

OUR APPROACH

# Manufacturing Strategy

## Enhancing Manufacturing Capabilities

We gave divided products manufactured by the Meiden Group into “mass production,” “equipment,” and “systems,” and established manufacturing strategies suited to the features of each group, and we will enhance product competitiveness by improving quality, cost, delivery, safety, and environment.

In this way, we will not only improve the quality of products, but by reforming the awareness of employees involved with manufacturing, we will foster worksites with a sense of achievement and growth, and remain a company that is attractive to the earth, society, and people.

### Progress of FY2023 Initiatives

In the second year since the introduction of our factory complex system, in which our 12 manufacturing units are divided into five large factory units for integrated management, we saw acceleration and advancement in the integration of people, technology, and products across manufacturing organizations.

In FY2023, we undertook initiatives to reform production and initiatives to innovate manufacturing by using DX in production activities. In terms of production systems, we increased the rate of automation on the EV drive unit mass production line in Nagoya to enhance quality and productivity. On distribution board assembly lines and assembly lines for various large machines, moreover, we streamlined our factory lines to improve productivity, reduce work in process, and shorten lead times.

### Policy for Initiatives from FY2024

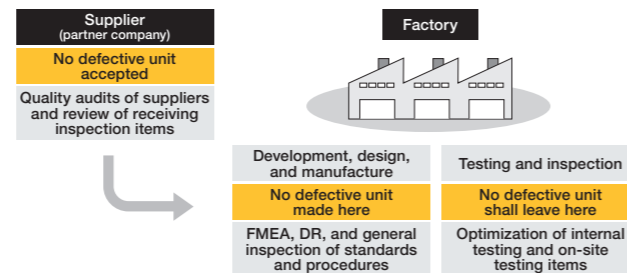
Company-wide improvement initiatives are divided into three groups: “mass production,” “equipment,” and “systems.” Through these initiatives, we are working to build up our manufacturing capabilities and product competitiveness. Initiatives in the “mass production” group include automating simple tasks as well as using image processing to automate inspections. Under “equipment,” we will establish core manufacturing technologies and develop and implement tools to support human work. And under “systems,” we will continue to streamline factory production lines, eliminate waste by visualizing production processes, and link design data to manufacturing and testing processes.

In addition, for the production of vacuum products such as vacuum interrupters and vacuum capacitors, we will work to improve quality and productivity by augmenting production capacity and using automated equipment.

In the EV business, we will work to further improve productivity by continuing to ensure stable production at our four bases in Numazu, Nagoya, Kofu, and China, including the second line in China, which started operating in FY2023.

## Quality Control

At the Meiden Group, which is involved with social infrastructure, each employee is not only aware of social responsibility in relation to the Meiden Group’s products and services, as well as the scale of the impact that defects could have on society, but engage in quality control activities from the perspective of “no defective unit accepted,” “no defective unit made in our factory,” and “no defective unit shall leave our factory,” satisfying customers and improving profitability by reducing unnecessary costs.



## Preventing Quality Fraud

In FY2023, we established a new Quality Assurance Audit Section in the Production Engineering and Management Group (Quality Control Department) to bolster our efforts to prevent fraud. The section has focused on (1) identifying fraud risks and making improvements and (2) raising awareness of fraud prevention.

### 01 Identifying Fraud Risks and Making Improvements

We double-checked the validity of test reports for products manufactured by each unit. Each department checked its own results (as a first line of defense) and the Quality Assurance Supervisory Section also checked (second line). We particularly focused on confirming the operational status of type test results, which are fundamental to product performance and quality. We also tested sampled products, performing detailed inspections of the items listed in their test reports. We discovered no cases of fraud. However, departments made improvements on items that were determined to be high-risk, for example by reviewing procedures and making sure they are thoroughly practiced.

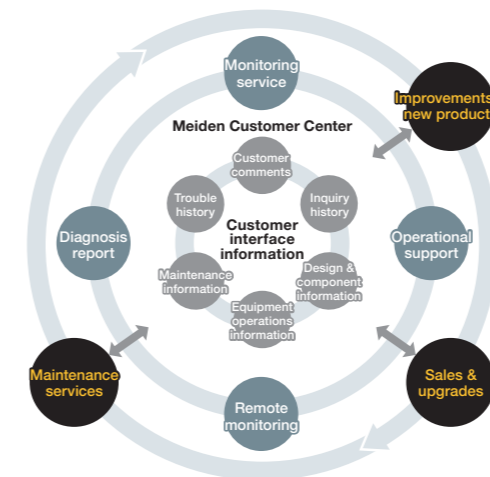
### 02 Raising awareness of fraud prevention

We conducted fraud prevention education and awareness by watching fraud prevention education videos, exchanging opinions within the workplace after watching them, and implementing e-learning. In addition, we conducted a questionnaire survey after the training to confirm the level of understanding and penetration of the training. The survey results showed that the percentage of people who work with an awareness of fraud prevention has increased significantly compared to the previous year, indicating that employee awareness of the prohibition of quality fraud and inappropriate conduct has further increased.

## Meiden Customer Center

The Meiden Customer Center is the point of contact for inquiries and trouble calls for all Meiden Group products. Our remote monitoring service connects the Meiden Customer Center with Meiden Group products installed in infrastructure facilities and renewable energy power stations. The service monitors the operating status of customers’ facilities and, if an abnormality occurs, asks maintenance service personnel to address the situation or even makes the first response to the failure itself.

In addition, by analyzing and utilizing equipment operating data, past issue data, plant design data, and on-site maintenance data centrally managed at the Meiden Customer Center, we will be able to make proposals to customers that will contribute to appropriate maintenance, reduction of life-cycle costs, and reduction of greenhouse gas emissions.



## Enhancing sensitivity to danger through hands-on safety training

Hands-on safety training is offered to each of our locations to enhance sensitivity to danger. In this training, we dispatch a safety simulator trailer equipped with safety simulation training equipment in the container it carries.

The safety education is not limited to classroom lectures, but also features simulated work-related accidents using virtual reality (VR), etc., offering strong learning potential. As of FY2022, we have newly developed a Metaverse hands-on safety educational program, which enables participants to receive non-contact safety experience education within the Metaverse using their own avatars. We have also started external sales of VR safety training content through a subscription service for external customers, providing an environment where the latest safety training content can be accessed at any time.



A VR hands-on safety educational program in progress

## Safety Promotion Center Preserves Lessons from Industrial Accidents

In order to ensure that the facts about past industrial accidents continue to be told, we have established the Safety Promotion Center as a place to provide these facts and a forum to consider them. We believe that our mission is to never turn away from a sad truth, and to consistently tell stories of past experiences to ensure that similar fates do not befall future employees and their families.

The Meiden Group will continue its efforts to raise safety awareness and achieve zero accidents, achieved by recording safety memories in our bodies through our safety simulator, and by having our hearts moved at the Safety Promotion Center.

While the Safety Promotion Center has a physical exhibition space at Numazu Works, for employees who live too far away to visit the museum, a new Metaverse Safety Promotion Center has opened as of October 2022, utilizing virtual space. This enables multiple employees to participate without location restrictions, whether in Japan or overseas, as long as they have a VR head-mounted display, and also allows them to exchange opinions while gathering as their respective avatars over the Metaverse.



Safety Promotion Center (actual scene shown on left, metaverse simulation on right)

## Occupational Safety and Health

At the Meiden Group, employee health and safety is a core management value. We work to “ensure a safe environment that is conducive to work, as well as achieve comfort and affluence for employees,” as it says in Meiden Group Corporate Code of Conduct, and aim to be a leading health and safety company.

### Confirmation of unsafe behavior using AI

Finding unsafe behavior by on-site patrol is an important way to prevent industrial accidents, but in terms of resources, it is difficult to constantly check worker movements and images sent by cameras. To address this issue, in FY2023, we began using our Safety AI Camera System to check for all unsafe behaviors.

AI detects speed violations or driving in the opposite direction when operating a vehicle on premises, walking outside the green belt, not wearing a helmet in the factory, dangerous forklift operation, working at heights, presence of persons at night, and so on. It then provides guidance to those who are acting in an unsafe manner.

## OUR APPROACH

### Supply Chain Management

#### Addressing Rising Material Prices and Long Lead Times

While the situation in FY2023 did not return to the pre-COVID-19 normal, the impact from slow delivery times for parts and materials eased significantly. On the other hand, unit prices for purchases continue to rise due to the soaring cost of raw materials, energy, transportation, and labor.

Facing this reality, we are working with the production management department of each plant and unit on several measures to minimize the impact of longer delivery times and price increases for the goods we procure while taking account of production and shipping plans. These include making advance arrangements, studying alternative goods, stocking up, and strengthening negotiations with suppliers. In addition, we are working to counter rising transportation costs by obtaining shipping information early and coordinating with departments concerned to establish the optimal manner of transportation.

#### Sustainable Procurement

The Meiden Group promotes sustainable procurement in conjunction with business partners in order to contribute to the realization of a sustainable society.

Based on the Corporate Code of Conduct that we established in line with the Meiden Group Corporate Philosophy, we ask all our suppliers to take initiatives similar to the Meiden Group's sustainability initiatives, and then we do business on that basis.

When we start doing business with a new supplier, we give them the Meiden Group Sustainable Procurement Guidelines and ask them to communicate them to their own staff and adhere to them. We are also stepping up supply chain capabilities in several other ways. Each year, we hold a production plan briefing at each works, which is where production happens, to explain our basic procurement policy. We hold study sessions on carbon neutrality. We introduce the various types of support we offer to help suppliers adhere to the Sustainable Procurement Guidelines (in such areas as legal compliance, human rights, labor, health and safety, environment, quality, information security, and business continuity planning). We work on communication such as by sharing information and opinions on how to enhance technical capabilities and by showcasing examples of outstanding improvements that suppliers have made.



Production plan briefing at Numazu Works

#### Building a Sustainable Supply Chain

When we start doing business, we investigate the company's efforts for sustainability and environmental conservation. Each year, we issue a scorecard with evaluation results.

With our evaluations, we are trying to understand the actual state of business operations and identify high-risk suppliers with respect to social issues such as climate change, biodiversity, environmental management, human rights, and the work environment. When necessary, we conduct site audits and support suppliers' initiatives.

#### 1 Promoting and Supporting EcoAction 21 Certification and Registration

We support our suppliers in registering and applying for certification in the EcoAction 21 environmental management system promoted by the Ministry of the Environment, with the aim of spreading environmental management systems and environmental improvements throughout the entire value chain. In FY2023, in cooperation with the Organization for Small & Medium Enterprises and Regional Innovation, Japan, we also started supporting visualization of our business partners' CO<sub>2</sub> emissions. As of FY2023, the ninth year of this program, 137 suppliers had earned EcoAction 21 certification.

Through these programs, the Meiden Group will work to promote environmental management systems, make environmental improvements, and reduce CO<sub>2</sub> emissions throughout the value chain.

#### 2 Environmental Audits

We conduct environmental audits of our suppliers. During these, we look at actual work sites as we confirm and provide guidance on compliance with laws and regulations regarding chemical substances, waste, and the like. Suppliers who do not pass the audit are asked to take corrective measures and given a follow-up audit (this happened with eight companies in FY2023). If suppliers do not yet have an environmental management system (EMS), we have them take part in an EcoAction 21 study session (Green Program).

#### 3 Holding Various Seminars

We hold seminars on process improvement and information security measures at our suppliers' manufacturing sites as needed to improve their capabilities. At product exchange meetings, we communicate and exchange opinions with workers on-site. We also conduct workplace checks of our suppliers using our Health and Safety Support Project.



Health and Safety Support Project



### The Transformer Business, Reborn

## Meidensha Numazu Works: Crossing Borders to Overcome Bottlenecks

With the growing use of renewable energy and expanded capital investment in Japan to ensure electricity supply stability, transformers that support the power infrastructure are again in robust demand that is reminiscent of their peak era.

This is the story of how Meidensha overcame a difficult period and worked closely with a "facilitator" from an overseas base to eliminate bottlenecks and increase production capacity for high-quality products.

#### "Shouts of Joy" When Site Achieves Full Operation: Overcoming Bottlenecks and Raising Production Capacity

"We've already taken orders for delivery in 2030. It makes me want to shout for joy."

After a long struggle following the collapse of Japan's "bubble economy" in the early 1990s, the transformer factory at Numazu Works is now undergoing major changes. Forecasts say that electricity demand will rise into the future, and at the same time, there is a growing need for more resilient power transmission and distribution networks. After remaining flat for several years, orders received more than doubled in FY2022 and have shown steady growth in FY2023 and FY2024.

Taking these changes in the external environment as an opportunity, we have considered a rapid succession of measures to increase production capacity at factory. To meet the strong demand, we plan to gradually increase large transformer production capacity by reconsidering the layout of production sites and the scope of in-house production. At the same time, we are digitizing blueprints and using AI for design work that would otherwise depend on a limited number of personnel.

Ito ▶ "We're trying to eliminate wasteful work. Moreover, we want to propose the most suitable designs for our customers and increase our production efficiency."

#### Helping Temporary Support Staff from India Bridge Cultures, On and Off the Job

Numazu Works is also striving to secure human resources, a challenge shared by many domestic manufacturers. In the spring of 2024, Indian affiliate MEIDEN T&D (INDIA) LIMITED, which shares transformer manufacturing work processes with Numazu, sent five employees as operations supporters for the first time. Each brought a high degree of skill as well as a sincere attitude toward monozukuri, which was a good stimulus for the Numazu staff.

Ruta Ono, who originally came from India, provided support in turn for the Indian staff and their lives in a foreign land. Ono came to Japan two decades ago and her language fluency has made her an indispensable help on the Japanese side.

Ono ▶ "For these operations supporters, language and religious differences, food, and medical care were just some of the things they were confused or had questions



#### R Yasuhisa Ito

Electric Design Section, Transformer Design Department, Power Transformer Manufacturing Unit, Power Equipment Factory Complex, Meidensha

Joined Meidensha in 2016. After a period working in transformer development, he is now engaged in electrical design of large transformers and in the building and operating of systems related to design work.

#### L Ruta Ono

Manufacturing Section, Transformer Manufacturing Department, Power Transformer Manufacturing Unit, Power Equipment Factory Complex, Meidensha

Joined Meidensha mid-career in 2018. She translates technical documents for overseas affiliates, does general office work, and interprets for operations supporters coming from India.

about. My hope is that they will feel comfortable working with me as a bridge while they are learning about Japanese technology, where there's such an emphasis on unseen details. Hopefully they can use this knowledge for manufacturing in their own country."

The transformer business is expected to remain brisk into the future. "Team MEIDEN" has diversity that crosses national borders, yielding high-quality, competitive products that support the electric power infrastructure. This diversity forms a core of innovation by bringing together a variety of perspectives and technological capabilities.

Relevant SDGs

