

Commissioning of the New 20-M Type Survey Boat “KURUSHIMA”



New Survey Boat “KURUSHIMA”, navigation in the SETO Inland Sea

The 6th Regional Coast Guard Headquarters (RCGH) takes charge of security and safe navigation in the SETO Inland Sea, which has complicated coast lines and a lot of islands. This area has rapid tidal currents and a complicated stream for many narrow waterways.

A previous survey vessel was built in 1977, and more than 25 years had passed and it was difficult to navigate through Kurushima Channel, which especially had maximum 10 knots of tidal current. So a new survey boat was constructed and named as “KURUSHIMA” as that substitution. The new boat surveys a harbor, a coast, and a traffic route efficiently and engages in the latest maintenance of the chart.

Furthermore, the boat also investigates coastal sea condition, tidal observation and harbor researches etc.

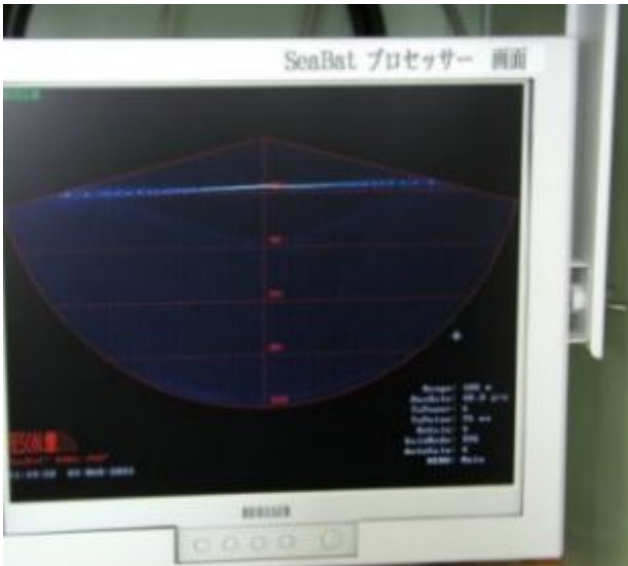
The new survey boat “KURUSHIMA” has about 20-meter length and has been installed with the latest devices, which are introduced below,

1 Multi-beam echo sounder (Seabat 8101)

This system illuminates a swath on the seafloor that is 150 degrees across track and 1.5 degrees along track from the boat.

The swath consists of 101 individual 1.5 by 1.5 degree beams with a bottom detection range resolution of 1.0 cm.

It is possible to survey about 7.4 times width of the water depth, when in depths of 1 to 100 m.



Display of SEABAT



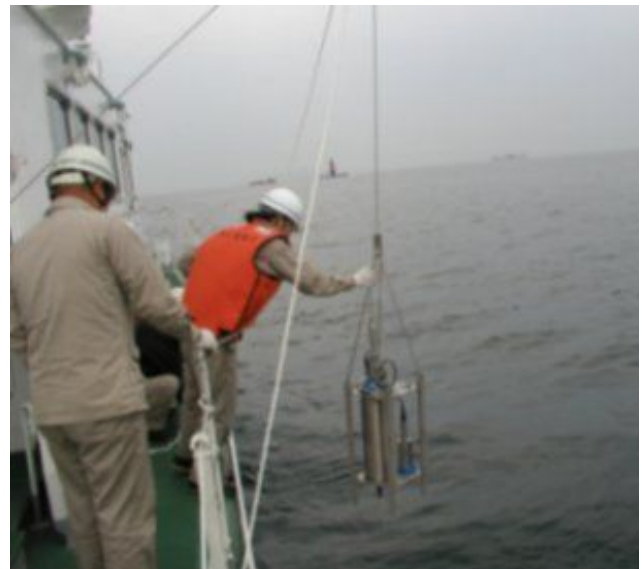
Sonar Head

2 Automatic Observation System of Water Quality

This device that was installed for the first time into the small size survey boat of Japan Coast Guard (JCG) can measure 7 items (water temperature, turbidity, water depth, conductivity, pH, dissolved oxygen and chlorophyll density). The observational value from surface to 100m depth can be displayed in real time.



Display of Automatic observation system



Sensor

3 Acoustic Doppler Current Profiler (Workhorse Mariner ADCP)

ADCP shoots the supersonic waves into the sea from the transmission device equipped in the bottom of the boat. And ADCP measures the current by utilizing the Doppler effect of the frequency of the reflection wave from the small particles and seabed etc. The frequency of ADCP is 600 kHz and it is possible to measure a current from depth of 1.5 m to 70 m.



Sensor of ADCP

4 Survey Data Recording System

This system uses automatic recording and processing software (HYPACK MAX) that is incorporated in the data processing device. And this system can process many kind of data, such as position data from DGPS or KGPS, sounding data from multi-beam echo sounder, direction and motion data of boat from POS/MV in real time, and etc. In the former survey system, the sound velocity of water must be measured by sound velocity measuring unit before survey. However, this system is able to correspond to the sharp change of the sound velocity because this system is able to take constantly the sound velocity simultaneous with multi-beam echo sounding.

5 Electronic Chart Display and Information Software (NAVI Sailor)

We use the Electronic Chart Display and Information Software (NAVI Sailor) not only for a voyage, but also for a hydrographic survey by indicating radar signal processing information in the survey area on the screen. NAVI Sailor is also used to make an observational plan on its screen and to display the position of the boat on the electronic chart to keep safe navigation during surveying.

Postscript

The most characteristic feature of the new survey boat “KURUSHIMA” is that automatic observation system of water quality is equipped. A previous survey boat could not observe dissolved oxygen in sea water under sailing, so it was doing measurement by using the chemistry analysis method after sailing. The dissolving oxygen quantity is an important parameter to know the condition of the poor oxygen water mass in the sea. The inhabitants cannot live if this dissolving oxygen quantity decreases extremely. And it will make a big fishing industrial damage. It is important to investigate the dissolving oxygen in the sea when we want to know the degree of satisfaction for the environmental standards. The observation result of new survey boat is expected with that is used greatly.

New Survey Boat "KURUSHIMA", Hull figure

