Brief Introduction To Three Georges Project

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17 March 2006
Main tasks and principal benefits of the project

Project layout and main hydraulic structures

Progress of the project construction
Brief Introduction Of the TGP

• Largest water conservancy project ever built in China
• One of the largest in the world.
  NPL: 175 m
• Total storage capacity: 39.3 b m³
• Flood control capacity: 22.15 b m³

A multi-purpose hydro-development project:
• Flood control
• Power generation
• Navigation improvement
Flood Control

• Flood storage capacity: 22.15 b m³

• Flood control capability of the Jingjiang River section: 10-year frequency flood to the 100-year frequency flood

For 1870 year flood

• Discharge at Zhicheng: at less than 80000 m³/s

• Water level at Shashi City: not in excess of 45.00 m
Sketch of integrated Yangtze flood control system
Power Generation

- Total installation of generating capacity: 18,200 MW
- Average annual output: 84.7 TW·h
- Solve the power utilization of Central China and East China
- Provide favorable condition for “west-to-east electricity transmission” scheme.
Navigation Improvement

- 660km long waterway improved
- 10,000 tons of barge fleet to the harbor of Chongqing directly
- Annual one-way navigation capacity: 10 million tons to 50 million tons
- Navigation cost: decrease 35% to 37%

- The minimum flow downstream of Yichang in the dry season: increased from 3,000 m³/s to over 5,000 m³/s
- Obviously improve the navigation condition in the dry season in the middle reaches of the Yangtze River
• Promote the development of fishery, tourism and recreational activities

• Improve the water quality of the middle and lower reaches of the river during the dry season

• Create favorable conditions for the South-to-North Water Transfer
Main tasks and principal benefits of the project

Project layout and main hydraulic structures

Progress of the project construction
● Dam site: Sandouping
● Bedrock of the dam site: granite with 100 MPa of compressive strength
● Composing of the project: dam, two power plants and navigation facilities
Dam

- Concrete gravity type
- Total length of the dam axis: 2,309.47 m
- Crest elevation: 185 m
- Maximum height: 180 m
- Spillway dam: 483 m long
- 23 bottom outlets: 7×9 m with an elevation of 90 m
- 22 Surface sluice gates: a net width of 8 m and a sill elevation at 158 m.
23 deep outlets:
Located in the middle of each monolith, sizes at $7 \times 9$m, with inlet bottom at el.90$m$, which is provided with 3 gates.

22 surface bays:
Arranged crossing on the transversal joints, with its weir crest at el.158$m$, 8$m$ wide, provided with 2 gates operated by the gantry crane.

22 diversion bottom outlets:
Sized at $6m \times 8.5m$ with inlet bottom at el.56-57$m$. 
• Two powerhouses, placed at the toe of the dam, one on each side
• The left one: 643.6 m long, 14 turbine generator units
• The right one: 584.2 m long, 12 turbine generator units
Shiplock

- Double—way and five—step flight locks
- Lock chamber: 280×34 × 5 m (i.e., length × width × water depth)
- Capable of passing 10, 000 tons of barge fleet
Shiplift

- One step vertical hoisting type
- Container size: 120 × 18 × 3.5 m
- Capable of carrying one 3,000 ton passenger or cargo boat each time
Outline

- Main tasks and principal benefits of the project
- Project layout and main hydraulic structures
- Progress of the project construction
Three Stages

Phased river diversion is divided into three stages:

1st stage: 5 years (1993--1997)
2nd stage: 6 years (1998--2003)
3rd stage: 6 years (2004--2009)
The First Stage

- Enclosed the sub-river on the right side of the islet
- Built the earth-and-rock fill cofferdam
- Excavated the open diversion channel
- Constructed longitudinal RCC cofferdam in the construction pit
- Finished the construction of the temporary shiplock on the left bank of the river
The Second Stage

- Built the 2nd stage transverse cofferdams both upstream and downstream
- Completed RCC longitudinal cofferdam and the 2nd stage construction pit
- Constructed the spillway, the intake dam and the power plant on the left bank
- Constructed the permanent shiplock and the shiplift on the left bank
The Third Stage

- Built the upstream third stage RCC cofferdam to cut off the open channel to impound the reservoir to 135 m in elevation
- Put the left bank power station and the permanent shiplock into operation
- Finish construction of right bank dam and power house
Memorabilia and Schedule

1993.1 — preparing for construction
1994.12 — declare the formal start
1997.11 — close-off the main river, entered the second stage
2002.11 — close-off the open channel
2003.4 — third stage cofferdam reached 140m
2003.6.10 — started to impound to 135m
2003.6.16 — shiplock put into use
2003.7 — first unit at left power station generated
At present — right dam reached 172-185m
12.2 billion RMB invested
2007 — first unit at the right power house generate
2008 — 12 units generate, fulfill TGP construction
2009 — impound to NPL 175m
Profit

- Generation: more than 100 billion KW.h until the end of January 2006

- Cargoes through shiplock: 80.99 million tons until the end of 2005

- Passengers through shiplock: 4.69 million until the end of 2005
Thank You All!