

The Three Gorges Project

Mr. Xu Keda

Director General

Dept. of Technology & Equipment,
State Council Three Gorges Project
Construction Committee

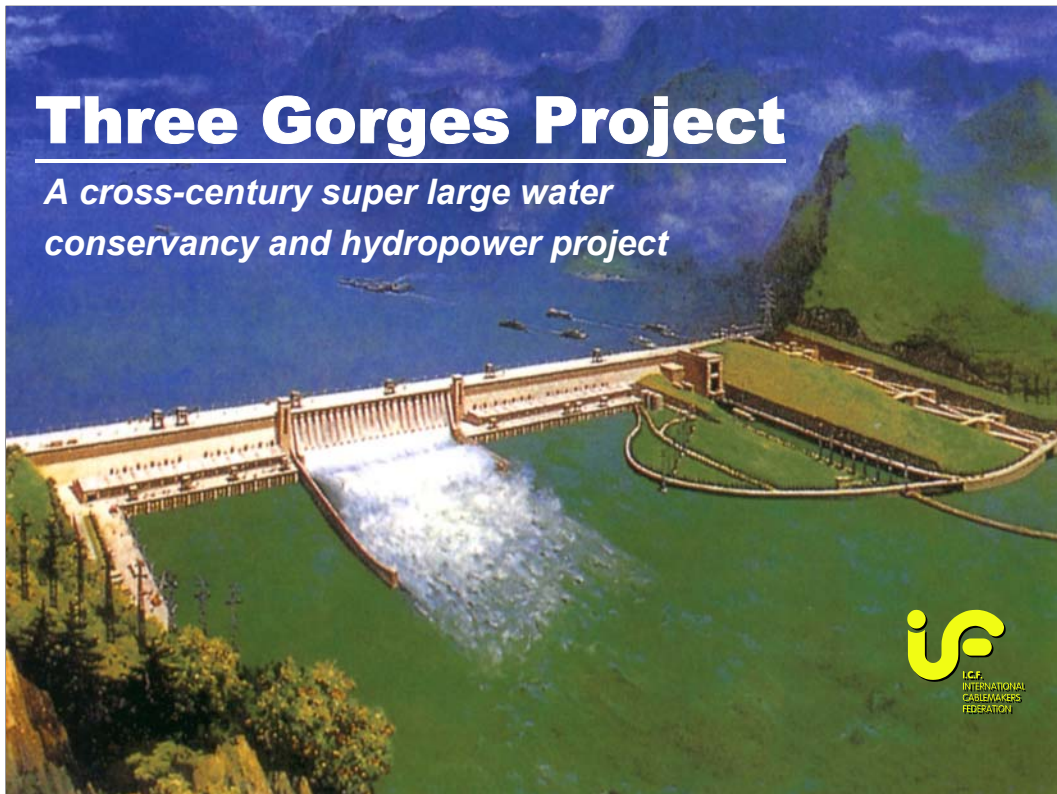
Mr. Hans Meiring, Chairman of ICF Standing Commission

For those people, who do not know this project, I would like to say, that the Three Gorges Dam project is probably one of the largest civil and electrical engineering projects in the world. The project is right now under construction in the central region of China. We will get an overview of this huge project that is happening right now in China. This presentation must follow the statistics we have heard this morning on the large potential of our market here in China.

The speaker is Mr. Xu Keda. He is the Director General of the Department of Technology and Equipment, State Council for Three Gorges Project Construction Committee.

Three Gorges Project

A cross-century super large water conservancy and hydropower project



Chairman, ladies and gentlemen. Good afternoon.

I am very glad to attend the ICF Congress 2002 in Beijing.

Today, the title of my speech is **Three Gorges Project**.

My speech will consist of 4 parts.

Part 1: General situation of the project and some hot point issues

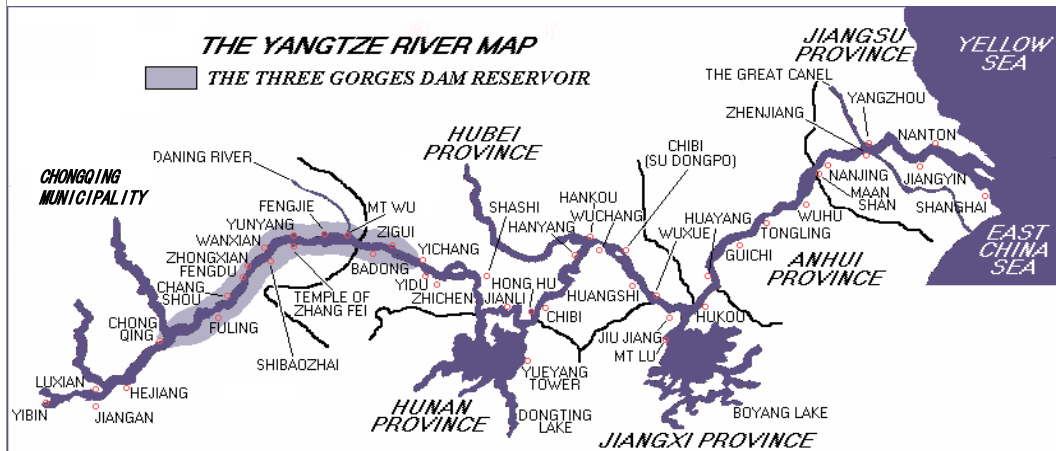
The Three Gorges project on the Yangtze River is a cross century super large water conservancy and hydropower project, that has drawn the attention of the world.

The project was formally commenced on Dec.14, 1994. The closing of the Yangtze River was successfully realized on Nov. 8,1997, symbolizing the smooth completion of the first phase of the project and the beginning of the second phase. The Three Gorges project has been progressing smoothly over the last 10 years with the support of the people throughout China and the hard work by all the constructors.

The re-settlement work in the reservoir region of the project and the corresponding support work have achieved initial success. The appearance of the reservoir region is changing day by day.

The Three Gorges Power Transmission and Transformation Project is also running smoothly as scheduled.

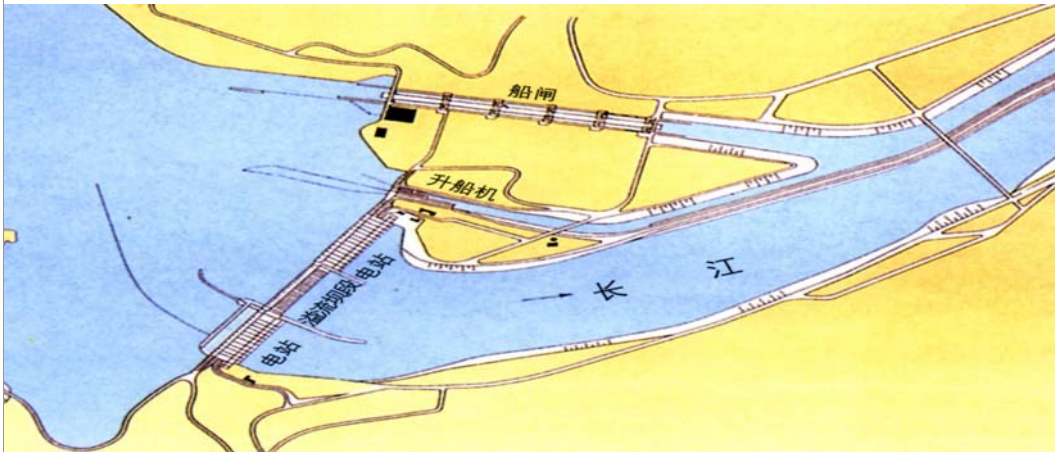
Description of Yangtze River



- **The third largest river in the world**
- **The segment of the Three Gorges is the world's largest treasure of water resources**

The Yangtze River is the third largest river in the world and the segment of the Three Gorges is one of the world's largest treasures of water resources.

Project History



- Building Dam at the Three Gorges was first studied by Dr. Sun Yat-Sen in 1919
- Mr. Savage, an American dam expert, investigated in 1944
- In 1992, the Three Gorges Project plan was approved by the 5th Conference of the 7th National People's Congress
- In 1993, the State Council set up the Construction Committee responsible for the construction of dam and relocation of residents

In January 1993, the State Council set up the Three Gorges Project Construction Committee of the State Council, which is the top decision making organization with responsibility to direct the construction of the project and the re-settlement work. The committee has a subordinate executive office that is particularly responsible for the daily work.

China's Three Gorges Project Development Corporation and the State Power Corporation are respectively the project entities of the Three Gorges Project and Power Transmission and Transformation Project.

Within the range allowed by the relevant state policies and the preliminary project design, they are completely responsible for the construction and the opening of the projects, the management and use of funds and the repayment of the debts.

Environmental Development

- Set up ecological and environmental monitoring system**
- Develop clean energy source such as hydropower to reduce environmental pollution**
- Invest RMB39.2 billion to control water pollution in the next 8 years**

The Three Gorges Project can produce not only remarkable economic benefits but also remarkable social and environmental benefits. It's one of key projects for China to realize its long term goals of social and economic development.

1. The Three Gorges Project is a non-replaceable key project for eliminating the serious threat of flood throughout the middle and lower reaches of the Yangtze River.
2. The Three Gorges Power Station is China's biggest hydropower production base and one of the important measures for the country to adjust the allocation of energy resources and implement west-to-east power transmission and nation wide networking.
3. The project can improve the navigation condition of the Chongqing to Yichang segment of the Yangtze River from the basis.
4. The construction of the project has an important meaning for improving the ecological environment of the Yangtze River valley in the future and protecting the people's living space.

Environmental Development

- Set up geological disaster prevention plan**
- Special focus to protect cultural relics**
- Organized a team to focus on silt problem**
- Next stage will focus on prototype observation and the research of optimized reservoir dispatching**

Project Schedule

- Project formed in December 14, 1994**
- Phase I 1993 – 1997: cut off of the main stream**
Phase II 1998 – 2003: reservoir's primary storage of water, electricity generation, and permanent ship lock's opening for navigation
- Phase III 2004 – 2009: project to be finished by end of**
- 2009, total 17 years with the installation of 26 large-scale hydraulic power units and the Corresponding high-voltage electrical equipment**

The Three Gorges Project Budget

Static investment

- **End of May 1993: RMB90.09 billion**
(50.09 billion for project, 40 billion for resident relocation)
- **Completion of the project is estimated to be about RMB180billion**

On the basis of the price level at the end of May 1993, the total state investment in the project was RMB 90.09 billion, including RMB 50.09 billion for the project and RMB 40 billion for re-settlement in the reservoir region.

According to the latest prediction, the dynamic investment will reach RMB 180 billion. The funds are and will be mainly obtained in China including Three Gorges Project Construction Fund collected by the State Council, the profit of the Gezhouba Power Plant, the profit of the Three Gorges Power Plant that will begin generating power from 2003, the loans from domestic banks, the bonds issued by the Three Gorges Corporation and a small amount of foreign export credit. Various funds have made timely contributions and investment has been under efficient control.

The project will be able to repay the loans from 2006 and expected to repay all loans including interests within 10 years after the project is completed. Because the method of static control and dynamic management has been adopted, various funds have been timely contributed and the investment has been under efficient control by now.

Power Station



- 26 power units each with a capacity of 700 MW
- Total capacity will be 18,200 MW
- Annual power output will be 84.7 billion KWH

Part 2:

General Situation and Progress of the Multi-Purpose Project

Located in Sandouping, Yichang City, Hubei Province in the middle of Xiling Gorge, the project is composed of a water detaining dam, a hydropower plant, navigation buildings, etc.

The dam top is 185 m high.

The power station will have 26 power units each with a capacity of 700 MW. The total capacity will be 18200 MW and annual power output will be 84.7 billion kWh.

Navigation Building

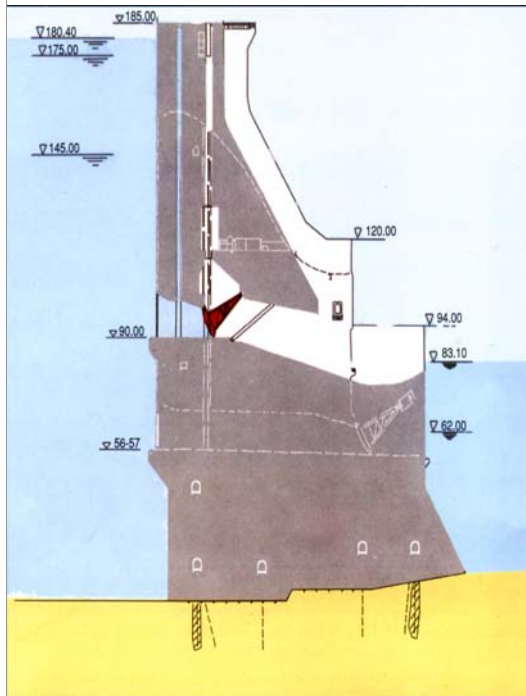


- **Including double line grade 5 Continuous ship lock**
- **One-line vertical ship lift**
- **Annual one-way traffic Capacity will be 50 million ton**

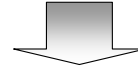
The navigation buildings will include a two-way, 5 step continuous navigation ship lock and a one-way vertical ship lift. The annual one-way traffic capacity will be 50 million tons.

The permanent ship lock will be put into operation in June of next year.

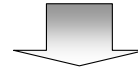
Dam Reservoir



Early stage : Water storage 135 M



Final stage : Water storage 175 M



Total storage is 39.3 billion cubic meters , including 22.15 cubic meters for flood control

The construction of the project is divided into three phases. The whole project will be completed in 2009 and the total construction period will be 17 years.

At present, the towering Three Gorges Dam is already standing in the middle and left parts of the river bed.

The coffer dam through the open diversion canal will be carried out in this November and the water storage level will be increased to 135 m in June of next year. It is expected that the installation of 2 power units will be completed in this year and 4 power units will be put into operation in the 4th quarter of next year.

Principal Material of the Project

- **102.83 million cubic meters of earth and stone excavation**
- **31.98 million cubic meters of earth and stone filling**
- **27.94 million cubic meters of concrete pouring**
- **260 thousand tons of rolled steel, 460 thousand tons of reinforcing bar**

Materials Used

Concrete pouring

- **Year 1999: 4.58 million cubic meters, with a monthly quantity of 554 thousand cubic meters, creating 2 world records**
- **Year 2000: 5.43 million cubic meters (a record high, once again)**

Areas Affected

- **The reservoir region of the Three Gorges covers 21 counties in Hubei Province and Chongqing**
- **28 thousand hectares of farming lands, ranches and forests will be submerged**
- **840 thousand residents need to be relocated**
(with natural growth, by end of 2009, it is estimated at 1.13 million people)

Part 3

Progress of Re-Settlement in the Reservoir Region

The reservoir region of the Three Gorges covers 21 counties in Hubei Province and Chongqing City.

28 thousand hectares of farming land, ranches and forests will be submerged .

840 thousand residents need to be relocated. In view of the natural growth of population, it is expected that in total 1.13 million people will need to be relocated by 2009 when the project is completed.

Resident Relocation

Major factor for the success of the Three Gorges Project

- safeguard their life
- promote the development of their economic condition
- invested RMB28.7 billion in relocation fund



The experimental re-settlement in the reservoir region of the Three Gorges Reservoir was started in 1985 .

This work has been completely launched with commencement of the project in 1993.

As proved by the practice, the work of re-settlement is basically successful.

Resident Relocation



- 418 thousand resident were relocated at the end of December 2001
- In the 10 county towns that will be submerged , Zigui and Yunyang
- have been relocated as a whole
- 5 million square meter of houses still need to be built
- 351 enterprises need to be relocated

Three Gorges Power Transmission and Transformation Project

- **Total installed capacity of the power station will be 18,200 MW**
- **Electricity will be transmitted through 15 loops of 500 kV outlets and 2 reserved for future expansion**
- **The regions covered include 9 provinces and 2 municipalities**
- **Investment will be RMB 27.532 billion**

Part 4

The General Situation and Progress of the Three Gorges Power Transmission and Transformation Project

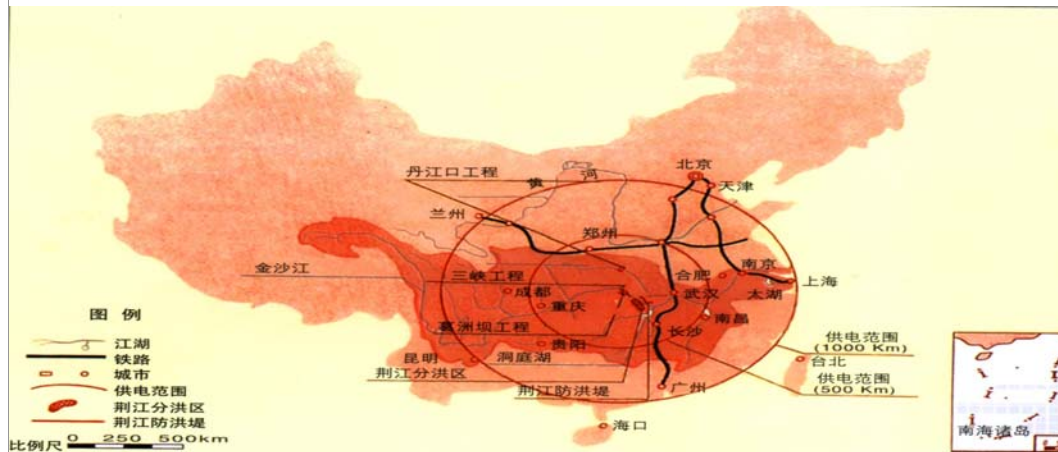
The power transmission and transformation project is an important part of the Three Gorges project. The total installed capacity of Three Gorges Power Station will be 18200 MW. Electricity will be transmitted through 15 loops of 500 kV outlets and 2 additional loops will be reserved for future expansion. The range of the power supply involves central China, eastern China, Sichuan, Chongqing and the southern China electric network.

The project will adopt 500 kV AC line for transmitting power to central China and the designed power transmission capacity is more than 9000 MW. 500 kV DC lines will be used to transmit power to eastern China and its designed capacity is 7200 MW. Also, 500 kV DC line will be used to transmit power to Guangdong and the designed capacity is 3000 MW.

With the completion and commissioning of the Three Gorges Power Station and the corresponding transmission and transformation project, the Three Gorges electric network connected to central and eastern China, Guangdong, Sichuan, and Chongqing will be formed.

The total investment in the Three Gorges Power Transmission System will be RMB 27.532 billion.

Progress of Power Station and Project



- Laying of 500KV AC power transmission line were commenced in March 1997
- Laying of 18 AC lines at the end of 2001 (2,558 km long)
- Construction of 12 substations were already commenced
- Started the construction of five 500KV intervals
- Budget consumed accounting for 28%

The project entered into peak stage of the construction at the end of 2001.

The laying of a DC line from Three Gorges to Changzhou, Jiangsu Province, was commenced in July 2000.

The project will enter the most important stage of installation and commissioning in this year. The whole project is required to satisfy the requirements of unipolar power transmission by the end of this year. Bipolar commissioning will be completed by the end of next May for satisfying the requirements of power transmission to eastern China.

At present, the Three Gorges Power Transmission and Transformation Project is under smooth progress according to plan. It can satisfy the requirements of the Three Gorges Power Station for transmission of the electricity generated by the first group of power units in 2003.

The investment in the project is controlled within the range of budget and the quality of works is also good.

Thank you for your attention.