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RiZm

CARBON NEUTRAL ACCELERATED.

RIKEN KEIKI Co.,Ltd.

Special Feature: Ramping Up Decarbonization

CARBON NEUTRAL ACCELERATED.

Carbon neutral markets are evolving. Collaborating with sales, market strategies, R&D, and production to develop new products and to achieve our 90th anniversary targets.

Executive Managing Director and Executive General Manager of Sales Division, RIKEN KEIKI Co., Ltd.

Shinya Kobu

Shinya Kobu

Sep. 29, 1960 Born in Mie Prefecture
Apr. 1984 Joined RIKEN KEIKI in the Section 1 of the Sales Department
Apr. 1986 Transferred to the new Sendai Office
Aug. 2003 Manager of the Sendai Office
Oct. 2005 Manager of the Sendai, Tsuruoka, and Niigata Offices under the East Japan Sales Department
Mar. 2007 Deputy General Manager of Sales Department 1
Apr. 2011 General Manager of East Japan Sales Department
Apr. 2014 Executive Officer and Senior General Manager of Sales Division
Jun. 2017 Director and Executive General Manager of Sales Division
Jun. 2021 Executive Managing Director and Executive General Manager of Sales Division (current position)

In 2018, the United Nations Intergovernmental Panel on Climate Change (IPCC)[*1] passed a declaration on significant carbon dioxide reductions. This signified a turning point toward a major trend toward global carbon neutrality. Even in Japan, an extraordinary session of the Diet held October 2020 committed to net zero GHG emissions by 2050. This decision shocked industry at large.
Government and industry alike immediately ramped up their shift toward carbon neutrality. As we support the core industries that have been transitioning to hydrogen, methane, and other renewable energies through providing gas detectors and analysis devices, our technological development, implementation, marketing, and sales proposal capabilities are being tested.
Executive Managing Director Shinya Kobu has long been strengthening product development and proposal capabilities with focus on the semiconductor industry. He has seen it all from the front lines of sales by working closely with each site and gaining feedback about customer needs and trends. As the Executive General Manager of Sales Division leading all domestic and overseas sales teams, Shinya Kobu first built on decarbonization efforts with sales targets and specific initiatives toward the 90th Anniversary. We sat down and talked with him about these initiatives as well as RIKEN KEIKI market strategies and its ability to make proposals in core industries ramping up this shift toward carbon neutrality.

*1 The IPCC was established in 1988 for the purpose of sharing the latest research results on global warming. The organization has members of 195 countries and regions around the world.

Two decades of Sales in the Semiconductor Market Since the Rise of a Tohoku Silicone Valley, Earning an 80% Share

—Mr. Kobu, you have handled all aspects of sales since joining RIKEN KEIKI. After you were appointed to Section 1 of the Sales Department at the Headquarters, you served as a Manager at the Sendai, Tsuruoka, Niigata, and Sapporo Offices of the East Japan Sales Department, and the Deputy General Manager of Sales Department 1 and General Manager of the East Japan Sales Department. Currently, you are the Executive Managing Director and Executive General Manager of Sales Division.

You have handled sales of everything from gas detectors for the civil engineering and construction industry as well as gas alarms and gas concentration meters for universities and research institutes. As part of these sales operations and your management of sales teams on various customer sites, you also contributed to the sales expansion into Tohoku's Silicon Valley and other semiconductor industries.

First, would you mind looking back on your long career in various sales departments?

Well, I joined RIKEN KEIKI in 1984, long before the current Headquarters building was built. As of this year, I will have worked for the company for 38 years.
When I first started here, RIKEN KEIKI was small in scale and did not have significant sales.
When I worked in Section 1 of the Sales Department at the Headquarters, we primarily focused sales on general contractors in the civil engineering and construction industry. As a fledgling salesperson fresh out of college, I didn't know left from right. The companies I worked with had extensive experience and intimidating as customers but still looked after me (laughing). I engrossed myself in these sales operations for the first two years.

After that, RIKEN KEIKI decided to set up a sales office in Sendai City as the first in the Tohoku Area. In 1986, I was deployed with two of my mentors to the Sendai Office to cultivate customers and conduct sales in all six prefectures across the Tohoku region. In fact, the sales estimate at the time of launch wasn't really clear. We started with an unbelievably small monthly sales target looking back on it now. Within two or three years though, we discovered how good the timing for the launch of the Sendai Office was. There was a rapid economic boom happening at the time. This began the initial uptick in construction and capital investments in Japan by major manufacturers in the semiconductor industry from companies the likes of NEC, Fujitsu, Toshiba, EPSON, Oki Electric Industry, Hitachi, Sony, and Tokyo Electron. The launch of the Sendai Office

coincided with this boom. Companies were building at a pace of two to three semiconductor production plants a year in Aomori, Fukushima, Yamagata, and the rest of the Tohoku region. This trend continued for over ten years. I was not assigned to be a part of the sales team in charge of this semiconductor production industry at first. In the midst of such tremendous development, I of course became involved in things. The Tohoku territory instantly went from this very reserved monthly quota initially at the launch of the Sendai Office to a large rapidly growing market with the potential to increase sales twenty fold.

Naturally, this was not limited to the Tohoku region. At the time, the semiconductor production industry throughout Japan was seeing this same type of boom in business. During this bubble, RIKEN KEIKI acquired roughly 80% of the share in this semiconductor fabrication market through area-specific sales in each territory. Even after this economic boom, these companies remain the valued customers of RIKEN KEIKI even today. This was my experience in the Tohoku region at a time when RIKEN KEIKI was cultivating and acquiring customers.

At the same time, I was in charge of centers researching semiconductors and optical communications at universities, such as Tohoku University and Yamagata University. The research center at Tohoku University was in fact the birthplace of optical communications development. I frequently visited the research laboratories because of my relationship with several of the professors who were authorities on semiconductors in the school of engineering. I worked to shape the research and development market growing alongside the semiconductor market through proposals for gas alarms and safety mechanisms.

At this point in my career, I also concurrently served as the manager of the Sendai, Yamagata (Tsuruoka City), Niigata, and Sapporo Offices and would travel to each territory about once a month for sales purposes. In 2007, just as I was considering who to appoint as my successor from the up-and-comers in the generation after me, I was suddenly appointed the Deputy General Manager of Sales Department 1 at the headquarters. After my 20 years in Tohoku, I returned to the Tokyo Headquarters. Looking back at myself at this time, this promotion felt more like a forced transfer from the Tohoku region which I had come to love after 20 years (laughing). I served as the General Manager of the East Japan Sales Department before I was appointed an Executive Officer, Director and, as of last year, Executive Managing Director. I feel my responsibilities increase as my position changes, and I work day to day to fulfill my duty with that in mind.

90th Anniversary Sparking Stronger Overseas Strategy, an Enhanced Sales Structure, and Broader Market Presence

—After such a long career driving on-site sales center upon the rapidly booming semiconductor fabrication market, you were now in charge of RIKEN KEIKI sales policy and the response to diversifying customer needs in your new duties as Executive Managing Director and Executive General Manager of Sales Division. Could you please tell us about your specific initiatives to achieve the sales target of 50 billion yen for the 90th Anniversary set by President Junichi Koyano last year?

Let me first explain the sales target. At the beginning of fiscal 2017 when I was first appointed Executive Director and Executive General Manager of Sales Division, we had set a target to achieve 40 billion yen in sales by the end of fiscal 2021 five years later. Unfortunately, we were unable to reach this goal. However, RIKEN KEIKI revised this target with the aim to achieve 40 billion yen in sales by the end of fiscal 2023 two years later. Using this target as a platform, we created a sales road map. The targets therein set a loftier target to achieve at least 50 billion yen in sales by end of fiscal 2029 six years later, which is also our 90th anniversary.

Then, the question becomes what we have to do in the future to achieve this target. In 2017 Chairman Hisayoshi Kobayashi, who was president at the time, established a broad policy to strengthen overseas strategies and enhance the name value of the RIKEN KEIKI brand in overseas markets. According to this policy, we have engaged in various measures in both product development and promotion. In addition, we expanded our sales network overseas over several years to strengthen our overseas sales capabilities. In addition to our two existing Group companies in China and Taiwan, we set up an additional three wholly-owned subsidiaries in Germany, America and Singapore, including a second-tier subsidiary in Malaysia. This expansion established a sales structure with an overseas network spanning North America, East Asia, and Southeast Asia. Under the guidance of management appointed by RIKEN KEIKI for Group subsidiaries, these subsidiaries supply the products required by each market, recruit the necessary human resources, and strengthen the maintenance structure with local employees acting as central figures. All of these efforts continually strive to increase sales.

Meanwhile in Japan, we have recently been seeing active capital investment in the semiconductor fabrication market. RIKEN KEIKI is also honored to have the patronage of a customer who presently has the largest production facility in Japan. This is further expanding sales in the domestic semiconductor fabrication market.

At the same time, we are working to develop products and strengthen sales based on new demand, including carbon neutral markets, in core industries. This consists of oil, fossil fuels, steel, power, gas, and automobiles in addition to the 40% of sales currently generated in the semiconductor fabrication market. These efforts aim to achieve the sales targets through a unified company-wide structure.

Combined Sensor System Realized by Cross-organizational Work Helping to Develop Products for Carbon Neutral Markets

—One last question about our main theme on ramping up decarbonization. The goal is to achieve net-zero GHG emissions by 2050. To realize the carbon-neutral society currently advocated by industry and government, RIKEN KEIKI has also positioned ideal sustainability management as a core management issue. On the other hand, the arrival of new markets supporting core industries shifting to renewable energies, such as the development of methanation technologies*2, creates tremendous business opportunities. RIKEN KEIKI is both developing and implementing new products related to carbon neutral technologies. Would you mind telling us about these and other specific initiatives for carbon neutral and hydrogen market strategies?

Carbon neutrality is one aspect of the RIKEN KEIKI Sustainability Policy. We have been actively working to decarbonize our business activities. These measures include a shift to 100% renewable energy*3 for the power used at the headquarters as well as the development and production centers.

That said, our main businesses are the development and provision of products and services supporting industrial infrastructure. This means it is our technologies, products, and services supporting customers in core industries that are furthering decarbonization. That is why decarbonization efforts are at the heart of our contributions to realize a carbon neutral society. As you said too, carbon neutrality does provide us with tremendous business opportunities.

One of our first undertakings in carbon neutral markets has been restructuring and coordination within our own organization. We have set up a new Market Strategy Department under Sales Division last year. Acting as a core sales team, this new department provides support by analyzing sales information worldwide as well as building and proposing strategies. Customer sales even gives feedback to the Market Strategy Department about information gathered on site. Furthermore, the information is shared with Development Division to develop new products or proposal of new systems. Thanks to this new organization, RIKEN KEIKI has already been able to make more than 20 new carbon neutral proposals to various customers.

The most well-received proposal thus far has been for the combined sensor system. This integration of gas detectors and gas calorimeters enables diverse gas monitoring. The theory behind this integration was originally tested by Research and Development Department in the Development Division.
Sales teams learn about the problems customers are facing and the type of ideas that they hope RIKEN KEIKI can propose. They gather a lot of other such information as well. The combined sensor system is the first example of a product realized by the Market Strategy Department by taking in all of this feedback to coordinate with development. It is a result of efforts by the Market Strategy Department to coordinate beyond departmental boundaries.

Proposals of this type respond to the needs of each customer by combining several different existing products. This means there is not an immediately large impact on sales. By sowing these seeds though, RIKEN KEIKI is able to aggregate customer needs sooner rather than later in carbon neutral markets. The purpose is then to help bring about new products specifically for these carbon neutral markets in the near future.

The carbon neutral needs of each customer are becoming more sophisticated. In response, we have started to consider the formation of a sales team dedicated to these markets. From the standpoint of sustainability and the SDGs, we want to increase the presence of RIKEN KEIKI in these new markets. Sales, development, and production will work as a unified group to bring the entire company together in efforts to achieve the sales target for our 90th anniversary.

(Interview: April 13, 2022)

*2 Methanation technologies are core decarbonization technologies that produce methane (CH4) from carbon dioxide (CO2) and hydrogen (H2).
*3 100% renewable energy combines non-fossil fuel energy certificates with tracking information together with a power supply of renewable energy (including FIT power).

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In-Depth INTERVIEW

Shaping the Future of Carbon Neutral Markets via the New Combined Sensor System

The goal is to become carbon neutral by 2050, which means net zero carbon dioxide emissions. To do this, every company in core industries are pushing forward the development and implementation of next-generation energy technologies. Last spring with the arrival of this rare opportunity, the Market Strategy Department announced the combined sensor system. This new system has found appeal in carbon neutral markets as a gas monitoring technology suitable on sites developing methanation, electrolysis as well as hydrogen and single fuel combustion technologies. However, what made this groundbreaking system possible? What is the core competence*1? What future potential awaits? This in-depth interview will seek to answer these questions with Market Strategy Department General Manager Atsuhiro Fujitani, Deputy General Manager Kohei Teramoto, and Sales Expert Hiroyuki Sato as well as Tomoo Ishiguro, a senior researcher who has been deeply involved with the conception, prototyping, and proof-of-concept for this technology in the Research and Development Department.

Combined Sensor System Realized by Out-of-the-Box Thinking

—Thank you all so much for taking time out of your busy schedules to join us today. Atsuhiro Fujitani, Kohei Teramoto, and Hiroyuki Sato, all of you have unique insight from your respective stances as General Manager, Deputy General Manager, and Sales Expert in the Market Strategy Department. Each of you have been involved in everything from formulating strategies for next-generation energy markets to managing promotions, planning marketing, and pitching presentations to customers. I have heard the combined sensor system that we will discuss today started through collaboration with the Development Division, and in particular a proposal from Tomoo Ishiguro, a senior researcher in the Research and Development Department. First, could you please explain what a combined sensor system is and tell me what led to its development?

Teramoto: To get straight to the point, we combined existing technologies with various applications and functions, which offered new types of features and benefits. The combined sensor system is the unique core system to combine these technologies. Some specific examples are the OHC-800 explosion-proof gas calorimeter and the SD-1RI non-dispersive infrared combustible gas meter to prevent explosions. As a senior researcher in the Research and Development Department, Tomoo Ishiguro had the idea and discovered the integration of these technologies could act as an analyzer. This groundwork is what originally sparked the development of this new system. We named it the combined sensor system after enhancing and solidifying the technology to a level that would give customers confidence through clear specifications. We started expanding promotion in carbon neutral markets in May last year.

Ishiguro: It was each strength and weakness of the various sensors developed by RIKEN KEIKI that provided a foundation for this system development. We decided not to focus on trying to eliminate weaknesses, but rather ask if we could find out-of-the-box ways to capitalize on them. For example, a sensor will respond and detect an unwanted gas. Rather than see this unwanted reaction as a weakness, we considered it to be one feature of the sensor. By combining different sensors with these unique features, the idea was to not only cover the weaknesses but create new value impossible to achieve with a single sensor. We had the idea to solve the detection of unwanted gases by using calculations to eliminate them. After some testing, we had found a solution to one problem.

Sato: Another aspect of the technology is the dramatic increase in the accuracy of sensors built into each product. This is what enabled Tomoo Ishiguro's own research experiments. It is also what led to the development of the OHC-800 as the revolutionary product which became the foundation of the combined sensor system.

Ishiguro: It is. The OHC-800 explosion-proof calorimeter is equipped with two different physical sensors. One is an optical interferometric sensor. The other is an ultrasonic sound velocity sensor. The higher sensor accuracy that Hiroyuki Sato just mentioned made this system possible for the first time. It also inspired the idea of optisonic operations to remove the impact of detecting the unwanted gases described earlier. The development of the combined sensor system could be considered an extension of the OHC-800.

Core Competence*1: Every Ultra Precision Sensor Developed In-house by RIKEN KEIKI

—That's interesting. How did the carbon neutral markets react before and after you announced the combined sensor system? I'd also like to know what the core competence*1 of the system is that gives it an absolute advantage over competitors.

Teramoto: Initiatives to achieve carbon neutrality at companies in core industries actually went into full swing about three years ago. We finally entered the social implementation phase when Japan announced its commitment to carbon neutrality in October 2020. As the nation shifts from fossil to next-generation fuels, it becomes clear that customers throughout the industry at large were facing challenges, whether ships, equipment and devices or engine maintenance, heavy electric machinery manufacturers, or EPC*2. This shift made gas detector and alarm manufacturers essential to anyone developing next-generation energy. These needs brought in an increasing number of inquiries to RIKEN KEIKI, especially during the implementation phase toward decarbonization. We saw a dramatic increase in customers consulting us about the incompatibility between generally expensive large analyzers from other manufacturers and solutions to the challenges each development site was struggling with. Each of these companies had a tremendous response to our proposal for a combined sensor system to solve these problems. The RIKEN KEIKI products used in the system are all explosion proof. In addition, the broad customizability to tailor the system to each site is a benefit none of our competitors can offer.

Ishiguro: Another point to make is that RIKEN KEIKI handles an overwhelming variety and quantity of sensors as a gas detector and alarm manufacturer. Moreover, all of these sensors have been developed in house. This can be seen as the core competence*1 of the combined sensor system. This also means that anyone who doesn't have a full grasp of the performance and features of the sensors in-use cannot propose this type of system. This knowledge gives us the power to propose a broadly customizable system. This is true for Japan of course, but there is also nothing like this combined sensor system anywhere else in the world either. I believe this makes RIKEN KEIKI competitive on the global stage.

Sato: As said before, a wide variety of markets had tremendous needs for this combined sensor system. This was particularly true in the shipping vessel market urgently trying to shift from conventional fossil fuels like petroleum and heavy oil to hydrogen, ammonia, alcohols, and other carbon-neutral fuels. The key to quality in hydrogen and ammonia fuels is the purity. For example, it is important to verify the hydrogen is completely pure without any impurities or secondary products. These unknown contaminants must not penetrate the engine driving these gigantic shipping vessels. On top of all that, the fuels engines use also impact future engine development. That is why these companies are placing so much hope in a RIKEN KEIKI combined sensor system that can provide accuracy head and shoulders above other manufacturers.

Shaping the Future of Carbon Neutrality Using Optical Interferometry as a Key Device

Finally, could you please tell us about the latent potential, each of your motivations, and your hopes for the future of this combined sensor system?

Fujitani: As one step for the combined sensor system, I would like to reach a phase where we are creating specifications for a system that can be used by turbine and device manufacturers as a component in electrolysis devices. Just as each of these companies still have tremendous potential in the development of next-generation energy, I think we have the same potential with the combined sensor system. For example, imagine the applications proven so far for the combined sensor system passed the implementation and specification stage and entered the integration phase. This may require other principles, but this is already within our field of view as we start developing other applications. In the future, some of the latent potential includes specifications for large industrial devices and popular general consumer products. Electric vehicles, or EV, are also a carbon-neutral category. In addition to creating new business segments for RIKEN KEIKI, the Market Strategy Department plans to work to create new markets.

Ishiguro: Presently, we are responding to the needs of each customer using the combined sensor system. The response of these customers has been beyond our expectations. Another one of my goals as a senior researcher is to create products in the future that can comprehensively resolve the broad range of challenges that these customers are struggling with. I believe we can also focus on building an organization to facilitate these goals.

Sato: I want to contribute to the efforts being done to address the major social challenge of carbon neutrality on a global scale. That is exactly what makes this work so rewarding. It is the fuel to the motivation that invigorates me to engage in my day-to-day tasks.

Teramoto: I feel the same way. RIKEN KEIKI has been driving optical interferometric sensor technology as a key device since its founding through to today. This technology is now propelling leading-edge carbon neutrality markets as a component built into the combined sensor system. These key devices are shaping the future of carbon neutrality. All of us are motivated to be involved in this shift as part of the Market Strategy Department.

(Interview: April 14, 2022)

*1 Core competence refers to core capabilities that other companies cannot imitate. These capabilities create a foundation for success and are the source of competitiveness.
*2 EPC is an abbreviation for engineering, procurement, and construction. EPC is a general term for an engineering company that conducts business in a sector that encompasses all three of these phases.

RK TECHNOLOGY TREND

The Ideal Solution for Methanation Development for Carbon Neutral and Hydrogen Markets!
The Groundbreaking RIKEN KEIKI Combined Sensor System Detects CO2, H2, and CH4 with High Precision Without Interference from Miscellaneous Gases!

Explosion-proof Calorimeter OHC-800 & Smart-Gas Detectors SD-1 RI

- Domestic Explosion-proof Product Certifications
- ATEX-certified Explosion-proof Product
- IECEx-certified Product
- CE-marked Product

■ This is the ideal solution for sites developing technologies for next-generation energy, such as methanation, electrolysis as well as hydrogen and single fuel combustion technologies.

As the entire world shifts toward carbon neutrality, the development of next-generation energy technologies is accelerating. This includes methanation technology that synthesizes methane (CH4) from carbon dioxide (CO2) and hydrogen (H2). RIKEN KEIKI combines multiple physical sensors to develop a combined sensor system for these sites. This new system enables them to monitor (concentration management) the carbon dioxide (CO2) and hydrogen (H2) necessary for the methanation process as well as the methane (CH4) gas in real time. Gas detectors feature continuous measurement (monitoring) and explosion-proof capabilities. Analyzers feature measurement and concentration calculation functions for multiple components. The combination of these two sensors can easily manage the concentration of these three gases with precision accuracy in real time. The combined sensor system enables complex monitoring, even in explosion-proof areas, typically difficult to achieve with a single gas detector.

■ The OHC-800 explosion-proof calorimeter has two built-in physical sensors. Optisonic operations even remove unwanted gases via calculations.

One primary product used in the combined sensor system is the OHC-800 explosion-proof calorimeter. This is the only device in the world that enables great precision, continuous measurement, and fast response at the same time. The OHC-800 has two built-in sensors. The first is the optical interferometric sensor to measure the interference of specific gases. The second sensor is an ultrasonic sound velocity sensor to measure the sound velocity (density) of gas. The RIKEN KEIKI optisonic operations are a patented technology that combines the unique calculation methods of these two sensors. The calculation can remove any type of gas not on the calibration curve of these two sensors by using the difference between the behaviors of each sensor. More specifically, the optical sensor identifies the relationship between the interference and heat content of gases. It can then calculate the ratio of hydrogen (H2) and methane (CH4) using the position of the gas on the calibration curve. Next, the sound velocity sensor uses the sound velocity measurement results to eliminate CO2 as a miscellaneous gas by the differing behavior. This approach achieves high-precision composition analyses of the three gases in the methanation process. Sensors sometimes do detect gases other than the three gases essential to the methanation process. Optisonic operations often can identify these gases in a composition analysis, which succeeds in providing high-precision monitoring on various sites.

■ The SD-1 RI is a smart-gas detector for combustible gases. An infrared light sensor makes carbon monoxide (CO) density correction possible.

Another product built on the combined sensor system is the SD-1 RI smart gas detector for combustible gases. RIKEN KEIKI provides an extensive lineup of smart gas detectors which benefit many different types of hazardous sites. This includes oil refineries and petrochemical plants as well as duct, service tunnel and other construction sites in addition to shipping vessels and offshore facilities. This technology has been combined with the OHC-800 to remove carbon monoxide (CO) and other unwanted gases that cannot be monitored with only optisonic operations through infrared light. Error correction in the compositional variations using the density of the carbon monoxide (CO) that is measured achieves an extremely accurate compositional analysis. The combined sensor system enables this type of sophisticated complex monitoring. For example, this performance can even be achieved on sites using steel gas with huge compositional variations, including nitrogen (N2), carbon dioxide (CO2), and carbon monoxide (CO) in addition to primary components of hydrogen (H2) and methane (CH4).

■ Integrated addition calculations enable more complex monitoring. The combined sensor system derives multiplication results.

A combination of a variety of sensors achieves more sophisticated complex monitoring even beyond methanation. The combined sensor system does this by deriving multiplication results, even on sites developing technologies such as electrolysis devices, hydrogen stations, and ammonia fuel engines. These include the LNG vapor gas LEL density monitoring system realized using two different sensors. The first is the FI-8000 optical interferometric gas monitor. The second is the GX-8000 (TYPE LEL) portable gas monitor for combustible gases.

RIKEN KEIKI responds to the needs of various sites using the new combined sensor system. These efforts support the next-generation technological development that contributes to carbon neutrality.

SUSTAINABLE DEVELOPMENT GOALS

The Sustainable Development Goals (SDGs) were adopted at the United Nations Summit held in September 2015. These 17 goals and 169 targets included in the 2030 Agenda for Sustainable Development lay the foundation as an international index in the hope of a better sustainable world by 2030.

CSR REPORT

Active Participation in Carbon Neutral Hydrogen Projects

Membership in the Japan Hydrogen Association

JAPAN HYDROGEN ASSOCIATION

RIKEN KEIKI joined the Japan Hydrogen Association on May 25, 2021. The Japan Hydrogen Association is an organization looking at the entire supply chain. This open cross-industry organization was launched to build a hydrogen society sooner rather than later.

As a company aiming to help realize a carbon neutral society, RIKEN KEIKI will work in the hydrogen field at a global level to form a hydrogen supply chain. These efforts will aim to contribute to the gas sensing and monitoring fields.

7 AFFORDABLE AND CLEAN ENERGY
13 CLIMATE ACTION

We will contribute to the above two SDGs through our membership in the Japan Hydrogen Association.

Co-existence and Co-prosperity Through Partnerships

Declaration of Partnership Building Notice of Corporate Registration

パートナーシップ構築宣言

The prolonged spread of the COVID-19 infection has had a tremendous impact on the economy in Japan. In the midst of this harsh economic environment, there are concerns of a shift toward the same type of business dealings as those done during the global financial crisis in 2008. At the same time, small and medium-sized businesses have not sufficiently rolled out telework programs to limit face-to-face interactions. This challenge has created a need to work with partners to promote telework and establish an EDI*.

To address these challenges, the Council on Promoting Partnership building for Cultivating the Future held its first meeting led by the Cabinet Office on May 18, 2020. The Chairman of Keidanren (Japan Business Federation), Chairman of the Japan Chamber of Commerce and Industry, President of the Japanese Trade Union Confederation (RENGO), and all relevant ministers were all in attendance as council members. At this meeting, the Council agreed to introduce a new Declaration of Partnership Building framework.

The Declaration of Partnership Building is an initiative in which companies declare their own transaction policies across the board from small to large corporate enterprises from an ordering party's point of view. These companies voluntarily declare that they will prioritize efforts on building new partnerships to co-exist and co-proposer across supply chains (corporate partnerships, IT implementation support, expert human resource matching, green procurement, etc.) and complying with promotion standards. RIKEN KEIKI announced its Declaration of Partnership Building on November 2, 2021.

The Declaration of Partnership Building resonates with the RIKEN KEIKI management philosophy to be a pioneer in creating safe working environments for workers as well as with the Sustainability Policy. Our commitment to this declaration aims to co-exist and co-prosper across supply chains by better recognizing the stance of customers and the importance of production management. In order to live up to our commitment, we will further ESG and SDG initiatives in the future.

*An Electronic Data Interchange (EDI) provides a computer-to-computer exchange of contracts, order invoices, and other business documents between companies.

3 GOOD HEALTH AND WELL-BEING
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
17 PARTNERSHIPS FOR THE GOALS

We will contribute to the above five SDGs through our commitment to the Declaration of Partnership Building.

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REPUBLIC OF SINGAPORE

Overseas Representative Report

RK GLOBAL FRONTLINE

Singapore is a relay hub for marine transport in Asia. As a leading company providing gas detectors to marine transport markets in which global shipping companies do business, RKS aims to become RK's Southeast Asia business base through establishing a better position in semiconductor, petrochemical, and EPC markets.

RK INSTRUMENTS (S) PTE LTD.

RIKEN KEIKI established RK INSTRUMENTS (S) PTE LTD. (RKS) in August 1993 as a joint venture with its sales distributor in Singapore. "Singapore is located just off the coast of the far south tip of the long and narrow Malay Peninsula. This island nation is separated from the Malaysian mainland by the Johor Strait." Isao Akahori, appointed President of RKS last year, explained. "Singapore rests on a territory of about 720 km2. This is slightly larger than the 23 wards of Tokyo (approx. 630 km2). Whether Hong Kong, European Nations, or Japan, Singapore is the regional hub in the Asia-Pacific region for companies worldwide. It provides wonderful access to countries in Southeast Asia. It also has developed infrastructure, low corporate taxes, and human resources proficient in the official languages of English, Chinese, and Malay. I think these are the major strengths of Singapore." The fifth report of RK GLOBAL FRONTLINE focuses on Singapore as a magnificent city-state where people, equipment, money, and information gather from around the world. It not only has a clean modern environment but also all the benefits desired by a business.

[Local Reporter]
Isao Akahori
President, RK INSTRUMENTS (S) PTE LTD.

RKS is a leading company selling gas detectors in the marine transport market.

RKS was first established to focus on the marine shipping industry, which is the main industry in Singapore. The company now boasts the top domestic share in sales and maintenance services of portable gas detectors for shipping vessels. As the relay hub for marine transport in Asia, many companies involved in marine shipping vessels have been entering Singapore. This spans from major shipping vessel operators to shipowners, ship management companies, ship equipment manufacturers and shipping brokers. Our customers always need a speedy response due to the nature of dealings with marine shipping companies that manage ships with a limited number of days in port. These could be anything from express product shipments or deployment of maintenance operators for international cargo ships, dry bulk carriers (bulkers), or tankers. That is why RKS secures inventory for a sufficient number of products and maintenance parts. We also employ a large number of service personnel. This is how we have been able to respond to customer needs for such a long time. This is what has differentiated RKS from the numerous competitors entering Singapore. Our maintenance services include repairs and inspections as well as replacement of sensors and filters as consumable parts. These services act as an indispensable product business that supports the stable RKS business management. In addition to products selling, these services are the source of our competitiveness in Singapore.

We are seeing a boom in the sales of fixed gas detectors. Singapore is also being used as a test market for market strategies.

Besides marine transport, RKS is also actively expanding sales activities in the electronics industry, including semiconductor plants, which is a main industry in Singapore, as well as in markets for petrochemical, pharmaceutical, and medical equipment industries. In particular, we will boost efforts that began several years ago to expand sales of fixed gas detectors for semiconductor, petrochemical and other major industries. As a new business model, RKS also plans to enter into the engineering, procurement, and construction (EPC) market to sell fixed gas detectors for new construction and expansions of plants. Many major EPC companies have set up locations in Southeast Asia. The Asian-Pacific region is expected to see high economic growth in the future due to the growing population. A rise is not only foreseen for power, chemical and medical product plants but also new construction projects for plants to respond to a higher energy demand. Right now, we are actively aggregating information about ongoing projects as well as those in the bid-planning stage to promote an even higher number of sales of fixed gas detectors.

Singapore concurrently has large-scale fabrication plants (FAB) for major semiconductor manufactures and foundries from European, American, and Taiwan. Additionally, many petrochemical and other Japanese companies have established local entities on Jurong Island—many of which use RIKEN KEIKI gas detectors. As the center for the petrochemical industry, Singapore government has positioned the Jurong Island as a base for a growth industry transforming the sustainable energy and chemical sectors. Therein, I think RKS needs to focus on information gathering alongside sales activities. These efforts will strive to understand the markets and needs that are expected to grow in the future. Many overseas competitors treat Singapore as a test market for products and market strategies due to its multinational nature. Therefore, these organizations are aggressively developing sales strategies. RKS is also cultivating new energy and other markets. We quickly gather the latest information and customer feedback overseas to share with the headquarters in Japan. This exchange of information aims to play a role in the marketing functions of RIKEN KEIKI as it broadly expands in North America and Europe.

Main Office

Service Team

Storehouse Team

Start of Plans This Year to Build a Foundation for a Southeast Asian Business Hub

One other major goal that we have for the future is the planned setup of a Southeast Asian Hub in Singapore. The first task is for Singapore to take over support of distributors in each country that has been handled by the RIKEN KEIKI headquarters up until now. This requires us to build an organization able to provide this support. There is an enormous amount of work that must be done, including sales and service support. I am very aware that this is a difficult undertaking. To fulfill our role as the Asian Hub as quickly as possible, I would like to actively invest in supervisory functions and build internal systems. At the end of last year, we established a new international department to do just that. This is the first year of the plan to start building this hub. This new system attempts to shift product distribution to four countries: the Philippines, Hong Kong, Indonesia, and Thailand.

We will put dynamic business management that recognizes the local circumstances into practice by establishing supervisory functions as quickly as possible in Southeast Asia. This will expand and secure our market share in Southeast Asia. These bold efforts will aim to solidify business infrastructure that can generate stable sales together with the economic growth of developing countries.

RK INSTRUMENTS (S) PTE LTD.

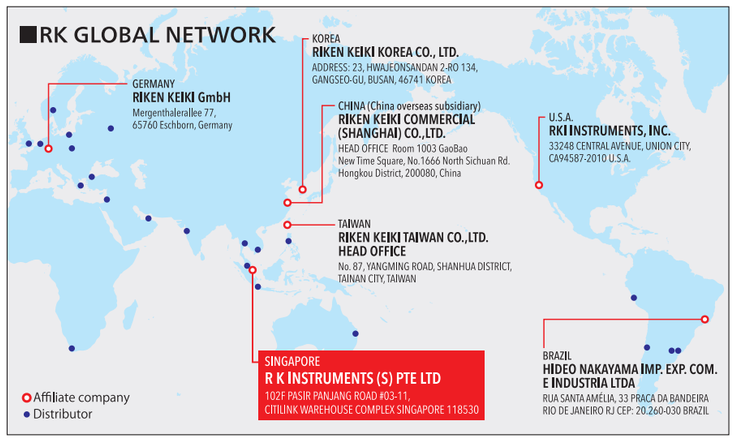
3 FOCUS

1	2	3
Marine	Land	International

COFFEE BREAK

Company Retreat

Once every year, RKS goes on a company retreat with all of its employees and their families. This picture is from the 2019 retreat to the Bintan Island in Indonesia before the COVID-19 pandemic. Everyone is looking forward to the end of the pandemic to enjoy these retreats once again. Our next trip is to Phuket Island in Thailand!!



Tracing Back the History by the Products

RIKEN KEIKI's History #4 as Told by Its Products

1964

Adoption of an Explosion-proof-type Remote Detection System to Enable Remote Operation and Instantaneous Measurement

GP-150 Catalytic Combustion Type Combustible Gas Detector and Alarm

Delivered to TEPCO Yokohama Thermal Power Station

Japan increased the production of coal as the industry key to reconstruction after the war. The industrial structure shifted from light industry to heavy industry with the discovery of large oil fields in the 1950s. The demand and amount of coal production fell off in 1962, which liberalized crude oil imports. This immediately accelerated the transition of energy to oil and LP gas. At the time, RIKEN KEIKI was not at the mercy of this energy revolution. We continued to work to expand our sales channels from chemical plants to electronic, gas, power, machine, ship-building, and construction industries. These efforts gave us the opportunity to eventually establish a firm standing in the power industry. We even received a request for an estimate from TEPCO Yokohama Thermal Power Station, which led to the widespread use of our products at chemical plants.

Specifications and Estimate for the GP-150 Catalytic Combustion Type Combustible Gas Detector and Alarm Packing Revolutionary Performance

The specifications in the estimate request from TEPCO Yokohama Thermal Power Station asked for 16 detection points. The specifications designated the installation of one gas detection alarm panel and one pump. This system had to measure the concentration of gas pulled from 16 detection points to the gas detector and alarm. At the time, RIKEN KEIKI did not have anything like this product. However, this was a critical opportunity to break through the monopoly of other companies fighting to service the needs of TEPCO. Therefore, we created and submitted new specifications for a system equipped with functionality going beyond the request along with the estimate.

The most distinct feature of these specifications was a remote detection combustion gas detector and alarm. A detector was installed at each of the 16 detection points. One indicator alarm panel with the same number of indicator alarm units as detectors was setup in the management office. Each detector was connected to each indicator alarm unit using cables. The detection results from each detector were instantly sent through to the indicator alarm panel through these cables. RIKEN KEIKI won the bid with this estimate. The system enhanced usability and dramatically reduced the more than 10-minute measurement time that it took for a typical pump sampling system. TEPCO also felt it offered the best cost performance with a total estimate of 2 million yen*. This consisted of 1 million yen for the detectors and indicator alarm panel, and 1 million yen for the construction costs. However, the real struggle had not yet begun.

Extremely Difficult Productization, Delivery, and Construction, Costs Way Over Budget, and the Tremendous Earnings that Finally Came

RIKEN KEIKI had cultivated expertise in explosion-proof equipment for coal mines. However, explosion proofing for a large-scale product like the indicator alarm panel was not quite the same. It required an internal pressure explosion-proof construction to increase the internal pressure of the indicator alarm panel. However, the lid did not remain stable when pressure was applied inside such a large indicator alarm panel. Even with the lid firmly sealed, the force of the pressure was enough to repel the lid. It took time to find a solution to this problem, and half a year from order to delivery. The construction was also a larger undertaking than had been expected. Even though the construction used things like cables in the design, RIKEN KEIKI had never done it before. The labor and costs ran way over the initial budget. As a result, the first GP-150 required 2 million yen* to just fabricate the product. This resulted in heavy losses. A former director of the development department appointed by the board described his experience saying, "I visited the President's office to discuss things, but what I talked about was neither apologies nor excuses for the trouble that we were facing."

However, our technical capabilities became widely known due to the development and delivery of the GP-150 to TEPCO. The widespread use of the GP-150 at chemical plants after that earned back the money that was lost on the first GP-150 and contributed greatly to our profitability.

Entry and Sustained Business in the Nuclear Power Market

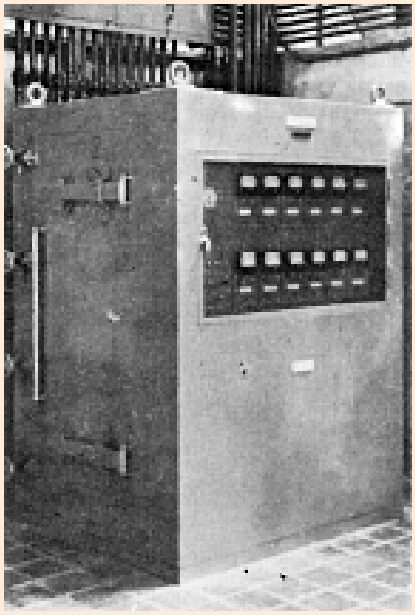
In addition to thermal power stations, RIKEN KEIKI began delivering Pocket Dosimeters and Geiger Counters to nuclear power plants in 1964 as products to measure radiation levels. At the time, RIKEN KEIKI was looking for new businesses to build from its two core products of gas indicators and photo-elasticity apparatuses. Researchers investigating radiation who left RIKEN due to its privatization joined RIKEN KEIKI and began to develop and introduce instruments to measure radiation. RIKEN transferred the patent license for the Pocket Dosimeters to RIKEN KEIKI. As an X-ray measurement instrument, the Pocket Dosimeters was developed for X-ray operators. Sales of these devices focused primarily on medical institutes. However, there was increasing demand for them at nuclear power plants. Employees at nuclear power plants carried Pocket Dosimeters while working on site each day. When these employees returned from the work site, their daily radiation exposure was recorded to guarantee safety. On the other hand, the Geiger Counters measured radiation levels inside of the nuclear power plant. These are the two products from RIKEN KEIKI that nuclear power plants used for safety management.

A large-scale meltdown happened in 1986 at the Chernobyl Nuclear Power Plant in the Ukrainian Soviet Socialist Republic—about 20 years after we released the Geiger Counters. RIKEN KEIKI responded by donating 20 Geiger Counters to the nuclear plant. Soviet Russia had a large number of coal mines and had purchased many gas detectors from RIKEN KEIKI. Although this donation of Geiger Counters was only to show our thanks for their patronage, the company stock saw a sudden unexpected rise. By chance, the name of RIKEN KEIKI became commonplace together with radiation measurement instruments.

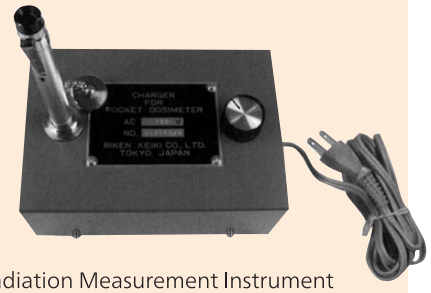
However, no one at that time could have predicted the meltdown 25 years later at the TEPCO Fukushima Daiichi Nuclear Power Plant.

(Series continues in VOL. 6)

*10,000 yen in 1965 is equivalent to approximately 42,000 yen today according to the Bank of Japan. Therefore, 2 million yen at that time would easily be worth more than 8 million yen today.



Combustible Gas Detector and Alarm Developed After the GP-150
(Cited from the 30th Anniversary Newsletter)
*The GP-150 had a hard steel box with a glass window. Unfortunately, no picture exists of it today.



Radiation Measurement Instrument
Pocket Dosimeter with Battery Charger

Radiation Measurement Instrument
Pocket Dosimeter

Geiger Counter

RIKEN KEIKI Co., Ltd.

Creating safe working environments

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