CASE STUDY • POWER

GURMAT GEOTHERMAL PLANT OPTIMIZES PRODUCTION AND REDUCES MAINTENANCE WITH ROSEMOUNT MAGNETIC FLOW METERS

Application

Brine circulation in geothermal plant - brine extraction (170°C, 23 bar) and brine re-injection into the reservoir

Customer

Gurmat Electric Generation Co. Inc. geothermal plant in Turkey (47.4 MWe nominal power capacity)

Challenge

The main operation units of a geothermal plant consists of three areas: i) separation of brine/water and steam, ii) electricity production, and iii) re-injection of separated and condensed brine/water in the underground reservoir. Control of the brine circulation in the plant, from extraction to re-injection in the reservoir, is crucial as it impacts the overall power plant efficiency. Magmeters are usually used to measure the water/brine flow, both on the hot side—including extraction and separation—, and on the cool re-injection side.

For the hot brine measurement (extracted brine is at 170°C and 23 bar), Gurmat was looking for magnetic flow meters that would offer superior reliability while operating close to their maximum temperature limits in order to reduce risk of failure and unplanned shutdowns.

On the re-injection sides of the plant, Gurmat needed a magnetic flow meter that would provide a precise brine measurement in order to determine an accurate indication of the turbine steam consumption and maximize its throughput. Moreover, an accurate measurement of the re-injected brine indicates when a well is at risk of plugging, allowing Gurmat to judiciously schedule the well cleaning process.

Results

- Reduction of energy losses by 3.000 MWh/year
- Optimized power production
- Reduced maintenance costs

> *"The Rosemount™ magmeters don't need any kind of maintenance."*

Baybars Dal
Electrical and Instrumentation Chief

Installed Magnetic Flow Meter in a cooling water application.

EMERSON

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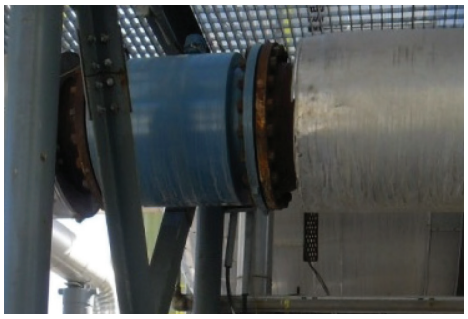
Solution

To achieve those critical measurement points on both the hot and cold brine, Gurmat has installed 25 Rosemount Magmeters. The Rosemount Magmeters have been in operation for more than five years and continue to meet Gurmat requirements. “The Rosemount Magmeters don’t need any kind of maintenance. We have installed over 25 meters of sizes between 2” and 20” and have experienced a perfect level of reliability of 100%,” explained Baybars Dal, Electrical and Instrumentation Chief. “Other supplier magmeters did not guarantee the required reliability when brine temperature was near to the operating temperature limit of the meter. It is known that in similar cases the flow tubes failed only few months after the installation. We use the Rosemount magmeters for those applications and although the brine temperature is only 7°C below the operating temperature limit of the Rosemount meter, the measurement is reliable,” continued Baybars Dal.

Emerson magmeter accuracy helps Gurmat reduce the uncertainty level of their energy losses. The 0.25% flow accuracy and electronics that are compensated across the operating temperature assure the best available installed accuracy. This enables Gurmat to quickly recognize the production losses, reducing total losses due to bad estimation by 3.000 MWh/year. Gurmat noted that Emerson magmeters have proven to be the most reliable and accurate solution for this kind of measurement and are capable of keeping the plant efficiency at the target level for the last five years with no impact on maintenance.



Installed magnetic flow meter in a main brine line.

Rosemount 8705 with integral 8732

For more information, visit
Emerson.com/RosemountMagneticFlow

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