Tianshengqia-1 (TSQ-I)

TSQ-I Hydropower Project comprises a concrete faced rockfill dam (178m high and 1104m long in crest), a large chute spillway, an emptying tunnel, a power generation tunnel and powerhouse. The total quantity of the rockfill dam is $18 \times 10^6$ m$^3$, and the excavation materials that can be used as rockfill is about $14 \times 10^6$ m$^3$ (about 78% of the total quantity), of which soft rock is $4.8 \times 10^6$ m$^3$ (1/4 of the total rockfill quantity). The spillway is located on saddle-back of right bank and the emptying tunnel is located on the right bank. The power house is located on the left bank with four tunnels and four turbines, and the total installed capacity is 1200 MW.

**General Features**
### Project location
On the Nanpan River
Guizhou/Guangxi, China

### Catchment and reservoir
- **Catchment area**: 50,139 km²
- **Mean annual runoff**: 612 m³/s
- **Reservoir area at FSL**: 173.7 km²
- **Storage at FSL**: $10257 \times 10^6$ m³
- **Active storage**: 5,796 million m³

### Spillway
- **Number of spillway**: 1
- **Type**: Chute surface spillway
- **Discharge capacity**: 21,750 m³/s
- **Type and no. of gates**: 5-radial
- **Size of gates**: 13m×20m

### River diversion
- **2 diversion tunnel**: 2-13.5m×13.5m

### Project developers
- **Owner**: South China Electric Power Joint Venture Corporation
- **Engineers**: KHIDI
- **Civil contractor**: Shca/Sinohydro Engineering Bureau
- **Erection contractor**: China Gezhouba Water & Power(Group) Co., Ltd

### Project purpose
Power Generation and Flood Control

### Years of construction
1992-2000

### Main dam
- **Type**: CFRD
- **Height**: 178 m
- **Crest length**: 1,104 m

### Power plant
- **Maximum gross head**: 143 m
- **Installed capacity**: 1,200MW
- **No. and capacity of units**: 4×300MW
- **Number and Type of units**: 4tunnels, D=9.6m
- **Type of turbine**: Francis

### Main construction volumes
- **Concrete**: $1.32 \times 10^6$ m³
- **Rockfill and soil**: $19.0 \times 10^6$ m³
- **Excavation**: $26.5 \times 10^6$ m³

### Main equipment suppliers
- **Turbines & generators**: Harbin Electric Machinery Limited Duty Co.
- **Hv Electrical**: Gec Alsthom / Xian Xidian Transformer Co. Ltd
- **Gates & Hydro Mechanical**: Fuchunjiajiang Hydro Machinery Works /Jiajiang Hydraulic Machinery Works

---

**TSQ-1 GENERAL LAYOUT**

[Diagram of Tianshengqia-I project location and layout]