

# A cascade power plant with VAG valves in the mountains of Huasahuasi, Peru

HYDROPOWER > FIELD OF APPLICATION HYDROPOWER > FIELD OF APPLICATION HYDROPOWER > FIELD OF



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VAG On-site

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## Huasahuasi, Peru

The city of Huasahuasi lies in the Peruvian Andes at 2,500 metres above sea level. Immense efforts were made here to improve Peru's hydrocarbon balance.

The country was looking for alternatives to thermal power stations powered by gas, oil and coal, and produce energy that is not only expensive but harmful to the environment.

The country high in the Andes turned to renewable energy for the generation of its power. With hydro-power so widely available, the Huasahuasi I + II

project was started in 2010. Two run-of-the-river hydropower stations in cascaded.

This is done by taking advantage of the natural slope of the two rivers Huasahuasi and Huacuas. First, the water from both rivers is routed into an equalizing basin (surge tank). From there, it flows into turbine houses I and II, each of which houses two Francis turbines. The total capacity of the four horizontally installed power generators is around 120 GWh a year. The generated power flows into the national grid through an own substation (SEIN).

## Project overview

### Project:

Construction of two run-of-the-river hydropower stations

### Valves:

4 VAG EKN® Butterfly Valves DN 900, PN 25 with VAG hydraulic actuator with lever and weight

### Project duration:

Commissioning July 2011

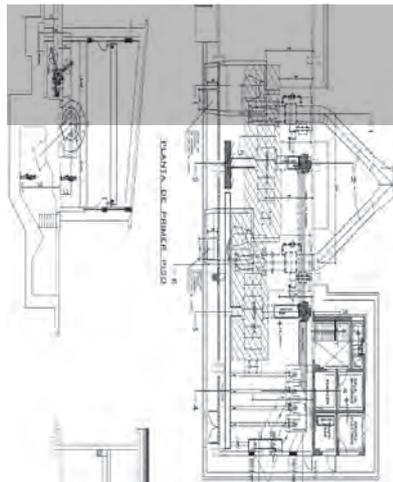
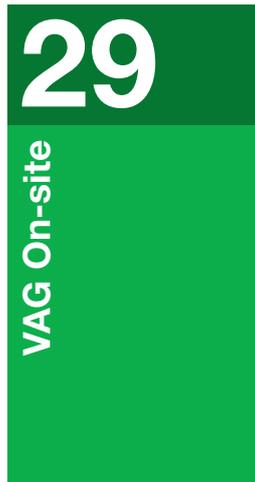
### End Customer:

Hidroelectrica Santa Cruz SAC Lima/Peru

### Client:

GCZ Ingenieros SAC





For this project, Hidroeléctrica Santa Cruz joined forces with GCZ Ingenieros, a Peruvian company with over 20 years of experience in the construction and operation of small hydroelectric power stations.

Managing Director of GCZ, Pedro Gonzalez-Orbego, likes talking about how they found out about VAG-Armaturen:

'We saw VAG's valves in operation in another project in Peru and the operator told us about their positive experiences. We were immediately convinced! VAG's EKN® Butterfly Valves were the first choice for our project too because of their reliability and opening and closing speed. We received excellent advice from VAG's experts already during the first meeting and were immediately convinced of the advantages of VAG's EKN® Butterfly Valve and the function of their own hydraulic actuators with level and weight.'

'Compared with a number of competitors, VAG-Armaturen had the most

economical solution. And because we want the project to run for 20 years, the high quality of products "Made by VAG" was another factor that spoke in favour of VAG,' adds Technical Director Miguel Paz.

In April 2011, GCZ came to VAG's plant in Mannheim to inspect and check the operation of the four valves. The inspection was completed without objection, and the four flawless VAG EKN® Butterfly Valves DN 900, PN 25 were packaged and sent on their long journey to Peru according to plan. GCZ transported the valves from the port of Callao into the mountains of Huasahuasi and installed them in both turbine houses, to the great satisfaction of the service team, who was impressed by the quality and the reliability of VAG's valves as soon as they had been installed. The delivered valves were an exact replica of the version that had been designed at the beginning of the project. Everything fit together perfectly. Once the valves were installed in the pipeline, the drop weight was added and the power connected according to VAG's plans. The valves with the hydraulic actuators were good to go.

They had already been filled with oil at the VAG plant and only had to be tuned to the turbine's characteristics on site, which was very easy to do thanks to the valves' standard configuration.

The plant was put into operation the same month and power generated.



Mr Frank Maita and Daniel Ayulo in turbine house Huasahuasi I with one of the VAG EKN® Butterfly Valves with the huge lever and weight arm that quickly closes the pipe in the event of an emergency.

