

# REVIEW OF OPERATIONS

## Construction of the Central Japan International Airport

The Central Japan International Airport will be a full-fledged offshore airport with a 3,500-meter-long runway. This will be an international airport open around the clock, and special consideration has been given to its facilities, systems, and operations. Due to start service in 2005, reclamation work, revetment work, and terminal building construction are progressing simultaneously. A 470 hectare airport site is to be reclaimed using 56,000,000 m<sup>3</sup> of earth and sand, of which 12,000,000 m<sup>3</sup> are provided by effectively utilizing earth and sand as recycled material dredged in the Nagoya Port, where the Company is in charge of reclamation work (Part 1) as a reading company Joint Venture business, after cement-type material is added for solidification. The remaining 44,000,000 m<sup>3</sup> consists of mountain soil transported to the site by sea. A revetment having a circumference of twelve kilometers will surround the airport island. The minimum distance in the sea area between the revetment and the opposite shore will be at least 1.1 km, and the island will be curved to prevent eddy currents. These measures will help ensure that any potential impact on the tidal stream from this project is minimized.



## Kansai International Airport 2nd Stage

In this project, a 545-hectare airport island will be built 200 meters off the airport in the first stage in order to construct a second 4,000 meter-long parallel runway, apron, and taxiway. The island will need 250,000,000-m<sup>3</sup> earth and sand because the average depth of the water at the site is some 19.5 meters deep. The revetment for the project began in July 1999 was completed in November 2001, and full-fledged reclamation work is proceeding along at this time. It is important to build a strong foundation free from any ground subsidence when preparing the ground for an airport. In order to ensure the construction of a strong foundation, TOA CORPORATION is freely using numerous technologies and techniques at the reclamation work site. These include the "Beluga" system, GPS for positioning of work ships, reclamation earth-and-sand dumping control system, and many other state-of-the-art technologies, thereby ensuring effective, efficient earth-and-sand dumping and high-precision earth and layer control technologies. Both these technologies and the results achieved thus far have been highly rated.



### Construction of new Hitachi Naka Thermal Power Plant (Coal unloading jetty)

In this project, the Electric Power Development Co., Ltd., and Tokyo Electric Power Co., Ltd. each respectively installed one 1,000,000 kW generating system to construct a 2,000,000 kW coal-fired thermal power plant in Tokaimura, Ibaraki. TOA constructed a coal-unloading jetty jointly with Nippon Kokan K.K. for unloading coal transported to the plant from overseas. One of the features of this work was to make an SRC jacket structure as the main structure of the jetty by making use of the exposed base rock at the sea bottom. Large blocks of the structure were then installed on top using a large crane ship, thereby shortening the work period and reducing construction costs substantially. The foundation work was conducted at a depth of twenty meters and consisted of excavating the soft rock layer by two meters in order to place underwater concrete. This was an engineering challenge requiring high-precision work that was successfully met.



### Construction of new submerged tunnel at Naha Port

Composed of more than sixty islands, Okinawa is one of the most popular tourist sites and destination in Japan. The region still fosters a unique traditional Ryukyu culture, which exalts the beautiful sea and nature. Securing effective traffic flow between the airport and Naha Port and the urban district is an important factor for further economic development in the area. In order to facilitate a smoother flow of people and goods between the port entrance of Naha Wharf and the airport, our company is moving ahead with construction to connect these two points by an undersea tunnel. The total length of the tunnel will be 724 meters. It will be constructed by the submerged tunnel construction method, in which eight hybrid caissons of full-sandwich structure measuring 36.9 meters in width, 8.7 meters in height, and 91 meters in length will be joined together. The tunnel is expected for completion by 2009.



### Construction of new Shibakawa Tunnel

Shibakawa is a river without a headspring, and the deterioration of water quality due to household wastewater from various sources has become a problem of ever increasing concern. To improve this situation, a project is being promoted to introduce clean water from Arakawa River for purification. As part of this project, our company received an order to construct a Shibakawa water tunnel from the Ministry of Land, Infrastructure and Transportation. It was difficult to recycle the sludge produced by the construction work that contained large quantities of water using conventional technologies and equipment. However, our company introduced the first sludge recycling system developed by Mitsubishi Heavy Industries into the 2,300-meter-long shield tunneling work site to recycle the sludge generated by the construction work. A total of some 5,300 m<sup>3</sup> of excavated mud was recycled for use as banking material. Our efforts were highly rated and acknowledged as the model for effective recycling work in 2001, winning the Chairman's Award of the Recycling Promotion Committee.



### Construction of Arai Auction Bayside

TOA received an order to design and construct the largest auction hall in Japan in the Higashi Ogishima district of Kawasaki, near Tokyo. Built on a site that is 100,000 m<sup>2</sup> or ten hectares in area, construction of the hall was completed in September 2001. The hall can support the latest digital video type satellite communication systems, is provided with 1,200 posting seats, a display motor pool that is about 82,500 m<sup>2</sup> in size and a carrier car space of 16,500 m<sup>2</sup> that can also be used as a parking lot, accommodating 5,000 cars on display.



### Construction of new Yumeshima container terminal

In order to cope with the recent increase in the size of containerships and the quantity of cargo being processed through at Osaka Port, work is being promoted to upgrade the largest high-standard container berth (three submerged type berths of 15 meters in depth) at Yumeshima (Kita-Konan district). During the current year, work was completed on the administration building, maintenance shop building used for repair of various port facilities and support of container handling, and the gatehouse building used for entry and exit of trailers. These facilities form the core of Yumeshima container terminal C-11, which is the largest physical distribution site at Osaka Port. TOA was responsible for construction of these facilities.



### Project for construction of Melville Street Fish Market

This project consists of construction of a fish market ordered by the Ministry of Agriculture, Lands, Forestry, and Fisheries, the Government of Grenada, a country in the Caribbean Sea in Central America. The site is located on the coast along Melville Street. The project was completed in August 2001.



### Phu My Thermal Power Plant

Vietnam has been enjoying a period of conspicuous development. This has led to increasing investment in the country by Japanese and many other foreign corporations each year. Consequently, the shortage of absolute electric power and related energy infrastructure has become quite serious. The Phu My district, 80 kilometers southeast of Ho Chi Minh City, has been designated as an important power supply district. Three power plants are under construction in the district in addition to the power plant that is currently in operation in the area. The Vietnamese government borrowed funds from the Japanese government to construct the Phu My No.1 Power Plant to produce 1000 MW of electricity. The Electricity Corporation of Vietnam will own this plant. As a subcontractor of Mitsubishi Heavy Industries, Ltd., who built the plant, our company took charge of the civil engineering and construction work, among other tasks for construction of the power plant. These tasks included construction of the following facilities: (1) a steam turbine building, (2) a gas turbine building, (3) a central control building, (4) and administration building, (5) C/W intake/discharge facilities, (6) an oil unloading jetty, amongst others. The project was completed in May 2002.

