

Shuakhevi Project

Non-Technical summary – Tunnel collapse and remedial actions:

Shuakhevi HPP consists of several structures:

Intake structure in Chirukhi with reservoir of 50 000m³ of water, Earth Dam in Skhalta with reservoir of 750 000 m³ of water, Concrete gravity Dam in Didachara with reservoir of 2 200 000m³ of water and 9MW Power Plant in Skhalta and Main 178MW Power Plant in Shuakhevi.

Reservoirs are connected between each other with the tunnels Chirukhi-Skhalta, Skhalta-Didachara and Didachara-Shuakhevi HPP. Overall length of the tunnels is nearly 38 000 meters.

In 2017 during filling of the tunnels the damaging of the tunnel surface was detected in some places. HPP was stopped and tunnels were drained to conduct investigation. During investigation it was identified that few locations in total approximately 300 meters (less than 1% of overall length) of the water diversion tunnels has damages accrued due to a reaction of the water on the surrounding geology resulting in an excessive overloading on the support structures.

In response, Adjaristsqali Georgia LLC (AGL), the project's parent company, launched a comprehensive investigation and testing program. The tunnels were remapped in detail based on thorough geological testing of over 1,000 samples. Based on this research, AGL created a comprehensive "Phase 2" rock support strategy. Experts from around the world were involved in reviewing the methodology. AGL engaged the expertise of **3G Austria** and **Professor Luiz DeMello** of the University of São Paulo. The project's engineering contractor Mott MacDonald enlisted Germany's **Zeidler Associates** to assist in investigation and design. The **Lahmeyer Group** (now **Tractebel**) in their capacity as the Lender's Engineer provided further oversight of the investigations and the design of additional rock supports. AGL also brought on board **Peter Pitts**, one of the world's leading tunnel engineers, as project director.

Investigation and rehabilitation work of the water diversion tunnels took around two years and cost around 120 000 000 \$

As a result, up to 80% of tunnel is lined including full lining of Didachara-Shuakhevi pressure tunnel.

After, rehabilitation of tunnels, Shuakhevi HPP was recommissioned in Feb 2020 and since then it is operational without any issues on tunnel and associated

infrastructures. Tunnel condition is monitored on daily basis by operation engineers at Shuakhevi HPP through various technical Parameters to ensure that there is no abnormality in tunnel.

Damaged Tunnel sections



Tunnel sections after rehabilitation

