

Preparing for Potential Threats Using IHI's Technologies, Products and Services

Many people are experiencing drastic social and lifestyle changes due to the pandemic of the novel coronavirus (COVID-19) and weather disasters associated with climate change induced by global warming. In the 20 years since 2000, weather disasters have increased by 82% worldwide. Climate change is now a threat to the safety of people around the world regardless of where they live. Now is indeed the time to prepare for potential threats.

As for the threat of the pandemic, we need to mitigate infection risks mainly through enhancing infection prevention practices. Meanwhile, the weather disasters are believed to be attributable to climate change associated with increased concentration of carbon dioxide (CO₂) and other greenhouse gases in the atmosphere. The cause of them lies in the activities of humankind. Therefore, the challenges for us to solve are slowing climate change over a long period of time

and realizing a carbon recycling society by reducing CO₂ emissions. In order to address the threats of natural disasters including weather disasters and earthquakes, it will be necessary to prepare for damage control with safety and prevent and mitigate disasters. Giving examples of the measures, it is required to control river floods, to share and effectively utilize information on water levels and weather, earthquake warnings and information on disaster prevention, to implement seismic base isolation and seismic control, to secure temporary shelters, and to maintain airport functions as the hub of rescue operations for disaster crises.

Think along with us at the IHI Group about how our 18 technologies, products and services may be used to prepare for potential threats. Preparation is the first step to realize a comfortable future society.

Ozone air purifier with HEPA filter for deodorization and disinfection

< IHI Logistics & Machinery Corporation >

The IHI Group has provided for many years medical institutions, public facilities, etc. with many high-performance ozone-related products that are capable of inactivating over 99.99% of bacteria with our ozone generation technologies that use electric discharge. In especially high and increasing demand is the eZ-100, which is a compact type with the same function as the larger type. Therefore, we have reinforced our production system for this product to significantly increase the monthly output to over 1 000 units.

Ozone, or O₃, is a type of gas that occurs when oxygen atoms (O) in the air bind together through chemical reactions. Ozone is highly oxidizing — the second most oxidizing agent after fluorine — and it is six times more effective in disinfection than chlorine. Ozone exists in the natural environment, but it can be formed as needed through electric discharge as well. Because ozone transforms back into oxygen (O₂) through oxidation reactions, disinfection can be performed safely.

Our ozone air purifiers with the function of deodorizers and disinfectors (with HEPA filters), including the eZ-100, of which 15 000 units have been delivered, effectively filter



Ozone Air Clear eZ-100

the air, decompose and remove viruses, deodorize the air and collect dust from the air. In air cleaner mode, the device sucks in the air from the room, disinfecting, deodorizing and removing dust from it with ozone and the high-performance multi-layered filters. The bacteria trapped by the filters are decomposed and removed by ozone to clean the inside of the device and prevent secondary contaminations. Once processed, the ozone in the air transforms into oxygen inside the device, clean air being released back into the room. This circulation keeps the air in the room clean.

[#CleanEnvironment](#)

Solutions for medical service providers

< IHI Logistics & Machinery Corporation >

The IHI Group supports medical service providers by providing various environmental sanitary machines developed by utilizing our ozone generation technologies using electric discharge. Nowadays, endoscopes are commonly used for various organs to find, examine and treat diseases because such approaches are considered to be less damaging to patients than other alternatives. Ozone Endoscope Disinfectant, which has received pharmaceutical approval from the Ministry of Health, Labour and Welfare, is used for washing and disinfection of endoscopes as a means to prevent infections. Conventionally in Japan, several types of gas disinfection methods were applied to bedding, which is considered to be a possible source of infection in hospitals, but such approaches are associated with exposure to carcinogens. Since the law revision in 2007 introduced disinfection methods using ozone, ozone disinfection has become more common, as it is a safer, easier approach that has been proven to be effective and that is free of residual toxicity.

Not only in medical facilities but also in various other facilities such as nursing homes, schools, commercial facilities, Simplified Negative Pressure Isolation Tents enable to easily set up an environment that is identical to those of the negative pressure isolation rooms for hospitals

that are compliant with the following parts of CDC (Centers for Disease Control and Prevention) guidelines: pressure differentials and air changes per hour for airborne infection isolation (AII). Moreover, our slipper sterilization dispenser has become a popular product amid efforts to prevent virus from spreading. We help medical service providers keep a clean environment.

[#CleanEnvironment](#)



Slipper sterilization dispenser

A highly effective anti-bacterial spray produced using fine bubble technology that is friendly to the human body and the environment

< IHI Logistics & Machinery Corporation >



Re:Clear

The ozone anti-bacterial spray “Re:Clear” is water that contains a super high concentration of ozone that has been decomposed using IHI’s unique fine bubble technology. Because this highly disinfectant spray can be stored in a plastic bottle, it can be used anytime and anywhere. Unlike alcohol or conventional chlorine-based disinfectants, this anti-bacterial spray is gentle to skin. In addition to being free of pungent odor, this product leaves little residue, so it is unlikely to cause corrosion, allowing it to be used anywhere. This spray can be disposed of easily because it transforms back into water after reacting with viruses and bacteria.

Being highly effective for disinfecting various microorganisms, such as general bacteria, fungi, viruses including the novel coronavirus and spores, this product helps ensure cleanliness and safety for medical facilities, ambulances, nursing vehicles, taxis, hotels, etc.

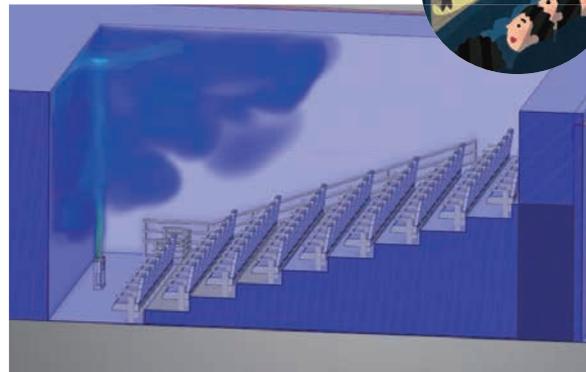
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Ventilation effect visualization service utilizing real-time thermal fluid simulation technology

< IHI Corporation >

The IHI Group can visualize air flows and the invisible effects of ventilation easily in real time by combining our thermal fluid analysis and digital technologies. Our real-time thermal fluid simulation technology makes it possible to give advice on how to improve ventilation and create a clean space by using our disinfection systems.

The IHI Group utilizes our thermal fluid analysis technology for the development and design of a wide range of products including aircraft engines, turbochargers, energy and environmental equipment, and transportation systems. Taking a look at an example of new transportation systems, which are used as a means of mobility in cities and airports in many countries, our air conditioning thermal fluid analysis has made it possible to achieve a good balance between creating a large comfortable internal space with minimum vehicle design modification and optimizing internal cooling, heating, and ventilation.



Simulation of air flows and ozone concentrations in a theater

The IHI Group will help customers create environments where many people can safely get together for various purposes such as shelters, medical facilities, trains, offices, performance and movie theaters, and public facilities.

#CleanEnvironment

Toward the solution of the climate change problem by reducing CO₂ emissions and realization of a carbon recycling society

< IHI Corporation >

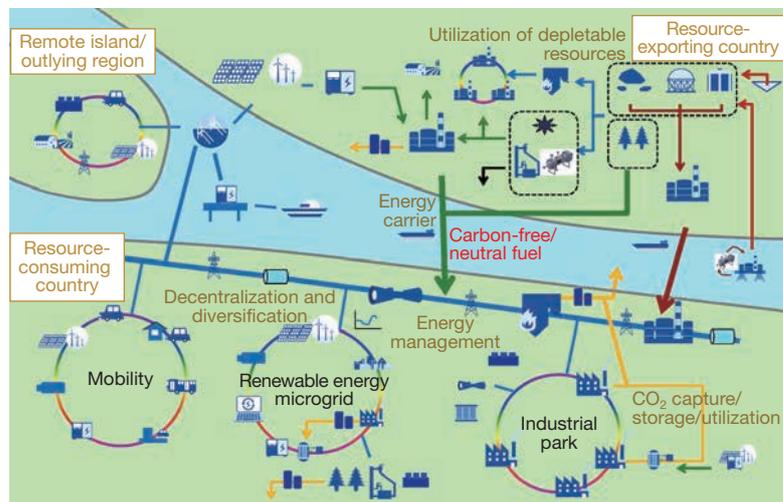
Focusing on carbon dioxide (CO₂) in addressing climate change as it accounts for the large portion of the greenhouse gas, the IHI Group is working on various projects for reducing CO₂ emissions. For example, for existing power plants that are in stable operation, we are working with customers to achieve sophisticated load change operation in order to meet increases in renewable energy-based power generation and reducing CO₂ emissions by usage of biomass and ammonia fuel.

The IHI Group ultimately intends to create a social system capable of carbon recycling through our technology in order to eliminate CO₂ emissions. We are trying not only to use energy sources that generate a relatively small amount of CO₂, but also to maintain the generated CO₂ inside the system to prevent its discharge into the environment. For this purpose, we are developing applicable technologies such as energy optimization, energy storage, CO₂ capture, and conversion of CO₂ into valuable products (conversion into basic chemicals, such as olefins, and methane). Hydrogen produced by renewable energy and synthesized chemicals derived from captured CO₂ are raw materials for carbon neutrality, which means that carbon can be recycled. Regarding hydrogen application, we

are also working on the development of technologies to utilize ammonia, which is an energy carrier that is less expensive and easier to transport and store than hydrogen itself. Ammonia can be fired directly with standard firing equipment and can be applied for various systems as a carbon-free fuel.

The IHI Group will continue to tackle the climate change problem by reducing CO₂ emissions and realize a carbon recycling society by making maximum use of our existing expertise and newly developed technologies in cooperation with customers.

#ClimateChange #GreenhouseGas
#CO2EmissionReduction

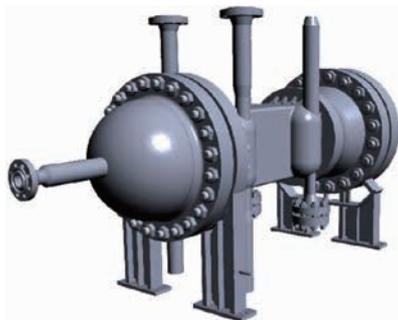


Conceptual image of a future energy project

Compact reactor for efficient hydrogen production

< IHI Corporation >

The world is undergoing a dramatic transformation into a smart society supported by optimized local production for local consumption, in order to avoid overproduction and become more disaster resilient. The IHI Group has developed a compact reactor which is a small, efficient reactor suitable for optimized production and capable of reducing carbon dioxide (CO₂) emissions. By applying the micro reactor (ideal reaction occurring in channels ranging in width from tens of micrometers to several millimeters) principle and combining it with our state-of-the-art manufacturing



Compact reactor

technology, it is now possible to establish a system capable of efficiently manufacturing the same amount of products by use of a reactor only one-tenth the size of a conventional one.

Development efforts are already underway for application to various chemical production processes. The first application of the compact reactor is expected to be the hydrogen manufacturing process. By downsizing the reactor, a key component of a production system (plant), and improving reactor efficiency, the production system footprint and transportation and construction costs incurred by plant installation can be reduced, so that production systems can be installed in places that are not suitable for conventional ones. For example, hydrogen is difficult to handle and transport, but the necessity for transportation and bothersome handling can be eliminated by installing the compact reactor-based production system in a consuming region for efficient production. This will contribute to the creation of a smart society where energy is locally and independently produced for local consumption and CO₂ emissions are reduced.

The IHI Group will continue to develop new energy infrastructure and explore ways to create a CO₂-free and recycling-oriented society in cooperation with the most suitable partners and customers by making full use of our technologies.

#ClimateChange #GreenhouseGas
#CO2EmissionReduction

Bio-jet fuel produced from microalgae for reducing CO₂ emissions from aircraft

< IHI Corporation >

Biofuel manufactured by extracting oil contained in a genus of microalgae, which grows by absorbing solar energy and carbon dioxide (CO₂), is drawing attention as a new source of energy to replace fossil fuels. Because its oil yield is much higher than those of other plants such as soybeans and palm and its utilization does not affect food supply, that species of microalgae is a promising sustainable energy source needed to achieve a CO₂-free, recycling-oriented society.

Drawing on its track record in the fields of water treatment and bio plant development, IHI Corporation set out in 2011 to develop bio-jet fuel produced from microalgae (Hyper-Growth *Botryococcus braunii* owned by GGT Corporation) by taking advantage of the opportunity provided by a project commissioned by the New Energy and Industrial Technology Development Organization (NEDO), a national research and development organization. The entire production process is being field-tested at a pilot plant built in Thailand with the aim of stable production through efforts including cultivation process and breed improvement.

In view of the International Air Transport Association's (IATA) ambitious goal of halving CO₂ emissions from aircraft by 2050, bio-jet fuel is said to be the most promising solution. In May 2020, the ASTM international certification was granted, and, in June 2021, ASTM-conforming bio-jet fuel was supplied to regularly flown aircraft departing from Tokyo International Airport.

Taking up the challenge of biofuel commercialization, IHI continues to contribute to the realization of a CO₂-free, recycling-oriented society.

#ClimateChange #GreenhouseGas
#CO2EmissionReduction



Steps in algal biofuel production

Water level gauges for flood crisis management

< MEISEI ELECTRIC CO., LTD. >

In order to make effective use of invaluable water resources and contribute to disaster prevention, MEISEI ELECTRIC CO., LTD. offers a full range of water management products to cover entire river systems from the uppermost reaches of mountain streams to the lowermost reaches of rivers.

A water level gauge for flood crisis management, which we offer under the name of 3L Water Level Gauge, is a low-cost water level gauge designed specifically for the water level observation of flooding rivers. To improve and refine river management and disaster response, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) is promoting the use of water level gauges in relatively small rivers by utilizing IoT and other advanced technologies. Detailed water level information can be collected by installing water level gauges in thus far ungauged, relatively small rivers. In normal times, a water level gauge for flood crisis management measures the water level at 10-minute intervals (monitoring mode). If the level specified by the river administrator is exceeded, the gauge switches to observation mode. In observation mode, water level data is transmitted to the cloud every 10 minutes. Water level data can be viewed on the cloud, and the water level gauge is maintenance-free (capable of running for

longer than 5 years without depending on an external power supply), compact (easy to install), and inexpensive (low initial and management costs). In Japan, water level observation data collected from rivers across the country are available on the MLIT website, and the data is used for evacuation activities in the event of heavy rain or flood.

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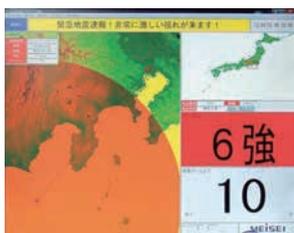
Water level gauge for flood crisis management

Earthquake early warning receivers

< MEISEI ELECTRIC CO., LTD. >

If we know that an earthquake will occur several seconds later, we can prepare for the strong shaking. For example, given a few seconds, we can prepare ourselves by getting under a desk to protect ourselves from falling objects, turning off the heater to prevent a fire, or opening a door or window to secure an escape route. This is why an earthquake early warning system has been established in Japan, one of the most earthquake-prone countries in the world. The two types of QCAST[®] series receivers are highly reliable earthquake early warning receivers of proven performance designed to protect people's lives and livelihoods from the threat of sudden strong earthquakes. These receivers are used at many facilities including airports, large facilities where many people gather, and public facilities.

The two receiver units receive earthquake early warning



QCAST[®] series receiver monitor screen and the receiver unit

information distributed by the Japan Meteorological Agency before shaking occurs to mitigate earthquake-induced damage and suffering. Seismic intensity and the time until shaking starts (estimated time until the arrival of an S-wave) at a particular location are estimated from the latitude and longitude of the installation site and the amplification factor (a numerical value indicating how easily the ground can shake) at that site. One of the two receiver units is capable of displaying animated data on a map and outputting voice messages from the speaker according to the estimated seismic intensity. Seismic intensity and the time until the arrival of an S-wave at up to 200 locations can be estimated. The other receiver unit is capable of alerting people by issuing voice messages (by using a public address system) and stopping various devices and equipment (e.g., elevators) by using contact output signals. In Japan, there are already established systems for broadcasting announced information via television, mobile phone, and other information networks, but our earthquake early warning receivers can be used to distribute location-specific estimates. Because both receiver units have an evacuation drill mode, they can be used for emergency response and evacuation drills to better prepare for earthquakes.

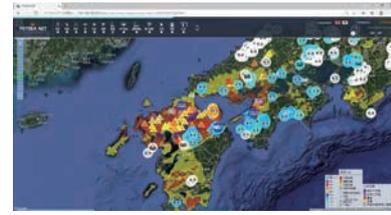
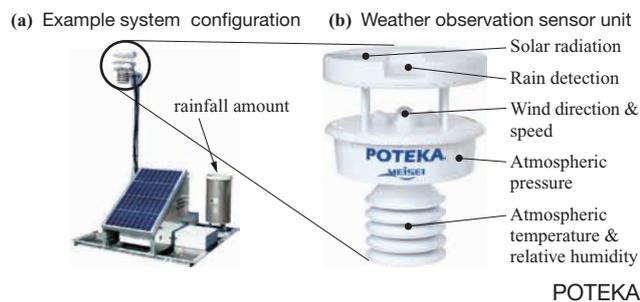
MEISEI ELECTRIC's early and predictive earthquake detection technology protects people from the threat of sudden earthquakes.

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High density weather observation system and information service

< MEISEI ELECTRIC CO., LTD. >

MEISEI ELECTRIC's meteorological observation systems including the Automated Meteorological Data Acquisition System (also known as AMeDAS in Japan) are used extensively for the observation of meteorological conditions at different altitudes from high up in the atmosphere to the surface of the earth. POTEKA is a compact, lightweight, and energy-efficient meteorological information instrument equipped with seven types of sensors (atmospheric temperature, atmospheric pressure, relative humidity, wind direction and speed, solar radiation, rain detection, rainfall amount) to meet varying needs of not only the general public but also specialized users. It is capable of telecommunication by using the mobile phone network and



POTEKA NET

can be installed easily at any location. By installing many POTEKA units in an area of meteorological importance, highly accurate location-specific meteorological information can be made available on the Internet any time from any place. POTEKA NET is a high-density weather observation and information service that delivers up-to-the-minute meteorological observation data sent from POTEKA, together with meteorological and disaster prevention information released by public institutions such as Japan Meteorological Agency, in real time.

POTEKA, which can be installed at any place where meteorological observation is needed, enables local residents to fully prepare themselves for the threat of natural disasters by collecting and analyzing location-specific meteorological information and providing meteorological data and meteorological and disaster prevention information through POTEKA NET.

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Linear motor active mass damper

< IHI Infrastructure Systems Co., Ltd. >

A linear motor active mass damper is a device for reducing wind-induced motion and earthquake-induced motion of a tall building such as a high-rise building or an air traffic control tower. The damper reduces motion by exerting a force in the direction opposite the external force acting on the building with the force of inertia generated by a weight. The use of a linear motor as the source of motive power allows the device to be lightweight and compact because the weight can be downsized by maximizing the stroke. The linear motor active mass damper, therefore, reduces the load on the building and makes for more effective use of space. Expansion of the mass stroke allowed the damper to be used to deal with long-term ground motion and a horizontal acceleration of up to 300 Gal. Because of its divisible structure, the damper system can be installed in existing buildings and not just new buildings.

Since the installation of the first device in 2013, linear motor active mass dampers have been installed in many buildings around the world, and the damper won an excellent product award of the Japan Society of Mechanical Engineers in 2015 and a technology award of the Japan Association for Vibration Technologies in June 2020. At present, linear motor active mass damper technology is used for a wide



Linear motor active mass damper

range of structures including high-rise buildings, air traffic control towers, and ships. The technology was first developed as a vibration control technology in the field of bridge construction, one of our specialties, specifically to reduce the motion of a suspended bridge tower under construction. As a team of experts in vibration control, we protect people from the threat of sudden earthquakes.

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Seismically isolated and vibrationally controlled storage

< IHI Logistics & Machinery Corporation >

IHI Logistics & Machinery Corporation's automated storage and retrieval systems (AS/RSs) feature "fast and smooth" control that enables gentle yet quick stacker crane acceleration up to its highest speed with the aid of originally designed vibration control software. The seismically isolated and vibrationally controlled AS/RSs ensure stable operation even in the event of an earthquake. The vibrationally controlled AS/RS is equipped on top of the rack with passive mass dampers developed jointly with IHI Infrastructure Systems Co., Ltd.,



Exterior view of seismic isolation AS/RS at downward angle

and the weight of the mass damper effectively reduces shaking by moving in the direction opposite the earthquake motion. The seismically isolated AS/RS uses seismic isolation devices, called slide bearings, installed under the rack to isolate the rack from the building so that earthquake motion is not transmitted to the rack. In 2018, IHI Logistics & Machinery delivered a large seismically isolated AS/RS for a food distribution warehouse, which was one of the largest of its kind in the industry. When a strong earthquake with a maximum acceleration of 313.7 cm/s^2 , which would cause the goods stored in the upper of the rack to collapse or fall, hit the northern Osaka region in June of the same year, the AS/RS successfully prevented the stored goods from falling and the pallets from being displaced. As a result, the AS/RS was highly praised by the customer.

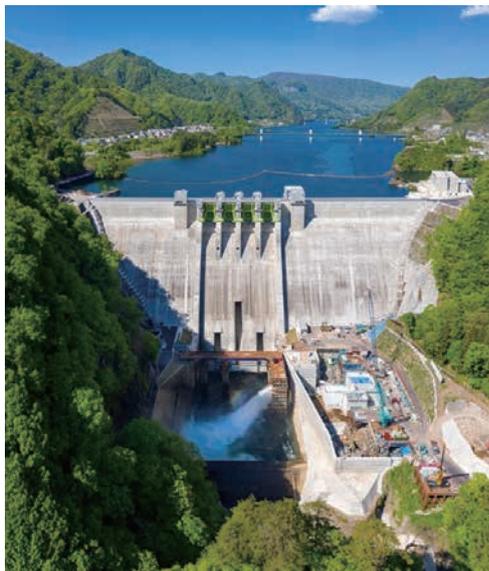
IHI Logistics & Machinery is a one-stop logistics product manufacturer that has delivered 296 vibration control devices (passive mass dampers) and 208 seismic isolation units (slide bearings). Drawing on the accumulated experience and know-how gained in a variety of fields of activity such as logistics centers and warehouses, we will continue to provide customer-optimized logistics solutions in order to help customers better prepare for the threat of earthquakes by effectively combining hardware and software technologies and pursuing cost reduction and reliability enhancement in logistics and physical distribution.

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Dam gates for downstream flood control

< IHI Infrastructure Systems Co., Ltd. >

IHI Infrastructure Systems Co., Ltd. is Japan's leading manufacturer of water gates for rivers and dams that provides integrated services ranging from production, to installment,



Dam gate

inspections, maintenance and update. We contribute to water utilization and flood control projects not only in Japan but also overseas, mainly in Southeast Asia.

The conduit gate is a type of dam gate for downstream flood control. This type of gate is installed in the dam body and plays a key role in controlling floods to protect people from flood and landslide damage. In the beginning stage of a flood, the spillway gate keeps the reservoir water level low by directly releasing the inflow downstream. At the peak of the flood, the gate adjusts outflow discharge, keeping outflow discharge less than that of the inflow to store water in the dam and prevent flooding downstream. When Typhoon Hagibis hit Japan in October 2019 and caused enormous damage, this solution helped significantly mitigate the flood damage in the Tokyo Metropolitan Area.

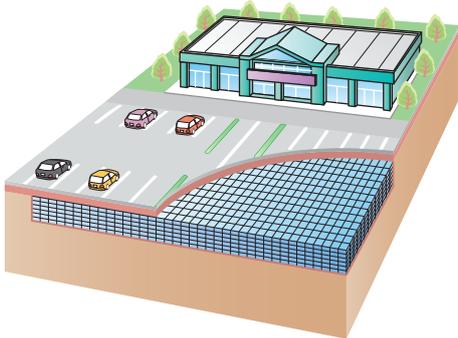
Meanwhile, lakes newly formed by these dams and the nearby attractions are expected to attract many tourists. The IHI Group is committed to continue developing water gates that create a harmony of tranquility, flow, elegance and beauty with the surrounding scenery and to update aging dams by utilizing our technologies in order to promote the reinforcement of infrastructure and regional vitalization, while ensuring that our water gates will protect society from natural disasters as guardians of safety and security.

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Rainwater storage and infiltration tanks to protect cities from torrential rain

< IHI Infrastructure Systems Co., Ltd. >

In the last 100 years, the global average temperature has risen by 0.68°C, and the average temperature in Japan has risen by 1.15°C. Under the influence of climate change, high-intensity rainfall events have increased in recent years, triggering damaging floods mainly in urban areas. Increases in rainfall amount are aggravating risks associated with flood control. If torrential rain exceeding an hourly rainfall of 100 mm occurs in Japan, rainwater flows into sewer systems and rivers in a short period of time. And if the discharge



Conceptual image of rainwater storage and infiltration tanks



Example of a GEOCUBE installation

capacity of rivers is exceeded, flood damage occurs in the areas along the lower reaches of the rivers.

To mitigate such damage in urban areas, we have developed an underground rainwater storage and infiltration tank (GEOCUBE) made of plastic that also enables the utilization of stored rainwater. In 2012, GEOCUBE was certified to satisfy all of the technological evaluation items required by the Association for Rainwater Storage and Infiltration Technology, and our tanks have been installed in the ground under various facilities including parks, school playgrounds, convenience stores, and parking lots of commercial facilities. GEOCUBE is designed to meet structural safety, earthquake resistance, and long-term durability requirements, but it has

a simple structure and is easy to install. Although GEOCUBE is an underground facility, it can be provided with an opening for easy access for maintenance activities such as inspection and cleaning.

IHI Infrastructure Systems will continue to provide safety and security to people in urban areas in order to help them better prepare for the threat of natural disasters.

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Drive-in multistory parking lot as a temporary community shelter

< IHI Transport Machinery Co., Ltd. >

IHI Transport Machinery Co., Ltd., Japan's leading manufacturer of parking systems with years of experience and expertise, has developed drive-in multistory parking lots that excel in space efficiency and ease of use. These are then combined with other types of facilities, such as shopping centers, multi-unit dwellings, hospitals, and game halls, enhancing urban city functionality. In November 2016, the Minister of Land, Infrastructure, Transport and Tourism designated one of our drive-in multistory parking lots as an initial emergency response facility in the event of a disaster equipped with an emergency supply storage warehouse. As a basic rule, the drive-in multistory parking lot must be designed as an open structure without exterior walls to ensure that smoke accumulation could be prevented in the event of a fire. The structure is also highly resistant to tsunami and floods as water could pass through openings without applying much pressure to the main structure. With these features, the parking lot can be used as a temporary shelter for locals. In fact, there are a growing number of cases where a local government and a private business entity conclude an emergency cooperation agreement so that a drive-in multistory parking lot can be made available as a

temporary shelter in the event of a flood. With the increase of such cases, the importance of this type of parking lots has become highly recognized.

We will continue to expand the functions of the drive-in multistory parking lot so that it can also serve as an electric power supply facility, a logistics base, and other useful facilities as part of the regional infrastructure, in order to contribute to disaster prevention and mitigation and hence make life more comfortable to everyone.

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Drive-in multistory parking lot

Emergency air traffic control tower system

< MEISEI ELECTRIC CO., LTD. >

In order to ensure safe takeoff and landing of aircraft, telecommunication equipment and weather observation facilities play an important role in helping air traffic controllers who need to inform aircraft pilots of air and ground traffic and meteorological conditions. If an air traffic control tower is rendered inoperable and its restoration is expected to take a long time in the event of an emergency, a transportable emergency air traffic control tower system that can perform the same function is used. In an emergency, an



Emergency air traffic control tower system deployed for operation

airport is to serve as a key facility for rescue and life-saving activities and must be capable of supporting aircraft operation in order to handle the transportation of emergency supplies and personnel. In such cases, there is a need for an emergency air traffic control tower system. We offer the system named Compact Tower.

When the Great East Japan Earthquake occurred on March 11, 2011, the tsunami caused by the earthquake inflicted devastating damage on Sendai Airport. The airport was temporarily closed, and it was said that its restoration would take more than six months. However, in cooperation with the organizations concerned including governmental organizations, the airport resumed air traffic control activities approximately 20 days after the earthquake by using an emergency air traffic control tower system, and commercial airliner operation was resumed approximately one month after the earthquake. The systems have been delivered to Fukuoka Airport and Osaka International Airport in addition to Tokyo International Airport, and these systems are kept ready for use at those and other airports in Japan.

In order to better prepare for the threat of natural disasters, MEISEI ELECTRIC CO., LTD makes effective use of our accumulated experience and know-how in helping to maintain the functions of emergency rescue and life-saving facilities and ensure air traffic safety in an emergency.

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Rotary snowplows

< Niigata Transys Co., Ltd. >

Snowplows are deployed in snowy regions in Japan to keep road traffic smooth and safe even in winter. For example, rotary snowplows are regularly in action on the Tateyama-Kurobe Alpine Route (located between Toyama Prefecture and Nagano Prefecture, where it snows a lot), one of the most famous tourist attractions in Japan, and at many airports in Japan including Narita International Airport. In Japan, where there are some of the snowiest regions in the world, once it begins snowing, deicer sprayers are mobilized, and if a certain amount of snow accumulates, snow removing trucks and snow graders push the snow to the roadsides. The snow thus accumulated along the roadsides, however, gradually makes the roadway narrower to the extent of obstructing road traffic. Rotary snowplows are used, therefore, to cut away the high mounds of snow with a rotating auger and throw the snow with a blower to keep the lanes open. In cases where it is not possible to throw the snow far enough away such as when removing snow in a built-up area, the snow is loaded onto trucks and hauled away. The most notable characteristic of rotary snowplows is their snow clearing capacity. The capacity of an NR303 rotary snowplows is 2 990 t/h and its maximum throwing distance is more than 45 m. If, therefore, the snow depth on



Rotary snowplow

a 2.6 m wide road is 1.5 m, then snow removal over a distance of up to 1.9 km is possible in an hour.

Under the influence of climate change due to global warming, record-breaking snowfall events have increased in recent years. There is concern, therefore, about the possible occurrence of traffic congestion and slip accidents on expressways and arterial roads. Rotary snowplows and their operators are ready to respond to the call of duty in order to fight heavy snow and maintain security and safety in snowy regions.

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Power systems for emergency generators and pumps

< IHI Power Systems Co., Ltd. >

In the event of a power outage caused by natural disasters such as earthquakes, typhoons, or localized heavy rain, emergency power generators driven by diesel engines or gas turbines can be used to supply electric power. Many offices, hospitals, government buildings, and public facilities are equipped with such emergency generators, and they support our daily activities, ready for action when we need them. At drainage pump stations and river pump stations, products of IHI Power Systems Co., Ltd. are used to drive drainage pumps in order to control the river water level and help prevent overbank flooding.

In recent years, customers have become increasingly more aware of the importance of BCP (Business Continuity Plan). To meet varying customer needs, we have added to our product lineup dual-fuel gas turbine generators capable of running for many hours by using gas fuel in addition to liquid fuels such as kerosene and diesel oil. As a standard feature, our emergency gas turbines have a 40-second restart function that enables instant response to power interruption following power supply recovery, in order to maintain security and safety and better prepare for the threat of natural disasters.

By taking advantage of our accumulated know-how and unique technologies, we will continue to meet the expectations of society associated with life cycle needs with our products and services designed to supply energy stably and produce energy best-suited to the environment with the aim of preventing and mitigating damage and making life better for everyone.

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2 000 kVA emergency gas turbine generator

Inquiries:

IHI Logistics & Machinery Corporation
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MEISEI ELECTRIC CO., LTD.
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IHI Infrastructure Systems Co., Ltd.
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IHI Transport Machinery Co., Ltd.
<http://www.iuk.co.jp/english/>

Niigata Transys Co., Ltd.
<http://www.niigata-transys.com/en/index.html>

IHI Power Systems Co., Ltd.
<https://www.ihi.co.jp/ips/english/index.html>

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