Beyond
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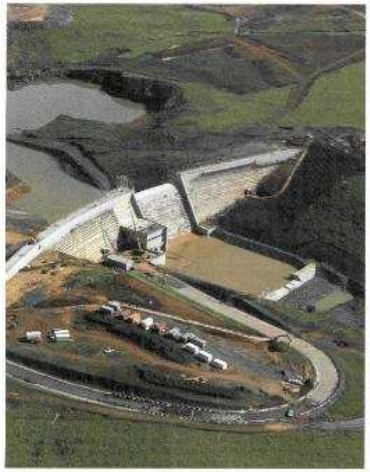

Ingula, Eskom's power generation project

Engineering and environmental consultants, SSI (in consortium) is currently overseeing one of Eskom's major new power generation projects. Due for final completion towards the end of 2013, the Ingula Pumped Storage Scheme is set to contribute power to the national grid during peak hours.

The Ingula Pumped Storage Scheme is situated in the Little Drakensburg mountain range just outside of Ladysmith in Kwa-Zulu Natal. Referred to as a 'peaking power station', the power station's rated generation capacity of the scheme is nominally 1332MW, with an energy storage capacity of 21 000MWh.

The intention is to produce 1332MW of power during the morning and evening peak hours.

The Ingula project will be the third peaking power station in South Africa, which already includes the Palmiet power station towards Sir Lowry's Pass and the Drakensberg station near Bergville, also in the Drakensburg Mountains.

The principle behind the technology

The project consists of two major reservoirs and a power house situated 350m below surface, in the mountain. The upper concrete-faced rockfill dam (CFRD) (Bedford, with a 810m crest length and a 49m height) is situated on the mountain top and feeds water through the power house, which generates power. The power house complex consists of a combined machine and valve hall, a transformer hall and other ancillary tunnels and caverns. The machine hall houses four reversible pump/turbines, coupled directly to generator/motors, each with a rated output of 333MW. The rated generating head is 441m. Water then passes a further 2500m to reach the lower reservoir (Bramhoek).

The crest length of the lower roller compacted concrete (RCC) dam is 310m and it has a maximum height of 38.6m.

During off-peak hours, thanks to the incorporation of reversible turbines, the water is pumped back up the mountain from the Bramhoek Reservoir to the upper Bedford Reservoir. The principal behind the design is that kinetic energy is converted into potential energy.

This R20bn project was started in 2004. Commissioning of the first unit is envisaged in early 2013, thereafter commissioning will take place at three-monthly intervals for each subsequent unit, with commissioning of the final unit towards the end of 2013.

SSI forms part of the Braamhoek Consultants Joint Venture who was tasked by Eskom to undertake preliminary feasibility studies, preliminary design, final design and lastly, site supervision.

Braamhoek Consultants Joint Venture - SSI, Arcus Gibb and Knight Piesold. Underground construction - CMC/Impregilo Consortium. Bedford and Bramhoek Dams' - Braamhoek Dams Joint Venture - WBHO, Concor, Edwin Construction and Silver Rock Construction