products and services can be provided.
For these reasons, the Group has formulated a Business Continuity Plan (BCP) to cope with disasters and accidents such as large-scale earthquakes. It takes into account many different risks such as securing supply for materials and the procurement of fuel while working to restore operations. The Group will continue reviewing issues and working to improve its BCP.
With the spread of COVID-19, the Group has developed its Regulations on Response to Natural Disasters and Novel Infection and set out provisions regarding employee safety and business continuity, based on the expansion of international businesses and new work styles such as telework.

Creation of the Earthquake Initial Response Manual

As part of the BCP, the Group has created the Earthquake Initial Response Manual. It specifies initial response actions to be taken in the event of a large-scale earthquake. The Group conducts regular drills at individual locations to help quickly form a local response headquarters and a voluntary fire brigade.

Establishment of Nippon Signal Group Philosophy and Our Code of Conduct

Principle 2.2 of Japan's Corporate Governance Code, which was formulated by Tokyo Stock Exchange, Inc., requires companies to formulate and put into practice a code of conduct that is to be followed by their staff members in Japan and other countries. The Group's corporate activities are supported by many different stakeholders, including customers, business partners, shareholders and investors, employees, and local communities. Working in line with its philosophy of safety and reliability, the Group seeks to remain a corporate group upon which society relies. To achieve this aim, the Group must build relationships of trust with stakeholders, backed by the proper behavior of each staff member.
The Group added Our Code of Conduct to Nippon Signal Group Philosophy in April 2016 to provide a foundation for these relationships of trust. Our Code of Conduct serves as a standard of behavior to be followed by all officers and employees of the Group.
The Group encourages all employees to respect laws, ordinances, and other rules. The Group is also working to build an organization with the capacity to quickly discover problems on its own and address them.

G Corporate Governance

Corporate Executives (as of June 24, 2022)

Directors



Hidehiko Tsukamoto
President and Chief Executive Officer

Apr. 1982	Joined NIPPON SIGNAL CO., LTD.
May 2005	General Manager of AFC Systems Sales Dept. of AFC Systems Division
Jun. 2006	Executive Officer
Jun. 2010	Director, Managing Executive Officer
Jun. 2014	Deputy Chief Executive Officer
Apr. 2015	Representative Director, Executive Vice President & Chief Operating Officer
Jun. 2016	President and Chief Executive Officer (to present)
Jun. 2020	Chief Executive Officer
Apr. 2021	President and Chief Executive Officer and Chief Operating Officer (to present)



Takeshi Fujiwara
Director

Apr. 1983	Joined NIPPON SIGNAL CO., LTD.
Jul. 2009	General Manager of Private Railways Sales Dept. of Railway Signal Systems Division
Jun. 2010	Executive Officer
Apr. 2013	Managing Executive Officer
Jun. 2013	Director (to present)
Apr. 2016	Chief General Manager of Sales and Marketing Head Office
Apr. 2019	Responsible for Domestic Business and Branch Offices
Apr. 2020	Deputy Chief Executive Officer (to present),Responsible for Domestic and Overseas Businesses and Branch Offices
Jun. 2020	Responsible for Smart Mobility Systems Promotion Division
Apr. 2022	In charge of Business Management, Responsible for Transport Systems, Smart Mobility Systems Promotion Division, and Branch Offices (to present)



Hideo Oshima
Director

Apr. 1979	Joined NIPPON SIGNAL CO., LTD.
Sep. 2004	General Manager of MEMS Business Development Dept. of Visionary Business Center
Jul. 2008	Chief General Manager of Visionary Business Center
Apr. 2009	Chief General Manager of Overseas Division
May 2011	Executive Officer
Apr. 2016	Managing Executive Officer (to present)
Jun. 2016	Director (to present)
Apr. 2019	Responsible for Corporate Strategy Dept. and Overseas Business
Apr. 2020	Responsible for Kuki Plant and TQM Promoting Dept.
Apr. 2021	Responsible for Overseas Business, In charge of International Projects (to present)



Masahiro Kubo
Director

Apr. 1983	Joined NIPPON SIGNAL CO., LTD.
Jul. 2006	General Manager of Accounting Dept.
Jul. 2009	General Manager of Tohoku Branch Office
Jun. 2014	General Manager of General Affairs Dept. of Business Administration Division
Apr. 2016	Executive Officer, General Manager of Corporate Strategy Dept.
Apr. 2018	Chief General Manager of Kuki Plant of Mono-zukuri Division
Apr. 2019	Senior Executive Officer, General Manager of Corporate Strategy Dept., Responsible for Finance Dept.
Apr. 2020	Managing Executive Officer (to present), In charge of Business Administration (to present)
Jun. 2020	Director (to present)



Masayoshi Sakai
Director

Apr. 1985	Joined NIPPON SIGNAL CO., LTD.
Jul. 2006	General Manager of Safety Technology Research Dept. of Research Center
Jul. 2010	Chief General Manager of Research & Development Center
Jun. 2014	Chief General Manager of Kuki Plant of Mono-zukuri Division
Apr. 2016	Executive Officer, Chief General Manager of Research & Development Center of Technical Development Head Office, Chief General Manager of Visionary Business Center
Apr. 2020	Senior Executive Officer, In charge of Research and Development, Chief General Manager of R&D Section, Chief General Manager of ANSHIN Center, General Manager of Safety Technology Research Dept., General Manager of Advanced Railway System Development Section
Apr. 2021	Managing Executive Officer (to present), In charge of Technology, Research and Development (to present), Chief General Manager of R&D Section, General Manager of IP Management Dept., General Manager of Advanced Railway System Development Section, Responsible for TQM Promoting Dept. (to present), Responsible for Kuki Plant (to present)
Jun. 2021	Director (to present)



Kazuhiro Hirano
Director

Apr. 1983	Joined NIPPON SIGNAL CO., LTD.
Jul. 2006	General Manager of Railway Signal Division of Osaka Branch Office
Jul. 2009	General Manager of Transport information Systems of Transport Information Systems Division
May 2011	Chief General Manager of Transport Information Systems Division
Jun. 2014	Executive Officer, Chief General Manager of Railway Signal Division of Business Division
Apr. 2019	Senior Executive Officer, Chief General Manager of Railway Signal Division
Apr. 2020	Chief General Manager of Transport Systems Division
Apr. 2021	Managing Executive Officer (to present), Responsible for Transport Systems, Chief General Manager of Transport Systems Division, Responsible for Smart Mobility Systems Promotion Division
Apr. 2022	Chief General Manager, Osaka Branch Office (to present), Responsible for western Japan area (to present)
Jun. 2022	Director (to present)



Yasuko Matsumoto
Outside Director

Apr. 1978	Registered as Attorney, Joined Yamashita Oshima Law Office
Apr. 2000	Part-time Lecturer, Seikei University
Feb. 2001	Member of Independent Administrative Institution Evaluation Committee, the Ministry of Economy, Trade and Industry
Apr. 2007	Part-time Lecturer, Tokyo University of the Arts
Jun. 2015	Outside Director, NIPPON SIGNAL CO., LTD. (to present)



Yuriko Inoue
Outside Director

Nov. 1993	Full-time Lecturer of Graduate Schools for Law and Politics, University of Tokyo
Apr. 2004	Professor, Graduate School of Law, Kobe University
Oct. 2010	Professor, Graduate School of International Corporate Strategy, Hitotsubashi University
Apr. 2018	Professor, Business Law Department, Graduate School of Law, Hitotsubashi University
Jun. 2018	Outside Director, NIPPON SIGNAL CO., LTD. (to present)
	Outside Director, Dai-ichi Life Holdings, Inc. (to present)
Apr. 2020	Professor, Business Law Department, Graduate School of Law, Hitotsubashi University (Chair of Department) (to present)



Yoshiyuki Murata
Outside Director

Apr. 2009	President and Representative Director, Taisei Housing Corporation
Apr. 2011	Executive Officer, Taisei Corporation
Apr. 2013	Managing Executive Officer, Taisei Corporation
Jun. 2013	Member of the Board, Taisei Corporation
Apr. 2015	President and Chief Executive Officer, Representative Director, Taisei Corporation
Jun. 2020	Vice Chairman, Representative Director, Taisei Corporation
Jun. 2021	Outside Director, NIPPON SIGNAL CO., LTD. (to present), Director and Executive Vice President, Daiwa House Industry Co., Ltd. (to present)
Apr. 2022	Outside Director, Fujita Corporation (to present)

Audit & Supervisory Board Members



Yoshitaka Tokubuchi
Audit & Supervisory Board Member (Full-time)

Apr. 1982	Joined NIPPON SIGNAL CO., LTD.
Jul. 2006	General Manager of Production Control Dept. of Kuki Plant
Jun. 2008	Executive Officer, General Manager of Corporate Strategy Dept.
May 2011	Managing Executive Officer
Jun. 2011	Director
Jun. 2014	Deputy Chief Executive Officer
Apr. 2018	Chief General Manager of Business Administration Division
Apr. 2019	Director and Executive Vice President, Executive Vice President and Executive Officer In charge of Plants and Group Companies, Responsible for IT Strategy Department
Apr. 2020	Assistant to the President, In charge of Plants (assigned to Kuki Plant)
Jun. 2020	Responsible for TQM Promoting Dept.
Jun. 2021	(Full-time) Audit & Supervisory Board Member (to present)



Mikio Shiokawa
Outside Audit & Supervisory Board Member (Full-time)

Apr. 1982	Joined National Police Agency
Aug. 2002	Head of Security Department, Kanagawa Prefectural Police Headquarters
Apr. 2004	Head of Counter International Terrorism Division, Foreign Affairs and Intelligence Department, Security Bureau, National Police Agency
Jan. 2013	Chief of Hyogo Prefectural Police
Jan. 2014	Councilor of Deputy Director General, Commissioner General's Secretariat, National Police Agency
Aug. 2015	Deputy Head of Cabinet Satellite Intelligence Center, Cabinet Secretariat
Sep. 2017	Ambassador Extraordinary and Plenipotentiary of Embassy of Japan in Tunisia
Jun. 2019	Outside Audit & Supervisory Board Member of NIPPON SIGNAL CO., LTD. (Full-time) (to present)



Masayuki Tamagawa
Outside Audit & Supervisory Board Member

Apr. 1981	Joined Ministry of Finance
Jun. 2000	Deputy Director General of Monetary Financial System Bureau, International Monetary Fund (IMF)
Jul. 2007	Regional Commissioner, Sapporo Regional Taxation Bureau
Jul. 2011	Deputy CFO, Japan Tobacco Inc.
Jul. 2012	Head of Asia External Representation Office, African Development Bank (AfDB)
Oct. 2016	Specially-appointed Professor of Educational Development Center, Kogakuin University (to present)
May 2017	Managing Executive Director, Kogakuin University (to present)
Jun. 2019	Outside Audit & Supervisory Board Member, NIPPON SIGNAL CO., LTD. (to present)



Naoko Shimura
Outside Audit & Supervisory Board Member

Apr. 1999	Registered as Attorney, Joined Nishimura & Partners (currently Nishimura & Asahi)
Apr. 2005	Admitted as Attorney-at-Law in New York
Jan. 2008	Partner of Nishimura & Asahi (to present)
May 2016	Outside Statutory Auditor, TABIKOBO Co. Ltd. (to present)
Jun. 2018	Outside Director, mixi, Inc. (to present)
Sep. 2018	Part-time Lecturer of Business Law Department of Graduate School of Law, Hitotsubashi University (to present)
Jun. 2019	Outside Audit & Supervisory Board Member, NIPPON SIGNAL CO., LTD. (to present)

Executive Officers and Deputy Executive Officers

Chief Operating Officer	Hidehiko Tsukamoto
Deputy Chief Executive Officer	Takeshi Fujiwara
Managing Executive Officers	Hideo Oshima Masahiro Kubo Masayoshi Sakai Kazuhiro Hirano Masaki Samukawa
Executive Officers	Kazuhiro Ryugo Ryuichi Goto Hiroyuki Mikuni Toru Horie Yutaka Namiki
Deputy Executive Officers	Hideaki Tagami Junichi Minami Masahiro Takahira Shinichi Machiyama Masayuki Hiramoto

Financial and Non-Financial Highlights (Years ended March)

Financial Data (¥ million)*2	2013	2014	2015	2016	2017	2018*1	2019	2020	2021	2022
Orders received*3	93,475	105,783	99,713	83,258	88,659	99,581	113,347	118,604	85,185	79,709
Net sales*4	85,339	93,217	100,416	90,593	82,134	83,770	99,857	111,675	92,755	85,047
Operating income	5,082	5,943	8,377	7,162	4,269	2,061	7,000	8,912	5,713	5,390
Income before income taxes and minority interests	5,985	7,039	9,111	8,038	5,315	3,192	7,916	9,662	7,282	6,531
Net income attributable to owners of parent	3,135	3,667	5,413	4,994	3,500	2,051	5,306	6,584	4,916	4,503
R&D expenses	2,363	3,167	3,291	3,419	3,078	2,587	2,401	2,887	2,753	2,628
Capital investment	833	1,700	1,953	3,502	3,035	3,564	1,903	2,459	2,912	2,516
Depreciation and amortization	1,635	1,555	1,701	1,685	1,787	1,968	2,128	2,066	2,052	2,170
Total assets	111,058	113,140	120,573	121,434	124,298	127,322	137,643	137,971	141,356	134,086
Net assets	62,954	66,886	74,764	79,801	79,252	79,401	82,135	79,648	84,694	86,740
Cash flows from operating activities	5,847	10,656	14,917	4,152	369	(305)	3,291	9,160	1,145	2,099
Cash flows from investing activities	(740)	(1,745)	(2,774)	(5,963)	(1,013)	(4,153)	(2,437)	(4,600)	(1,911)	(2,344)
Free cash flow	5,106	8,911	12,142	(1,811)	(644)	(4,458)	854	4,560	(766)	(244)
Cash flows from financing activities	(2,435)	(7,237)	(6,502)	(1,412)	(492)	3,111	426	(4,367)	1,354	(6,750)
(Yen)										
Earnings per share (EPS)	50.25	58.32	79.37	73.24	51.59	31.42	81.29	103.34	78.82	72.21
Book value per share (BPS)	917.15	975.92	1,091.55	1,167.75	1,195.14	1,216.17	1,258.04	1,276.99	1,357.90	1,390.71
Dividend per share	13	16*5	20	22	23	24	25*6	26	27	27
(%)										
Return on equity (ROE)	5.8	5.9	7.7	6.5	4.4	2.6	6.6	8.1	6.0	5.3
Return on assets (ROA)	5.6	6.0	7.8	6.6	4.3	2.3	6.0	7.0	4.6	4.7
Equity ratio	51.5	58.8	61.8	65.6	63.8	62.4	59.7	57.7	59.9	64.7
Payout ratio	25.9	27.4	25.2	30	44.6	76.4	30.8	25.2	34.3	37.4

Non-Financial Data*2

Personnel Data

Number of Employees*7	1,215	1,207	1,207	1,232	1,254	1,278	1,255	1,232	1,265	1,261
Average age of employees	41 yrs & 9 mos	41 yrs & 8 mos	41 yrs & 6 mos	41 yrs & 10 mos	41 yrs & 6 mos	41 yrs & 10 mos	42 yrs & 6 mos	42 yrs & 10 mos	42 yrs & 9 mos	42 yrs & 11 mos
Average length of service of employees	17 yrs & 11 mos	17 yrs & 11 mos	17 yrs & 9 mos	17 yrs & 11 mos	17 yrs & 2 mos	17 yrs & 1 mo	17 yrs & 4 mos	18 yrs & 3 mos	18 yrs & 2 mos	18 yrs & 3 mos

Environmental Data*8

Inputs										
Electricity (1,000 kWh)	8,066	8,413	8,282	7,867	7,613	7,850	8,456	7,986	7,645	7,361
Gas (km^3)	300	319	311	285	310	332	347	349	309	296
Fuel (petroleum) (kl)	28.8	28.7	28.6	29.5	30.9	31.9	31.6	32.9	25.4	27.3
Water (km^3)	59	57	73	54	51	54	51	50.2	54.6	54.9
Outputs										
CO_2 (tons)	3,173	4,015	3,947	3,739	3,700	3,851	4,051	3,917	3,714	3,546
Wastewater (km^3)	59	57	73	54	51	54	51	50.2	54.6	54.9
Non-industrial waste (tons)	236	227	269	223	206	218	262	264	224	196
Industrial waste (tons)	404	437	447	412	292	394	324	364	253	248
Recycling rate (%)	98.3	98.9	98.8	99.0	99.4	99.5	99.6	99.4	99.3	99.2

*1 The Company has applied the Partial Amendments to Accounting Standard for Tax Effect Accounting (ASBJ Statement No. 28, February 16, 2018) from the start of fiscal 2019. Management indicators and other important data related to fiscal 2018 have been retroactively revised to reflect this newly applied standard.
*2 Financial data is presented on a consolidated basis, while non-financial data is presented on a non-consolidated basis.
*3 Orders received are exclusive of consumption tax and other taxes.
*4 Net sales are exclusive of consumption tax and other taxes.
*5 The dividend per share for the fiscal year ended March 31, 2014, which amounted to 16 yen, included a commemorative dividend of 2 yen for the 85th anniversary of the foundation of Nippon Signal Co., Ltd.
*6 The dividend per share for the fiscal year ended March 31, 2019, which amounted to 25 yen, included a commemorative dividend of 1 yen for the 90th anniversary of the foundation of Nippon Signal Co., Ltd.
*7 The number of employees includes staff on loan from other companies to Nippon Signal, and excludes Nippon Signal staff on loan to other companies and temporary employees.
*8 The figures for the environmental data are those for the sites of Kuki Plant, Utsunomiya Plant, Ageo Factory, Yamagata Nisshin Electronics Co., Ltd. and Nisshin Tokki Co., Ltd.

Corporate Data

Corporate Overview (as of March 31, 2022)

Name of Company:	Nippon Signal Co., Ltd.
Date Established:	December 27, 1928
Paid-in Capital:	¥10 billion
President and CEO:	Hidehiko Tsukamoto
Number of Employees:	3,009 (consolidated)
Accounting Auditor:	Grant Thornton Taiyo LLC

Overseas Offices

Taipei Office　Dhaka Office　Yangon Office

Consolidated Subsidiaries

Nisshin Electronics Service Co., Ltd.
Nisshin IT Field Service Co., Ltd.
Sendai Nisshin Electronics Co., Ltd.
Chubu Nisshin Electronics Co., Ltd.
Nisshin Industry Co., Ltd.
Tochigi Nisshin Co., Ltd.
Nisshin Tokki Co., Ltd.
Nisshin Software Engineering Co., Ltd.
Nisshin Electric Construction Co., Ltd.
Yamagata Nisshin Electronics Co., Ltd.
Sapporo Nisshin Electronics Co., Ltd.
Fukuoka Nisshin Electronics Co., Ltd.
Asahi Electronics Co., Ltd.

Non-Consolidated Subsidiaries

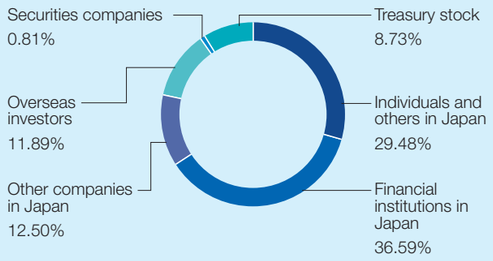
Nisshin Enterprise Co., Ltd.
Nisshin Okabe Nikoh Co., Ltd.
Nisshin TECHNO Engineering Co., Ltd.
Nisshin Hutech Co., Ltd.
Saitama Union Service Co., Ltd.
Yokohama Techno Engineering Service Co., Ltd.
Hokumei Electric Industry Co., Ltd.
Beijing Nippon Signal Co., Ltd.
Nippon Signal India Pvt. Ltd.
Nippon Signal Technology Taiwan Co., Ltd.

For further details, please refer to our website.
➡ **https://www.signal.co.jp/english/aboutus/branch.html**

Stock Information (as of March 31, 2022)

Number of Shares of Common Stock Issued:	68,339,704
Stock Exchange Listings:	Tokyo Stock Exchange, Prime Market
Number of Shareholders:	14,585
Shareholder Registration Agent:	Mizuho Trust & Banking Co., Ltd.

Distribution of Shares by Shareholder Category



Major Shareholders

Shareholder	Number of Shares Held (thousand)	Investment Ratio (%)
The Master Trust Bank of Japan, Ltd. (trust account)	7,231	11.59
Fukoku Mutual Life Insurance Company	4,793	7.68
Nippon Signal Group Employees Shareholding Association	4,003	6.42
The Nippon Signal Trading-Partner	3,191	5.12
Mizuho Bank, Ltd.	2,200	3.53
West Japan Railway Company	2,050	3.29
Custody Bank of Japan, Ltd. (trust account)	1,738	2.79
MUFG Bank, Ltd.	1,372	2.20
Aioi Nissay Dowa Insurance Co., Ltd.	1,334	2.14
The Dai-ichi Life Insurance Company, Limited	1,200	1.92

*1 Fukoku Mutual Life Insurance Company has placed 730,000 shares of Nippon Signal stock in a retirement benefit trust separate from the aforementioned shares it holds. It reserves the right to give instructions on how to exercise related voting rights.
*2 5,968,067 treasury shares have been deducted for the purpose of calculating the investment ratio.

Offices and Plants

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Shin Marunouchi Building, 1-5-1 Marunouchi, Chiyoda-ku, Tokyo 100-6513 Japan
Phone: +81-3-3217-7200 Fax: +81-3-3217-7300

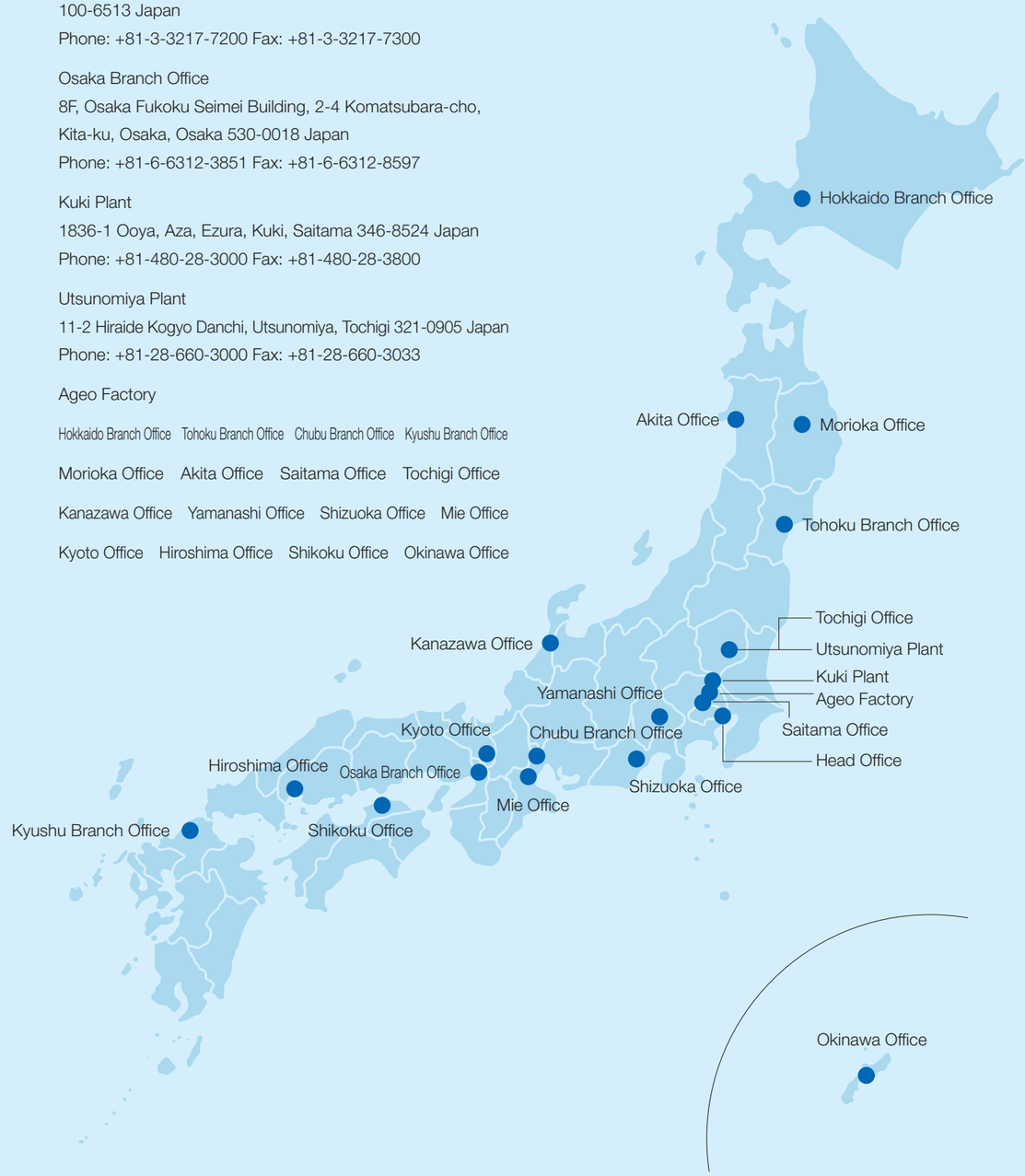
Osaka Branch Office
8F, Osaka Fukoku Seimei Building, 2-4 Komatsubara-cho, Kita-ku, Osaka, Osaka 530-0018 Japan
Phone: +81-6-6312-3851 Fax: +81-6-6312-8597

Kuki Plant
1836-1 Ooya, Aza, Ezura, Kuki, Saitama 346-8524 Japan
Phone: +81-480-28-3000 Fax: +81-480-28-3800

Utsunomiya Plant
11-2 Hiraide Kogyo Danchi, Utsunomiya, Tochigi 321-0905 Japan
Phone: +81-28-660-3000 Fax: +81-28-660-3033

Ageo Factory

Hokkaido Branch Office　Tohoku Branch Office　Chubu Branch Office　Kyushu Branch Office
Morioka Office　Akita Office　Saitama Office　Tochigi Office
Kanazawa Office　Yamanashi Office　Shizuoka Office　Mie Office
Kyoto Office　Hiroshima Office　Shikoku Office　Okinawa Office



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