

Three Gorges Dam Passes First Major Test With Flying Colors

by William Jones

The heavy flooding in southern and eastern China this year, as well as in the northwestern regions, compared to the relative calm along the otherwise hard-hit Yangtze River Basin, dramatically attests to the overwhelming importance of the giant Three Gorges Dam at Yichang in the middle reaches of the Yangtze River. No dam had been so heavily attacked by the environmentalist activists as has the Three Gorges Dam, one of the world's largest hydroelectric projects, standing 606 feet high and stretching 7,575 feet across the river. The Yangtze, the fourth-longest river in the world, empties into the East China Sea about twice the amount of water as the Mississippi dumps into the Gulf of Mexico.

Strenuous efforts were undertaken to sabotage the dam project: It was denigrated as another crazy, giant infrastructure project promoted by an out-of-control Communist regime (in fact, the project was originally proposed by U.S. authorities assisting the Chinese effort against Japan during World War II; a Yangtze Valley Authority was created, named for the FDR-era Tennessee Valley Authority [TVA], after which it was modeled); the silting of the river would

create terrible problems downriver, which would be deprived of important nutrients, and would gradually fill the bottom of the reservoir, decreasing the amount of floodwater it could contain (instead, the lower sluice gates built into the dam seem to have done a good job in washing any accumulated silt out of the reservoir area); and millions of people would have to be evacuated to make room for the reservoir (while the process was wrenching for many families, it has been accomplished quite successfully over the last few years).

China, like most countries this year, has been experiencing very abnormal weather conditions, with excessively heavy rainfall last month in the southern and western sections of the country, and severe drought in northeastern and eastern sections, as well as in the Yangtze delta. By mid-July, with the third flood this year on the river, waters in the Three Gorges Dam area began to rise precipitously, reaching flood peak on July 22. The 18 sluice gates on the dam were opened to release the water at the rate of 48,000 cubic meters per second, and then reduced to 44,000 cubic meters per second. At the same



NASA

NASA satellite photographs of the Yangtze River show the effect of the installation of the Three Gorges Dam, one of the greatest infrastructure projects in the world.



DigitalGlobe

The Three Gorges Dam in 2003. This July, the dam withstood heavy flooding, saving thousands—or even hundreds of thousands—of lives. Next year, as construction proceeds, the water in the reservoir will be allowed to reach its maximum height, allowing it to contain an even greater amount of water.

time, the reservoir level was allowed to reach the height of 475 feet, within the limits set by the water authorities at the present level of the reservoir's development. Only next year will the water in the reservoir be filled to the maximum height of 574 feet, allowing it to contain an even greater amount of floodwater.

But already the dam has proven its worth, having reduced the effects of the extreme rainfall on the cities of the middle and lower reaches of the Yangtze, home to 15 million people and occupying 1.5 million hectares of rich farmland. After the release of the water from the reservoir, the water several miles downriver from the dam at Shashi was still below the danger line of 43 meters.

Sixteen of the 24 turbine generators were still in full operation when the sluice gates were opened, and they continued uninterrupted in spite of debris which had accumulated as the water rose. The 14 turbines on the left bank of the river went into operation by June 2005, while the first of the 12 turbines on the right bank were activated in June this year, and more recently the 16th went live. When completed next year, all 26 generators will be fully operational and will be able to

produce 85 billion watts of electricity per year, nearly one-ninth of China's present power needs.

Historic Floods

This controlled rise of the waters of the lower Yangtze by the action of the dam contrasts sharply with floods of earlier years, before the Three Gorges Dam was built. In 1998, the Yangtze experienced one of the worst floods of the century. A massive national effort, over three months, was undertaken to battle the floodwaters. More than 13 billion renminbi was expended on flood-fighting equipment, dispatched from all around the country, and 6.7 million people and hundreds of thousands of soldiers took part in the relief operations. In spite of the great effort, the flood still caused great losses, with 239,000 hectares of farmland inundated, 2.3 million people affected and 1,526 people killed in the provinces of Hunan, Hubei, Jiangxi and Anhui, on the lower and middle reaches of the Yangtze.

Such flooding was not unusual for China. From time immemorial, there are records of floods on the Yangtze River. In the 20th Century, China had major floods occurring at least once every ten years: in 1931, 1935, 1949, and 1954, just to name a few of the worst. In these, millions of

people were affected, and in 1931 and 1954, hundreds of thousands were killed. For many years, the Yangtze flooding was accepted as an ugly fate for those destined to live on or near the river.

Now this has all changed, at least for the areas controlled by the Three Gorges Dam. While this year's flooding did not reach the level of a 100-year flood, the Yangtze reservoir still has a further 100 feet in height to be filled before it reaches its maximum level. The dam reservoir, which will stretch 370 miles back to the city of Chongqing, will have a total storage capacity of 39.3 billion cubic meters, including a flood regulation and storage capacity of 22.2 billion cubic meters. This alone assures protection to the area between the dam and the city of Wuhan on the middle reaches of the river, from a 100-year level flood. With the completion of other protection measures further downriver, and on the Dongting Lake overflow area, the dam will protect the region from floods that might occur only once every 1,000 years. But already this year, one can easily see that thousands, perhaps hundreds of thousands, have been spared the effects of another major flood on the Yangtze.