

# Chinese American Water Resources Association

## CAWRA Newsletter

No. 5  
May, 1995

CAWRA co-sponsored the first Conference on Promoting Exchanges of Information and Technology in Water Resources Engineering Across the Taiwan Strait. The Conference was a resounding success. It is the first formal conference of this kind. Eight CAWRA members joined with 20 delegates from Taiwan and 47 delegates from Mainland attended the

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Conference in Beijing on March 20 and 21 of 1995. During the Conference 3 forums were held in addition to 15 status-information paper presented. As CAWRA President Dr. B.C. Yen pointed out in the opening ceremony, the Conference was the result of tremendous efforts put in by many individuals of both sides of the Strait. CAWRA was very glad about its role in promoting the Conference and assisting in communication. Although the Conference was postponed from last year, there is a special meaning to hold the Conference this year because 1995 happens to be the 100 years commemoration of Maquan Treaty between China and Japan and 50 years of the end of WWII. This Conference opens another door in technology exchanges and cooperation for the water resources engineering. We shall broaden our visions in issues for exchange. Subjects can include: technology, research, professional training, studying abroad; or books, instruments, and even working together on joint projects. Professor Yan KeQiang, president of Chinese Hydraulic Engineering Society, mentioned in his opening ceremony: "Mainland China is facing the shortage of water resources and frequent flood/drought damages. In her coastal and northern provinces, the shortage of water has affected, in fact limited, the regional economic development. Water pollution too, has become obvious in many areas which resulted in ecological as well as environmental problems. Development, utilization, and protection of new and existing water resources are issues that require major efforts in the Mainland China."

Dr. Hsu Ming-hsi of Taiwan University, spoke for Dr. Yen Chin-Lien, greeted participants and expressed the desire of Taiwan water resources engineers to learn about the Mainland's research on sediments in reservoirs and redistribution of water resources, while sharing some of their own experiences with the experts from Mainland.

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### CAWRA NEWS

Preparation for the Second Conference on Promoting Exchanges of Information and Technology in Water Resources Engineering Across the Taiwan Strait - CAWRA has endorsed and joined the organizational committee in planning for the **Second Conference** on Promoting Exchanges of Information and Technology in Water Resources Engineering Across the Taiwan Strait. The date will be in July of 1996 and the venue will be in Taiwan. Participants of this Conference will again be on invitation basis. However we will keep our members informed and welcome everyone planing ahead to participate in this Conference.

Input Being Solicited for a Conference - Suggestion has also being made for CAWRA to sponsor an International Conference on Water Resources in Developing Countries with Special emphasis on China. The Conference will be held in Hong Kong immediately before or after the Second Conference on Promoting Exchange. If you have any suggestions please contact Dr. Ben Chie Yen or Dr. Ta Wei Soong at your earlier convenience, but preferably before August 1, 1995. The Conference proposal and your ideas will be discussed at a meeting in San Antonio during the ASCE Hydraulic and Water Resources Conference on August 14-18 of 1995.

Proceedings for the First Conference on Promoting Exchanges of Information and Technology in Water Resources Engineering Across the Taiwan Strait - Several members have asked about the proceedings from the Conference on Promoting Exchanges. A copy of the table of content of the proceeding is enclosed. Copies of the Proceeding can be ordered from Professor Li Guifen at 86-1-841 2173 (Tel) or 86-1-841 2316 (fax), Institute of Water Conservancy and Hydro-Power Research, P.O. Box 366, Beijing 100044, China.

### General News

Construction of Three Gorges Dam Officially Started - Chinese government has officially announced the construction of Three Gorges Dam on December 14, 1994. This construction will be the world's largest on-going dam construction. According to a report, the Three Gorges Dam will take three phases in construction: *The first phase*: build dam body on the narrow and shallow portion between the southe bank and the Zhongbao Island transect of the Yangtze River. At the same time, start shiplock earthwork on both banks of the River. Flow and navigation will be maintained in the main channel between the north bank and Zhongbao Island. *The second phase*: start building the dam body on the main channel portion of the transect. Flow will be diverted through the portion completed in Phase I, and install the first hydropower generating unit. *The third phase*: complete the construction of the dam, buildings, power generating facilities, ship locks and other auxiliary projects. The total schedule will take approximately 17 years with 1997, 2003, and 2009 as three designated end year for each phase.

After its completion, the Three Gorges Dam will provide flood control for its downstreams, generate electricity for a vast areas, and improve navigation that freights over 10,000 tons can reach Chongqing (of Sichuan Province) from Wuhan (Hubei Province) directly. Some key equipment for the Three Gorges Project can be summarized here (China Science and Technology Newsletter, February 15, 1995):

**Water-Turbine Generating Unit:** The whole terminal project in the Three Gorges area will be carried out in stages. In this case there are some critical parameters for different phases,

	Initial Phase	Final Phase
Storage Water Level above mean sea level, m	156	175
Maximum water head, m	94	113
Minimum water head, m	61	71
Rated water head, m	80.6	80.6

The water turbine is a mixed flow turbine with 700 MW in single capacity and 75/74.1 rpm in rated rotary speed. The nominal diameter of the turbine's runner is about 10 meters. The generator will use full air cooling, rotor-air cooling or stator-air cooling. The dead weight of the generating unit is about 7000 tons.

**AC/DC Transmission Facilities:** The power station will use 500 KV AC to transmit power to central China and eastern Sichung region. While to the eastern China,  $\pm 500$  KV or over DC transmission is suggested. The main transformer of the generating unit is three-phase and two-wing one. The single capacity is 780,000 KVA. The transportation of the huge parts of the transformer needs special arrangement. At present, the application of DC transmission technology in china is not widespread yet.

**Dual-Way 5 Step Ship Locks:** Based on the storage water level in the second half construction of the project, the maximum drop between upper and lower stream is 133 m. the lock is designed in 5 steps with an effective capacity of 280 by 34 by 5 (m) for each and able to transit 10,000 ton ships. The regular operation is one way for outgoing, and one way for incoming. It will take 180 minutes for ships to pass through, among which 141 minutes are needed to go from the first to the last step of the lock.

**Vertical Ship Lift:** To meet the rapid-pass-through need, a one-step single way vertical ship lift will be installed at the left bank of the Yangtze River. The lifter has a ship reception chamber with an effective volume of 120 by 18 by 3.5 (m). Its lifting capacity weights 11,800 tons among which 9300 tons go to the water contained in the chamber and its maximum lifting height is 113 m. As a rapid passing through channel, the lifter is mainly passenger ship oriented. It is able to carry one 3000 ton passenger-ship at one time lasting about 40 minutes with an annual lifting capacity of 3.5 million tons.

**Large Metal Structural Components:** There are 23 deep holes (7 m wide and 9 m deep) located in the flood drainage gates and drainage tunnels of headstock gears. Twenty-three segment gates will be installed in each of the holes and operated by 23 hydraulic headstock gears. There are also 22 segment fixed-wheel gates installed in 22 surface holes (8 m wide) respectively and operated by 2 gantry gate hoists located on the top of the dam. Other gates, buried structural members and hoisting facilities which will take 70% of the total metal structural components of the Project.

**Integrated Automatic Systems and Telecommunication Equipment:** Three Gorges Project will use most advanced telecommunication and automation system to meet the needs in future generations.

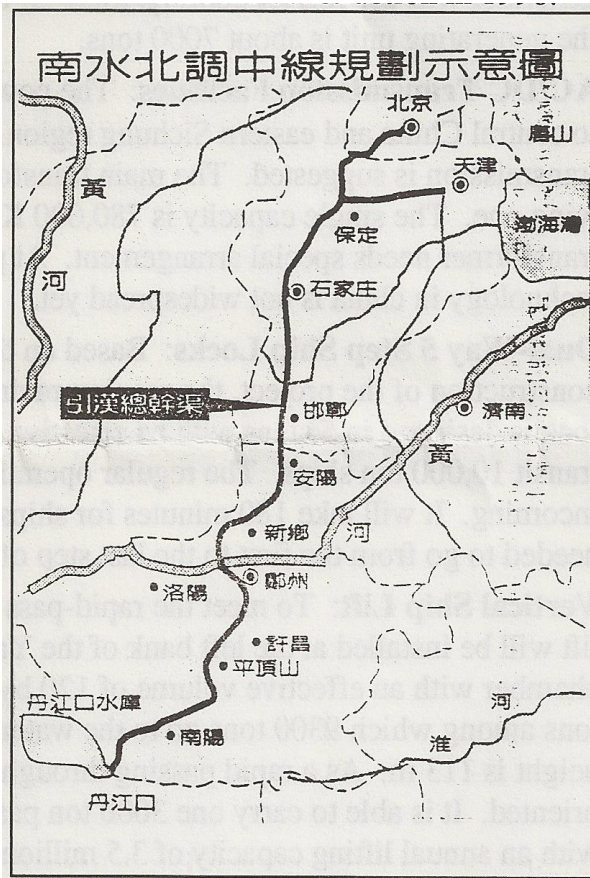
*South to North TransBasin Water Diversion Project* - Transporting water from Central or Southern China to its Northern Plain has been proposed since 1950s. Three paths have been proposed. However, debate regarding which path could optimize the uses and reduce impacts has never been ceased. Recently, according a major newspaper in Hong Kong, the Chinese authority has decided to adapt the "Middle Path proposal" which is to start from the DanJian (丹江) Reservoir, located at the boundary of Henan and Hubei province, and connect to Beijin and Tianjin; a total of 1241 km man-made canal. A figure of the approximate path is showing in next page (courtesy of the World Journal). The key construction and the most difficult part will be how to transmit water through the Yellow River. Present solution is to construct underground tunnel. The tunnel will be located near Zhengzhou and consists of two 8.5 m diameter 7.2 km long tunnels, approx. 50 m under

the Yellow River -- according to the Hong Kong Newspaper. The total construction cost will be about 6.5 billion US dollar, major financial support will be provided by the Japanese Government. International bid will be held for the underground tunnel part. The Chinese Government will start the construction in 1996.

According to Patric E. Tyler (The New York Times) the aqueduct would trace a path equaling the distance from Washington, DC, to the Mississippi River and would deliver an annual 4 trillion gallons of water -- more than 7 times the volume used by New York City each year. The water shortages suffered by nearly 300 Chinese cities are said to cost the country about \$14 billion a year in lost economic output.

An overview of all three proposed paths for the transbasin South to North Water Diversion Project has been given by Mr. ErMing Zhu's paper in the First Conference on Promoting Exchange. Eventually all three South to North Diversion Paths will be built. Summary of the other two paths and their scopes can be described as follows.

Eastern Path Diversion Project - This project start from the north bank of Yangtze River near YanZhou (JiungShu Province). By utilizing and



expanding the existing Jinghang (京杭) Canal with combination of pump stations, the project will connect the Yangtze River, Hongze (洪澤) Lake, Luema (駱馬) Lake, Nansi (南四) Lake and Dongping (東平) Lake to Shandong Province; using reverse siphons underpass the Yellow River, and open channel flow along Jinghang Canal to Tianjin. Total length is 1150 km (south of the Yellow River 660 km and north of the Yellow River 490 km) and planned finishing year is 2020. The Eastern Path Diversion Project is designed to relieve domestic and industrial water needs in the Eastern part of Huang-Huai-Hai Plain, also providing irrigation and navigation functions.

Western Path Diversion Project - The project design is to connect the upstreams of the Yangtze and Yellow Rivers. Tentative path is by building reservoirs at upstream of the Tongtian (通天), Yalong (雅龍) and Dadu (大渡) Rivers, passing water to upstream of the Yellow River by cross mountain tunnel through the BaYanKeLa Mountain. The project area locates at elevations between 3500 to 5000 above msl. Three dam constructions will have heights around 200 to 300 meters, and the length of cross mountain tunnel is around 150 km. The Western Path Diversion Project is designed to supplement water to the Yellow River and provide water for domestic, industrial, and livestock uses in Northwestern Plain and western portion of North China Plain.

*Energy Related Power Development* - According to the China Science and Technology Newsletter (January 15, 1995), mainland's State Planning Commission and Ministry of Foreign Trade and Economic Corporation have compiled and announced for the first time 210 major capital construction and technical renovation projects which will require to introduce technology and equipment for the period between 1993 and 2000. These projects cover 23 industrial sectors in which Energy Sector covers many hydropower developments. Following is a summary of contents Energy sector.

3rd phase Jiujiang power plant in Jiangxi Province	1st phase Ezhou Power Plant, Hubei Province	Lingjintan Hydropower Station, Hunan Province
Sanhe Power Station, Beijing	Hejin Power Plant, Shanxi Province	Longtan Hydropower Station, Guangxi Zhuang Auto. Region
Wagpuzhou Hydropower Station, Hubei Province	2nd phase Storage Power Station, Guangdong Prov.	Yangzhou Power Plant, Jiangsu Province
Xaiolangdi Key Water Control Project, Henan Prov.	Qitai River Power Plant, Heilongjiang Province	Beilun Port Power Plant and Transmission Network Renovation, Zhejiang Prov.
2nd phase Daqi Power Plant, Inner Mongolia Autonomous Reg.	Hongjiadu Hydropower Station, Guizhou Province	Tuoketuo Power Plant, Inner Mongolia
Ertan Hydropower Station, Sichuan Province	Mianhuatan Hydropower Station, Fujian Province	2nd phase Huaneng Dalian Power Plant
The first-class Tianshengqiao Hydropower Stations	E. China Sea Natural Gas Development, Shanghai	2nd phase Qinshan Nuclear Power Plant

### **Meeting/Conference**

**June 18-23, 1995. International Association of Geomorphologists Southeast Asia Conference on Geomorphology.** Singapore. Contact: Avijit Gupta, Department of Geography, National University of Singapore, Singapore 0511, Singapore. Fax 65-777 3091.

**June 19-25, 1995. 7th International Conference of the International Rainwater Catchment Systems Association - Rainwater Utilization for the World's People.** Beijing, China. Contact: Dr. Mao Haisheng, Department of Hydrology, Institute of Geography, Chinese Academy of Sciences, Bldg. 917, Datun Road, Anwai, Beijing 100101, China. Fax: 86-1-491 1844.

**June 25-28, 1995. Annual Summer symposium on Water Resources and Environmental Hazards: Emphasis on Hydrologic and Cultural Insight in the Pacific Rim.** Honolulu, Hawaii, USA.

**July 25-28, 1995. ASCE International Conference on Water Power '95.** San Francisco, Contact: ASCE.

**August 14-18, 1995. The ASCE First International Conference on Water Resources Engineering, International Groundwater Management Symposium, Watershed Management Symposium, and Texas Water '95.** (see CAWRA Newsletter July, 1994 issue) San Antonio, Texas. Contact: Dr. W.H. Espey, Jr., RMI, 8310 Capital of Texas Hwy., Austin, Texas 78731. Tel 512-345 5415, Fax 512-345 6534.

**July 29-31, 1996. 7th IAHR International Symposium on Stochastic Hydraulics.**

MacKay, Queensland. Contact: Dr. Ian, Goulter, University College of Central Queensland, Rockhampton. Queensland, Australia.

**Sept. 11-15, 1995. 26th IAHR Biennial Congress. London, UK.** Contact: Dr. W.R. White, Hydraulics Research Wallingford, Oxon OX10 8BA, UK. Tel (44) 491-35 381, Fax: (44) 419-32-233.

**Sept 9-13, 1996. 7th International Conference on Urban Storm Drainage.** Hannover, Germany. Contact: Prof. F. Sieker, Institute of Wasser Wirtschaft, University of Hannover, Appelstr. 9a Queensland, Australia.

**Sept. 1996. 6th International Symposium on Flow Modeling.** Tallahassee, Florida, USA. Contact: Prof. C.J. Chen, FAMU/FSU. College of Engineering, P.O. Box 2175, Tallahassee, FL 32316-2175, USA.

**Aug. 11-15, 1997. 27th IAHR Biennial Congress.** San Francisco, CA, USA. Contact: ASCE.

**Members' Activities**

*Professor Lawrence K. Wang* has started his one-year service at UNIDO (United Nations Industrial Development Organization) as their Senior Interregional Adviser. Before this appointment, Professor Wang serves as an Extension Specialist and Visiting Professor of the Department of Agricultural and Environmental Engineering at the University of Illinois Urbana-Champaign.

*Eight CAWRA Members Attended the First Conference on Promoting Exchanges of Information and Technology in Water Resources Engineering Across the Taiwan Strait -* Ben Chie Yen, Chao-Lin Chiu, Show-shan Fan, Wen-Chiang Wang, Sam S.Y. Wang, Baolin Wu, Ten-Shuenn Wu, and Ralph T. Cheng attended the First Trilateral Conference and presented papers.

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**Chinese American Water Resources Association**

**Officers:**

Ben Chie Yen	President
Chao-Lin Chiu	Board of Director
William W.G. Yeh	Board of Director
Shou-Shan Fan	Board of Director
Chih Ted Yang	Board of Director
Ta Wei Soong	Treasurer/Secretary
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