

Geothermal Power Plant

Suginoi Hotel, Japan
Suginoi Geothermal Power Plant
1,900kW



Outline

The turbine, generator, in-house electrical equipment, storage pump, and circulating water piping of the aging power plant were renewed, and a monitoring system was newly installed. Since commencing operations in May 2006, this power plant has been contributed as the base load for the hotel.

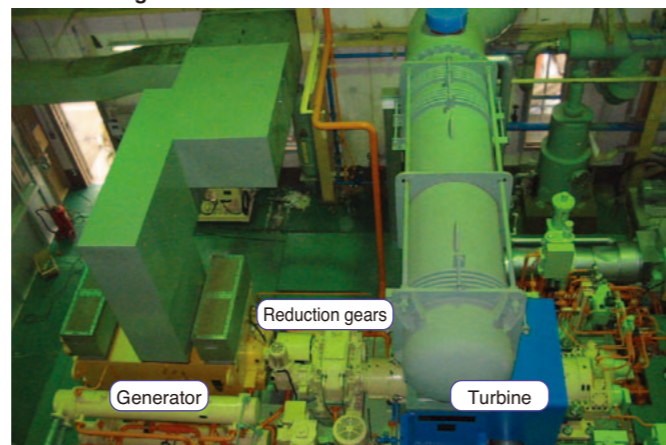
Hotel



Power plant



Turbine and generator



Steam Turbine

A high-speed turbine was adopted, with performance and economic efficiency taken into consideration. A compact turbine, reduction gear, and generator were adopted, along with the common bed structure, to use the existing foundation as it was.

This steam turbine features the following:

- (1) Reaction blades
- (2) Full arc admission without a control stage
- (3) Integral shroud band on the moving blades
- (4) Self-standing low-pressure blades without lacing wire

Specifications

Type : Single-cylinder, condensing, high-speed turbine
 Speed : 5,670r/min
 Steam condition
 Pressure : 0.2MPa
 Temperature : 119.6°C
 Exhaust pressure : 30kPa

Reduction Gear

A single helical reduction gear was adopted, and the shaft end after reduction is connected to the 4-pole generator.

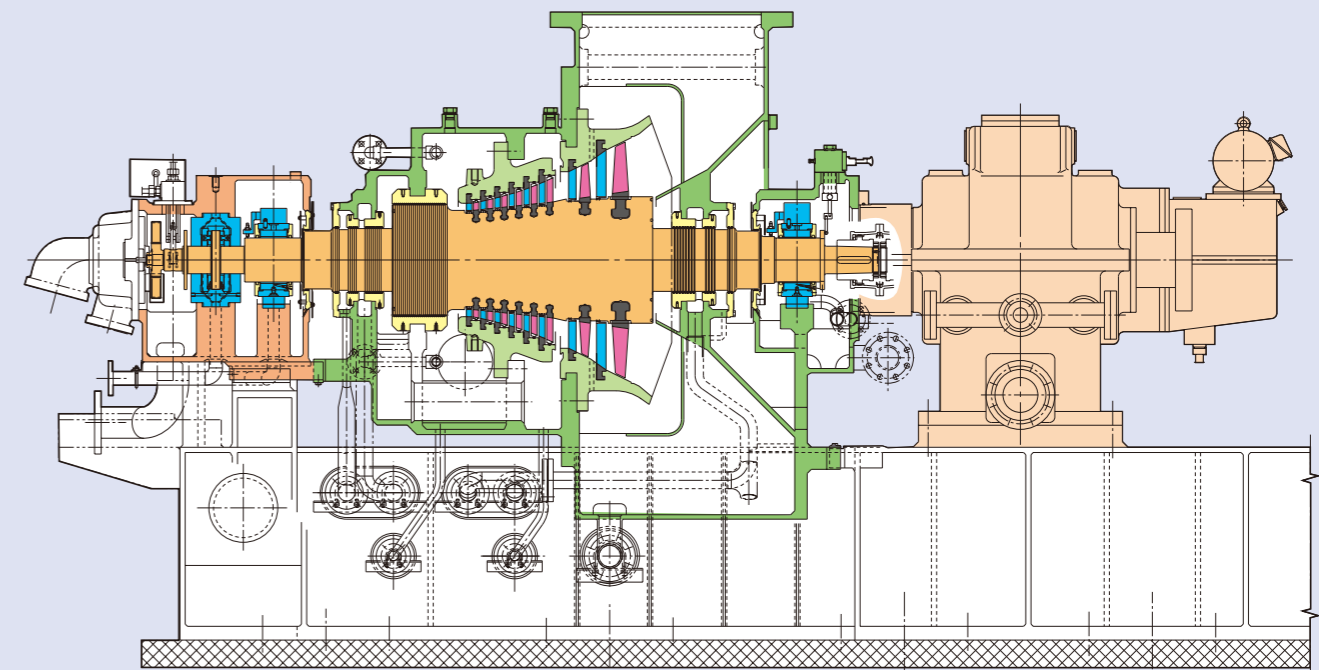
Specifications

Type : Single helical gear
 Speed
 Primary : 5,670r/min
 Secondary : 1,800r/min

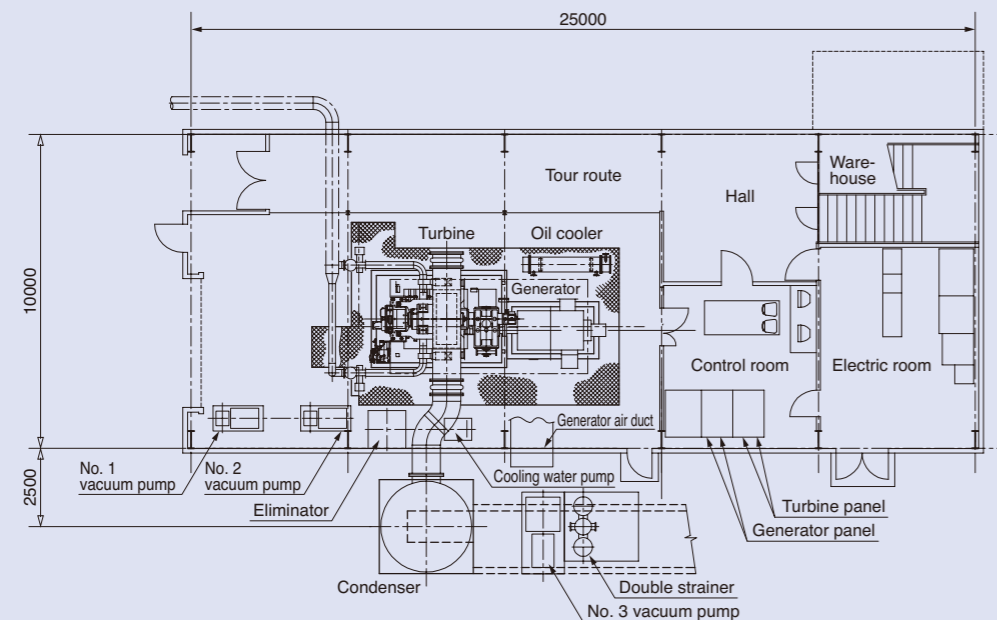
Reduction gear



Turbine sectional view



Overall layout



Electrical and Control System

The existing generator, house electric panel, turbine, and generator monitoring panel were removed, and a new open air-cooled turbo generator, turbine, generator monitoring panel, DC electric power unit, DC start panel, motor control center, and monitoring system were installed.

The turbine is started, accelerated, synchronized, and placed under load operation by the electric governor (Woodward).

Generator

Specifications

Type : Open air-cooled generator

Output : 2,240kVA

Power factor: 0.85 (lagging)

Speed : 1,800r/min

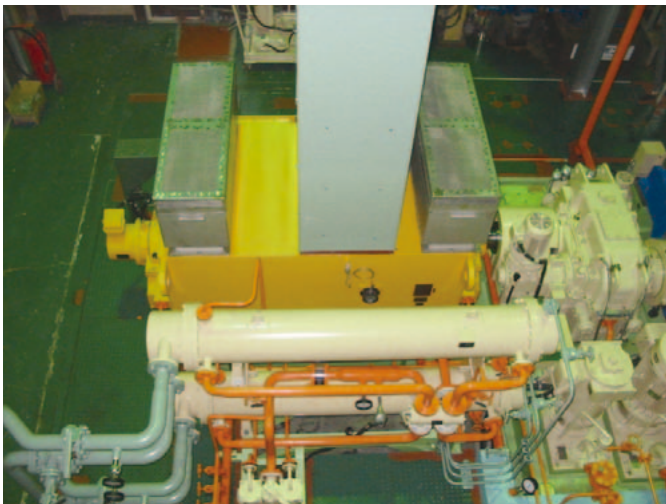
Frequency : 60Hz

Excitation : Brushless

Turbine monitoring panel



Generator



Monitoring system



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