



Lessons learned from the Design, Build and Operate of Deriner Dam & HEPP Scheme in Turkey

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Overview: The objective of the presentation is to present the project from all design, build and operator phases while focusing on specific technical, planning, cost, environmental and political challenges.

Speaker: Dr Russell Gunn

Place: EPFL campus (CH-1015 Lausanne)

Room: [EPFL BC 01](#)

Online: [zoom link](#)

Abstract

The Deriner Dam and HEPP scheme is located on the Çoruh River in the North-Eastern part of Turkey. The main structures comprises of (1) a double-curvature arch dam, 253 m in height and currently the tallest dam in Turkey; (2) two gated overflow spillways on the left and right abutments of the dam with a total capacity of 2'225 m³/s and with tunnel lengths of 420.86 m and 446.60 m respectively; (3) one power intake structure, (4) eight mid-level bottom outlets with a total discharge capacity of 7'000m³/s and (5) a 670 MW (four vertical Francis turbines of 167.5MW with a 9 m diameter penstock) underground powerhouse of 126 m x 20 m x 45 m (L x B x H).

The dam's reservoir has a catchment area of 18'839 km², a mean inflow of 154 m³/s, a storage volume of 1'969 million m³ and an area at full-supply level of 26.4 km². The reservoir's designed full supply level is 392 m.a.s.l, maximum flood level is 395 m.a.s.l and minimum operating level is 347.83 m.a.s.l. The HEPP has an annual output capacity of 2'118 GWh, accounting for approximately 1.1% of the total energy production in Turkey and roughly 6% of Turkey's hydropower generation capacity.

Short bio

Dr Russell Michael Gunn graduated in 1987 with a BSc with Honours from Aston University, UK and gained his PhD on the *Non-Linear Analysis of Arch Dams including an Anisotropic Damage Mechanics Based Constitutive Model for Concrete*, in 1998 from Brighton University, UK in collaboration with the EPFL and STUCKY, Gruner Ltd. He has over 35 years' experience in Dam and HEPP engineering comprising of 3 years at the EPFL, 25 years with Stucky Ltd, 2 years with BG Ltd and 7 years with the Swiss Federal Office of Energy. Russell designed the Deriner arch dam and was the on-site technical office manager for 5 years covering all aspects of the Dam and HEPP project.