



TATA CONSULTING ENGINEERS LIMITED

ENGINEERING A BETTER TOMORROW SINCE 1962



CASE STUDY

ITEZHI TEZHI (120 MW)

OVERVIEW

The Itezhi Tezhi (ITT) dam is located across Kafue River, about 330 km from Lusaka, the capital of Zambia. The components of ITT hydro project were to be located on the downstream of existing Itezhi Tezhi dam. The project essentially comprises concrete lining of existing 13.1 m dia. D-shaped and 425 m long south side diversion tunnel (SDT), construction of new 9 m dia. horse shoe shaped and 200 m long RCC tunnel, 14 m dia. surge shaft, two nos. of steel lined tunnel each of 6.2 m dia. and 20 m long, surface powerhouse and 40 m wide tailrace canal. Rated head & rated discharge of the plant are 40 m & 311 m³/s respectively. The electro-mechanical works include 2 units of Kaplan turbines each having 60 MW capacity with a 132 kV outdoor switchyard.

Tata Consulting Engineers (TCE), India in association with ZESCO Limited, Zambia was awarded the work for providing Project Management, Preliminary Design Engineering Construction Supervision and Commissioning Services for the EPC contract for development of Itezhi Tezhi HEP.

OUR ROLE:

- Pre-project activities such as DPR, site investigations.
- Preparation of EPC tenders for Civil & Hydro-mechanical Works and Electro-mechanical systems.
- Review of EPC drawings and vendor drawing review.
- Project Management and coordination.
- Supervision of erection, testing and commissioning of hydro turbines & generators including start-up and performance testing.

CHALLENGES

- SDT excavation posed difficulty due to its proximity with existing dam and other components.
- Lining and curing of concrete was a challenge owing to the large diameter and depth of the surge shaft.
- Location of major access roads was revised at later stage across tailrace channel.

SOLUTIONS

- Controlled Blasting was carried out based on recommendations of blasting expert thereby avoiding damage to existing components.
- Elephant chute was used to provide concrete lining at deeper locations and a special sprinkling arrangement was adopted for curing of concrete in surge shaft and pressure tunnels.
- TCE played an important role in finalising designs for bridge and facilitated speedy construction.
- Advanced laser technology during erection was adopted for precise alignment resulting in minimal vibrations.

VALUE ADDITIONS

- Optimised project layout and designs resulting in cost benefit of about 30 Million USD and reduction in construction time by about 10 months.

OUTCOME

- Unit I was successfully commissioned in January 2016 and Unit II was commissioned in February 2016.