

Environmental Conservation Activities

Developing Products Contributing to the Environment/Environmental Solutions

In addition to reducing environmental impacts from business activities, Oki Electric positioned the development of products that solve environmental problems as a focus theme to reduce environmental impact further. We provide our customers with environmental solutions through, for example, “products

contributing to the environment (energy-saving or resource-saving system products, environmental conservation equipment)” and “environmental education”, and “environmental consulting”. The following shows some examples.

Products Contributing to the Environment

Energy-saving and Resource-saving Products

To reduce environmental impact through business reform, and for other purposes, Oki Electric is developing energy-saving and resource-saving systems. The following shows some examples.

VICS Traffic Information and Communication Systems

VICS is a system to communicate traffic information. It is deployed all over Japan as part of ITS (Intelligent Transport Systems).

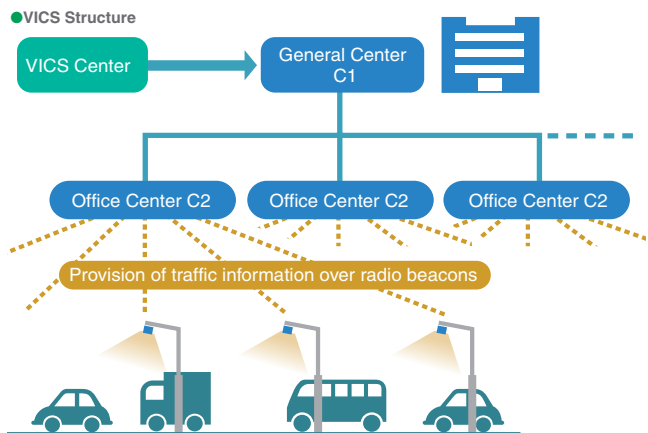
Through beacons or FM multiplex broadcasting installed on the roadside, drivers are provided with necessary information (such as traffic jams, traffic regulations, routes or parking space) over their on-board equipment (car navigation system). The deployment of VICS all over Japan promises to reduce traffic jams, exhaust gas and wasted fuel energy. Oki Electric offers communications control equipment for VICS centers and the roadside radio beacons installed at the road side.



Radio Beacon



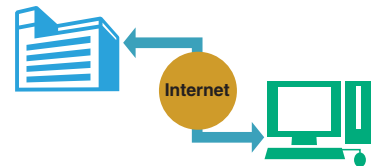
Server at an Office Center



Electronic Document Delivery System

On April 1, 2001, the “IT Document Summary Law” came into force, and the delivery of official documents as electronic files using, for example, the Internet became possible. “Electronic Document Delivery Systems” are systems that transmit documents to customers, etc. in the form of electronic files over the Internet. In fiscal 2003, we expanded the “Electronic Document Delivery Services” we are providing to financial institutions. We increased the documents that can be delivered over the Internet to five types so that the system can now handle all documents required for the

sale of investment trust products. By enhancing security functions, we have also improved management functions such as the delivery history. We expect that the utilization of this system will reduce the resources consumed for paper, and energy for transport.



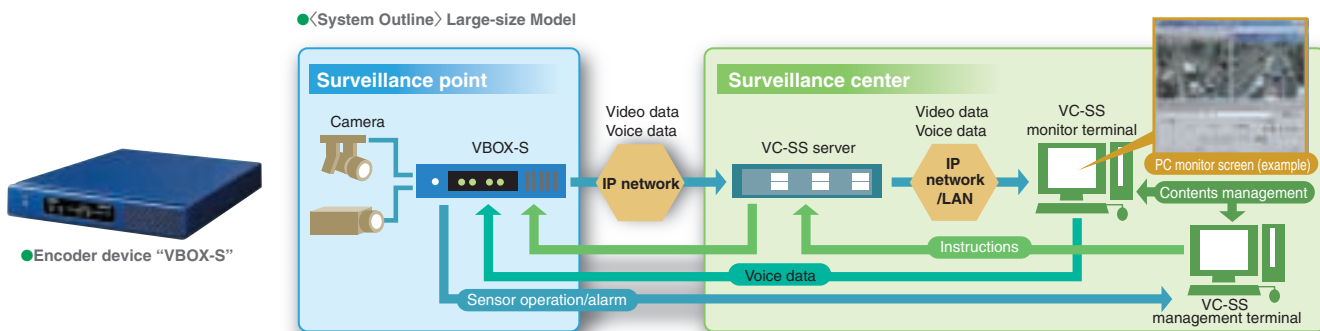
Real-time Security Surveillance System Capable of Live Video Streaming

OWith the spread of broadband networks, live video streaming systems that store, deliver and replay videos or sound in real time are being more and more used. A higher awareness of crisis management further requires highly reliable video streaming systems that offer a wide variety of functions to support surveillance work. This is where Oki developed VisualCast[®]SS, a real-time security surveillance system that can deliver live videos from over 200 locations. Energy and time required to move from one location to another can be reduced by utilizing, for example,

the live video surveillance function, which works in connection with the individual sensors, and the bi-directional voice communication function. The encoder device “VBOX-S”, which was newly developed for this system, was reduced to less than half the size of conventional devices by concentrating the encoder for the encoding of video signals to one chip. Video surveillance also starts up only when the sensor responds to something. With these and other features, the device promises to save resources and electric power.

*1) VisualCast[®]: A registered trademark of Oki Electric.

(System Outline) Large-size Model





Environmental Conservation Activities

■ Environmental Conservation Equipment

The Oki group is conducting research and development of environmental conservation equipment to measure or reduce environmental impacts generated by, for example, production plants. The following shows some examples.

▣ Bio-Recycling System for Organic Waste Fluids of Semiconductor Plants

Miyagi Oki Electric Co., Ltd., one of our semiconductor manufacturing sites, developed a system for highly efficient treatment of waste using microorganisms. Using this system, they were able to reduce the waste from organic waste fluids emitted during the manufacturing process by 70% (1,980 tons) compared to the conventional method. The treatment with microorganisms is a safe method where microorganisms decompose organic substances into carbon dioxide and water, so that the final waste is reduced and no hazardous substances are generated. The new system improved the conventional method to treat various kinds of composite organic waste fluids generated during the semiconductor manufacturing process together for each plant building to a method using separate distribution pipes for each type of organic waste fluid of the whole plant. Because the system uses the most suitable microorganisms for each type of organic waste fluid and keeps the water at a temperature that is optimal for the respective microorganism to be active, the decomposition efficiency improved 1.5 times. To control the water temperature, waste heat from air conditioning boilers, etc. is used to save energy and cost. Thanks to this system, 97% of the organic waste fluids can now be treated within the plant premises. Treating the waste fluid mostly within the premises also reduces the environmental risk of accidental leakage during transport. For the future, we aim to treat 100% of the organic waste fluids with microorganisms.



● Bio-recycling System Installed at a Waste Water Treatment Site

▣ Wet Treatment Equipment for Toxic Gas in Semiconductor Plants

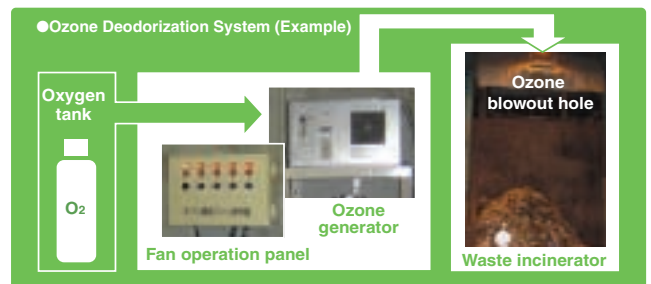
Oki Engineering Co., Ltd., a group company engaged in the design of environmental systems, etc., developed wet treatment equipment for toxic gas generated in, for example, the semiconductor manufacturing process. With this equipment, toxic gas is not treated centrally in "bulk", but in a distributed form by small treatment units installed at each site where the gas is generated. In the units, the gas is decomposed by being showered with large quantities of water. The components are then diluted in circulating water, detoxified, and emitted as waste water. The equipment uses an original technology where the generated gas is not fixed in the reactor when it reacts with the water. Before the installation, the generated gas is measured and analyzed in detail. Because in this way, the system is tailored to the conditions of gas, reliable and efficient treatment of very small quantities of gas are possible, and maintenance is required only once every year. The types of gas that can be treated were also increased from a few to about 30, which means that we can handle almost any gas generated in the semiconductor manufacturing process. In the future, we will aim to expand sales to our customers based on the expertise accumulated with the installation of the system within the Oki group.



● Equipment for Wet Treatment of Toxic Gas

▣ Ozone Deodorization System for Incinerator Sites

Oki Environment Technologies Inc., a group company engaged in the design and installation of environmental facilities, developed a system that decomposes the odor generated by waste using ozone. The system was experimentally installed in the waste incinerator facility of a treatment site for industrial waste in Miyazaki prefecture. This incinerator faced the issue that foul odor generated from the waste brought in spread into the surrounding region. This odor, however, can be significantly reduced with ozone. The system generates ozone using oxygen from a tank and deodorizes the waste in the incinerator by directly blowing the ozone onto the waste with fans. The mechanism of the deodorization is that ozone molecules (connections of three oxygen atoms) react with the molecules that cause the odor to decompose the odor. After the decomposition, the ozone returns to oxygen so that there is no influence on the environment. For the future, we aim to expand sales for waste incinerators, kitchens, meeting halls, meat processing sites and other facilities all over Japan.



▣ Monitoring System for the Density of Released Chlorine Residue for Hot Spring Facilities

Oki Environment Technologies Inc. developed a system that automatically measures the density of chlorine residue in the bathtubs of hot spring facilities around the clock, keeping the density to a certain level. In bathtubs that circulate hot water for repeated use, there are risks of, for example, mass infections with legionnaire's disease, and chemicals containing chlorine are used for disinfection. However, the chlorine density of has to be kept at a certain level, which is difficult to maintain because the density of chlorine decreases when the number of bathers increases. This system can collect samples of hot water from each bathtub for measurements in intervals of 3 to 5 minutes to control the quantity of chlorine injected into the bathtub when the chlorine density is too low and bring the chlorine density close to the preset value. For the future, we aim to expand sales to hot spring facilities and swimming pool facilities all over Japan.



● Monitoring System for the Density of Released Chlorine Residue for Hot Spring Facilities

▣ Other Environmental Conservation Facilities

The following are examples of other equipment we worked on up to now.



● Conservation of Water Resources Using a Recycling System for Surface Active Agents (Example from Fiscal 1998)



● Water Quality Control Using the "Mizumonban" (Example from Fiscal 2001)