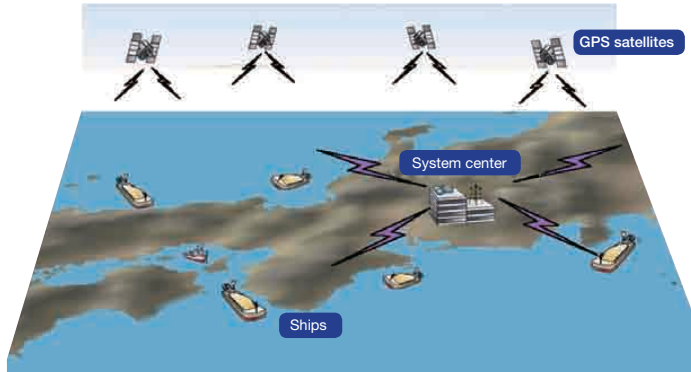


# RESEARCH & DEVELOPMENT

## COS-NET (Construction On the Sea Network)



COS-NET (Construction On the Sea Network) is a system for monitoring and controlling work vessels through a combination of GPS and IT technology. Utilizing this system makes it easy to obtain accurate positions and other operation data.

## Koukaku



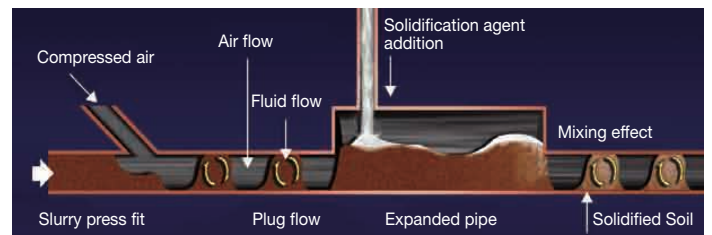
Koukaku is a special vessel designed for use with the CDM (Cement Deep Mixing) method, which is utilized to improve soft ground into a solid foundation suitable for the construction of a seawall, wharf, or quay. Koukaku is essential for providing stable support for large-scale structures. In addition, it is the first ecologically-oriented vessel equipped with a hybrid system that combines the high efficiency of fuel energy and natural energy.

## Magical Dredging Ball

In collaboration with Tokyo Electric Power Company, TOA developed and has been putting to use the Magical Dredging Ball. This is a small-sized device for removing sediment, and is useful for eliminating sand and sludge from ponds for adjustment, as well as from reservoirs of dams for hydroelectric power plants.



## Plug Magic Method



TOA developed an engineering method called the "Plug Magic Method." This method enables soft dredged soil to be solidified efficiently for reuse as a filling material. This method requires no mixer, reducing the operating cost by as much as 10 to 15%. It is also an environmentally-friendly method that enables in-pipe transportation of soft mud from the dredging site to the reclamation site. Plug flow occurs when compressed air is mixed into soft mud in a pneumatic pipeline. This method kneads soft mud and solidification material in the pneumatic pipeline, utilizing the characteristics of plug flow. It has a maximum solidification capacity of 1,000m<sup>2</sup>/h.

## Beluga System

This is an original system developed by TOA for accurate and speedy measurement of the depth of ground level in water by effectively combining the latest measurement devices, including the narrow multi-beam depth measuring sonar and GPS, in order to acquire data in wide spaces.

