BRAZIL- PARAGUAY

Itaipù is at present the largest hydroelectric project in the world, in terms of installed capacity and energy production. Despite its huge reservoir, the large river discharge makes it essentially a run-ofriver plant, with the powerhouse operating round the clock to supply base energy to the systems of South and South-East Brazil and Paraguay. Studies started in 1971 with the reconnaissance of the binational stretch of the river, and construction commenced in 1976, being essentially completed in 1983, when the reservoir was filled. The installation of the 18 generating units, at an average rate of three units per year, was complete in 1990. Among the different peculiar aspects of the project, the following are especially significant from the technical point of view:

- Difficult hydraulic problems were faced for the planning of the river diversion, particularly for the design of the cofferdams, two rockf ill structures about 70 m high, built almost completely underwater. - The structural design of the dam required extensive studies, including mathematical, structural and geomechanical models.

- The size of the generating units was pushed to the limit to minimise the cost of the equipment and the length of the powerhouse, taking into account the reduced space available in the riverbed. The design of the equipment had also to solve difficult technical problems raised by the binational character of the project, as the frequencies of the Brazilian and Paraguayan networks are different. - As the financial charges represent a huge part of the total investment, the strict respect of the construction planning was a paramount condition, often requiring the updating of the design to specific construction needs in order to minimise difficulties and keep the implementation schedule.