The Khlong Tha Dan Dam

Introduction

The people of the Nakhon Nayok basin have long been subject to the vagaries of the Nakhon Nayok River, which rises from the slopes of Khao Yai National Park and runs southwest. Eventually draining into the Prachinburi River and the Bang Pakong River. The problem has always been too little water or too much of water. in Years of low rainfall, the flat land cannot store sufficient water for irrigation and the result of severs drought. In years of heavy rains, flooding flows through the flat plain causing massive destruction of property. In 1990, for example, flooding devastated over 300,000 rai or 48,000 ha of paddy. To add to the woes, the alternate cycles of drought and flooding cause an increase in soil acidity, In Nakhon Nayok province, more than 40 percent of the land suffers from high acidity causing and estimated 336 million baht lost in income annually.

“Dam is a median tool. In the year of plentiful water, store the excess. Do not use it because rain water is adequate for use. In the year of water shortage, use it to ease the dangerous threat from drought. Danger from floods will also be abated.“

His Majesty the King became aware of these problems many years ago. Following many personal site inspections on foot and by helicopter, His Majesty pinpointed the problems and suggested that adequate surplus water retention and in improved drainage and irrigation system would eliminate most of the problems experienced by the farmers, as well as businesses and industries along the Nakhon Nayok River.

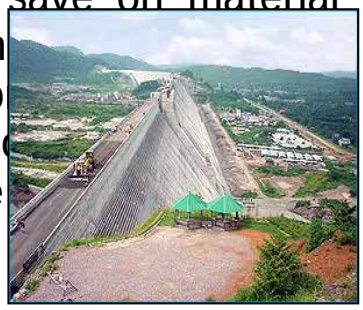
The Royal Irrigation Department took action on His Majesty’s ideas. Project feasibility studies and environmental impact assessments, for the dam were completed in 1996, and Cabinet approval for the project was granted the same year. Construction completed in 2005 and it started operation the same year.

The Construction

Royally initiated by HM the King in 1993, Khlong Tha Dan Dam in Nakhon Nayok province is the world's longest and largest-volume roller compacted concrete (RCC) dam with a total length of 2,720 m, a height of 93 m, and a dam volume of 5,470,720 cubic meters. The earth saddle dam is 350 m long, 46 m high, and 8 m wide, with a dam volume of 1.22 Mm3, The Spillway with a maximum capacity of 1,454 cms is equipped with 10 m wide and 8.4 m high radial gates.

For the Khlong Tha Dan project, lignite fly ash has been introduced as a cement replacement in order to reduce the amount of cement used, to save on material



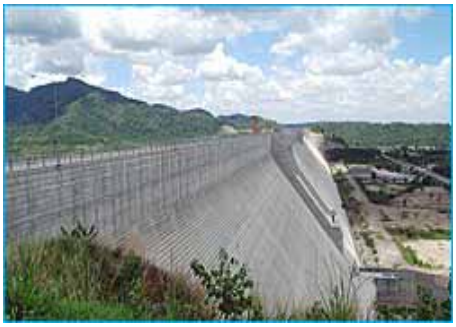


The main construction works involved in the project are:

- Excavation and blasting of 1,550,000 cubic meters rock for the dam foundation.
- Blasting and crushing of 5,000,000 cubic meters of rock from the quarry in order to produce aggregates for the RCC and CVC (Conventional Vibrated Concrete).
- Drilling and grouting of drainage and grout curtains (total length of drill holed 397,000 meters.)
- Placing of 5,470,000 cubic meters of RCC as well as 558,000 cubic meters of conventional concrete.

RCC Work

The RCC technique was selected for the dam owing to its solidity, reduced construction time frame and relatively



With a total storage capacity of 224 Mm3, the project will benefit 29,600 ha (185,000 rai) of agricultural land. Water supply for consumption will increase by 16 Mm3 per year, benefiting 5,400 households. Flood disaster will be reduced by about 35% and soil acidity problem will be solved.