4. Maintaining Harmony with the Local Environment

Kyushu Electric makes positive efforts towards protecting the environment, such as through conducting environmental impact assessments prior to construction of power plants, preventing pollution during power facility operation, and properly managing the facility itself, as well as by maintaining harmony with the local environment.

(1) Environmental impact assessment

In accordance with the Environmental Impact Assessment Law, Kyushu Electric conducts a survey on the natural (sea, land and air) and social environments prior to the construction of power plants. Then, the environmental impact likely to be caused by construction of the plant is estimated and evaluated, and appropriate measures taken to protect the environment of the vicinity.

Survey of sea

(2) Prevention of air, water and noise pollution

In operating its power plants and other facilities, Kyushu Electric conforms not only to the laws and regulations, but also the environmental conservation agreements concluded with related local governments in regard to air, water and noise pollution as well as vibration.

Measures against air pollution

Using the best technology in the world, Kyushu Electric takes measures to address exhaust gas from thermal power plants.

- Kyushu Electric's fiscal 2000 emissions intensity (emissions per kW thermal electric power production) was 0.29g/kWh for sulfur oxide (SOx), and 0.23g/kWh for nitrogen oxide (NOx).

◇ SOx reduction measures

- Use of heavy and crude oil with a low sulfur content
- Promotion of LNG use, which does not contain sulfur
- Installation of desulfurization facilities which remove SOx from exhaust gas

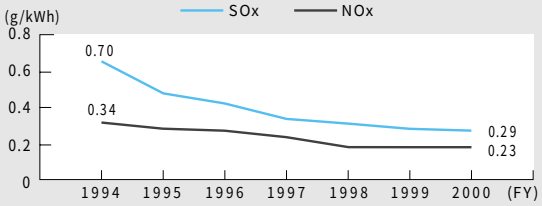
◇ NOx reduction measures

- Combustion method improvement including boilers
- Adoption of two-stage combustion method
- Adoption of exhaust gas re-circulation combustion
- Adoption of low NOx burners
- Installation of denitrification facilities which remove NOx from exhaust gas

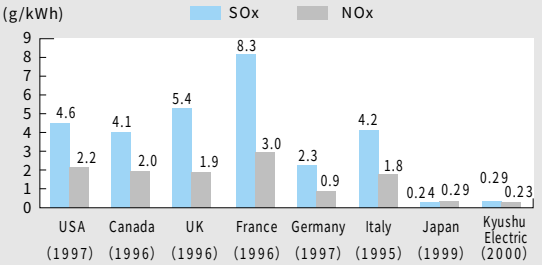
◇ Particulate reduction measures

- Promotion of LNG use, which does not generate particulate
- Installation of high efficiency precipitators, which remove particulate from exhaust gas

● Kyushu Electric SOx and NOx emissions intensity
(per kW thermal electric power production)



● SOx and NOx emissions intensity around the world
(per kW thermal electric power production)



Source: "Energy and the Environment" by the Federation of Electric Power Companies

Water quality conservation

- At all the company's thermal and nuclear power plants, waste water from facilities and sites is treated using special waste water treatment systems and is discharged after confirming its quality.
- The cooling water used at Kyushu Electric's thermal and nuclear power plants is low temperature seawater taken from deep-sea levels. This helps minimize the temperature difference between water discharged after cooling and the seawater near the drainage outlet.

Measures against noise and vibration

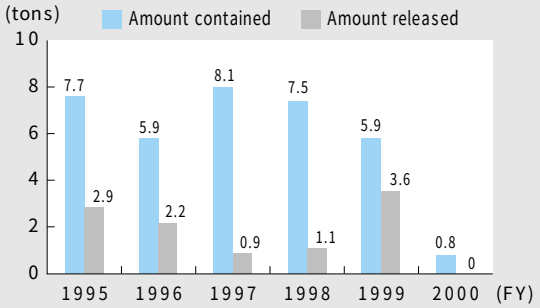
- Kyushu Electric addresses noise and vibration problems by adopting low-noise, low-vibration equipment, installing mufflers and sound-proofing walls, and by installing such equipment indoors.
- Low-noise and low-vibration machinery is selected for construction work.

(3) Ozone layer protection

Kyushu Electric tackles the reduction of specific freons and other gas to prevent ozone layer destruction.

- Kyushu Electric's specified freon and other emissions (specific freons and carbon tetrachloride) for fiscal 2000 was zero, thanks to measures such as washing work clothes by water instead of dry cleaning. Future tasks include reducing alternative freon and halon emissions, which are used as air conditioner refrigerant and in fire extinguishing facilities.

● Amount of specific freons and other gas contained and released



Note 1: Specific freons and other gas refer to specific freons and carbon tetrachloride.

Note2:" Amount contained "refers to the amount of specific freons and other gas contained in equipment.
" Amount released "refers to the amount of such gases actually used for replenishment or othe purposes.

(4) Environmental protection management

Kyushu Electric's power plants are strictly managed to ensure environmental protection, by means of environmental monitoring and chemical substance control.

Environmental monitoring

- Continuous monitoring using environmental supervisory instruments
- Telecamera monitoring
- Patrol monitoring
- Regular measurement and analysis
- Reporting environmental data to related authorities

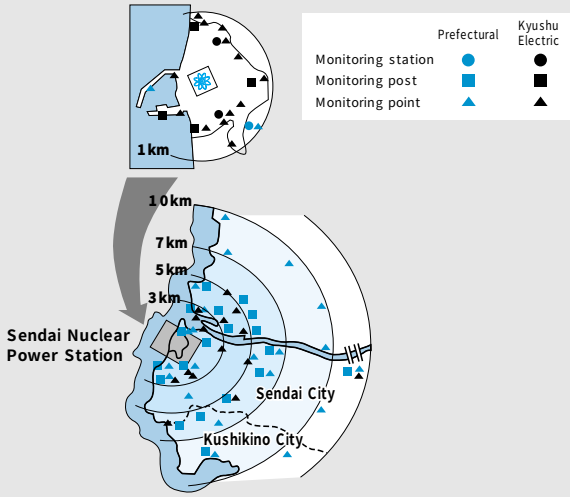
- The environment surrounding power plants is under strict control, with power plants cooperating with related municipalities and neighboring businesses. No major environmental accidents have occurred to date.

◇ Environmental monitoring for radioactivity around nuclear power plants

The radioactivity of air, seawater, and environmental samples of agricultural and marine products is measured.

- Kyushu Electric reports on the measurement results to the related prefectures. The prefectures in turn review and evaluate the reports under the guidance and advice of academicians, and publicize the findings in public relations magazines.
- The radiation dosage on people living near power plants is less than 0.001 mSv per year. This is much lower than the 1 mSv per year statutory dosage limit, and also lower than the annual 0.05 mSv target set by the Nuclear Safety Commission.

● Radioactivity inspection in vicinity of Sendai Nuclear Power Station



∗ Monitoring station and post: continuous measurement of radiation dosage in the air
∗ Monitoring point: measurement of total dosage for a certain period of time

● Evaluation of dosage in vicinity of nuclear power plants

(unit: mSv/year)

	FY1998	FY1999	FY2000
Genkai Nuclear Power Station	Less than 0.001	Less than 0.001	Less than 0.001
Sendai Nuclear Power Station	Less than 0.001	Less than 0.001	Less than 0.001

Radioactive waste management

Radioactive waste includes low-level radioactive waste issued from nuclear power plants and high-level radioactive waste resulting from spent fuel reprocessing. Both require different management and disposal methods.

◇ Management of low-level radioactive waste

- Waste in the form of gas or liquid is discharged into the air or sea after being treated, measured for radioactivity, and confirmed as safe.
- Concentrated, treated waste water is solidified with asphalt and sealed in drums.
- Solid waste is first bulk-reduced by incineration or compression, then solidified with cement and sealed inside drums. These drums are first stored stringently in the solid waste storage located within the power plant site. The drums are then transferred to the Low-level Radioactive Waste Disposal Center of Japan Nuclear Fuel Limited in Rokkasho-mura, Aomori Prefecture. There, they are buried and kept until the waste ceases to have any effect on the living environment.

● Low-level radioactive waste storage status at Kyushu Electric

(unit: a 200-liter drum)

	Waste stored in power plant sites	Waste transferred*
Genkai Nuclear Power Station	18,074 (16,933)	5,936 (5,600)
Sendai Nuclear Power Station	9,689 (8,466)	—
Total	27,763 (25,399)	5,936 (5,600)

Figures are the cumulative totals as of the end of FY2000, and figures in parentheses are totals as of the end of FY1999.
∗ Amount transferred to the Low-level Radioactive Waste Disposal Center.

Chemical substance management

Most chemical substances Kyushu Electric handles are for use at thermal or nuclear power plants, and are properly managed at each office in full accordance with related laws and regulations.

◇ PRTR (Pollutant Release and Transfer Register) system

The Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (PRTR Law) was established in July 1999 in Japan. Since April 2001, organizations handling these tasks have been required to identify the states of these chemical substances, and in fiscal 2002, the national government will begin disclosing the results of this data.

- Kyushu Electric has taken the initiative in investigating and collecting data relating to the subject substances. The results for fiscal 2000 are shown in the table below.

● PRTR investigation results (FY2000)

Index No	Chemical substances	Applications	Amount handled	Amount released into environment			Amount transferred ＊1	FY1999 (reference)		
				Air	Water	Soil		Amount handled	Amount released	Amount transferred
124	HCFC-123	Refrigerant for AC	1.10 tons	0.1kg	0	0	0	—	—	—
179	Dioxins	Waste incinerator	—	140mg-TEQ＊2	0	0	230mg-TEQ＊2	—	—	—
213	CFC-113	Cleaning agent	—	—	—	—	—	3.61 tons	3,605.0kg	0
253	Hydrazine	Feed water processing agent	31.17 tons	4.1kg	0	0	0	34.1 tons	0.8kg	0
311	Manganese and manganese compounds	Desulfurization agent	2.31 tons	0	96kg	0	0	2.31 tons	135.8kg	0
353	Tris phosphate (dimethyl phenyl)	For turbine control	7.77 tons	0	0	0	7,800kg	8.41 tons	0	10,744kg

＊1: Amount transferred as waste
＊2: Since the toxicity of dioxins differs according to type, values are expressed in toxicity equivalent quantity (TEQ) in 2,3,7,8-T4CDD.

Note: Under the PRTR system, operators keep track of the amount of each chemical substance subject to PRTR that is released during operational activities, and of the amount transferred as waste. These results are then reported. This system serves to promote voluntary management efforts by operators together with society as a whole, fostering countermeasures against the environmental risks imposed by such chemical substances.

◇ Dioxins

Kyushu Electric has discontinued the use of 300 waste incinerators believed to have emitted dioxins. The remaining 54 waste incinerators at these specified facilities operate below statutory emission limits.

◇ PCB

- Equipment which utilizes PCB (1,509 high-voltage transformers, capacitors and others) is kept at special storage areas at Kyushu Electric under stringent surveillance.
- Kyushu Electric plans to treat the equipment and render it harmless by 2016, the deadline set by the law concerning special measures against PCB waste, effective as of July 2001.

(5) Harmony with the surrounding environment

When designing facilities, Kyushu Electric takes into consideration the natural landscape of the area and implements environmentally friendly measures such as tree planting.

Greening of power plants

Kyushu Electric is proceeding with an ecology campaign to surround its power plants with greenery.

- Upon siting power plants, Kyushu Electric endeavors to minimize alterations to the land or the felling of trees. Further, trees are planted that suit each area's climate. During fiscal 2000, the company averaged an increased in the amount of greenery to about 25% at thermal power plants, and to 40% at nuclear power plants.

Buzen Power Station (awarded the Prime Minister's Prize for afforestation in 1989)

Achieving harmony with the environment upon facility development

Kyushu Electric takes care to improve the appearance of power plants and substations, for example by painting steel towers to create harmony between facilities and their surroundings.

Shinchi Substation (Nagasaki City)