

## II. Environmental Activities



### 1. Constant Thermal Output Operation at Nuclear Power stations

Constant thermal output operation will be adopted at all Kyushu Electric Power nuclear power stations because this method contributes to a more effective use of the existing power generation capacity and reduces CO<sub>2</sub> emissions.

#### (1) Description of constant thermal output operation

At nuclear power stations, electricity is made by generators connected to turbines rotated by steam produced from the heat emitted by the fission reaction of uranium and other materials. The operation method in question, which maintains the reactor thermal output at a rated value, is called the constant thermal output operation. Meanwhile, the conventional operation method, which maintains electric output at a constant value, is called the constant electric output operation.

#### Conventional operation method and constant thermal output operation

Conventional operation method (constant electric output operation)

In winter, seawater is naturally colder, therefore increasing nuclear power stations' thermal efficiency. Consequently, if the reactor thermal output is kept constant, electric output naturally rises, exceeding the rated electric output of 100%. Japan's nuclear power stations have typically responded to this issue by lowering reactor thermal output in winter and keeping electric output constant.

Constant thermal output operation

Constant thermal output operation is not a special operation system, but an operation method to keep the reactor thermal output at a rated thermal output of 100%, the value approved by the government. This method increases electric output about 1-4% over the 100% rated electric output in winter, when seawater temperature falls. In many countries such as the US, France, the UK, Germany and South Korea, nuclear reactors are commonly operated constantly at their rated thermal outputs. In addition, before beginning the constant thermal output operation, the safety and soundness of steam turbines and generators are evaluated at every relevant plant, and the results are reported to the government for confirmation that there are no safety problems.

Comparison between constant electric output operation and constant thermal output operation

