

# Value Created through Dialogue with Customers

We develop advanced technologies as a world pioneer with the aim of creating an affluent and sustainable future.

## 1 Creating an environment for viewing digital terrestrial television broadcasting in Botswana

In May 2014, a tender was conducted for the supply of digital terrestrial television broadcasting transmitters for the entire Republic of Botswana. After a review by state-run broadcaster Botswana TV, the name of Hitachi Kokusai Linear Equipamentos Eletrônicos S/A (“Hitachi Kokusai Linear”) was announced as the chosen supplier in an official gazette in September. A formal contract was signed between the parties in October. Botswana is the first country on the African continent to adopt Japan’s ISDB-T (Integrated Services Digital Broadcasting – Terrestrial) standard as its digital terrestrial television broadcasting standard.

Since April 2015, digital transmitters manufactured and shipped by Hitachi Kokusai Linear have been installed in transmitting stations in Botswana. Hitachi Kokusai Linear

has also sent engineers from Brazil to Botswana to provide technical instruction. ISDB-T allows users to obtain useful information such as local weather forecasts by pressing the “d” button on the remote control. In Botswana, it is expected to provide a variety of unique contents such as, “How to breed cows efficiently.” The Company will contribute to the popularization of terrestrial digital broadcasting equipment to help people all over the world access essential information through TV broadcasting.



A representative of the Company shaking hands with Mr. Calvin Goiletswe of Botswana TV (Photo taken at Botswana TV in February 2014)

Note: From the Hitachi Kokusai Electric version of Hitachi Group’s “1/Hitachi” commercial series

### VOICE

I was very fortunate to have the opportunity to visit Hitachi Kokusai Linear’s factory. Thanks to this visit, I was able to deepen my understanding of the products and systems of the Hitachi Kokusai Electric Group. I sincerely ask for your continued support and cooperation for the development of Botswana.

**Mr. Calvin Goiletswe**

Project Manager, Department of Broadcast Services

Mr. Calvin Goiletswe (center) and our personnel (at our booth at the African Fair, held in Yokohama City, Kanagawa Prefecture, in May 2013)



## 2 Our cameras contribute to TV broadcasting of the Asian Games in Incheon

About 150 cameras made by the Company were used at the 17th Asian Games Incheon, held in South Korea from September to October 2014. The vivid images produced by the cameras, which give viewers the feeling of being right there among the action, were broadcast in various countries, including Japan.

In addition to conventional HD cameras, various other types of broadcast cameras were used, including special high-speed cameras and compact box cameras for shooting goal post areas. In addition, our new 4K camera was also used for broadcasting live.



Our cameras used extensively in the Games

We provided technical support to broadcasting stations as well as camera operators and relay broadcast staff. From setup to rehearsal through to the actual telecast, all parties involved worked together as a single team to broadcast the Games successfully. In the future, we will continue striving to support on-site filming operations at various events, including international sporting events, and to develop innovative cameras capable of capturing beautiful and vivid images that let viewers share in the emotion and excitement, thereby contributing to the development of the broadcasting industry.

### VOICE

It was the first time we have had so many cameras—about 150—produced by our Company used simultaneously in a large-scale event like these Games. It was a challenging experience for us, as our overall capabilities including our product power, technical expertise and support capability were tested through our performance and contribution to the broadcasting of the event. In the future, we would like to contribute to providing even more beautiful images through the development of innovative cameras for the 4K/8K era.

**Min Hwangsoo**

Global Business Management Division,  
Video & Communication Systems Division



### 3 SCQI Award received from Intel Corporation

On March 5, 2015, in the U.S. city of Santa Clara, California, the Company became one of 11 companies to receive Intel Corporation's most prestigious Supplier Continuous Quality Improvement (SCQI) Award for its performance in 2014. This award was given in recognition of the industry-leading results and commitment demonstrated across all critical focus areas: quality, cost, availability, technology, customer service, labor and ethics systems, and environmental sustainability. Representing Intel's highest honor, the SCQI Award is bestowed on suppliers who have demonstrated exceptional performance.

"We are truly honored to receive Intel's SCQI Award for

2014," said the general manager of our Semiconductor Equipment Division. "We believe that this award was presented in recognition of our commitment to quality and the close partnership we have nurtured with Intel to enable continual advances in semiconductor manufacturing technology."

All related personnel have renewed their determination to continue to implement vigorous improvement activities this year also.



Delegates from the Company posing with representatives from Intel Corporation  
Photo provided by Mr. Chip Holley

### 4 Promoting dialogue with customers as well as local production for local consumption

In fiscal 2014, the Company made a tender offer to make its consolidated subsidiary Kokusai Electric Korea Co., Ltd. ("KEK") a wholly owned subsidiary in order to further strengthen cooperation and synergies with KEK as a member of our Group. Since its establishment in May 1993, KEK has developed and produced the Company's semiconductor manufacturing equipment in Korea and provided after-delivery maintenance and services. Under the strengthened cooperation framework, we plan to promote the division of functions as well as personnel exchange within the Group.

Also, based on the concept of "local production for local consumption," we will expand design, production and procurement activities in Korea and step up our service improvement efforts to further increase customer satisfaction and contribute to the development of the region.



Head Office, Main Factory (Cheonan-si, Chungnam)



Pyeongtaek Factory (Pyeongtaek-si, Gyeonggi-do)

### 5 Film-forming process technology leads to a new future for the semiconductor

The demand for semiconductor devices, mainly for smartphones and data centers, is expected to continue to grow.

With the drive toward miniaturization, these devices have become more highly integrated and sophisticated. But miniaturization is expected to reach physical limits in the near future, making the production of a semiconductor device with a three-dimensional structure a critical task. In the case of such a three-dimensional semiconductor device, however, irregularities on the wafer surface are significantly more pronounced than those on a semiconductor device with a conventional two-dimensional structure. This makes it difficult to secure sufficient high step coverage and film thickness uniformity in the film-forming process, which may in turn lead to reduced device reliability and deterioration of manufacturing yield.

To overcome these challenges, our R&D team sought to develop a new film-forming technology and, as a result, has

successfully developed a process for forming high-quality insulating film with good step coverage and film thickness uniformity.

This technology was born in Toyama City's Yatsuo Town, the historically and culturally rich area in which the Toyama Works is located. The Toyama Works will continue striving to develop device technologies and thereby contribute to a better world through technological innovation.

#### VOICE

We engineers identify problems with current products as well as figure out what kinds of devices and processes customers will need and want in the future. We do this by talking directly with customers and reflecting their feedback in our development. Thanks to the concerted efforts of all staff members, the Toyama Works, located in Yatsuo Town in Toyama City, was able to ship the 10,000th unit of our vertical film-forming system this year. We will continue to strive to develop products that satisfy our customers, while at the same time actively contributing to our local community through activities such as forest development.

**Masato Terasaki**

Volume Equipment Engineering Center, Toyama Works



Inspection of the batch-type vertical film-forming system

# Value Created through Dialogue with Customers

By pursuing *Monozukuri*, we provide true value to the customers and society.

## 6 Defense Structure Improvement Foundation Award granted

On November 25, 2014, the Company's Defense Electronics Division received the Defense Structure Improvement Foundation Award for its development of the ORQ-2 Series marine wireless router.\*1

This Award is to recognize the outstanding achievements of voluntary research & development and production technology improvement related to defense equipment. Winners are selected by a screening committee comprised of external experts.

By leveraging the Company's long-accumulated know-how in wireless and defense communication systems, we developed this award-winning product as a piece of communication equipment suitable for use in operations undertaken by Minesweeping Units\*2 of the Japan Maritime Self-Defense Force. It has been delivered for use in

minesweepers, minesweeper tenders and minesweeping helicopters. We believe that this award was presented in recognition of the new value this product offers to customers, namely, its broadband-based high-speed, high-capacity communication capability, and added convenience such as the automatic relay function. Winning the award has given us renewed confidence to move forward.



Defense Structure Improvement Foundation Award

\*1 ORQ-2 Series marine wireless router : Device for enabling communication over a wireless network between minesweepers, minesweeper tenders and minesweeping helicopters of the Maritime Self-Defense Force.

\*2 Minesweeping : The detection and disposal of marine mines that have been placed in important harbors, straits, etc. Minesweeping is necessary to secure the safety of marine vessels.

### VOICE

We would like to express our thanks to our customers and other concerned parties who gave us extended support and cooperation throughout the project, from the proposal and development to delivery, tests and operation. Particularly in the sea tests, thanks to the kind support of Minesweeping Unit personnel, we were able to achieve results despite suffering intense seasickness of a kind we had never experienced before. We will continue working hard to develop equipment suitable for the operations of the Minesweeping Units, thereby contributing to creating a safe and secure society.

**Hiroshi Nakano**  
Engineering Center,  
Defense Electronics Division



At the award ceremony  
(From left : Shoji, Nakano,  
and Yamamoto)

## 7 Achievement of safe and secure road traffic by radio unit with ITS\*1 technology

Autobobiles have become an essential means of transportation. They do cause, however, various road traffic problems such as traffic accidents, congestion, and environmental pollution. One of the solutions is to apply the route information collection system (DSRC\*2 radio unit).

The DSRC radio unit, which uses the 5.8-GHz frequency band, enables communications between road users and the information collection server. It provides information to support safe driving for drivers. The information includes sudden braking operations, obstacles, the tail end of

congestion, other hazardous conditions, etc. At the same time, it accumulates traffic data that can be used to achieve optimal road development and improvement.

In addition to expressways, we installed our DSRC Roadside radio units on major national highways in fiscal 2014. We will install more units and improve their functions so as to contribute to "safety and security," "ecology and efficiency," and "comfort and convenience."

\*1 ITS : Intelligent Transport Systems

\*2 DSRC : Dedicated Short-Range Communication

### ■ Communication between a vehicle and unit



### VOICE

In fiscal 2010, the first roadside radio units were installed along expressways nationwide. In fiscal 2014, our units were installed along major national highways around the country. We have delivered more than 200 units. Currently, these units mainly support safe driving. We believe that providing more attractive services for users such as helping them to avoid congestion will lead the units to more widespread use. We will continue to do our best to ensure the system enhances the convenience of users in avoiding and alleviating traffic jams and thereby reducing fuel consumption.

**Ryoki Haramoto**  
Transportation Systems Engineering Department,  
Video & Communication Systems Division

## 8 Solutions of video and audio communication with wireless broadband technology

In the field of public communications, important information used to be mainly transmitted through voice communication. Now the needs to transmit visual information are increasing rapidly to grasp the condition of disaster sites and to promptly control emergency.

The Wireless Broadband System for Public Safety utilizes the frequency characteristics of the VHF band that went unused due to the digitalization of terrestrial TV broadcasting. The system transmits video in real time from non-line-of-sight areas and mobile stations where video transmission is difficult generally.

We have developed those kinds of mobile radio equipment to realize a safe and secure society. We are marketing our

products both in Japan and overseas focusing on the digital divide.

### ■ Use scenario of the mobile wireless device



#### VOICE

In fiscal 2014, we delivered the first model of the mobile broadband system to the Kanto Regional Development Bureau of the Ministry of Land, Infrastructure, Transport and Tourism. The equipment is expected to be a means to transmit video promptly in case of a disaster or accident involving dams, rivers, or roads. We will strive to realize a safe and secure society through our systems.

**Yuki Haruta**

Mobile Communication Products Sales Department,  
Video & Communication Systems Division



#### VOICE

In order to demonstrate the maximum capabilities of the system under harsh conditions of a disaster site, we conducted a series of field tests. With these experiences, we will design the systems speedy and securely.

**Yoshihiro Kawashima**

Communication Systems Engineering Department,  
Video & Communication Systems Division



## 9 Development and proposal for a Wi-Fi station for tourism and disaster prevention

### Distributing local tourism and disaster information via smartphones

With the increasing number in recent years of major disasters, such as large-scale earthquakes and so-called “guerilla” torrential rains, there has been an increasing demand for a system that can transmit disaster information to local residents. In response, Hitachi Kokusai Yagi Solutions Inc. has developed an easy-to-use community-based public wireless LAN system in close collaboration with Tatsuno Town in Nagano Prefecture, which is famous for its fireflies. Known as the “Wi-Fi Station for Tourism and Disaster Prevention,” the system was adopted in December 2014. It comprises a wireless LAN (Wi-Fi) connected to an emergency power supply, disaster monitor cameras, and weather-monitoring units (measuring wind speed, wind direction, temperature and rainfall amount) installed at the town’s 11 designated emergency evacuation centers. The central device collects and edits information sent from each node in the network and retransmits the edited information. It also records announcements broadcast over the community wireless system. The system enables local residents to receive disaster information on their smartphones in the form of images, sound and text, thus helping them to get much-needed information in a timely manner.

In the future, we will enhance the functions that can be used by tourists in normal times, thereby contributing to the development of the community.

#### VOICE

This system enables people to see, hear and read information about their local community in real time on their smartphones. In normal times, the system provides local tourist information; in the event of a disaster, it transmits accurate information about the disaster and as well as evacuation guidance, thereby contributing to disaster mitigation.

**Kazuo Shimazu**

Solution Engineering Department, Hitachi Kokusai Yagi Solutions, Inc.



### ■ Example of smartphone display

(Images and data that were actually transmitted to residents’ smartphones are shown under the consent of the Tatsuno municipal government.)

