New contents are exhibited one after another

Kawasaki Yoake Project

Yoake, or sunrise — the start of a new day and the embodiment of all of our hopes and dreams. Sunrise has the power to wake our hearts.

Kawasaki strives to emulate the sunrise’s role in arising potential power throughout the world.

Through the “Yoake Project,” we will introduce Kawasaki’s endeavors to be a force for expanding the potential of society.

Scope
Kawasaki Heavy Industries Quarterly Newsletter

No. 102  Winter 2015

Project K
This footage offers viewers a look into the story of how Kawasaki and its customers have opened up new possibilities for people around the world by tackling some of the problems facing the world.

Inside K
This footage introduces Kawasaki’s technologies that empower the people, companies and societies around the world tackling various challenges, helping them open up new possibilities. Take a look at these technological breakthroughs as well as the thoughts of the people who have created them, against the backdrop of Kawasaki’s factories.

Special Feature
Kawasaki Motorcycle Spec Is 10 Years Ahead of Its Time

www.khi.co.jp/english/yoake

Kawasaki Heavy Industries, Ltd.
Kawasaki Motorcycle Spec Is 10 Years Ahead of Its Time

Winter 2015 No. 102
Kawasaki Heavy Industries Quarterly Newsletter

Scope
Winter 2015
No. 102

Contents
2 Special Feature
Kawasaki Motorcycle
Spec Is 10 Years Ahead of Its Time

8 Epoch Maker
Industrial Robots

10 Zi Cone Crusher
High-Efficiency Cone Crusher

12 Interviews with Today’s Pioneers
Ken Noguchi

14 HOT TOPICS

Special Feature

2007
Ninja H2R: First Mass-Production Model with Supercharged Engine

It has been 30 years since the arrival of the Ninja caused a revolution in the world of motorcycles. In this anniversary year Kawasaki confronts the world with new innovation. It is the Ninja H2R.

“What would we make if we could design any motorcycle without restrictions?” The answer the development team reached is to “realize a spec which is 10 years ahead of its time.” That motorcycle is the Ninja H2R.

The 1,000 cc four-cylinder engine with a supercharger, the world’s first for a production motorcycle, delivers unparalleled acceleration from its enormous power of 300 ps, and maximum speed that easily exceeds 300 km/h. The chassis, which must take on this immense power, uses a short wheelbase to produce good handling in turns and ensures stability at high speeds by adopting a small-diameter steel pipe frame to raise turbulence convergence. Development team rider Shigeru Yamashita, foreman of a product evaluation division at KHI Corporation, spoke of the intense feeling of acceleration: “This is the fastest thing I’ve ever ridden. You get the feeling of being launched forward, even at 300 km/h. About providing both high speed and stability, he added. “The chassis behavior is extremely stable. It has dickle leaning characteristics; you can take your hands off the handlebars in a constant turn and the machine will keep the line without any tremor. You feel secure ground contact even at an extra high speed of 330 km/h or more, so the handling is entirely direct.”

The Ninja H2R is a motorcycle that can be said to combine craftsmanship with unique technologies that jump the fences in the Kawasaki Group. The intense power inducing supercharger was studied and designed by power plant engineers using gas turbine technology.

Kawasaki Motorcycle
Spec Is 10 Years Ahead of Its Time

Kawasaki is once again bringing out a new legend: the Ninja H2R. Not bound by convention, Kawasaki continually innovates to create a paradigm shift. What is the essence of the Kawasaki motorcycle business that continues to meet the world’s expectations for the brand?

The Ninja H2R crowned with the River Mark emblem. Shigeru Yamashita is employed as the development rider for the Ninja H2R. In order to test the pipe frames with various diameters and plate thicknesses in millimeter units, and to produce a better sensation of direct handling, Yamaha used its entire body as a sensor to aid in improvement. “The direct handling feels like your body has been integrated with a socket, so there is rich assist stability even at over 320 km/h. This is something I can approve.”
In the world today, new motorcycles are developed with a focus on environmental performance, which means improvement of fuel economy. The newly developed supercharged engine was born from a process that aimed to establish both fuel economy and high power output. This is due to the development philosophy that places a strong product at its center. The focus is not on low-priced high-volume products like mopeds and scooters, but on high-performance premium motorcycles. The company creates strong products overflowing with the kind of originality that other manufacturers cannot copy, which are talked about and attract customers through their uniqueness. This is the reason why owning a “Kawasaki” becomes a source of great joy and pride. Actually, the motorcycle business is the only Kawasaki business targeted to ordinary consumers. For this reason, in the middle of the 1960s, when severe sales competition arose, it was rumored that Kawasaki would leave the business. The Z1, which came out in 1972, was the product that broke through that adversity and showed the possibilities of the motorcycle business as well as the company’s development philosophy. At that time, the company adopted a four-cylinder DOHC engine (500 cc), which had been used only in race bikes, in a production motorcycle. This opened a new era in the world of motorcycles. In the internal discussion of engineers, there were often heated arguments such as “We will not survive unless we create the world’s best,” and “Horsepower, maximum speed, and quarter mile acceleration these are what should identify Kawasaki.”

In 1984, the first generation Ninja GPz900R came on the scene. A ninja boom in the United States at the time became the inspiration for the naming, and unrivaled performance attracted riders around the world with adoption of a side case chain with the DOHC four-cylinder water-cooled engine, a diamond frame that integrated with the engine, and a special cowling with a superior aerodynamic performance. The next innovation that shocked the technology. In addition, aircraft wing aerodynamics were incorporated into the front wings to suppress lifting of the front wheel at high speed travel. Learning from gas engine technology, suppression of knocking is provided by a novel combustion chamber shape not used before. Persistence Inherited from the Z1. Placing a Strong Product in the Middle

Kawasaki is a broad-based equipment manufacturer, but not a few people think of “Kawasaki” as a motorcycle manufacturer. In the motorcycle world, the name Kawasaki has such a strong presence. Ichi, who designed the Ninja H2R, also became an impetus that eventually launched him on a career as a motorcycle engineer. “Now, the motorcycles of this generation Ninja H2R/H2R that I designed have been sold around the world with a paradigm shift was the Ninja 250R in 2008. The 250 cc class is an entry model in matured countries, although in developing countries it is positioned as a premium model, but this bike became a strategic product for the whole world, due to its quality and performance that exceeded the class.”

The Ninja became a much sought-after item for motorcycle fans around the world. Some even got a license just so that they could ride a Ninja. In Japan, where the average age of a new motorcycle owner is 51, the Ninja 250R corralled 70% of its new owners in their 30s and younger. It has an appeal that consistently attracts people. The bike is manufactured at a factory in Thailand, which helped reduce the sales price to under ¥500,000, and this pricing proved to be a highly successful marketing approach.

Ichi, who designed the Ninja H2R, also had a yearning for the Ninja, which became an impetus that eventually launched him on a career as a motorcycle engineer. “Now, the motorcycles of this company are known for their characteristic Kawasaki lime green, but back then the lime green color was considered an unlucky color in the western world. We will never forget the spirit of challenge shown by Kawasaki engineers in the late 1960s, when they joined international races by boldly using the lime green color,” he said.

Famous Bikes

Kawasaki lime green, but back then the lime green color was considered an unlucky color in the western world. We will never forget the spirit of challenge shown by Kawasaki engineers in the late 1960s, when they joined international races by boldly using the lime green color. Kawasaki Z1

Ninja/GPz900R

Ninja 250R

Ninja H2/H2R

Competing with European Manufacturers

Eyes Set on Top Status with Brand Power and Design Quality

Worldwide motorcycle production, including mopeds and scooters, greatly fell due to the Lehman shock. Subsequently, signs of recovery started to be seen mainly in developing countries, and our motorcycle production expanded 60 million units worldwide for the first time in 2011. Kawasaki motorcycles are deployed with a focus on mid-size to large models, and while the production volume is not on the scale of a large manufacturer, we are proud of our top-level branding in the mid-size and large motorcycles segment. In particular, Kawasaki pulls the most weight as a motorcycle brand in developing countries, and with this being the case, we take much pride in our accomplishments.

Our rivals are not manufacturers who produce mopeds and scooters but, the manufacturers in Europe who gain support for their designs and branding power. By placing ourselves on a stage of competition completely different from that of other Japanese manufacturers, we focus on delivering maximum enjoyment to customers with our strong line of products. From this point on, I want to pour our efforts into activities that will let more people, especially people of the younger generation, come to know the “Fun to Ride.” I do not want to simply make and sell, but to convey to many people, through activities that include safe riding training, the joys of riding a Kawasaki.
In the motorcycle business at Kawasaki, the words “product appeal” and “marketability” are used separately. Product appeal is the power to acquire customers by offering product attributes that can be understood as superior to those of other companies before a customer purchases a product. The development philosophy manifested in paradigm shifts or DNA is also found in product appeal. On the other hand, marketability is the power to foster buyers who intend to repeatedly purchase the same brand by offering product attributes that can be understood as superior to those of other companies after the customer purchases a product. There are key factors like performance, quality, and ease of maintenance, but what should not be missed at this point are activities that deepen potential customer knowledge of Kawasaki motorcycles. Akane, General Manager of Marketing & Sales Division, expresses this as “Providing events.”

A symbolic example is the KAZE activity, organized by Kawasaki Motors Japan, which is the sales company for motorcycles. It is a club for Kawasaki motorcycle monthly information magazines, offering insurance plans with additional benefits, and organizing races and touring excursions. Other manufacturers also organize similar clubs, but KAZE is the only one that successfully continues these activities even now.

The company also continues to hold meetings such as the Kawasaki Coffee Break Meeting and the Kawasaki Owners U-29 Meeting. The Coffee Break Meeting held in 100th event in 2013, and as many as 3,800 fans gathered at the venue in Awajishima. “Why Kawasaki? What is good about Kawasaki?”—the members share the pleasures of the motorcycle experience. In providing such a place for fans and listening to enthusiastic ideas, there can be sought the next paradigm shift. Deeply understanding customers will stimulate new technical innovation. This can produce a favorable spiral of technology and aspiration, by having technology and understanding customers’ dreams for the ultimate “Fun to Ride” experience. This is the essence of the Kawasaki motorcycle business.

Preparing Global Manufacturing and Sales Locations to Meet the Desires of Young People Worldwide

Kawasaki’s motorcycle business competes in markets around the world. In the 1950s the company began full-scale global expansion with the United States as the focal point, and in the 1970s it started to expand to Southeast Asia. The Kawasaki Dealer Meeting held each year in the United States gathers dealers from across the country and shows them new models and plans for sales strategies. This meeting also serves as a place where strong demands are voiced by those at the forefront. After the Lehman shock, sales of motorcycles fell dramatically, but in comparison to other companies Kawasaki motorcycles continued to put up a good fight. Sharing a spirit of challenge with the dealers through this meeting was one factor in having been able to take the top share among Japanese manufacturers.

Regarding Asia, China, India and Indonesia are three of the largest markets in the world, and the company has continued to develop a manufacturing base and sales network to support these markets. The Thailand factory is already providing enough capacity to supply components to factories around the world, and the company started operations at the second factory in Indonesia in April 2014. In combination with the first factory, annual production output in the country will be increased by more than double, to 250,000 units. Furthermore, in India, a joint venture with a leading company in the country has been used to establish a manufacturing and sales network.

In addition to these three large markets, Kawasaki is a sought-after brand in Thailand, Malaysia, the Philippines, and other countries as well. The emergence of an affluent class in this part of the world has resulted in a greater number of consumers who enjoy motorcycles for recreation, and Kawasaki continues to be a favored name for buying. It is a motorcycle that makes young people excited. It is something that makes a person yearn for tomorrow, and this was the case in Japan.

There continues to be efforts to aim for sustainable growth in the motorcycle industry in Japan. In 2013, a committee called Bike Love Forum (BLF) was inaugurated by a public-private group with support from the Ministry of Economy, Trade and Industry. They have been organizing topics and setting of goals targeted for the fiscal year 2020, and discussions about execution plans and ideas on how to move forward with deployment.

In May 2014, it was publicly announced that an effort to create a “Roadmap for Motorcycle Industry Policy” will be made to give strategic growth scenarios for motorcycles, in conjunction with BLF activities, with the cooperation of eight related motorcycle organizations such as the Japan Automobile Manufacturers Association, and five regional governments that embrace the motorcycle industry locally.

The roadmap promotes three targets for the year 2020: increasing Japanese-brand motorcycles in the global market until they reach a 40% share; stimulating 1 million new vehicle sales within the Japanese market; and improving user manners in Japan. On the international market, there will be contributions to improve the quality of life for people in the world and to develop social and economic conditions by offering excellent products from Japan, while aiming for sustainable growth of the motorcycle industry in Japan.

Kawasaki is cooperating in building a foundation for the growth of the motorcycle industry by working to bolster BLF activities and produce the roadmap.
Industrial Robots

Ever since it developed Japan’s first industrial robot, Kawasaki has blazed a trail through many uncharted terrains laying the foundations of the robotics industry.

Industrial robots have become indispensable in modern manufacturing. Japanese industrial robots command a majority share of the world market, and as a major robotics center, Japan supports manufacturing around the world.

In alliance with Unimation, a US company founded by Dr. Joseph Engelberger, who is called the father of industrial robots, Kawasaki succeeded in producing the first Japan-made industrial robot in 1969. Robots were increasingly adopted by major automakers in the 1970s, and this led Japan down the road toward becoming a major player in industrial robots.

Various uses for robots have been tested at the facilities of Kawasaki, and the knowledge gained has allowed adaptation to a wide range of industrial fields. For example, the automated operations system for machine tools developed at the Akashi Works in 1971 was the first test utilization of industrial robots for the automation of mechanical processing. At one point there were over 200 robot manufacturers, but competition caused a convergence to the remaining manufacturers, which all share a common trait: it is a drive to seek new areas for applying robotics technology, much like Kawasaki did during the period of rapid growth in robotics. In that sense, development of industrial robots at Kawasaki helped form the DNA of the robotics industry for all of Japan.

Industrial robots combine technologies such as mechanics, electronics, computers, servo-motors and sensors, and they are supported by implementation, production and workplace technologies, thereby wielding much power in the industrial arena. Backed by this combination of forces, Kawasaki’s robotics business is guided by a philosophy of human-oriented manufacturing, where harsh and demanding tasks are left to robots while the human workforce concentrates on other operations.

Kawasaki is now a pioneer in the field of medical treatment and health care, where demand is increasing for automated operations performed by robots. This model works to prevent workplace errors and intrusion of microbes that can occur with the intervention of human personnel, and it prevents infection from the handling of high potency active pharmaceuticals such as anti-cancer drugs. Its stainless steel construction gives the MS005N high resistance to medicinal liquids, provides easy cleaning, and remains highly sanitary.

**Clean Robot**

**NT Series**

Designed for semiconductor manufacturing in cleanrooms, where even a speck of dust can be allowed, this horizontal articulated robot is used in wafer transport. A unique drive mechanism provides high accuracy and stiffness, as well as smooth movement.

**Spot Welding Robot**

**B Series**

Vertical articulated welding robot. Greatly shortened cycle time by lightening the arm, using a high-output high-speed compact motor, and implementing the latest anti-vibration control technology. In addition, it internally houses cables and hoses within the arm, thereby eliminating interference with neighboring robots and peripheral equipment.

**High-Speed Picking Robot**

**Y Series**

Two compact models with a maximum payload capacity of 2 kg or 3 kg support safe, high-speed, high-accuracy transport. These models can be used in a wide variety of applications, from production lines for food products, pharmaceuticals, and cosmetics, to electronic equipment.

**Medical and Pharmaceutical Robot**

**MS005N**

Kawasaki is now a pioneer in the field of medical treatment and health care, where demand is increasing for automated operations performed by robots. This model works to prevent workplace errors and intrusion of microbes that can occur with the intervention of human personnel, and it prevents infection from the handling of high potency active pharmaceuticals such as anti-cancer drugs. Its stainless steel construction gives the MS005N high resistance to medicinal liquids, provides easy cleaning, and remains highly sanitary.
High-Efficiency Cone Crusher

ZI Cone Crusher

By Akimasa Koga
Crushing Part & Machinery Section, Engineering Department
EARTHTECHNICA Co., Ltd.

Crushes Meter-size Rocks Down to Millimeter-size Rocks

EARTHTECHNICA, a Kawasaki Group company that manufactures crushing and grinding equipment, has an extensive range of products for the crushing and screening field and holds the leading position and largest market share in the Japanese market. The ZI Cone Crusher, launched in 2012 as a strategic model for overseas markets, was developed to meet the market demand for high efficiency as well as compact design and high throughput capacity, and has been well received in the most demanding mining industries. Aggregate quarries and mining operations use several types of crushers, with primary crushers handling raw materials that are 1-2 meters in size, and secondary and tertiary crushers reducing the material size down to 10-20 mm to achieve finer gradations. Each crusher is designed to work with a certain size of feed material and the ZI Cone Crusher is dedicated to secondary and tertiary crushing applications.

Boosting Productivity with Special Crushing Technology That Does Not Crush Diamonds

Since the introduction to the market, more than 20 units of the ZI Cone Crusher have already been ordered and delivered, all of which are for overseas customers. Especially, the ZI Cone Crusher has been used extensively in the liberation of diamonds in diamond mines across Southern Africa with excellent results. The reason the ZI Cone Crusher is successfully adapted for diamond liberation is a special crushing technology that does not crush diamonds. Diamonds are concealed in a rock called kimberlite. Accordingly, kimberlite must be crushed by crushers to liberate the diamonds. However, diamonds must not be crushed with kimberlite during the crushing process, if a diamond is damaged, its market value will drop drastically. The solution which EARTHTECHNICA is able to offer its customers for this conflicting requirement is the mild steel inserted (MSI) type crushing chamber of the ZI Cone Crusher. Mild steel plates are cast in manganese steel castings to form shallow grooves on the surface of mantle and concave and maintain until the liner is worn out. The shallow grooves are very important for liberating diamonds without damage (See Fig. 1).

For the crushing process (especially mineral processing), EARTHTECHNICA has drawn on its extensive knowledge and years of field experience to design the crushing chamber that meets the customer’s requirements. Thanks to a newly developed crushing chamber design, the throughput capacity is improved approximately 20-25% compared to the previous model.

First Machine in Stable Operation in Malaysia

The first unit of the ZI Cone Crusher is currently in operation in the state of Sarawak in Malaysia as the main machine in an aggregate production plant for the development of Malaysian domestic infrastructure.

EARTHTECHNICA is highly reputed for its customized crushing chamber design and for developing mining and minerals processing solutions.

Special Crushing Technology for Supporting Diamond Mines

Southern Africa is one of the largest diamond producing areas in the world, and 14 units of the ZI Cone Crusher have been installed and are in operation in Botswana, South Africa, Namibia and Lesotho. Kimberlite, which contains diamonds, has special characteristics. If the kimberlite ore contains a lot of water inside, it will split in the crushing chamber (between the mantle and concave), but it is difficult to be crushed. As a result, the throughput capacity will drop drastically. To prevent this phenomenon, a special crushing chamber design developed based on our years of experience and extensive crushing tests, is adopted. EARTHTECHNICA is highly reputed for its customized crushing chamber design and for developing mining and minerals processing solutions.
In 1999, at the age of 25, Ken Noguchi became the youngest person on record to have conquered the Seven Summits. Following that achievement, he went on to become a volunteer on the environmental patrol of the Ogasawara National Park, and for the Mt. Fuji Rangers, where he works as an honorary commander. Currently he is putting his efforts into creating a framework to protect Mt. Fuji, which has been listed as a World Heritage Site. In a book published this past summer, he assesses that progress is not being made on the island, with too many people whose only concern was getting registered, as well as the various interest groups who seek to profit off of Mt. Fuji. He also proposes how both environmental protection and tourism can be promoted at the same time.

"When Mt. Fuji was registered, I thought it was too early. It was registered before we had a blueprint for protecting it. The way I see it, though, is that because we were given the task of drafting a report, we now have to address the various problems we discovered. It is not a matter of seeing things from the perspective of the natural environment or of tourism, but of finding diverse ways for Japan to enjoy as well as protect Mt. Fuji."

A unique strength in Noguchi is his positive attitude about a bright future. He speaks frankly to everyone, a trait frowned on by office staff, he recalls with a smile. His positive frame of mind is one that only a person who knows the harshness of the mountains can finally arrive at.

Mountain Treks to Get Back on Track

These days Noguchi still isolates himself in the Himalayas twice a year. A mountain climber is a person who can live in the worst possible conditions, but who soon returns to daily life when they get back to the regular world. Noguchi regularly tours the country for lectures. He normally has a first-class rail car arranged for him, but once he had to travel in an unreserved seat. "I thought that the seats were too hard, but the next moment I was ashamed of myself for having that thought. Even when you think you are being faithful to your principles, it is more than likely that you have slightly gone off course somewhere along the way."

A Way of Life Learned from the Mountains

It gives him pause when he visits a junior high school or high school during his lectures and is asked if there is a good way to attain success. There is no book of secrets that can guarantee success if you read it, and you might not succeed even if you do read such a book. In mountain climbing, accidents easily happen to someone who surges ahead. Seeing someone at the mountain top shouting "Hurray" is great, but it took many months of careful preparation to get to that point. "Mountain climbing is a matter of enduring bad weather and steadily making progress," he says. Sometimes I am asked when I will quit the cleanup climbs, and at times I tire of it myself. But in the end it is the mountains that teach me over and over the importance of completing what I am doing now." With the direct and honest comments of a pioneer, Noguchi gives us sense of the wonder of his missions.
Pratt & Whitney PW1500G and PW1900G Engine Programs for New Regional Jet Aircraft

Kawasaki will participate in the Pratt & Whitney PurePower™ PW1500G and PW1900G engine programs for new regional jet aircraft as a risk and revenue sharing partner (RRSP), based upon a recent agreement between the parties. Pratt and Whitney is a division of United Technolo-
gies Corp. (NYSE:UTX). The PW1500G engine has been selected as the sole engine for Bombardier Aerospace’s new CSeries family of aircraft. The PW1900G Geared Turbofan™ (GTF) engine was the first of the GTF engine range to be certified. GTF engines feature high bypass fans and advanced reduction gear systems that deliver up to 16 percent fuel burn improvement, 50 percent noise reduction, and lower emissions compared with the existing aircraft engines. The PW1500G is a derivative of the PW1900G and has been selected as the sole engine for Embraer’s new E190E2 and E195E2 jets.

Acer Arrow

Semi-open Hatch Type Bulk Carrier Acer Arrow Delivered

Kawasaki recently delivered the semi-open hatch type bulk carrier Acer Arrow to Cardinal Maritime S.A. at Nantong CSOSD KHI Ship Engineering Co. Ltd (NACK) located in Nantong, China. The vessel is the first of the new semi-open hatch type bulk carrier developed jointly by Kawasaki and NACK. The vessel has a flush deck with a forecastle and five holds that are designed for optimum transport of such cargo as grain, coal, ore, wood pulp, lumber, and steel products. It can also carry lumber on its hatch covers. The vessel is positioned between the standard bulk carrier and the open hatch type bulk carrier. All of its holds have double hull structure with large hatch openings. The three holds in the middle part of the vessel are box-shaped for efficient handling of cargo like wood pulp and other products. Four 36-ton-deck cranes installed along the centerline in between hatch covers enable cargo loading and unloading in ports that lack cargo handling facilities.

The vessel employs the latest technology to minimize fuel consumption, including an energy-saving, electronically controlled main diesel engine, highly efficient propellers, the Kawasaki rudder bulb system with fins (RBS-F) and semi-duct system with contra-advanced reduction gear system that deliver up to 16 percent fuel burn improvement, 50 percent noise reduction, and lower emissions compared with the existing aircraft engines. The PW1500G is a derivative of the PW1900G and has been selected as the sole engine for Embraer’s new E190E2 and E195E2 jets.

Under the risk and revenue sharing arrangement, Kawasaki will be responsible for the production of the Fan Drive Gear System (PDGS) and combustor, and will act as an additional production source to Pratt & Whitney. Kawasaki has substantial experience in the development and production of helicopter transmissions, engine programs, and international joint development programs and accessory gearboxes for engine co-engineer. Kawasaki will contribute to Pratt & Whitney’s PW1500G and PW1900G programs.

Testing Underway for Japan’s First Industrial Hydrogen Liquefaction System

Kawasaki is currently testing Japan’s first industrial hydrogen liquefaction system that it developed. Made entirely in Japan with Kawasaki’s proprietary technology, the hydrogen lique-
faction system has been installed in Kawasaki’s Harima Works in Hyogo Prefecture. The system has the capacity to liquify about five tons of hydrogen per day. It is mainly comprised of a hydrogen liquefaction machine and a tank specially designed to store liquefied hydrogen. In developing the system, Kawasaki harnessed the strength of its proprietary, homogenized technologies, including its cryogenic materi-
als handling technology as well as the tech-
nological turbine expertise it has gained through the development of high-speed rotary machines.

To produce liquefied hydrogen, the system employs a liquefaction machine that cools compressed hydrogen gas and hydro-
gen that has been pre-cooled via a refrig-
eration cycle through a heat exchange pro-
cess. After confirming that the system suc-
cessfully produced liquefied hydrogen during its post-development trial run, Kawasaki has shifted to the performance evaluation test phase.

Kawasaki is testing the system’s per-
formance, reliability, maintainability, etc. and working to make technological improvements with an eye to commer-
cialization. Aiming to get a leg up on the competition in the hydrogen infrastructure market, Kawasaki will also work on developing a larger, more efficient liquefaction system to promote widespread use of hydrogen energy. Dubbed the ultimate clean energy, hydro-
gen is expected to become a primary source of energy in the future. While the use of hydrogen is expected to dramatically increase, it will take building efficient trans-
portation and storage systems to bring a large amount of hydrogen to the market. When liquefied, hydrogen is reduced to approximately one eight hundredth of its volume. It can be returned to high-purity hydrogen gas simply via evaporation. Kawasaki is leveraging these properties of hydrogen to build a hydrogen supply chain geared mainly to liquefied hydrogen.

Moving ahead with an eye to bringing an ample amount of hydrogen to the market, Kawasaki is working to develop and commercialize the infrastructure technologies needed to build a complete supply chain, ranging from production to transportation, storage, and use of hydro-
gen. More specifically, in addition to the hydrogen liquefaction system that is the key to unlocking the passageway to mass transport and storage, Kawasaki is moving forward with developing and commercializing a liquefied hydrogen car-
rrier and storage tank as well as a hydro-
gen fuel-driven gas turbine, and more.

Assignment of Shares of KCM Corporation

Kawasaki recently reached an agreement with Hitachi Construction Machinery Co., Ltd. (HCM) on the assignment to HCM of all of the shares of KCM Corporation (KCM) as of October 1, 2015 (scheduled). Since October 2008, Kawasaki and HCM have had a business alliance covering wheel-loader operations, including joint research and development of new models of wheel loaders to meet the Tier 4 exhaust emission regulations. KCM was established in January 2009 and acquired Kawasaki’s wheel-loader operations by assignment in April of the same year. With HCM’s capital investment in June 2010, it further accelerated joint research and development on new models of wheel loaders and on an efficient production system. Kawasaki agreed to HCM’s proposal, having judged that it would be effective to pursue synergies within the HCM group for the further development of HCM under a policy of investing manage-
ment resources in a focused manner, in order to enhance enterprise value amidst intensifying global competition in the con-
struction machinery industry. Currently, under discussion is the transfer of the businesses of KCM Corporation, which engages in sales and servicing operations for KCM products within Japan, to Hitachi Construction Machinery Japan Co., Ltd. at around the same time as the execution date of the assignment of shares of KCM.
New contents are exhibited one after another

Kawasaki Yoake Project

Yoake, or sunrise – the start of a new day and the embodiment of all of our hopes and dreams. Sunrise has the power to wake our hearts.
Kawasaki strives to emulate the sunrise’s role in arising potential power throughout the world.
Through the “Yoake Project,” we will introduce Kawasaki’s endeavors to be a force for expanding the potential of society.

Project K
This footage offers viewers a look into the story of how Kawasaki and its customers have opened up new possibilities for people around the world by tackling some of the problems facing the world.

Inside K
This footage introduces Kawasaki’s technologies that empower the people, companies and societies around the world tackling various challenges, helping them open up new possibilities. Take a look at these technological breakthroughs as well as the thoughts of the people who have created them, against the backdrop of Kawasaki’s factories.

Special Feature
Kawasaki Motorcycle Spec Is 10 Years Ahead of Its Time