

POWER GENERATION



GEOHERMAL POWER

Geothermal power is a fast growing section of renewable energy, accounting for nearly 13,450 MW of capacity. To date, several hundred plants around the world are utilizing the Earth's thermal energy reserves as a relatively clean and carbon neutral alternative for the production of sustainable electricity.

In order for Geothermal Power producers to meet critical economic goals, they plan for the majority of their capital expenditures to be in the exploratory and construction phases of each project. Once constructed, these plants utilize the heat reserves as free energy. How well a plant is able to sustain operation and maximize process uptime becomes the critical driver in meeting or exceeding economic projections.

ELECTRAULIC™ ACTUATION

Geothermal Power Generation

At REXA, we have more than 20 years of experience in the Geothermal Power market. We offer high-quality, low/no maintenance Electraulic™ Actuators that have been field-proven in some of the most critical and difficult process applications:

- Production Well Control
- Injection Well Control
- Production/Injection Well Isolation
- Condensate Control
- Steam Turbine Control and Isolation
- Rock Muffler Pressure Reduction

Why REXA?



Production Well Isolation and Control

- Harsh environment/extreme heat
- Abrasive process conditions
- Hazardous gaseous atmospheric conditions

Condensate Control

- Precise control:0.05% resolution
- 50-70mSec deadtime
- Zero hysteresis
- Low power consumption
- 120VAC power available

Rock Muffler

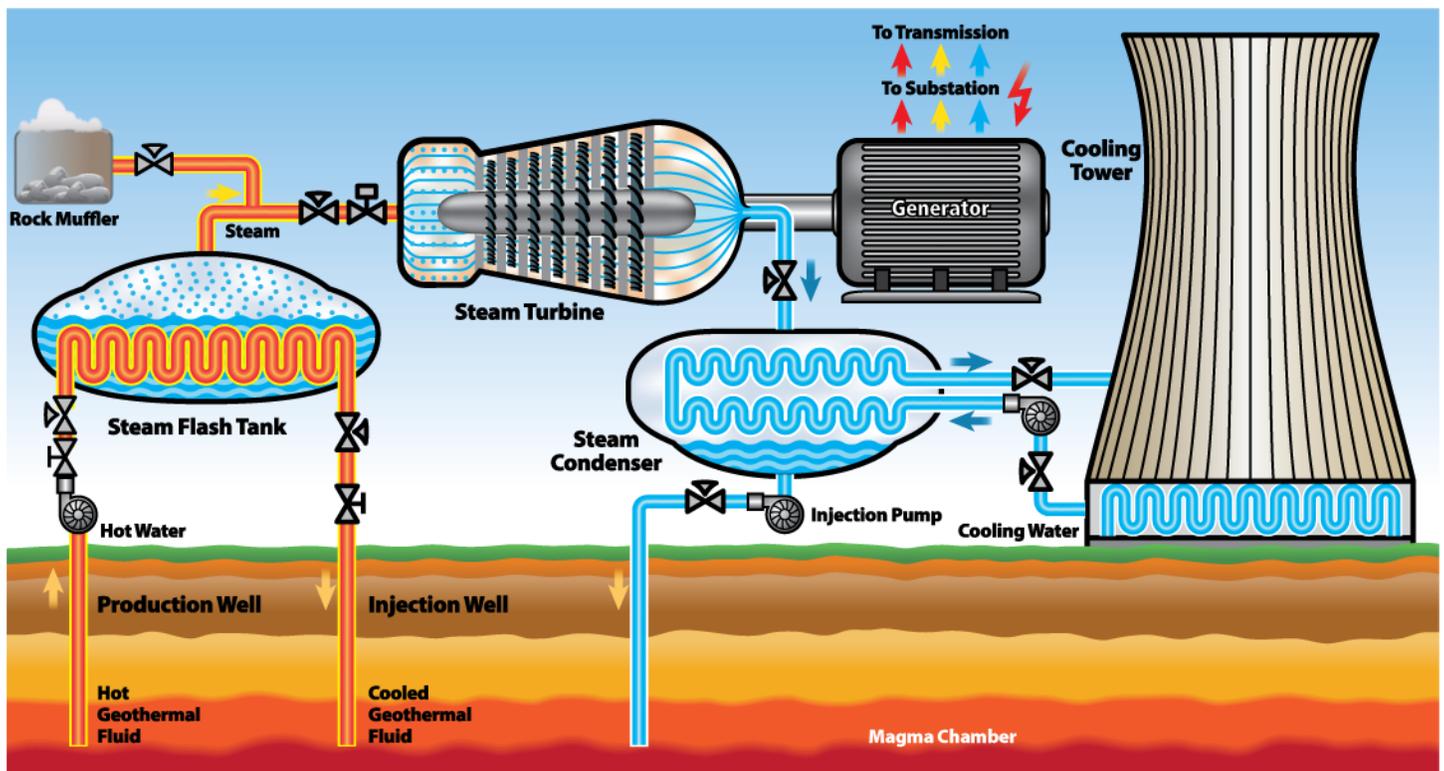
- 100% duty cycle
- Tight shutoff
- Fail safe capable
- <1 Second full trip and surge to position speed
- High reliability

“ My REXA Actuators have stood the test of time in the most difficult environment imaginable! We were able to eliminate any requirement for compressed air or three phase power on installation and have been virtually maintenance free through years and years of service...”

Geothermal Flash Steam Power Plant

Flash steam power plants utilize geothermal heat resources, also called hydrothermal resources, (steam, water, brine) at temperatures greater than 175°C (350°F). These heat resources are extracted at production wells and piped as two-phase fluid to the plant. During the extraction process, from the underground geothermal reserve to the surface, the hydrothermal resources see a significant pressure reduction, causing the resources to flash to steam. When entering the plant the two-phase mixture is admitted to lower pressurized vessels where the flashing process is completed and steam is separated to be used at the steam turbine.

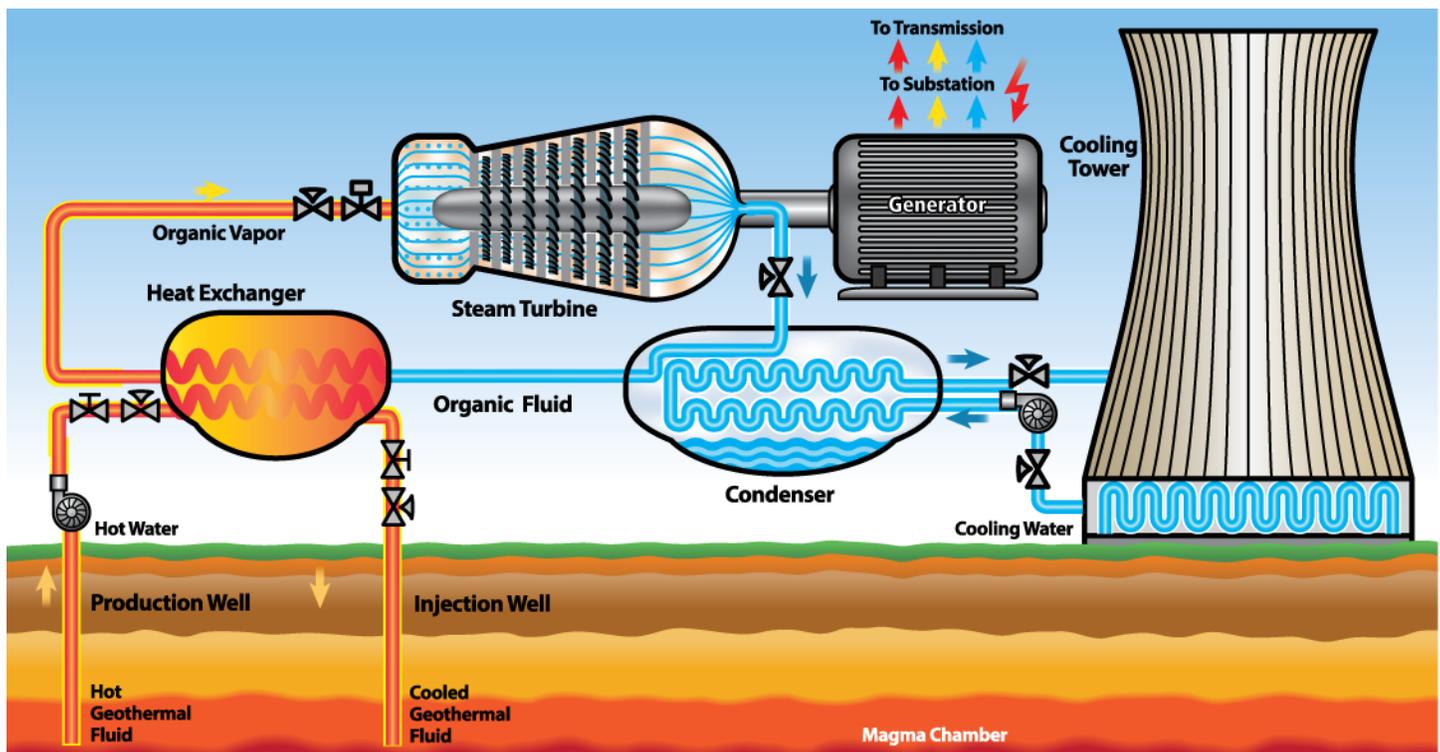
The condensed fluids (water/waste) are sent to the injection well to replenish the reserve over time. The steam cleaning process is very extensive, as many harsh and corrosive fluids and solids need to be removed from the process. These harsh environmental conditions require equipment with the highest level of reliability to keep the process on line. Flash systems can be simple single flash systems, as depicted below, or more complex dual or triple flash systems that utilize different steam pressure stages at the turbine to drive additional efficiency.



Geothermal Binary Cycle Power Plant

Geothermal Binary Cycle Plants are capable of utilizing hydrothermal resources at a much lower temperature range than Flash Plants (160-350°F), making the possibility for use of this technology more widespread. In the binary cycle plant, the hydrothermal resource is used as the heating source for secondary organic fluid, typically isobutane or isopentane, in a heat exchange process. The key to the process is that the organic fluid has a lower boiling temperature than water, allowing the organic fluid to flash to vapor at a lower temperature.

There are significant advantages with a binary plant, even beyond the ability to use a lower temperature heating medium. The hydrothermal resources are a closed loop system and are fully re-injected into the geothermal reserve, making the system very efficient with a reduction in environmental impact. Likewise, the organic fluid/vapor is also in a closed loop system, which does not require separation and cleaning to the same level as a comparable flash system. A high level of control is required to maintain the highest level of efficiency in these plants.



" After upgrading from pneumatic actuation to REXA Electraulic Actuation™, we were able to stabilize our condensate system and achieve greater operational efficiency..."

Steam Turbine Upgrades

“HPU/Servo based hydraulic systems had been a problem for over a decade site-wide. Oil based maintenance was a massive expense to the company and unplanned shutdowns, the result of servo valve failures, cost the company millions of dollars in lost revenue. REXA Actuators eliminated these problems completely and paid for themselves in a matter of months. As an unexpected benefit to the plant we completely eliminated generation swings. On units that used to swing anywhere from 2MW-10MW the units hold dead on now...”



- Retrofit existing governor control valves and trip valves
- Eliminate control oil skid: 95% plus oil reduction
- No oil maintenance required with REXA
- Eliminate oil filters
- Increase uptime
- Eliminate oil cleanliness based trip events
- Eliminate swings in megawatt output
- Minimize and consolidate spares across different turbine manufacturers





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Place representative sticker here



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