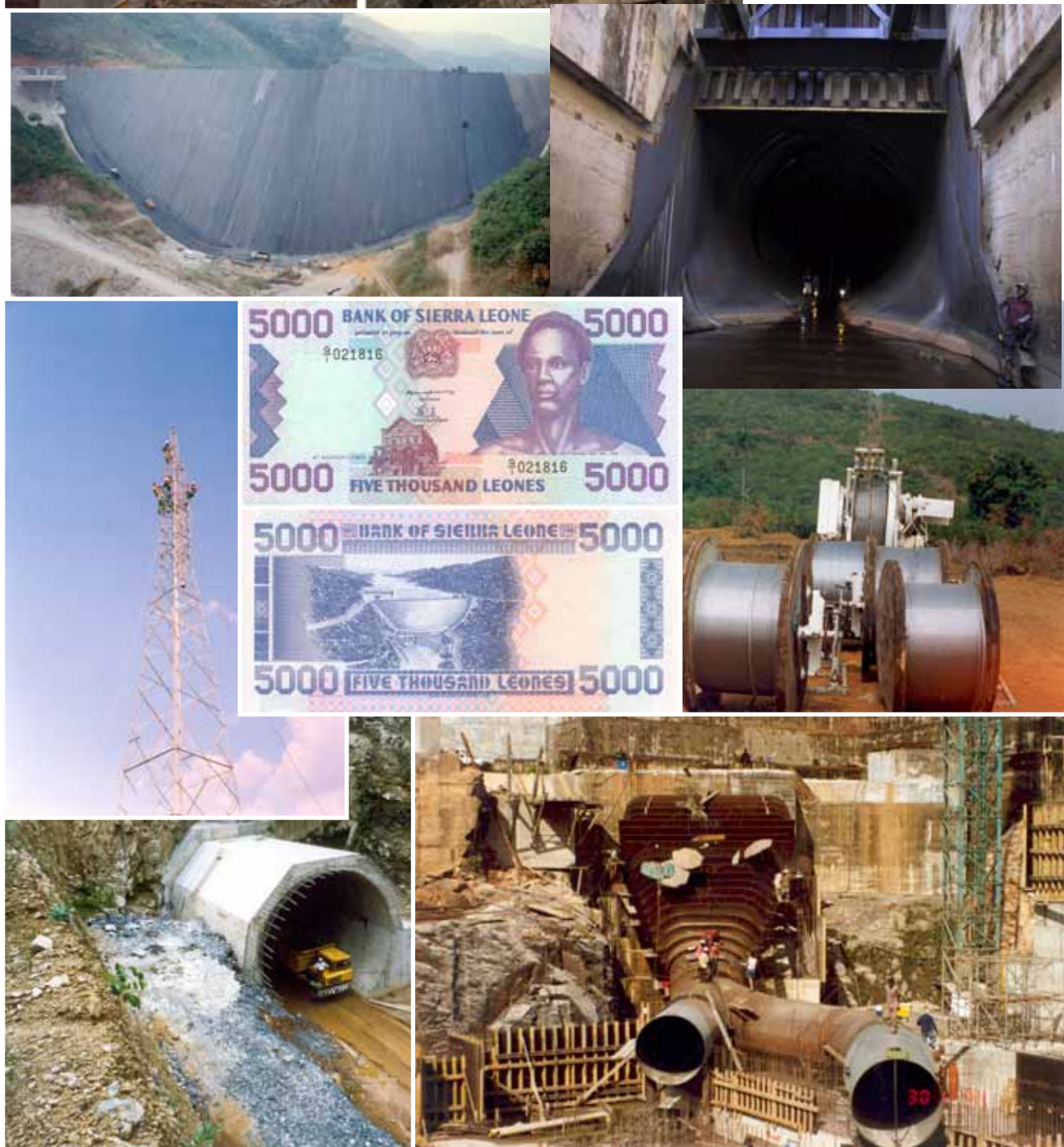


HYDROELECTRIC POWER PLANT
TO BE REALIZED IN 5 PHASES
275 MW – Installed power Final phase
50 MW – Installed power Phase 1

SIERRA LEONE



BUMBUNA

LOCATION : Bumbuna, SIERRA LEONE

PROJECT : Hydroelectric Power Plant to be constructed in five phases, with 275 MW installed in the final phase and a total energy production of 1,400 GWh/year.

CIVIL WORKS :

- **Rockfill Dam**
 - Height..... 88 m
 - Crest Length..... 440 m
 - Crest Width..... 4 m
 - Embankment Volume..... 2.5 Mm²
 - Bituminous Facing Area..... 51.000 m²
 - Reservoir Volume 480 Mm³
- **River Diversion Tunnels (No. 2)**
 - Diameter 9 m
 - Length 620 m
- **Morning Glory Type Spillways (No. 2)**
 - Bellmouth Diameter 32 m
 - Maximum Height 65 m
 - Total Design Discharge 3.000 m³/s
- **Intake Tower**
 - Internal Diameter..... 7.5 m
 - Height..... 93 m
 - Cylindrical Gate 6.5 x 4.0 m
- **Power Tunnel**
 - Steel Lining..... 205 m
 - Radial Gate 7.4 x 7.0 m
- **Roads**
 - Roads..... 40 Km
 - Bridges 2 n°

ELECTROMECHANICAL EQUIPMENT :

- **Machine Hall** Surface Outdoor Type
- **Francis Turbine (No. 2)**
 - Axis Position..... Vertical
 - Installed Power..... 2 x 25 MW
 - Maximum Turbines Discharge..... 80 m³/s
 - Max/Min Head..... 80/40 m
- **Synchronous Generators (No. 2)**
 - Rated Power..... 33,7 MVA
 - Frequency 50 Hz
 - Poles..... 18 n°

- **Switchyard** 58 x 100 m
 - Main Step-up Transformers..... 2 n°
 - Rated Voltage..... 13.8 / 161 KV
- **Gantry crane** 115 ton
- **Two-floor Control Building** 22 x 7.5 x 7.5 m
- **Diesel Generator Building**..... 15 x 7.0 x 5.5 m

TRANSMISSION LINE AND SUBSTATIONS :

- **Transmission Line**
 - Voltage..... 161 KV
 - Length..... 200 km
 - Galvanised Steel Towers 500 n°
 - ACSR Conductors 400 mm²
- **Step-down Transformers in Freetown (No. 2)**
 - Rated Power 40 MVA
 - Frequency..... 50 Hz
 - Rated Voltage..... 161/33/1 KV
- **Interposing Transformer in Bumbuna**
 - Number 1
 - Rated Power 5 MVA
 - Rated Voltage..... 13.8/34,5 KV
- **Step-down Transformer in Makeni**
 - Rated Power 4 MVA
 - Rated Voltage..... 34.5/11 KV
- **Pole Transformers**
 - Permanent Camp..... 200 KVA
 - Bumbuna Village..... 315 KVA
 - Rated Voltage..... 34.5 KV / 415 V
- **Control Building in Freetown** 29 x 15 x 5 m
- **Switchyard in Freetown** 95 x 100 m

COST :

- Amount (year 1993)..... 145 MUS\$

STUDIO PIETRANGELI SERVICES :

- Prefeasibility, Feasibility and Final Design 1975/96
- Supervision of Works..... 1990/In Progress

CLIENT :

Ministry of Energy and Power, Sierra Leone

