Electrical Equipment

Consolidated sales of the Electrical Equipment group rose 5.6% to ¥349,418 million, accounting for 39.2% of net sales. Sales growth was supported by strong performance in the energy area, reflecting favorable market conditions for geothermal power generation stations, especially in Southeast Asia. In the electrical equipment and machinery area, the Company secured large-scale orders for power transmission and distribution equipment. In the ED&C and drive systems area, export sales of inverters to the European, North American and Asian markets were brisk. Sales of motors for machine tools, fans and pumps increased, and demand expanded for control systems and power and distribution related systems for power and distribution equipment and industrial machinery.

Energy

In the energy area, Fuji Electric manufactures thermal, hydroelectric and nuclear power generating units and related equipment, as well as power transmission and distribution systems. The Company is also developing combined cycle generation technology and promising new energy sources, including fuel cells and photovoltaic cells.

In the thermal power generation field, Fuji Electric received an order for three 59.5 MW geothermal power units from Indonesia and delivered four 20 MW geothermal power units to the National Power Corporation of the Philippines during the term. The Company made strong efforts to secure orders for geothermal power plants, particularly in Southeast Asia. To complete an order from Taiwan, the Company is now manufacturing four 600 MW steam turbine-generator units. Shipment of the first unit is scheduled for the end of 1996.

In the hydroelectric power generation field, Fuji Electric delivered a 24 MW large-capacity bulb turbine-generator unit to one of Japan's electric power companies. We also supplied a 26.8 MW hydroelectric generating unit. We worked to boost demand for inspection and maintenance services, and for the renewal of various existing power generation and substation equipment.

In the power transmission and distribution system field, the Company supplied two banks of 500 kV, 750 MVA transformers during the period. We also delivered underground substation equipment, including gas-insulated transformers and switchgear. In the field of power network protection and control, we developed and delivered a directly grounded, 187 kV transmission line, fault-location detector to aid in rapid repair and restoration during power disruptions.

Fuji Electric delivered a 24 MW large-capacity bulb turbine-generator unit to the Kansai Electric Power Co., Inc. Among generators using a fin-cooling method, this has the world's largest capacity.

Turbine-generators at the Palimpinion Geothermal Power Station are of the skid-mounted type so that each can be easily moved as a single unit to any site where the wells are able to produce sufficient steam flow. The installation period has also been greatly shortened.

Fuji Electric has received an order for four 600 MW steam turbine-generator units for a coal-fired power plant in Taiwan. This is a large-scale project even by international standards.

Electrical Equipment and Machinery

In the electrical equipment and machinery area, Fuji Electric's main products are industrial power application systems for industry and railway use.

Domestic orders for electrical power application systems for industry fell sharply because of a slump in capital investment by steel companies and other major industrial companies. However, Fuji Electric received significant orders from overseas, such as for electrical equipment for cogeneration and a substation in Taiwan and for DC power conversion equipment for aluminum smelting in Australia.

The Company developed compact, lightweight, low-loss, high-performance inverters, which use power semiconductor IGBTs, for industrial plants and general industrial use. Also, a cycloconverter-driven, permanent-magnet synchronous motor was developed and delivered to a domestic coal mining company.

In electrical power applications for railway use, sales and orders were supported by firm capital investment by domestic railway companies. Fuji Electric developed a main converter/inverter incorporating 2.5 kV/1 kA-rated flat-packaged IGBTs for the Shinkansen. The equipment is being evaluated through actual run performance tests. In new products for railway use, a door driving system that uses a synchronous linear motor was developed to open and close platform barriers and trains doors.

Fuji Electric has delivered 110 kV underground substation equipment to the Chubu Electric Power Co., Inc. for use in a multiple purpose building. The gas-insulated transformer of 40 MVA at 110 kV is the largest made by Fuji Electric.

We developed this direct-current, common bus-line voltage PWM-control FRENIC 4000 VM4 Series inverter for industrial plants. It incorporates the latest advances in miniaturization, performance and function.

Fuji Electric developed low-noise, highly efficient converter/inverter units incorporating 2.5 kV/1 kA-rated flat-packaged IGBTs for the 300 series Shinkansen.

Fuji Electric's new type of push-button switch is easily attached and detached.

Electric Distribution & Control and Drive Systems

This area can be divided into the electric distribution and control (ED&C) system and the drive system fields. Major products in the ED&C system field include control equipment, such as magnetic motor contactors, push-button switches and programmable logic controllers (PLCs), and electrical distribution equipment, such as molded-case circuit breakers and earth-leakage circuit breakers. Major products in drive systems include induction motors, motor-related equipment and inverters.

In ED&C systems, demand for machine tools and other machinery was robust, and an upturn in demand for electrical distribution equipment finally materialized as well. As a result, production and sales of ED&C systems were strong throughout the year. Among new products, sales of the compact, high-performance MICREX-F55 Series of PLCs and the new AR series of push-button switches expanded steadily.

In drive systems, inverter sales benefited from strong domestic markets for air conditioners, fans and pumps. Higher exports, mostly to Europe, North America and Asia, also contributed to strong sales growth. Sales of motors improved, supported by favorable demand for conveyor equipment, fans and pumps.

This hoist for inclined mine shafts moves worker transport cars farther and faster than any other hoist in the world. Using the latest controller theory to develop this system, Fuji Electric cut transport time by one-third.

Although miniature in size to meet the needs of equipment downsizing, the MICREX-F55 Series of programmable logic controllers delivers performance on a scale with medium-sized controllers.